Participation in the Global Value Chains and Domestic Technology Change: Evidence from Japanese Patent-Firm-Matched Data

Topic: Enterprise-related input-output analysis
Author: Keiko Ito

Today's economies are increasingly interconnected through Global Value Chains (GVCs). In particular, East Asian countries have achieved rapid economic growth and gained their presence as "Factory Asia" in the world economy. Japan has been an important player in the GVC, or "Factory Asia," but in fact, her presence has been relatively declining.

This paper explores how changes in the relative position and degree of participation in the Global Value Chains (GVCs) affect firm innovation activities, focusing on the experience of Japanese firms. We conjecture that firms and industries positioned at the center of complex production networks have access to a greater variety of foreign products embodied with skills and technologies as well as a greater breadth of disembodied knowledge, with greater potential for knowledge spillovers, compared to those at the periphery. Therefore, whether firms and industries sit at the fringes of global production or are tightly knotted at the center of a network is likely to affect economic outcomes, particularly technological capabilities of firms and industries.

The analysis is based on patent-firm-matched data with information on GVC networks for the period from 1995 to 2011. We reflect position within GVCs using measures of network centrality and GVC participation utilizing the OECD Inter-Country Input-Output Tables.

We find that Japan's position in the GVCs has shifted from being the core towards the periphery relative to other countries in the network, i.e. becoming less "central". Our analysis shows that forward centrality tends to be positively associated with innovation activities (measured as the number of patent applications). Being located in the key hubs in GVCs, more specifically being key suppliers, would benefit from knowledge spillovers from various customers and downstream markets.