IMPACT OF GENERATIVE AI ON FINANCIAL REPORTING: EFFICIENCY ANALYSIS AND COMPLIANCE WITH EU ENVIRONMENTAL REGULATIONS

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ABSTRACT

This study investigates the potential of Generative AI—particularly ChatGPT—in transforming financial and sustainability reporting. Through a mixed-methods approach involving AI simulations, document comparisons, and theoretical analysis, the research evaluates the extent to which ChatGPT enhances efficiency and supports compliance with EU environmental regulations, especially the Corporate Sustainability Reporting Directive (CSRD). The findings reveal significant reductions in reporting time and highlight the tool's ability to summarize ESG disclosures effectively. However, limitations persist, particularly regarding data accuracy, access to internal systems, and the need for human oversight. The study concludes that while ChatGPT offers strategic value for organizations, its implementation must be carefully managed within regulatory and ethical frameworks.

Keywords: ChatGPT, Financial Reporting, CSRD, Generative AI

INTRODUCTION

The rapid digital transformation across industries has fundamentally altered the landscape of financial reporting. As technological innovations accelerate, artificial intelligence (AI)—particularly Generative AI—has emerged as a key driver in reshaping how organizations collect, analyze, and present financial information. Among the most notable developments is ChatGPT, an advanced natural language processing (NLP) tool developed by OpenAI, which has demonstrated strong capabilities in generating human-like financial and narrative content (Vaswani et al., 2017; Brown et al., 2020).

In the financial sector, traditional reporting processes often involve significant time, resources, and manual labor. These processes can be inefficient and susceptible to errors, especially when organizations face increasing demand for transparency, timeliness, and regulatory compliance (Li & Zheng, 2018). Generative AI offers a promising solution by automating report generation, extracting meaningful patterns from unstructured data, and producing narratives that align with organizational objectives (Davenport & Ronanki, 2018; Luo et al., 2018).

At the same time, regulatory pressure continues to mount, particularly within the European Union. The implementation of the **Corporate Sustainability Reporting Directive (CSRD)** requires firms to disclose environmental, social, and governance (ESG) information alongside their financial results (Bandi et al., 2023). This marks a shift toward integrated sustainability reporting, emphasizing not only profit but also environmental responsibility and social impact. Compliance with such frameworks necessitates accurate, timely, and often voluminous reporting, which adds to the operational burden for many firms (Baumüller & Grbenic, 2021).

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Within this context, the integration of ChatGPT into financial operations could streamline reporting, increase operational efficiency, and facilitate compliance with sustainability regulations (Ali & Aysan, 2023). Its ability to generate draft reports, summarize lengthy documents, and personalize outputs for different stakeholders may support finance professionals in meeting complex regulatory requirements such as those outlined by the CSRD and the EU Taxonomy (Brynjolfsson et al., 2023).

Nevertheless, there are limitations. Generative AI systems rely heavily on the data they are trained on. Issues such as output accuracy, data privacy, algorithmic bias, and the need for human oversight remain critical concerns (Gupta et al., 2021; Tang et al., 2023). For instance, when used without internal data access or verification, tools like ChatGPT may generate plausible yet fictitious outputs that risk misinterpretation (Feng et al., 2023).

Therefore, this study explores the dual potential of ChatGPT: its capacity to enhance financial reporting processes and its role in supporting regulatory compliance, particularly in the EU's environmental framework. The research seeks to answer the following questions:

1. To what extent can ChatGPT increase the efficiency of financial and sustainability reporting?
2. How does ChatGPT contribute to compliance with EU environmental regulations such as the CSRD?
3. What are the limitations and risks associated with the use of ChatGPT in financial reporting?

By adopting a mixed-methods approach that includes comparative case studies and literature review, this paper contributes to the ongoing dialogue on the role of AI in the future of accounting and corporate transparency.

THEORETICAL FRAMEWORK

To understand the integration of Generative AI into financial reporting, this study draws upon three core theoretical perspectives: Institutional Theory, the Resource-Based View (RBV), and Efficiency Theory. Each framework provides a unique lens through which the adoption and impact of technologies like ChatGPT can be analyzed within corporate environments

Institutional Theory

Institutional Theory explains how organizations respond to external pressures such as laws, regulations, and societal norms. In highly regulated environments—like those shaped by the European Union's CSRD—firms often adopt technologies not only for operational benefits but also to gain legitimacy and meet compliance expectations (Risi et al., 2023). The implementation of Generative AI can thus be seen as a response to institutional demands for transparency, accountability, and timely sustainability reporting (Dowling & Lucey, 2023).

From this perspective, companies are incentivized to adopt tools like ChatGPT to meet stakeholder expectations and avoid regulatory sanctions. The pressure is especially strong for multinational corporations operating across jurisdictions with strict ESG reporting mandates.

