

R&D Diffusion and Productivity in a Globalized World: Country Capabilities in an MRIO Framework

Authors : S. Jimenez, R.Duarte, J.Sanchez-Choliz, I. Villanua

Abstract : There is a certain consensus in economic literature about the factors that have influenced in historical differences in growth rates observed between developed and developing countries. However, it is less clear what elements have marked different paths of growth in developed economies in recent decades. R&D has always been seen as one of the major sources of technological progress, and productivity growth, which is directly influenced by technological developments. Following recent literature, we can say that 'innovation pushes the technological frontier forward' as well as encourage future innovation through the creation of externalities. In other words, productivity benefits from innovation are not fully appropriated by innovators, but it also spread through the rest of the economies encouraging absorptive capacities, what have become especially important in a context of increasing fragmentation of production. This paper aims to contribute to this literature in two ways, first, exploring alternative indexes of R&D flows embodied in inter-country, inter-sectorial flows of good and services (as approximation to technology spillovers) capturing structural and technological characteristic of countries and, second, analyzing the impact of direct and embodied R&D on the evolution of labor productivity at the country/sector level in recent decades. The traditional way of calculation through a multiregional input-output framework assumes that all countries have the same capabilities to absorb technology, but it is not, each one has different structural features and, this implies, different capabilities as part of literature, claim. In order to capture these differences, we propose to use a weight based on specialization structure indexes; one related with the specialization of countries in high-tech sectors and the other one based on a dispersion index. We propose these two measures because, as far as we understood, country capabilities can be captured through different ways; countries specialization in knowledge-intensive sectors, such as Chemicals or Electrical Equipment, or an intermediate technology effort across different sectors. Results suggest the increasing importance of country capabilities while increasing the trade openness. Besides, if we focus in the country rankings, we can observe that with high-tech weighted R&D embodied countries as China, Taiwan and Germany arose the top five despite not having the highest intensities of R&D expenditure, showing the importance of country capabilities. Additionally, through a fixed effects panel data model we show that, in fact, R&D embodied is important to explain labor productivity increases, in fact, even more than direct R&D investments. This is reflecting that globalization is more important than has been said until now. However, it is true that almost all analysis done in relation with that consider the effect of t-1 direct R&D intensity over economic growth. Nevertheless, from our point of view R&D evolve as a delayed flow and it is necessary some time to be able to see its effects on the economy, as some authors have already claimed. Our estimations tend to corroborate this hypothesis obtaining a gap between 4-5 years.

Keywords : economic growth, embodied, input-output, technology

Conference Title : ICBEIM 2018 : International Conference on Business, Economics and Innovation Management

Conference Location : Stockholm, Sweden

Conference Dates : July 12-13, 2018