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Abstract

Research and development (R&D) activity is considered to be a key driver of productivity and long-run economic growth. International trade has been argued to act as a channel of transmission for international R&D spillovers, that is, productivity-enhancing technological diffusion between countries. Regional economic integration, such as the forming of the European Union and deepening of the European integration, affects international trade and the general level of interaction between member states and therefore may have an effect on the diffusion of technology to and from the member states.

This study contributes the previous literature on the role of international trade in the transmission of international R&D spillovers by studying the relative significance of six different main categories of international trade. Total factor productivity of countries is regressed against domestic and aggregated foreign R&D capital stocks, which are constructed by accumulating R&D expenditures. Foreign R&D capital stocks are weighted by relative, bilateral trade volumes. The role of EU membership in the utilization of international, trade-related R&D spillovers is also analyzed. The role of EU membership is studied by using an interacting dummy variable of EU membership with the measures of foreign R&D capital stock. The study is carried out using panel regression methods and taking into consideration the non-stationarity and cointegration of the series.

Main findings are that both imports of capital goods and total exports act as channels of transmission for international R&D spillovers. The results are checked for robustness by including two alternative non-trade-based measures of foreign R&D capital stock as control variables. The existence of trade-based international R&D spillovers remains significant even after the control variables are included. However, the results indicate that the non-trade-based channels of transmission of international R&D spillovers also have an important role in the cross-border diffusion of technology.

The EU membership is not found to provide members additional productivity gain, when the larger set of 14 EU countries are studied. However, for the EU6 countries (Belgium, France, Germany, Italy, Netherlands), the membership is found to provide positive productivity effect through improved utilization of the trade-based international R&D spillovers originating from the EU countries. The membership effect exists respect to spillovers transmitted via both imports of capital goods and total exports. The effect is also present with both alternative estimators used, but is statistically significant only with Fixed Effects estimator used on differenced data.

Key words	R&D spillover, total factor productivity, international trade, European Union
Further information	