Proceedings of Business and Economic Studies, 2025, Volume 8, Issue 4
http://ojs.bbwpublisher.com/index.php/PBES
Online ISSN: 2209-265X
Print ISSN: 2209-2641

Research on the Impact of the Digital Economy on Enterprises' ESG Performance

Yun Li*, Chaofu Qin

Hainan Vocational University of Science and Technology, Haikou 570100, Hainan, China

**Author to whom correspondence should be addressed.*

Abstract: The digital economy has significant positive externalities in promoting the sustainable development of enterprises, providing an important opportunity for enterprises to improve their ESG performance. Through analysis, it is found that the digital economy has a huge impact on enterprise performance, mainly through three mechanisms: promoting environmental performance, strengthening social responsibility, and optimizing the governance structure. The research results of this paper help to expand the understanding of the dividend effect of the digital economy and deepen the theoretical understanding of the sustainable development of enterprises in the context of the digital economy.

Keywords: Digital economy; Enterprise ESG; Mechanism of action

Online publication: September 10, 2025

1. Introduction

The "Overall Layout Plan for Digital China Construction" clearly points out that the digital economy is an important driving force for promoting Chinese-style modernization. According to the data in "The Research Report on the Development of China's Digital Economy (2023)", in 2022, the total volume of China's digital economy exceeded 50.2 trillion yuan, accounting for 41.5% of GDP. The rapid development of the digital economy not only promotes high-quality economic growth but also provides strong impetus for digital economy construction. With the advancement of industrial digitalization, the digital economy has brought significant dividends to real-economy enterprises. It alleviates the financing difficulties of enterprises by changing the traditional financial ecology, promotes the application of digital technologies, improves enterprise efficiency, and drives management transformation. These changes have a profound impact on the sustainable development of enterprises. Environment, Social, and Governance (ESG), as the core criteria for measuring the sustainable development capabilities of enterprises, have received increasing attention from all parties [1]. The performance of enterprises in environmental responsibility, social responsibility, and corporate governance reflects their comprehensive management level. Therefore, it has become an important task at present to encourage enterprises to fulfill more

ESG responsibilities, especially in the context of the digital economy [2].

2. Overview of the digital economy

2.1. The connotation of the digital economy

The digital economy refers to the sum of various economic activities driven by digital technologies, with data as the key production factor and modern information networks as the foundation. Its core lies in deeply optimizing and reconstructing resource allocation, production processes, and service models through technical means, thereby improving the efficiency and quality of economic operation [3].

2.2. The characteristics of the digital economy

(1) Relying on cutting-edge technologies such as big data and artificial intelligence, it significantly improves the operating efficiency of enterprises, making the decision-making process more scientific and intelligent.

(2) The development of the platform economy and blockchain technology has broken the traditional centralized model, promoting the open flow and collaborative sharing of resource elements.

(3) The digitalization and visualization of information enhance the transparency of the transaction process, improving the controllability and compliance of enterprise management.

3. The impact mechanism of the digital economy on enterprises' ESG performance

3.1. The promoting effect on environmental performance

3.1.1 Improving resource utilization efficiency

Through technical means such as intelligent manufacturing, the industrial Internet, and the Internet of Things, the digital economy enables enterprises to conduct real-time monitoring and dynamic optimization management of energy, water resources, raw materials, etc. For example, intelligent sensors can collect energy consumption data, and with the help of AI algorithms, identify energy-efficiency bottlenecks and put forward improvement suggestions. The industrial Internet platform can achieve remote equipment management and predictive maintenance, reducing energy consumption and emissions and improving the overall resource allocation efficiency, helping enterprises build a green production system [4–6].

3.1.2. Promoting green innovation

Digital technologies also provide solid support for green technology research and development. A big-data-based carbon-emission monitoring system can accurately assess the carbon footprint of enterprises, providing a scientific basis for setting carbon-emission reduction targets and performance appraisals. At the same time, enterprises can use cloud computing and artificial intelligence to accelerate the design and testing of green products, promoting the industrialization of technological achievements such as new energy, degradable materials, and green packaging, and forming a sustainable green-innovation ability [7].

3.1.3. Realizing the transparency of environmental information

With its characteristics of "non-tampering" and "full-process traceability", blockchain technology provides a new solution for the recording and disclosure of enterprise environmental information. At the same time, enterprises can use the blockchain system to record energy use, emission data, and green investment, building an open

and trustworthy environmental-information disclosure platform. This not only enhances the transparency and credibility of environmental protection data but also facilitates the supervision of enterprises' responsibility-fulfilling behaviors by the government, investors, and the public, further promoting enterprises to assume environmental responsibilities.

