

Multinational enterprises (MNEs)

Multinational enterprises (MNEs) play a leading role in technological innovation, R&D investment and patenting. By serving various markets and their size, they often benefit from economies of scale and scope, and have a stronger financial capacity to invest in innovation including risky innovation projects. They are in a better position than small and local firms to attract talent, acquire sophisticated equipment, adopt comprehensive technology management tools, and build innovation networks with suppliers, customers, strategic partners, universities, and public research institutes.

The 2012 EU Industrial R&D Scoreboard shows that the world's top 1500 companies by R&D expenditure jointly invested more than €511,155 million in R&D in 2011, which represents over 50% of the world's total R&D expenditure. Moreover, R&D investment is very concentrated among a few of these MNEs, with just 100 companies accounting for 57.2% of the total R&D investment by the 1500 companies. The world's top R&D investors in 2011 were Toyota Motor, Microsoft, Volkswagen, Novartis, Samsung Electronics, Pfizer, Roche, Intel, General Motors, and Merck.

As globalization proceeds MNEs have modified their strategies and spatial organization. The motivations behind the globalization of corporate innovation are manifold, ranging from efficiency-seeking and demand-seeking investments, which aim at reducing costs or adapting products to foreign markets, respectively, to supply-driven investments, which aim at tapping into resources and capabilities of different locations in order to integrate and leverage them into competitive advantages. Regarding the nature of changes, recent research shows that innovation in MNEs is evolving from a centralized and hierarchical function towards one that builds upon a network of geographically dispersed innovation centers and R&D labs. A study by consulting firm Booz Allen Hamilton found that the largest 1,000 companies by R&D expenditure allocated on average 55 percent of their R&D budget outside the countries where they are headquartered, and 99% of these firms conducted some R&D in their subsidiaries abroad (Jaruzelski and Dehoff 2008). Moreover, in recent years, the affiliates of MNEs have come to play a more active role in global innovation networks, involving not only incremental innovations but also multi-technology product development and basic research. However, while the number of supply-driven R&D centers has increased, MNEs often operate with just a few such global R&D labs in carefully selected locations, with the historical core R&D unit in the country of origin often holding a coordinating role. During the last decade, global innovation networks are becoming more multi-polar, as MNEs locate an increasing number of their new R&D centers in emerging countries (Bruche, 2009).

In parallel to internationalization, a complementary trend in the organization of MNEs' innovative activities is their higher reliance on external sources of knowledge; a gradual and ongoing process which has been described as the transition from a closed to an 'open innovation' model. Indeed, there is a growing tendency to use cooperative and/or contractual relationships to manage the external network of the MNE, with the MNE itself focusing on its core competences. Thus it is important to consider not just FDI but also other forms of non-equity relationships and knowledge-intensive linkages established by MNEs across borders to improve their innovative performance.

In a world where multinationals are increasingly internationalizing their R&D activities, competition among countries and regions to attract the R&D activities of these corporations is on the rise (OECD, 2011). In addition to its direct impact, attracting the R&D activity of MNEs can bring along indirect effects or spillovers to other firms in the country, resulting in productivity improvements. These spillovers relate to knowledge diffusion from multinational affiliates to domestic firms, encompassing technology and all forms of codified and tacit knowledge related to production, including management and organizational practices. Thus it is important for national innovation policy to consider how to attract the innovative activities of MNEs and how to encourage existing MNE affiliates to engage further in innovation domestically and to collaborate with local firms and universities.

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