



The effects of international R&D on innovation and performance in the EU

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- Internationalisation of R&D and integration into GINs raises concerns of 'hollowing-out' EU knowledge base and reduce employment
- But economic research has highlighted that it may bring important positive effects, among which are
 - Learning and 'reverse technology transfer'
 - Better market access
- WP 8 of INGINEUS aimed at assessing what is the evidence on such effects of integration of EU firms into GINs





Methodology

- Assessing the long-term impact of GINs requires a time series of data
 - the survey could not be used for this purpose (but it would do, if more surveys are carried over the years)
 - we chose to employ different methodologies on different types of data and level of analysis
 - information from case studies carried out for WP5
 - data on firm-level patents worldwide (for EU, US and Japan MNCs)
 - data on cross-border investment projects in R&D from/into EU NUTS 2 regions
 - data on import of R&D and other services in EU industries





Preview of results

- The pessimistic view of 'hollowing out' effects is NOT supported by any of our empirical evidence
- We find that
 - Offshored R&D is mostly complementary, rather than substitute to R&D at home
 - Patenting abroad is positively correlated with EU MNCs' profitability, but it does not seem to cause a significant increase in long-term profits
 - (Past) R&D offshoring (measured by cross-border investments in R&D) is positively correlated with (future) productivity growth of EU regions
 - Import of R&D services does not cause any significant employment losses in EU industries.





R&D complementarity vs. substitution

- We assessed whether offshored R&D complement or substitute R&D at home
 - Based on the case studies carried out for WP5 on 18 EU-based MNEs in ICT, automotive and agro-food industries.
- We gather that
 - in the case of the ICT industry both substitutability and complementarity between R&D in North and South countries occur.
 - the strategic R&D that requires specialised know how and high investments are centralised, mainly at HQ locations, some in European location outside the HQ and in the US.
 - the applied research and application, and engineering are dispersed and are located near their important markets.
 - in the case of automotive and agro-food industries
 - a greater degree of complementarity rather than substitutions, since R&D abroad is more often meant to adapt products to local markets.





Foreign patenting and MNCs' long-term profitability

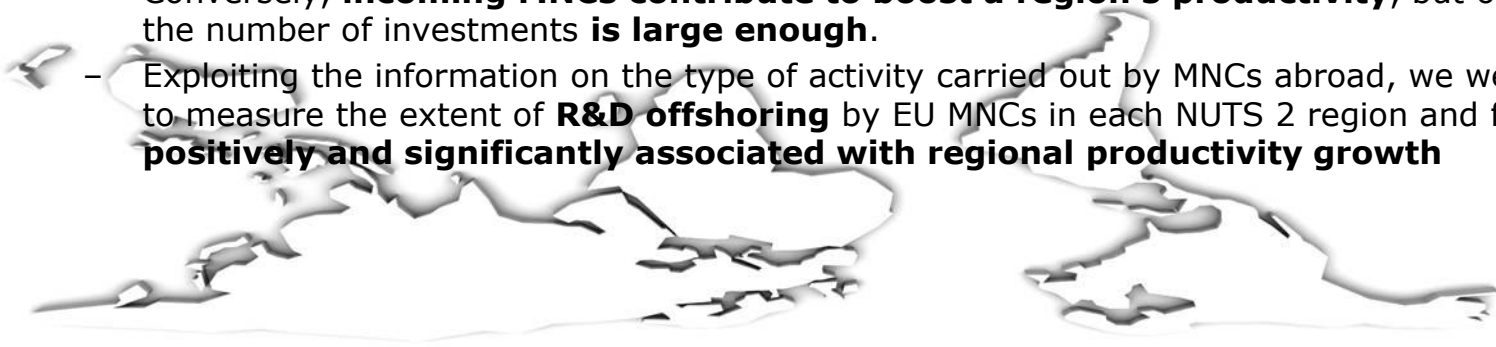
- we analysed the relationship between the extent and geographic spread of innovative activities abroad and the market value of those firms
 - econometric analysis on 365 firms from US, EU and Japan.
 - measured the extent of offshored innovative activities by means of the **number** of patents granted to foreign affiliates of the sample companies and the **spread** of such activities using the number of countries where a firm has been granted such patents.
 - our measure of firm market value is the Tobin Q.
- Our results are consistent with the idea that better performing firms are more likely to offshore innovation, but this does not seem to affect significantly their profitability.
- In other words, R&D offshoring **does not** cause any significant hollowing-out of MNCs knowledge base and profit potential





R&D offshoring and EU regional productivity growth

- given the relevance of regional policy within the EU, we carried out an econometric analysis at the NUTS2 level.
 - at this level of analysis we can gather not only the benefits or costs accruing to the firms involved in R&D offshoring, but also on other firms, such as their suppliers and competitors, which could benefit from the (positive or negative) externality.
- we collected information on the number of cross-border investments (both within and outside Europe) of MNCs based in each of the NUTS2 regions and those from foreign MNC incoming in the region.
- We then related this measures of inward and outward FDIs to the productivity growth of each region, controlling for a number of country and regional characteristics.
- Our results suggest that
 - **offshoring regions experiment higher productivity growth**, although this positive effect fades down when the extent of offshoring is too large.
 - Conversely, **incoming MNCs contribute to boost a region's productivity**, but only when the number of investments **is large enough**.
 - Exploiting the information on the type of activity carried out by MNCs abroad, we were able to measure the extent of **R&D offshoring** by EU MNCs in each NUTS 2 region and find this **is positively and significantly associated with regional productivity growth**





R&D offshoring and labour demand in EU industries

- we have estimated the effect of service offshoring in general, and offshoring of R&D in particular, on employment.
 - Following previous works, we measure service offshoring as the share of imported private services in the industry's total purchases of intermediate inputs.
- The results show that
 - the effects are very small and, if anything, weakly positive.
 - the aggregate results are almost entirely driven by offshoring of business services, the largest category in Europe;
 - financial, computer, and R&D service offshoring have instead negligible impacts on the employment level.
 - Finally, we do not find negative effects on any groups of workers; rather, our results suggest imported services to complement with domestic workers with higher skills.
- The analysis also reveals that service offshoring contributes to making labor demand more elastic, but the economic magnitude of the effect is found to be small also in this case.
 - results seems somewhat differ across countries.
 - service offshoring raises labor demand elasticity only in countries with weak regulations, and the effect is almost entirely borne by unskilled workers





**Thanks for your
attention/questions**

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