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Research on the Influence of Technology Transfer on Green Innovation Ability: Evidence from China

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Introduction

In recent years, driven by policies related to technology transfer, technology transfer activities between cities have shown a significant growth trend. Based on the patent data of 283 cities at or above the prefecture level in China from 2007 to 2019, this paper uses a fixed-effect regression model to deeply analyze the intrinsic relationship between technology transfer and green innovation capabilities, and explores the mechanism of technology transfer level in improving green innovation capabilities. In addition, this paper uses heterogeneity analysis to test whether technology transfer has differentiated effects in different types of cities and regions with different levels of development, in order to provide more targeted empirical evidence for the precise formulation of regional green innovation policies.

Research Questions

This paper focuses on the impact of technology transfer on green innovation capability and its mechanism of action, explores whether technology transfer promotes regional green innovation capability, analyzes its mechanism of action (such as by enhancing R&D motivation), and examines whether technology transfer produces differentiated effects in different types of cities or regions.

Methodologies

This paper uses a fixed-effect regression model to analyze the relationship between technology transfer and green innovation capability, and examines its differentiated effects in different regions and city types through heterogeneity analysis.

Mathematical Formulas

$$GIC_{i,t} = \alpha_1 + \beta_1 Trans\_in_{i,t} + \gamma_1 X_{i,t} + \delta_t + \theta_i + \varepsilon_{i,t} \quad (1)$$

$$peo_{i,t} = \alpha_1 + \beta_1 Trans\_in_{i,t} + \gamma_1 X_{i,t} + \delta_t + \theta_i + \varepsilon_{i,t} \quad (2)$$

Tables

Regression results

Variable	*(1)* *lnGIC*	*(2)* *lnGIC*	*(3)* *lnGIC*	*(4)* *lnpeo*
lnTrans_in	0.587***	0.0651***	0.0347***	0.073*
	(49.94)	(4.95)	(2.68)	(1.819)
lnpgdp			0.427***	0.422
			(6.19)	(1.344)
rdm			3.618*	6.385
			(1.86)	(1.149)
edu			0.394	2.396**
			(0.61)	(2.153)
sec			0.0142***	–0.017
			(5.58)	(–1.521)
lnroad			0.0152***	–0.012
			(5.26)	(–1.132)
open			0.326	–0.357
			(1.24)	(–0.411)
_cons	2.579***	4.387***	–0.953	2.242
	(51.92)	(94.54)	(–1.39)	(0.737)
N	3358	3358	3358	1679
Fixed time	NO	YES	YES	YES
Fixed area	NO	YES	YES	YES
r2	0.455	0.944	0.948	0.601
F	2494.3	24.46	25.63	1.803

t-statistics in parentheses, *** p < 0.01, ** p < 0.05, * p < 0.1

Conclusion

1) Regional technology transfer has a significant role in promoting regional green innovation capabilities.
2) Different cities have heterogeneous problems in terms of their regions and innovation development. Technology transfer has a greater impact on the central and eastern regions and innovation-developing regions.
3) Channel test results show that technology transfer can significantly enhance R&D motivation and thus promote green innovation capabilities.