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Does Firms' Engagement in International Activities Foster Their Innovation and Productivity?¹

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Recent theoretical models of international trade and investment have established that firms with international activities are more productive than firms serving only domestic markets. Existing empirical evidence indicates that highly productive firms self-select into exporting and foreign direct investment. However, engagement in international activities is a source of knowledge that could lead to higher productivity. Productivity gains associated with post-entry in international activities are linked to learning from partners in international markets and to competitive pressure. Evidence on productivity dynamics following engagement in international activities is limited and less clear cut. Most existing evidence on innovation and productivity at firm level does not distinguish between firms with international activities and firms that serve only the home market.

To fill this evidence gap we examined the extent to which innovation behaviour and performance of firms engaged in international activities differ from those of firms serving only the home market. For this purpose we used Community Innovation Survey data for Ireland over the period 2004 – 2008. This panel data allowed us to provide robust evidence on the links between firms' innovation input, innovation output and productivity. The analysis distinguished different types of innovations such as product, process, and organisational innovations as well as combinations of these innovation outputs.

The research results indicate that firms with international linkages were more likely to invest in innovation; had a higher probability of introducing innovation outputs; and they were more productive than firms serving only the Irish market. Foreign-owned firms had significantly higher innovation expenditure per employee in comparison to firms that served only the home market. With respect to the innovation types, firms with international linkages were particularly more likely to introduce new or significantly improved products.

Larger firms and firms with higher human capital intensity were more likely to invest in innovation. Firms' engagement in cooperation for innovation increased

¹ Iulia Siedschlag and Xiaoheng Zhang, "Internationalisation of firms and their innovation and productivity", *Economics of Innovation and New Technology*, 24(3): 183-203. <http://dx.doi.org/10.1080/10438599.2014.918439>.

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the probability of successful innovation. In particular, firms' cooperation for innovation with suppliers and with universities was positively linked to the probability of product, process and organisational innovations and combinations of these innovation types.

In contrast to evidence for many other countries, on average, innovation expenditure intensity in Ireland's firms was not significantly linked to innovation outputs over and above other factors driving innovation output such as firm size, international activities, cooperation for innovation with other enterprises and institutions and industry characteristics. This result might be linked to lagged effects of innovation expenditure on the innovation output beyond those captured by the data analysed. Furthermore, this result may be also explained by the important role multinationals play in the innovation performance in Ireland. The innovation performance of these firms is linked to their world-wide engagement in innovation while the survey data includes only innovation expenditure reported in Ireland.

Over the analysed period, the strongest link between innovation and productivity appears to be in the case of firms with process and organisational innovations. Our empirical evidence also shows that foreign affiliates had a higher productivity than Irish-owned exporters.

This research suggested three main implications for enterprise policies. Firstly, policy measures aimed at incentivising innovation and productivity should be designed in connection with policies supporting the engagement of firms in international markets. Secondly, strengthening cooperation for innovation within the national and global innovation systems is an important way to generate innovation output. Thirdly, given the increasing internationalisation of R&D and innovation, innovation policies need to be designed in an international context.