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## **TECHNOLOGY MARKETS AND GREEN TRANSFORMATION: INNOVATION, POLICY AND REGIONAL DYNAMICS**

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### **Abstract**

Achieving high-quality industrial development in China requires a rapid transition toward green transformation. The mechanism by which the development of the technology market, as a key factor market, influences industrial green transition has not yet been systematically deconstructed, and especially lacks quantitative analysis of nonlinear transmission paths and institutional constraints. Based on this, this study utilizes provincial panel data and adopts SBM-GML, IV-2SLS, double-fixed model, quantile regression and Chain mediating effect model, explores how the development of technology market affects industrial green transition, emphasizing its dynamic impact and internal mechanism. The results of the study find that technology market development significantly promotes green transformation. At the same time, technology market development shows an asymmetric inverted U-shaped pattern on green transformation, with the weakest impact at the 75% quantile, indicating diminishing returns beyond a certain threshold. Mechanism analysis reveals that this transformation is primarily facilitated through technological innovation and industrial upgrading, reinforcing sustainable industrial practices. However, heterogeneity analysis uncovers regional disparities: the positive effects are more pronounced in regions with high levels of informatization and strong government-driven innovation, while areas with strict intellectual property protection experience a weakening effect, potentially due to reduced technology diffusion. These findings offer novel insights into the complex relationship between technology market evolution and green industrial transition, providing valuable guidance for policymakers aiming to balance innovation incentives, market regulation, and sustainable industrial policies.

*Key words:* green transformation; industrial upgrading; innovation diffusion; technology market dynamics

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