3.2. The strengthening effect on social responsibility

3.2.1. Promoting the intelligent management of employee welfare and labor protection

The health and safety of employees are related to their well-being and should be taken seriously. With the help of digital human-resources management systems, enterprises can monitor the health, safety, and satisfaction of employees in real-time. Through big-data analysis of career preferences and performance trends, personalized career-development paths and welfare policies can be customized for employees. For example, some enterprises have provided health-consultation services for employees through remote-medical platforms, enhancing employees' well-being and sense of belonging and reflecting their attention to employees' rights and interests [8].

3.2.2. Expanding public welfare and social influence

Digital platforms (such as WeChat official accounts, public-welfare APPs, and crowdfunding platforms) provide convenient and efficient channels for enterprises to participate in public-welfare activities. Enterprises can expand their public-welfare influence through live-streaming, short videos, online donations, etc., enhancing social recognition. For example, some enterprises use digital tools to carry out targeted poverty alleviation, connecting the specific needs of poverty-stricken areas to achieve efficient resource allocation, thereby enhancing the enterprise's social reputation and public trust [9].

3.2.3. Ensuring the fairness and compliance of the supply chain

Digital supply-chain management tools (such as ERP systems and blockchain traceability platforms) enable enterprises to monitor all links of the supply chain in real-time, ensuring that the sources of raw materials are legal and that suppliers have no issues such as child labor, forced labor, or environmental violations. The system can also automatically identify risk nodes and provide early-warning prompts, strengthening supply-chain responsibility governance, effectively reducing legal and reputational risks, and improving the overall performance of enterprises in social responsibility [10].

3.3. The optimizing effect on corporate governance

3.3.1. Improving governance transparency and data visualization capabilities

Enterprises can use business intelligence (BI) tools, data dashboards, and financial-analysis systems to keep track of key business data in real-time, improving governance transparency. Intelligent audit systems (such as RPA combined with AI technology) can automatically identify financial anomalies, strengthening internal control and reducing the risk of fraud. Data visualization transforms complex operational data into intuitive charts, providing accurate decision-making support for management and optimizing governance effectiveness [11].

3.3.2. Strengthening external supervision and investor communication

Digital technologies promote the standardized and real-time disclosure of enterprise ESG information. Through sustainable-development report platforms and ESG rating websites, enterprises can actively release key information such as environmental emissions, social-responsibility fulfillment, and governance structures,

improving information transparency and investor confidence. At the same time, enterprises can also use online investor-relations management systems to interact with the market in real-time, meeting the high requirements of the capital market for sustainable governance [12].

3.3.3. Supporting the optimization of the governance structure

Digital tools provide the board of directors and management with real-time operation and external-environment data, enhancing their sensitivity to the operating status of the enterprise and their ability to respond. For example, an AI-driven strategic-management platform can dynamically assess external risks and internal performance of the enterprise, assisting in formulating and adjusting development strategies. In addition, intelligent systems can support the board of directors in achieving refined management in risk control, performance appraisal, and incentive-mechanism design, promoting the evolution of corporate governance towards transparency and professionalism [13].

4. Typical case analysis

In the context of the rapid development of the digital economy, Alibaba Group, relying on its powerful digital-technology capabilities, actively promotes the comprehensive improvement of enterprises in environmental protection, social responsibility, and corporate governance (ESG), becoming a model for Chinese enterprises to achieve sustainable development through digital means.

4.1. Environmental performance: Building a green supply chain and carbon-management system

Cainiao Network, a subsidiary of Alibaba, uses the Internet of Things and big-data technology to create an intelligent logistics system, optimizing the transportation routes of packages and significantly reducing carbon emissions. In 2021, Cainiao launched the “Green Package” initiative, promoting the use of degradable environmental-protection packaging materials and driving the use of recyclable express boxes nationwide. Cumulatively, it has reduced plastic use by more than 30,000 tons. In addition, Alibaba Cloud’s “Carbon-Neutral Computing Platform”, which combines cloud computing and blockchain technology, provides carbon-emission monitoring, accounting, and reporting services for enterprise customers, effectively helping upstream and downstream enterprises carry out green transformation [14].