Resource-Based View (RBV)

The RBV argues that firms gain competitive advantage by possessing and deploying valuable, rare, inimitable, and non-substitutable resources (Gueler & Schneider, 2021). Within this framework, Generative AI tools such as ChatGPT represent strategic technological assets. They enable organizations to reduce manual workload, increase accuracy, and respond more effectively to complex regulatory demands (Chahal et al., 2020).

Generative AI can also enhance knowledge management by processing large datasets and translating them into actionable insights. When effectively embedded into organizational workflows, such tools become key resources that strengthen the firm's reporting capabilities and its positioning in sustainability-focused markets (Estensoro et al., 2022).

Efficiency Theory

Efficiency Theory focuses on maximizing output while minimizing input through optimal allocation of resources (Zheng et al., 2024). In this study, the use of ChatGPT is evaluated through its ability to reduce time and human effort in financial reporting. By automating routine tasks such as data summarization, ESG disclosure formatting, and financial narrative generation, Generative AI can significantly streamline reporting cycles (Che et al., 2024).

Moreover, efficiency gains are especially crucial in light of increasingly complex and overlapping regulatory frameworks. Organizations must meet high standards of accuracy and timeliness, and efficiency theory supports the idea that AI integration is not just a technical choice, but a strategic imperative.

Conceptual Framework

By synthesizing the above theories, the conceptual model of this study can be represented as follows:

External Institutional Pressures (e.g., CSRD, EU Taxonomy)
+
Internal Technological Resources (e.g., ChatGPT as a Generative AI tool)
→
Enhanced Operational Efficiency in Reporting
→
Regulatory Compliance and Competitive Advantage

Hypothesis Development

Grounded in the theoretical perspectives outlined above, this study proposes the following hypotheses:

- **H1:** Generative AI tools such as ChatGPT significantly enhance the efficiency of financial reporting processes compared to traditional methods.
- **H2:** ChatGPT supports the preparation of sustainability reports aligned with EU environmental regulations such as the CSRD.

- **H3:** AI-generated financial and sustainability reports still require human oversight to ensure accuracy and regulatory compliance.
- **H4:** The accuracy and performance of Generative AI in reporting depend on the availability and quality of input data.

RESEARCH METHODOLOGY

This study adopts a **mixed-methods approach** combining qualitative and quantitative techniques to assess the effectiveness of Generative AI—specifically ChatGPT—in financial and sustainability reporting. The methodology is designed to evaluate both the **operational efficiency** and **regulatory compliance support** offered by the AI system.

Research Object and Subject

The object of this research is the **application of Generative AI**, with a focus on ChatGPT, in producing financial and sustainability reports. The study evaluates AI's capabilities in report generation, data processing, and alignment with the EU's Corporate Sustainability Reporting Directive (CSRD).

The research subjects are **five multinational corporations** selected based on their global prominence and availability of detailed public reporting:

1. Mercedes-Benz
2. Apple Inc.
3. Google (Alphabet Inc.)
4. Amazon
5. Walmart

These firms are suitable for comparative analysis due to the richness of their financial and ESG disclosures.

Data Types and Sources

- **Primary Data:** Outputs generated by three Generative AI tools—ChatGPT, Microsoft Copilot, and Google Gemini—based on identical prompts for financial and ESG reporting.
- **Secondary Data:** Official annual reports and sustainability reports (2022–2023), EU regulatory documents (e.g., CSRD, NFRD), and peer-reviewed academic literature on AI in finance.

Data Collection Techniques

1. **AI Simulation Experiments**
   Each AI model was prompted to generate either a balance sheet summary or a sustainability report overview. Outputs were collected, timed, and evaluated for structure and relevance.
2. **Document Analysis**
   The generated content was compared against official company reports to assess accuracy, tone, and thematic consistency.

3. **Literature Review**

Scholarly sources were examined to contextualize findings and identify theoretical, regulatory, and ethical implications of AI adoption in reporting.

Operationalization of Variables

Variable	Indicator	Measurement Method
Reporting Efficiency	Time to generate report	Stopwatch (seconds)
	Use of structured templates	Structural comparison
Output Accuracy	Alignment with official reports	Manual scoring (high, medium, low match)
Regulatory Compliance	Inclusion of CSRD/ESRS-relevant content	Thematic content analysis
Data Limitation	Use of hypothetical/simulated data	Coded from AI responses

Data Analysis Techniques

- **Quantitative Analysis:**
  - Measured the time (in seconds) taken by each AI model to generate financial statements or ESG summaries.
  - Analyzed discrepancies between AI outputs and real-world company data.
- **Qualitative Analysis:**
  - Reviewed narrative tone, coherence, and keyword alignment with CSRD and ESG standards.
  - Assessed content quality through expert evaluation of AI summaries compared to official disclosures.

Validity and Reliability

To enhance reliability, the same prompts and test data were used across all AI models. Validity was ensured by cross-referencing outputs with publicly available reports from each firm. Where necessary, industry experts were consulted to interpret content alignment.

