R&D Subsidies and Technological Progress in the Chinese ICT Manufacturing Industry

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１　目的

As one of China's seven strategic emerging industries identified by the State Council, the ICT industry has received fiscal, taxation, and financial policy support in technology research and development (R&D). However, there have always been different opinions on whether the government should grant R&D subsidies to enterprises. There are also many doubts about the effect of government R&D subsidies. This research explores whether R&D subsidies promote business R&D activities and technological progress in the Chinese ICT manufacturing industry.

２　方法

This research adopts causal inference methods for mediation analysis with interaction and bootstrap methods to empirically examine the direct and indirect effects of R&D subsidies on private R&D activity and R&D outputs in the Chinese ICT manufacturing industry from 2002 to 2019. The independent variable is R&D subsidies. The dependent variable is enterprise innovation outputs, such as number of granted patents, number of patent applications, and new product revenue. The mediator variable is private R&D expenditures. The control variables include sector export dependence and economic share, regional human capital level, state-owned enterprise (SOE) proportion, information level, population, openness degree, and sector, region.

３　結果

First, the impact of R&D subsidies on private R&D expenditure and innovation outputs is significantly (statistical) positive. However, higher subsidy intensity may crowd out private R&D expenditures. Second, more private R&D investment and new product output are brought out, while fewer patents are granted in the Eastern region. Third, in the Electronic Equipment and Communication Equipment (ECE) sector, the incentive effect of R&D subsidies on firms is relatively weak. Finally, regional SOE proportion, openness, and information levels positively contribute to innovation outputs, while sector export dependence has no impact.

４　結論

The R&D subsidies promote innovation outputs, such as patent grant number and patent application number, via stimulating private investment in R&D. When formulating incentive policies, the government should avoid the crowding-out of private R&D investment due to excessive subsidy intensity. The differences between regions and sectors are significant. The government should promote firms in the Eastern region to invest more in radical innovation, and firms in the ECE sector to increase their own R&D investment.

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