4.2. Social responsibility: Digital platform empowering public-welfare practices and inclusive development

In terms of social responsibility, Alibaba advocates that users reduce their carbon footprint through the Ant Forest project. For every certain amount of “green energy” accumulated by users, the platform plants trees on their behalf. As of 2023, this project has planted more than 400 million trees in western China, significantly improving the ecological environment in desertified areas. At the same time, Alibaba uses its e-commerce platform and big-data capabilities to implement the “Digital Village” plan, helping agricultural products enter the market and driving millions of small and medium-sized farmers to increase their incomes, demonstrating its important role in promoting inclusive social development.

4.3. Corporate governance: Digital governance system improving transparency and decision-making efficiency

In terms of corporate governance, Alibaba has built a complete digital governance framework. Through the enterprise middle-platform, it integrates the operation data of various business units in real-time, providing scientific decision-making support for the board of directors. Its compliance management department uses AI algorithms for public-opinion monitoring and risk identification, improving compliance early-warning capabilities and effectively preventing enterprise risks. In terms of ESG information disclosure, Alibaba introduced the SASB and TCFD framework standards in its annual reports released on the Hong Kong and New York Stock Exchanges, establishing a systematic ESG disclosure mechanism and continuously enhancing investor relations management and social supervision transparency.

5. Policy recommendations and enterprise countermeasures

Driven by the digital-economy wave, it has become a key path for enterprises to achieve high-quality sustainable development by using digital technologies to improve their Environmental, Social, and Governance (ESG) performance. To further unleash the potential of the digital economy in empowering enterprises to improve their ESG performance, this paper puts forward the following recommendations from the two levels of policy-making and enterprise practice [15]:

5.1. Policy recommendations

5.1.1. Improve the policy framework for digital ESG governance

The state should accelerate the establishment of an ESG evaluation and supervision system supported by digital technologies, promote the formulation of unified and authoritative digital information-disclosure standards for ESG, improve the comparability, transparency, and standardization of ESG data, and build an efficient and collaborative governance system.

5.1.2. Increase policy support for green digital technologies

The government should set up special funds and tax-incentive mechanisms to encourage enterprises to carry out green-technology innovation and digital transformation, and promote the in-depth application of technologies such as the industrial Internet, artificial intelligence, and big data in fields such as green manufacturing, energy conservation and emission reduction, and environmental monitoring.

5.1.3. Promote the construction of a data-sharing mechanism between the government and enterprises

It is recommended to build a data-collaboration platform between the government and enterprises, promote the interconnection and sharing of data in key ESG areas such as carbon emissions, labor protection, and work safety, and improve the regulatory efficiency and the authenticity and integrity of enterprise ESG data.

5.1.4. Strengthen digital empowerment support for small and medium-sized enterprises

In view of the shortcomings of small and medium-sized enterprises in digitalization and ESG construction, the government can provide customized technical consultations, talent training, and financial support to help them reduce the transformation threshold and enhance their sustainable development capabilities.

5.2. Enterprise countermeasures

5.2.1. Develop a digital-driven ESG strategic plan

Enterprises should combine their industry characteristics and development stages, clarify the path to achieve ESG goals through digital means, and develop a digital-transformation strategy covering environmental, social, and governance dimensions, realizing the coordinated promotion of sustainable development and technological innovation.

5.2.2. Build an enterprise-level ESG data platform

Promote the construction of an internal data-governance system, integrate multi-dimensional data resources such as finance, operation, supply chain, environmental protection, and human resources, and establish a unified and efficient ESG information-management platform to provide strong support for internal management and external disclosure.

5.2.3. Strengthen the construction of green-innovation capabilities

Actively apply advanced technologies such as artificial intelligence, the Internet of Things, and blockchain to promote green product design, green manufacturing, and green logistics, improve the ability to apply for green patents and transform technologies, and build the core competitive advantage of enterprise sustainable development.

5.2.4. Promote the transformation of corporate culture and governance mechanisms

Pay attention to the integrated cultivation of digital literacy and sustainable development concepts, and build a composite management team with both technical and ESG awareness. Strengthen the supervision responsibility of the board of directors in ESG affairs, guide management to pay attention to long-term value creation, and achieve a transformation from a “compliance-oriented” governance model to a “value-oriented” one.

