

ICT Business R&D measurement – Towards bridging macro and micro evidence

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Abstract

R&D led innovation is deemed to be a key driver of economic growth for advanced economies. As a result, the European policy agenda increasingly focuses on creating framework conditions enabling an increase in private R&D investments. However, in its attempts to attract private R&D investments the EU is competing with other parts of the world, where some countries out-perform it in relative R&D investments (e.g. USA and Japan), and others are rapidly catching-up (e.g. India and China). In particular, evidence shows that most of the R&D gap with the USA (and even more with Japan) originates from the Information and Communications Technology (ICT) sector. However, a comprehensive overview of ICT R&D expenditures is still largely lacking.

This paper addresses R&D performance by contrasting a comprehensive inventory of macroeconomic data centred on business R&D spending (BERD) with company level R&D data (from the EU Industrial Scoreboard). Focus is on the aggregate comparison between the EU and the USA, although industry level and EU member states cases are also considered. The paper also identifies the main conceptual and methodological problems in matching BERD and company level data and carefully considers the inherent differences between these two data sources.

Macro evidence shows that the US ICT BERD is about twice the EU one, both in value terms and relative to GDP. This latter gap can be further decomposed into a contribution of about one third stemming from the larger relative size of the ICT sector (VA_{ICT}/GDP) in the USA, and of about two thirds from its higher R&D intensity ($BERD_{ICT}/VA_{ICT}$).

The USA-EU gap in ICT R&D appears to be even larger when using company data. However, micro evidence also shows that R&D intensity of the major US ICT companies is similar to that of their European counterparts, while the US vastly outnumbers the EU among the global top ranking R&D investors.

These findings, and also the discrepancy between macro-level and corporate data evidence, call for an explanation that, at this stage, can only be tentative. To this end, in the final part of the paper we propose some additional hypotheses regarding the internationalisation and the distribution of R&D efforts of small versus large firms, with differential impacts across industries and along time.

¹ Disclaimer: The views expressed do not necessarily reflect those of the European Commission.