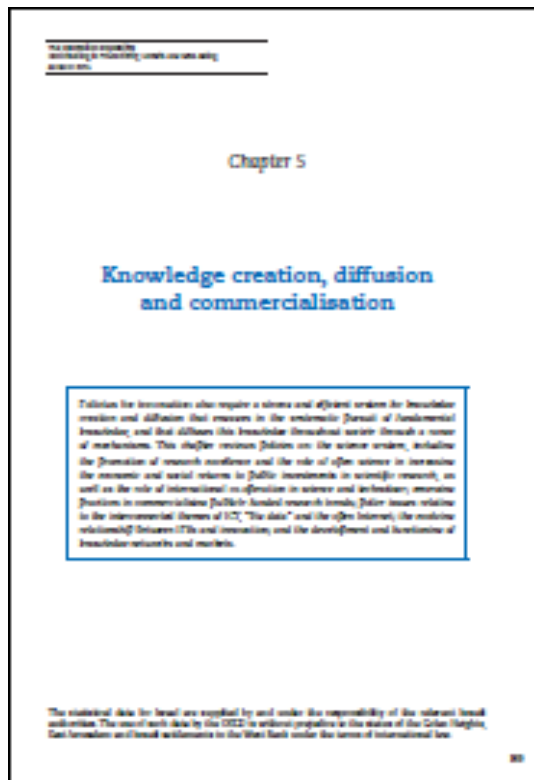


## Knowledge creation, diffusion and commercialisation



[Access the full chapter](#) [1]

### Government plays a critical role in providing some of the foundations for innovation

Basic research, in particular, drives long-run productivity growth by enhancing the ability of economies to learn from innovations at the global frontier. Public funding is needed to address the inherent under-investment in basic research of private firms, linked to the large knowledge spillovers of such research. Long-term funding for curiosity-driven research must be preserved, as this has been the source of many significant innovations in the past and has high social returns, while project-based funding can allow for more direct steering of public research towards major public policy objectives, complementing private research spending. A long-term and stable perspective for public research funding is essential; focusing on short-term results will put the future seeds of innovation at risk. While public budgets for R&D have held up well since the crisis in most OECD countries (Figures 1 and 2), they are now declining in several.

#### Figure 1. Higher education expenditure on R&D (HERD), % of GDP

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#### Figure 2. Government expenditure on R&D (GOVERD), % of GDP

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## **The broader system of knowledge creation and diffusion is equally important for productivity growth**

More intensive collaboration between firms and universities is associated with more diffusion of foreign technologies. Policy makers should facilitate knowledge flows and encourage the development of networks and markets which enable collaboration and the efficient creation, circulation and diffusion of knowledge. Policies for commercialisation of public research should go beyond patents and licensing, however, and should also include public-private collaborative research, student and faculty mobility, contract research, faculty consulting and student entrepreneurship. A modern IPR system is important to foster knowledge creation and diffusion, as is a policy and regulatory environment that manages the risks associated with innovation and enables the responsible development of technologies and their convergence.

### **Strategies for promoting R&D**

Rising international connectedness and the key role of multinational firms in driving frontier R&D imply that the benefits from public basic research and support to private R&D will become more widespread globally. This may weaken incentives for national governments to support these activities while at the same time pushing them to compete to attract mobile investments by MNEs. Thus, global cooperation on research – i.e. joint funding and mechanisms to facilitate cross-border and cross-field collaboration – will become increasingly important. Developing effective science and technology initiatives at the global level requires responsive and adaptable modes of governance, combined with flexible funding and spending mechanisms.

Governments continue to stimulate R&D either directly through contracts, grants and awards or indirectly through R&D tax credits. A focus on high social returns and international good practices is essential. R&D tax incentives should be designed to also meet the needs of young, innovative firms and avoid amplifying resource losses from cross-border tax planning. R&D tax incentives are often unsuitable for young firms, as they often not yet generated taxable income, and therefore cannot benefit, despite their particular strengths as R&D performers (e.g. in creating radical innovations) and job creators. Good design of tax credits through cash refunds, carry forwards, or other approaches can address this problem. Governments should also ensure that R&D tax incentives are predictable for firms, and avoid tinkering with them repeatedly to minimise policy uncertainty. Governments should systematically evaluate tax relief measures to assess whether their targeting and design remain appropriate.

