Technology Transfer and productivity growth- evidence from Indian manufacturing industries

Topic: (6.3) Energy Input-Output Modeling (2)
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The importance of international technology transfer (ITT) for economic development can hardly be overstated. The acquisition of technology and its diffusion foster productivity growth. Developing countries across the world have relied largely on import of technologies from developed countries for driving their technological change. India too has been no exception. The country has had a fairly long history of acquiring technology from abroad. With the adoption of the New Economic Policy in early nineties, the Government of India put much focus on ITT with the expectation that it would result in the technological upgradation of the countryâ€™s industries and hence lead to improvement in their international competitiveness. The policies to facilitate such ITT have been aligned and realigned by the government time and again over the past few decades in response to the particular needs of the industries, the supply position of technology and the overall philosophy of development of the country.

Against this backdrop, the present paper seeks to evaluate the extent to which international technology transfer may have led to productivity growth at the industry level in India, with particular focus on manufacturing industry. There are many channels through which ITT happens. The present paper focusses on imports as a significant mechanism for acquiring knowledge from international markets. Both import of knowledge as well as import of capital goods and inputs may result in productivity growth in the importing country. Productivity growth is a function of local stock of knowledge. Thus, import of knowledge which adds to the local pool of knowledge is likely to increase productivity. Likewise, import of capital and intermediate goods and their usage brings with them the embodied technology and R&D of the foreign country leading to productivity gain of the importing country. The present paper uses these imports along with foreign direct investment to assess the role of such technology transfer in promoting productivity growth in Indian manufacturing.

Based on data from the Annual Survey of Industries published by Central Statistical Organization (CSO) of India and Centre for Monitoring Indian Economy (CMIE) database, a panel regression is run for Indian manufacturing firms. The results obtained show that import of knowledge have been a very important determinant of productivity growth among the manufacturing industries in India. Based on this result, the paper focuses further on assessing how much import of knowledge as a source of technology transfer has led to productivity growth in Indian manufacturing. For this the inter industry supply chains are estimated using input-output (IO) tables of India that CSO publishes at regular intervals and the own sector imports and downstream imports of a sector are calculated. Using the downstream import figures as a determinant the industry level productivity growth due to import of knowledge is estimated. The detailed panel data analysis shows that firms in industries supplying import-intensive sectors have higher productivity than other firms. This finding suggests that linkages though vertical supply relationships are the channel through which import-driven technology transfer occurs.