5.2.5. Strengthen the interaction mechanism with stakeholders

Rely on digital tools to build a communication platform for enterprises with investors, employees, customers, communities, and other parties, improve information transparency and response efficiency, and build an ESG ecosystem in which enterprises and stakeholders have positive interactions and share the benefits.

6. Conclusion

Under the combined influence of policy support and market demand, digital inclusive finance and corporate green finance are showing a trend of deep integration. Digital technology has made the popularization of green finance possible, while green concepts have infused inclusive finance with the connotation of sustainable development. In the future, as relevant policies are further implemented and technology continues to advance, the two will play a greater role in serving the real economy, promoting social equity, and achieving carbon neutrality goals

Finding

Exploration of the Impact of Financial Reforms in the Hainan Free Trade Port on Enterprises, General Project (Project No.: HKKY2024-13)

Disclosure statement

The authors declare no conflict of interest.

References

[1] Zhu H, Wang C, 2021, Industrial Digital Transformation under the Strategic Background of the "Dual-Cycle" New Development Pattern: Theory and Countermeasures. Finance & Trade Economics, 2021(3): 14–27.

[2] Fu Y, Xu Q, Lin S, 2021, The Impact of Incumbent Enterprises' Process Digitalization on Innovation Performance – The Moderating Role of Organizational Inertia. R & D Management, 2021(1): 78–89.

[3] Li Q, Xiao Z, 2020, Heterogeneous Environmental Regulation Tools and Enterprises' Green-Innovation Incentives – Evidence from Green Patents of Listed Enterprises. Economic Research Journal, 2020(9): 192–208.

[4] Zhao C, 2022, Research on the Impact of Digital Transformation on Corporate Social Responsibility. Contemporary Economic Science, 2022(2): 109–116.

[5] Zhang J, Long J, 2022, Digital Transformation, Dynamic Capabilities, and Enterprise Innovation Performance – Empirical Evidence from High-Tech Listed Enterprises. Economy and Management, 2022(3): 74–83.

[6] Ren B, 2020, The Logic, Mechanism, and Path of the Digital Economy Leading High-Quality Development. Journal of Xi'an University of Finance and Economics, 33(2): 5–9.

[7] Sun Y, 2023, Digital Transformation and Enterprises' ESG Performance – Empirical Data from Private Listed Enterprises. Productivity Research, 2023(9): 100–105. DOI:10.19374/j.cnki.14-1145/f.2023.09.013.

[8] Kuang Z, Zhou X, 2025, Research on the Impact of Digital Transformation on Enterprises' ESG Performance. Journal of Shanghai University of International Business and Economics, 32(1): 34–50. DOI:10.16060/j.cnki.issn2095-8072.2025.01.003.

[9] Liu X, 2025, The Impact of Digital Transformation on Enterprises' ESG Performance. Industrial Innovation Research, 2025(4): 156–158.

[10] Li M, Tao T, Bao H, 2025, The Impact Effect and Action Mechanism of Digital Transformation on Enterprises' ESG Performance – Based on the Empirical Data of Chinese A-Share Listed Companies. Market Outlook, 2025(4): 10–13.

[11] Wang L, Zhang L, Wang P, Liu Y, 2025, Digital Economy, ESG Performance, and the High-Quality Development of the Manufacturing Industry. Statistics and Decision, 41(3): 180–184. DOI:10.13546/j.cnki.tjyjc.2025.03.031.

[12] Wang M, Xu P, He J, 2025, The Impact of Control-Right Allocation on Enterprises' ESG Performance in the Context of the Digital Economy. Finance Magazine, 2025: 1–8. http://kns.cnki.net/kcms/detail/42.1290.F.20250331.0859.018.html

[13] Wu C, Dong H, 2023, Digital Transformation, High-Quality Development Level, and Enterprises' ESG Performance – Empirical Data from Listed Manufacturing Enterprises in the Yangtze River Delta. Journal of Dalian Minzu University, 25(6): 507–517. DOI:10.13744/j.cnki.cn21-1431/g4.2023.06.015.

[14] Li J, 2022, The Impact of the Digital Economy on Enterprises' ESG Performance – An Empirical Study Based on Chinese Listed Companies. China Foreign Investment, 2022(24): 87–89.

[15] Rao J, Zhang X, 2023, An Empirical Test of the Impact of the Digital Economy on Enterprises' ESG Performance. Finance and Accounting Monthly, 44(21): 78–85. DOI:10.19641/j.cnki.42-1290/f.2023.21.010.