Centrality in Production Networks and International Technology Diffusion

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Abstract

This paper examines the relationship between international research and development (R&D) spillover effects and the structure of global value chains (GVCs). Previous literature on international spillover effects has mostly considered direct trade relationships, and few have even dealt with indirect effects. In this study, to take into account not only the direct demand but also the indirect demand, I use the Leontief inverse matrix and estimate the spillover effects from foreign R&D contents embodied in intermediates. Also, to answer the problem that Keller (1998) suggested the possibility that it does not matter from which a country imports, I use "centrality" that implied importance in trade and examine how the centrality of exporters affect importer's productivity. As a result, the impacts of foreign R&D contents from high centrality exporters are positively significant, both in backward and forward linkages. Also, I find that it is statistically significant from exporters with middle forward centrality. Finally, it turns out that trading with high centrality exporters does not always produce spillover effects, as the proportion of domestic and foreign R&D contents flowing into a country is important.

Keywords: Production networks, Centrality, International R&D spillovers, Technology diffusion

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