The new global geography of innovation – implications for Sweden

Sweden is one of the countries in Europe with the highest engagement in global innovation networks in terms of research collaboration, sourcing of technology and offshoring of R&D (Chaminade et al., 2010). Firms (as well as universities) are very active internationally in terms of their research and innovation activities. Given that profile, it is no surprise that Swedish firms and policymakers are more sensitive to changes in the global geography of innovation activities. One of the most important changes in the last decade is the rise of China and India as global innovation players. They are currently the most important destination worldwide for R&D offshoring while, increasingly becoming the source of R&D investments abroad. We analyse the main implications of these changes in the geography of innovation for Swedish firms and policymakers.

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The patterns of R&D offshoring as well as research collaboration of Swedish firms reflect the general global trends towards a higher internationalization of innovation activities. While most of the international innovation activities of Swedish firms continue to take place within Europe and the USA, they are also actively engaged in innovation activities with China and India. What is a particular feature of Sweden is the high involvement of small and medium size enterprises in global innovation networks, at least compared to the EU average. In Sweden about 21 percent of the innovative firms that engage in collaboration for innovation, do so with Chinese or Indian partners. These firms represent one-fifth of all Swedish firms engaged in collaboration for innovation (225 firms out of 1076 that report collaboration for innovation). It is remarkable that these figures are still high among small firms: 16 percent of innovative firms with less than 50 employees that engaged in collaboration for innovation, have at least one partner from China or India while this percentage is 18 percent for firms between 50 and 250 employees (medium firms).

Understanding what is the impact of the internationalization of innovation activities – being offshoring of R&D or research collaboration, particularly towards China and India, becomes then a crucial issue for policymakers in Sweden.

Our research confirms that engaging in research collaboration with international partners and, more specifically with users, is associated with higher degree of novelty (Harirchi and Chaminade, 2014). With regards to R&D offshoring, it is important to highlight that R&D offshoring is still a relatively limited phenomenon. In other words, the bulk of R&D is still carried out in the home countries, but the share of R&D offshored to advanced and (increasingly) to emerging countries is non-negligible and it is increasing rapidly.

In general, we find that offshoring regions have a higher productivity growth than non-offshoring regions, but the gains from offshoring decrease when the extent of this process exceeds some threshold level (Castellani and Pieri, 2013). Although more research is needed
to understand and separate the channels underlying the positive relation between R&D offshoring and productivity growth at home, our study sends a reassuring message to Swedish policymakers. It supports the idea that carrying out R&D abroad is, on average, associated with strengthening rather than ‘hollowing out’ of European sources of competitiveness, probably since the R&D conducted abroad may complement and not substitute the R&D in Sweden. From this point of view, governments should not discourage offshoring of R&D in particular. To the contrary, they should implement policies that allow firms to engage in global R&D projects, gaining access to complementary assets and technologies unavailable in their home economies, as well as to qualified research staff.

The positive association between offshoring and productivity growth in the home regions is particularly strong in the case of R&D offshoring toward China and the South-East Asian countries (Castellani and Pieri, 2013). This does not apply in the case of R&D offshoring towards India, which is negatively associated with productivity growth. We posit that the positive results for South-East Asian countries and negative for India may be explained by a combination of destination country characteristics and the sectorial composition of the offshored R&D activities.

In South-East Asia the largest share of investments tend to be heavily concentrated in high-tech manufacturing sectors, whereas in India they are in knowledge-intensive services, especially software, business, financial and bank services. In terms of the policy implications, policy action towards internationalization of innovation activities should recognize the importance of differences across industrial sectors. While the internationalization of R&D and other innovation activities related to manufacturing may have a positive impact in terms of productivity growth of the home country, the implications of offshoring of R&D related to knowledge intensive services can be more problematic.

Orchestrating the value chain in such knowledge-intensive services may be more complex than in the case of the manufacturing industry, especially when such value chain is not linear, as in many manufacturing industries (Mudambi and Venzin, 2010). The inherent difficulty of that process could explain why offshoring of R&D and global research collaboration is associated with high technological and organizational firm-based competences (Plechero and Chaminade, 2013). Globalizing innovation activities may produce positive gains, but orchestrating geographically distant innovation processes is a costly and complex process, and not all firms have the required capabilities to engage in global innovation networks, either in the form of offshoring of R&D or research collaboration.

On the other hand, the relatively lower organizational problems in high-tech manufacturing and the concentration of cutting edge technologies developed in South-East Asian countries, contribute to a soundly positive association of offshoring R&D in this area with the productivity growth of EU regions. Taking this background of factors into account, policy makers should consider the possibility of directly supporting the development of management techniques for international business and cross-cultural communication.

These types of direct interventions for the development of competences related to managing the internationalization process may be particularly relevant for SMEs. Since SMEs tend to be more embedded in the regional innovation systems, they may serve as mediators between global and local knowledge networks, if they have the required capabilities (Giuliani and Bell, 2005). Policy makers need to recognize the importance of international innovation linkages
for Swedish SMEs and their potential role as mediators, and begin to articulate **policies targeting the specific competence needs of small and medium size enterprises. This awareness of the critical role of such meta networks** is particularly important for firms that are highly internationalized since their inception (the so-called “born-global”) (Halldin, 2012).

Specific efforts should be made to understand how SMEs use the knowledge acquired through international networks in their innovation processes, and how they combine it with local knowledge sources.

General **policies supporting the development of technological capabilities** continue to be paramount. Benefiting from international innovation networks is contingent on having sufficient absorptive capacity to locate and integrate relevant knowledge into innovation processes (Chaminade and de Fuentes, 2012). Internationalization of innovation should not be seen as diminishing the importance of investing in technological capabilities at home. In this new state of affairs it is rather the opposite that is true.

Last, the analysis presented in the report shows that offshoring of R&D and global research collaboration may be the only option to access critical knowledge needed to innovate for firms located in regions that lack a strong organizational infrastructure (critical mass of R&D labs, specialized firms in the industry, universities) and networks. Firms in these marginal regions may be more dependent on international linkages to access the knowledge needed to innovate, while they may lack the capabilities to do so (technological and managerial) (Chaminade and Plechero, forthcoming 2014). In addition to providing direct support in the form of training in international business and cross cultural communication, policy makers may support firms in these regions by **creating incentives for sustained general networking and the presence of foreign MNCs.** Unfortunately, with the data currently available we are not yet able to pinpoint which institutions influence more or less on the capacity of firms to engage in international innovation networks which could provide policy makers with a more nuanced understanding of how to support internationalization in firms located in more marginal regions.

Finally, efforts should be made at the policy level to regularly measure the degree of internationalization of innovation activities and its impact, including all forms of internationalization of innovation, from offshoring of R&D to global research collaboration and technology sourcing. This is particularly critical to understand how and why Swedish small and medium size enterprises use their collaborative networks with Chinese and Indian partners for innovation, and to monitor changes over time.

It is also paramount to continue monitoring changes in the global geography of innovation. The analysis of the more recent data on offshoring of R&D activities, shows a decline in the number of projects going to China and India. Whether this trend is a structural change or rather an ad-hoc response to the contemporary crises remains to be studied.

**References**


This article is based on a recent report published by Entreprenörskapsforum entitled “The emergence of China and India as new innovation power houses – threat or opportunity?”