Technology Adoption and Late Industrialization*

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Abstract

We study the impact of the adoption of foreign technology and its local spillover on late industrialization in South Korea using archival data that covers the universe of firm-level adoption of foreign technology in the 1970s. We provide empirical evidence of direct productivity gains of adopters and local productivity spillover of the adoption. We estimate the direct productivity gains by comparing adopters to non-adopters that failed to adopt in the end because of exogenous cancellations by foreign firms. For the spillover, using rich geographic information on the location of production, we find that non-adopters that were geographically proximate to adopters had higher sales and productivity growth. Based on these empirical findings, we develop a dynamic spatial model with firms' technology adoption decisions and local spillover of the adoption that operates with a lag and conduct the counterfactual analysis on the temporary adoption subsidies provided by the Korean government in the 1970s. Because of the spillover, there is dynamic complementarity in firms' adoption decisions, which can generate multiple steady states. A temporary adoption subsidy can have permanent effects by causing an economy to converge to a different steady state through path dependence. We calibrate the model to the micro data. Had no adoption subsidies been provided, South Korea would have converged to an alternative less-industrialized steady state where the heavy manufacturing GDP share and the aggregate welfare are 15% and 10% lower than the steady state with successful industrialization.

Keywords: Technology Adoption, Industrialization, Knowledge Spillover
JEL Codes: O14, O33, O53, R12

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