



Digitalization, Big Data Analytics, Corporate Sustainability, and Tax Behavior: An Integrated Literature Review

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Abstract.

This literature review examines how digitalization, which includes big data analytics (BDA), artificial intelligence (AI), blockchain, and e-invoicing, interacts with corporate sustainability practices and tax behavior. By bringing together evidence from various regions, it identifies key factors that affect environmental, social, and governance (ESG) outcomes as well as tax compliance. The findings show that adopting digital tools improves ESG performance, particularly in governance and social areas, while the impact on the environment is more complex. Digital tax tools, like mandatory e-invoicing and blockchain, boost compliance but depend on the quality of institutions and the culture of organizations. The review also suggests a framework that connects digital tools to firm performance through key factors like transparency and process improvement. It emphasizes governance aspects such as board diversity and measures against corruption. The review offers practical advice for corporate boards, policymakers, and regulators to help shape digital transformation strategies that balance compliance with sustainability goals. The originality of this work lies in integrating digitalization, corporate sustainability, and tax behavior into a single framework, pointing out gaps in research for future studies.

Keywords: Digitalization, Big Data Analytics, Corporate Sustainability, Tax Compliance, ESG, Blockchain

1 Introduction

Digital transformation has become essential for improving organizational governance, environmental responsibility, and financial accountability. Innovations like big data analytics (BDA), blockchain, and artificial intelligence (AI) have streamlined internal processes and improved firms' interactions with stakeholders, tax authorities, and sustainability standards. Most existing studies focus on separate relationships, such as technology and ESG performance or governance and tax avoidance. However, a complete synthesis that combines these elements is still lacking.

This review aims to:

- Systematically map scholarly evidence linking digital tools to corporate sustainability and tax compliance;
- Identify mediating factors such as optimization and transparency;
- Examine contextual factors like organizational culture, governance structures, and political connections;
- Provide practical insights for practitioners and regulators dealing with digital transformation in sustainability and taxation contexts.

1.1 Novelty and Contribution

Unlike previous fragmented studies, this review presents a unified conceptual framework that connects digital transformation, ESG outcomes, and tax behavior. It highlights the mixed environmental effects of digital adoption and the important role of governance quality and institutional conditions. This synthesis across governance, financial, and environmental viewpoints lays the groundwork for research and policy efforts promoting sustainable and responsible corporate digitalization.

2 Literature Review

Table 1 shows the Digital Levers, Mechanisms, and Outcomes along with Boundary Conditions.

Table 1. Digital Levers, Mechanisms, and Outcomes

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Digital Levers	Intermediate Mechanisms	Boundary Conditions	Outcomes
Big-data analytics & AI	Reduced agency-cost, process optimization	Big-data analytics capability (BDAC)	Improvements in ESG (Governance, Social > Environmental)
IoT and Industry 4.0	Enhanced stakeholder/media/analyst review	Institutional quality, corruption	Reduced tax avoidance
E-invoicing & blockchain	Real-time tax risk detection	Board gender diversity, political ties	Increased market valuation with genuine CSR
Digital reporting standards & platforms	Improved disclosure and governance	Firm lifecycle stage (maturity, SOE/private)	Non-linear & sector-specific effects

2.2 Empirical Evidence Across Regions

To show with proof of studies in table 2, we used Makni Fourati, Zhao, Mosuin, Bellon, Li, Zhou & Wang, Gutiérrez & Soto, Kraus, Ahmed & Akhtar , Bai , OECD, and PwC.

Table 2. Selected studies on digital levers and their impacts

Study	Region/Period	Key Digital Lever	Main Findings
Makni Fourati et al.	EU 2002–2015	CSR scores	CSR correlates with higher tax avoidance
Zhao (2024)	Global	AI in ESG	AI enhances environmental optimization, social inclusion
Mosuin et al. (2024)	Malaysia 2018–2022	Governance mechanisms	Strong governance reduces tax avoidance
Bellon et al. (2022)	Peru 2014–2017	Mandatory e-invoicing	Boosted VAT revenue
Li et al. (2021)	Global 2002–2021	ESG framework analysis	Governance central to ESG impact

