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Joint and Cross-border Patents as Proxies for International Technology Diffusion

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Abstract

With the advent of globalization, economic and financial interactions among countries have become widespread. Given technological advancements, the factors of production can no longer be considered to be just labor and capital. In the pursuit of economic growth, every country has sensibly invested in international cooperation, learning, innovation, technology diffusion and knowledge, and outward direct investment. In this paper, we use a panel data set of 40 countries from 1981 to 2008 and a negative binomial model, using a novel set of cross-border patents and joint patents as proxy variables for technology diffusion, in order to investigate such diffusion. The empirical results suggest that, if it is desired to shift from foreign to domestic technology, it is necessary to increase expenditure on R&D for business enterprises and higher education, exports and technology. If the focus is on increasing bilateral technology diffusion, it is necessary to increase expenditure on R&D for higher education and technology. It is also found that outward foreign direct investment has no significant impact on either joint or cross-border patents, whereas inward foreign direct investment has a significant negative impact on cross-border patents but no impact on joint patents. Moreover, government expenditure on higher education has a significant impact on both cross-border and joint patents.

Keywords International Technology Diffusion, Exports, Imports, Joint Patent, Cross-border Patent, R&D, Negative Binomial Panel Data.

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