

# Digital Finance, Green Ambidextrous Innovation, and High-Tech Firms: Differentiated Mechanisms

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## Abstract

Under the impetus of China's "dual-carbon" strategic goals, the empowerment of green entrepreneurship through digital technologies has emerged as a pivotal agenda for reconstructing innovation ecosystems and driving economic structural transformation. Grounded in financial functions theory and organizational ambidexterity theory, this study innovatively integrates digital finance and green ambidextrous innovation into a unified analytical framework, systematically deconstructing the differentiated empowerment pathways through which digital finance enhances corporate green exploratory innovation and green exploitative innovation. By unveiling the dynamic support mechanisms of digital finance for heterogeneous innovation activities, this research provides theoretical insights for overcoming the "financing-risk-management" trilemma faced by green entrepreneurial firms, offering critical implications for building a digital technology-driven green entrepreneurship support system. Theoretically, this paper proposes that digital finance empowers green ambidextrous innovation through triple mechanisms—financing support, risk control, and management oversight—and is the first to demonstrate the asymmetric effects of these mechanisms across innovation types: financing support and management oversight significantly promote breakthrough-oriented green exploratory innovation, while risk control exerts a stronger explanatory power on incremental green exploitative innovation. Empirically, leveraging multi-dimensional data from China's A-share eco-innovative enterprises (2013–2023) and employing two-way fixed effects and mediating effects models, the findings reveal: (1) Digital finance significantly enhances corporate green ambidextrous innovation, with a larger marginal effect on green exploratory innovation; (2) Mediation analysis indicates that financing mechanisms, particularly through alleviating resource constraints for SMEs by broadening funding channels, account for the highest proportion of total effects in reducing green technology R&D uncertainties; (3) Heterogeneity analyses demonstrate stronger innovation-promotion effects in state-owned enterprises, non-polluting industries, and low-marketization regions, highlighting the interactive influence of institutional environments and digital empowerment. This study yields three practical implications for innovation ecosystem development: First, digital finance reshapes resource acquisition patterns for green ventures by mitigating information asymmetry, informing tiered entrepreneurship support policies. Second, synergizing risk compensation mechanisms with digital regulatory tools can effectively bridge the "valley of death" in green technology commercialization. Third, given the asymmetric promotion of green exploratory innovation, establishing government-platform-financial institution data-sharing mechanisms is advised to cultivate disruptive green tech startups. These findings not only expand the application boundaries of ambidexterity theory in sustainable entrepreneurship but also provide policy anchors for optimizing digital-driven green innovation ecosystems.

## **Keywords**

Digital Finance, Green Ambidextrous Innovation, Green Entrepreneurial Firms, Innovation Ecosystem, Entrepreneurship Support Policy