Multinational Activities, Intellectual Property Rights Protection and Intra-Firm Technology Transfer

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Introduction

For multinational corporates, technology transfer along with FDI is a relatively prudent decision as technology spillover to local firms is not conducive to maintaining the dominant position of multinationals in host markets. Therefore, during this process, intellectual property rights (IPR) protection is crucial to the parent firm' decision to transfer technology to affiliate firms.

IPR Trade

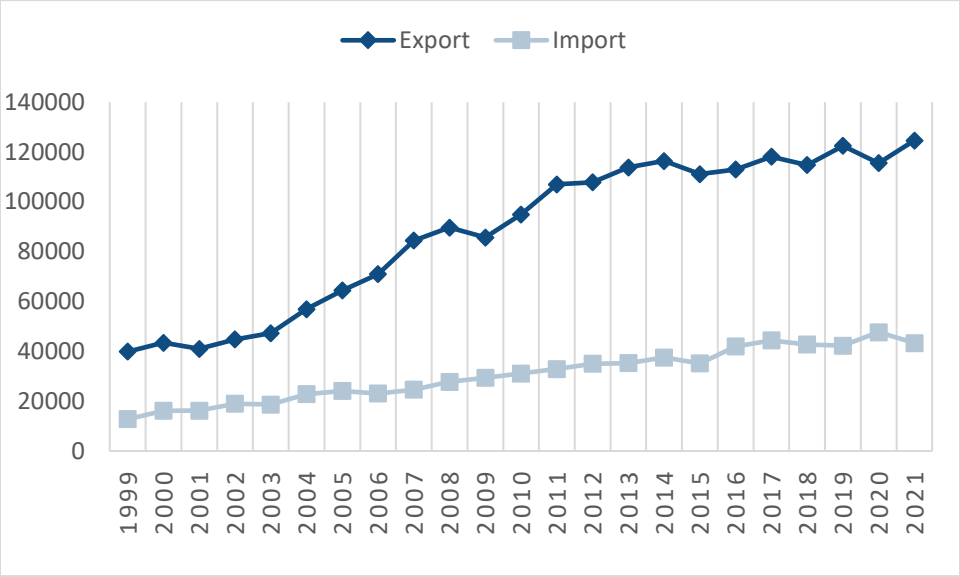

Figure 1. US trade in charges for the use of intellectual property (Millions of dollars)
Data Source: U.S. Bureau of Economic Analysis

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Literature Review

FDI and Technology Transfer

There is a positive relationship between FDI and export charges for the use of intellectual property (a reflection of technology transfer) (Wang & Gao, 2021; Li & Meng, 2018; Tomohara, 2018).

Investment Type and Technology Transfer

Horizontal FDI: two economies may have a relatively smaller technology gap (Markusen & Maskus, 2002), thus, parent companies may transfer technology to affiliates due to effective technology absorption capacities of the host economy;

Vertical FDI: a small technology gap between parent companies and affiliates favors direct knowledge transfer, like licensing (Hovhannisyan,2019).

IPR Protection and Technology Transfer

IPRs holders are more encouraged to conduct international technology transfer if the protection of IPR is enhanced (Park & Lippoldt, 2005);

For multinational firms technology transferred to affiliates increased after IPR reforms, especially for parent firms that use US patents extensively (Branstetter et al., 2006);

In the circumstance of vertical FDI, a higher level of IPR brings about a larger share of imports from vertically integrated manufacturers rather than offshoring (Biancini & Bombarda, 2021).

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Theoretical Framework

A Cournot-Nash Duopoly Model (Wakasugi and Ito, 2007)

$$P(x_1 + x_2) = A - (x_1 + x_2)$$

Inverse Demand Function

Profit Function

$$\pi_1 = x_1 P - c_1 \tau x_1$$

$$\pi_2 = x_2 P - {}^{c_2}/_{T} * x_2 - mT$$

$$2x_2 \frac{\partial x_2}{\partial T} - m = 0$$

Optimal amount of technology transferred

Results

$$\frac{dT^*}{d\tau} > 0;$$

$$\frac{dT^*}{dm} < 0.$$

Hypotheses

H1

Stronger IPR protection in the host market and technology absorption ability of subsidiaries will improve the optimal level of technology transferred.

H2

The greater the share of subsidiaries' sales in the host market, the more pronounced the impact of IPR protection on technology transfer.

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Empirical Analysis

Empirical Model

$$LnTT_{hit} = \propto_0 + \alpha_1 LnIPR_{ht} + \alpha_2 L.R\&D_{hit} + \alpha_3 Localsales_{hit} + \alpha_4 LnGDP_{ht} + \alpha_5 Lnsales_{hit} + \alpha_6 Taxrate_{hit} + \alpha_7 LnPolitical_{ht} + \sigma_h + \lambda_i + \mu_t + \varepsilon_{hit}$$

LnTT

The royalties and licence fees received by US parent companies from their overseas affiliates in a given industry, host economy, and year.

IPR

The patent enforcement index of Papageorgiadis and Sofka (2020), which captures the de facto state of patent rights, compared with Park index (2008). This index is the overall score by allocating equal weights to three separate scores between 0-10 for the service costs, property rights protection costs, and monitoring cost constructs, covering 51 economies from 1998 to 2017.

L.R&D

The R&D expenditure divided by total sales of subsidiaries (R&D intensity) is used as a proxy variable for technology absorption ability.To avoid contemporaneous influence from technology transfer to R&D spending, R&D intensity is lagged one year.

Localsales

The ratio of local sales of all foreign subsidiaries in a given industry to their total sales.

LnGDP

The market size of a host economy is denoted by GDP.

Lnsales

The total sales of subsidiaries in a given industry.

Taxrate

The ratio of income taxes paid to subsidiaries' pre-tax net income at the industry-level.

Lnpolitical

The political risk index of host economies is considered as a measure of the quality of a host country's institutions.

Benchmark Regressions

VARIABLES

Dissicussions

Strengthening patent enforcement encourages more technology transfer from US parent firms to their overseas subsidiaries.

Lower production costs may not encourage parent firms to transfer technology because their subsidiaries have a cost advantage.

The proportion of local sales has not strengthened the positive impact of IPR protection on technology transfer.

Host-Economy Heterogeneity

(1)

Dissicussions

IPR protection has a significant positive effect on intra-firm technology transfer only in the developing group.

Regarding local sales as a percentage of total sales, it has a significant positive effect on the development variable for the advanced group.

Industry Heterogeneity

(1)

Technology transfer is more dependent on the level of IPR protection in computers and electronic products industry.

As far as R&D intensity is concerned, it has a significant positive effect on technology transfer in chemicals industry.

Both in computers and electronic products, and electrical equipment industries, a higher proportion of local sales increases technology transfer.

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Conclusions

Firstly,

Overall, strengthening IPR protection from host markets induces parent companies to transfer their technologies to foreign subsidiaries. However, there are different responses to IPR protection between developing and developed countries and between different industries.

Secondly,

It remains to be seen whether the technology received by host subsidiaries from parent companies has resulted in an overall welfare improvement for developing countries.

THANK YOU