Policymakers should also balance indirect support for business R&D (fiscal incentives) with direct support for innovation. Direct support measures – e.g. contracts, grants, awards for mission-oriented R&D or support for networks – can be particularly effective for young firms that lack the upfront funds or collateral to finance an innovative project. Any allocation of direct support should be competitive and based on objective and transparent criteria. Selection processes must be designed to ensure efficiency (including minimal bureaucracy), avoid rent-seeking (especially by vested interests) and support challengers (e.g. young firms). Non-financial support measures, e.g. training, mentoring and network development, including for SMEs, are an important component of the overall policy mix, as lack of funding is only one of the barriers that hold back innovation. Across all innovation policies, well-designed public-private partnerships are increasingly important to help lever government funding.

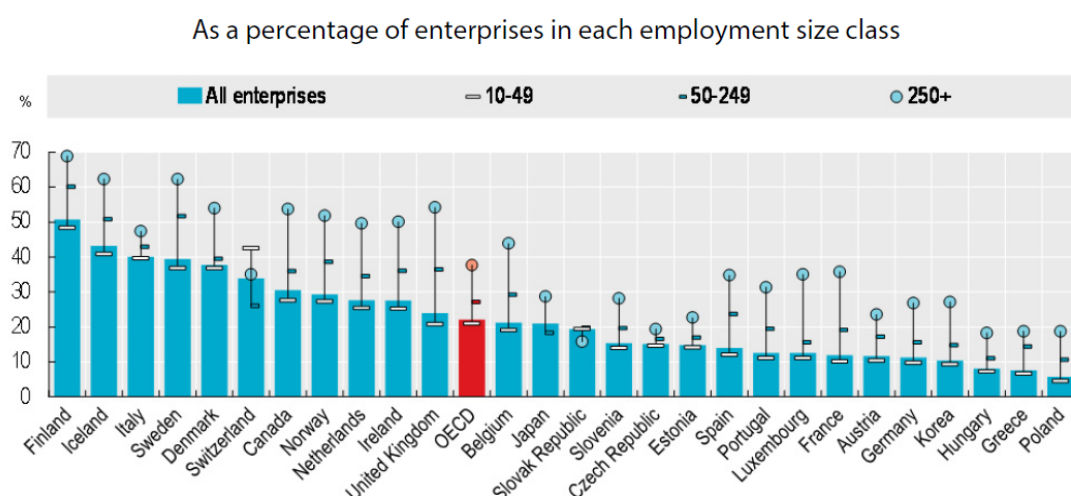
### **Access and participation in the digital economy**

Almost no business today is run without the help of ICTs. In 2014, almost 95% of enterprises in the OECD area had a broadband connection. However, only 21% of firms in the OECD area conduct e-sales, and only 22% using cloud computing services (Figure 3). Overall, differences among countries in the use of various ICT technologies remain considerable. This is closely, but not exclusively, related to differences in the share of smaller firms across countries.

At the same time, the growing number of computer-mediated transactions and the accelerating migration of social and economic activities to the Internet are contributing to the generation of a huge volume of (digital) data – commonly referred to as “big data”. Big data are now used by organisations, often in highly creative ways, to generate innovations in products, processes, organisational methods and markets. However, the use of big data creates several for governments. Governments will need to foster investments in broadband, smart infrastructure and the Internet of Things as well as in data and analytics, with a strong focus on SMEs and high value-added services. Promoting skills and competences in data analytics is also important. Moreover, removing unnecessary barriers to the development of the Internet of Things, such as sector-specific regulations, can help ensure its impact across the economy.

An open and accessible Internet, with high fixed and mobile bandwidth, is essential for innovation in the 21st century. The Internet has become a platform for innovation thanks to its end-to-end connectivity and lack of gatekeepers, providing a place where creativity, the exchange of ideas, entrepreneurship and experimentation can flourish. Furthermore, an open Internet enables the management of GVCs, in which companies increasingly spread production internationally. Governments need to strike the right balance between the social benefits of openness and private preferences for a less open system, however. It will be particularly important to preserve the open Internet and promote the free flow of data across the global ecosystem. At the same time, governments will need to address individuals’ concerns about privacy violations and also promote a culture of digital risk management across society. Finally, to ensure the digital economy is inclusive, governments need to assess market concentration and address barriers to competition.

**Figure 3. Enterprises using cloud computing services by size, 2014**



Source: OECD (2015), *Digital Economy Outlook 2015*, <http://dx.doi.org/10.1787/888933224863>.

[2]

**Source URL:** <https://www.innovationpolicyplatform.org/content/knowledge-creation-diffusion-and-commercialisation>

### Links

[1] <https://www.innovationpolicyplatform.org/document/knowledge-creation-diffusion-and-commercialisation-innovation-imperative-contributing>

[2] <http://dx.doi.org/10.1787/888933224863>