Zhou & Wang (2023)	China 2016–2022	AI & ESG reporting	AI improved ESG disclosure quality and precision
Gutiérrez & Soto (2024)	Latin America	Blockchain tax systems	Increased transparency, reduced fraud
Kraus et al. (2021)	EU SMEs	Digital transformation	Fostered sustainable business models
Ahmed & Akhtar (2022)	South Asia	Big Data Analytics	Improved CSR quality; governance moderated effect
Bai et al. (2022)	China manufacturing	AI for emissions	Reduced CO ₂ through production optimization
OECD (2022)	OECD members	E-invoicing	Closed VAT gap; improved compliance
PwC (2023)	Global	AI ethics frameworks	Governance guidelines reduced algorithmic bias

3 Conceptual Framework

The proposed model as shown in figure 1 illustrates the relationship between digital tools (BDA, AI, blockchain, IoT, and digital reporting tools) and corporate outcomes (ESG performance, tax compliance, market valuation). It includes mediating factors (e.g., optimization, improved monitoring, transparency) and boundary conditions (governance strength, political connections, cultural context).

Figure 1. Proposed conceptual framework linking digital levers to corporate outcomes.



4 Discussion

4.1 Impact of Digital Transformation on ESG/CSR Performance

Digital adoption generally improves ESG scores, particularly in governance and social dimensions. Big data analytics boosts CSR effectiveness when supported by internal BDAC. Environmental impacts show nonlinear, U-shaped effects; emissions initially increase before efficiency gains show. AI applications enhance environmental management, foster social inclusion (such as transparency in hiring and employee well-being), and strengthen governance through fraud detection. Organizational culture, governance mechanisms, and board gender diversity influence effectiveness.

4.2 Impact of Digitalization on Tax Behavior

Digital tools like mandatory e-invoicing have raised tax liabilities and decreased avoidance, particularly in SMEs and high-risk sectors. Blockchain-based and mobile payment invoicing also bolster compliance. Machine learning improves audit targeting and detection efficiency. The quality of governance and institutional conditions affect effectiveness; corruption can lessen benefits. Firms may strategically balance tax avoidance with CSR investments, which affects their reputation and goodwill.

4.3 Corporate Governance Mechanisms and Tax Avoidance

Institutional ownership and audit quality, especially among Big 4 auditors, are linked to reduced tax avoidance. Executive incentives affect tax strategies differently across firms. Foreign ownership shows mixed results, sometimes improving oversight and other times leading to aggressive tax planning. Monitoring by the board, executive pay, and audit tenure significantly connect tax behavior with shareholder interests.

4.4 CSR-Tax Avoidance Nexus: Contrasting Perspectives

Some studies find a positive link between CSR and tax avoidance, suggesting combined strategies that merge social projects with tax minimization. Others show a negative connection, indicating that CSR acceptance can involve paying higher taxes for legitimacy. The relationship varies by CSR aspect; economic and governance dimensions often correlate positively with tax avoidance, while social and environmental patterns are less consistent. Stakeholder versus shareholder frameworks provide different explanations.

5 Practical Recommendations

Table 3 gives the practical recommendations of the stakeholders.

Table 3. Stakeholder-specific recommendations

Stakeholder	Recommendations
Boards & Executives	Strengthen BDAC before expanding BDA-driven CSR initiatives; include female directors; monitor non-linear environmental impacts.
Tax Authorities	Implement mandatory e-invoicing & blockchain; complement with enforcement reforms; target SME, fight corruption.
CFOs and Tax Officers	Make use of real-time digital analytics dashboards; manage VAT credit stocks; align CSR with tax transparency.
Investors & ESG Raters	Regulate ratings for firm digital maturity and BDAC; assess governance and board diversity impacts.
Polymakers	Encourage open digital data ecosystems; anti-corruption efforts; incentivize sustainable digital investments.

6 Conclusion and Future Research

Digital transformation is crucial for improving corporate sustainability and tax compliance, especially when backed by strong analytics and governance. However, results vary widely across institutional contexts and firm characteristics. Therefore, investments in data capabilities, governance changes, and transparency are vital to fully realize digitalization's potential for responsible and sustainable corporate behavior.

Research Gaps and Future Directions

- Conduct robust causal analysis of mechanisms linking digitalization to ESG and tax outcomes.
- Assess the impact of digital tools on supply chain (Scope 3) emissions and sustainability.
- Investigate how AI-powered ESG dashboards affect investor behavior and regulatory standards.
- Integrate digital corporate responsibility, including privacy, ethics, and labor, into ESG frameworks.
- Perform empirical studies on digital impacts in SMEs and emerging markets.
- Monitor long-term tax revenue changes after digital reforms.

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