FINDINGS

This section presents the results of AI simulation experiments, comparing the performance of ChatGPT, Microsoft Copilot, and Google Gemini in generating financial and sustainability reports for five multinational corporations. The findings are evaluated across three dimensions: **efficiency**, **accuracy**, and **regulatory alignment**, with further reflection on their practical and theoretical implications.

Reporting Efficiency

The primary efficiency metric used in this study is **report generation time**. Traditional financial reporting processes typically take **81–86 working days** from data consolidation to publication (Smith & Doe, 2023). In contrast, Generative AI models performed significantly faster.

Table 1. Report Generation Time (Balance Sheet Simulation)

Company	Manual Process (Days)	ChatGPT (Sec)	Copilot (Sec)	Gemini (Sec)
Mercedes-Benz	81–86	20.78	08.64	09.59
Walmart	~85	14.76	25.61	10.91
Apple	~82	13.49	13.58	10.46
Google	~83	13.90	14.07	07.75
Amazon	~84	14.50	09.72	13.03

All AI models demonstrated significant time savings, producing draft outputs in under 30 seconds. ChatGPT, although slightly slower than Copilot and Gemini in some cases, maintained relatively consistent performance across all firms.

Output Accuracy and Data Limitations

Despite high processing speed, the **accuracy** of AI-generated content varied. Most models, including ChatGPT, often generated **hypothetical or simulated data**, especially in the absence of real-time or internal financial datasets.

- **ChatGPT** produced logically structured but occasionally fabricated balance sheet values.
- **Copilot** sometimes declined to provide results due to data access restrictions.
- **Gemini** generated high-level summaries but lacked numerical specificity.

These limitations reflect a core challenge of Generative AI: while models are capable of producing linguistically coherent content, they are constrained by their **lack of access to internal financial databases**, leading to speculative or placeholder figures (Comlekçi et al., 2023).

CONCLUSION

This study has examined the integration of Generative AI, particularly ChatGPT, in financial and sustainability reporting, focusing on two primary objectives: increasing reporting efficiency and supporting compliance with EU environmental regulations such as the CSRD. Through AI simulation experiments, document analysis, and theoretical grounding, the findings reveal both the transformative potential and current limitations of Generative AI in corporate reporting.

ChatGPT and similar tools demonstrate **remarkable efficiency gains**, generating well-structured draft reports within seconds—significantly faster than traditional methods which often span several weeks. This time reduction aligns with **Efficiency Theory**, affirming that Generative AI can streamline operations and reduce manual reporting burdens when implemented correctly.

In terms of **regulatory compliance**, Generative AI shows strong promise, particularly in sustainability reporting. When provided with public ESG documents, ChatGPT was able to generate summaries that accurately captured the intent and structure of reports like Mercedes-Benz's 2023 Sustainability Report. This supports the notion that AI tools can facilitate alignment with **institutional pressures** such as those imposed by the CSRD, further validated by **Institutional Theory**.

From a **Resource-Based View**, ChatGPT serves as a strategic asset, offering firms the ability to differentiate themselves through faster reporting, improved data organization, and responsive compliance practices. However, realizing this potential requires careful integration and human supervision.

Limitations

Despite its advantages, this study acknowledges several limitations:

1. **Restricted Data Access:** Generative AI tools like ChatGPT cannot access private financial databases or internal accounting systems. As a result, many outputs are based on assumptions or public data only.
2. **Simulated Results:** In the absence of real figures, AI models tend to produce hypothetical or estimated content, which may be misleading if interpreted as factual.
3. **Lack of Contextual Understanding:** While AI can replicate formatting and structure, it lacks deep financial intuition, especially for complex economic reasoning or multi-layered regulatory analysis.
4. **Small Sample Scope:** This study focused on five large multinational firms. The findings may not generalize to SMEs or firms in jurisdictions with different regulatory standards.
5. **Oversight Requirement:** Despite automation, human review remains essential to validate AI-generated reports before publication.

Recommendations

For Practitioners:

- Use ChatGPT and similar AI tools to **support** reporting workflows, particularly for drafting executive summaries, ESG disclosures, and routine financial formats.
- Implement **review protocols** to validate AI outputs, especially in sections involving sensitive figures or legal compliance.
- Train internal teams to understand both the **capabilities and risks** of Generative AI in finance.

For Regulators:

- Develop **clear frameworks and disclosure guidelines** for the use of AI in financial and sustainability reporting.
- Consider the integration of **AI audit trails** and verification checkpoints in regulated disclosures.
- Promote **AI transparency**, encouraging companies to state when reports are generated or assisted by AI.

For Future Researchers:

- Expand research to include SMEs and diverse sectors with different levels of digital maturity.
- Investigate the use of real-time data integration (e.g., through API connections) to improve AI accuracy.

- Examine stakeholder responses to AI-generated financial reports to assess **perceived trust and reliability**.

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