Ireland

Following a prolonged economic recession preceded by a severe financial crisis, determined policy implementation has restored confidence in the Irish economy and underpinned the strong cyclical recovery now underway. The Irish economy is projected to continue its robust expansion in 2016 and 2017.

Both exports and business investment, which surged due to a temporary impetus by multinational enterprises, are expected to moderate but remain solid. Unemployment is still high, although it has declined substantially in the last few years. An important challenge is to improve long-term growth prospects by making the Irish-owned business sector more dynamic, productive and innovative, while staying attractive to foreign investors.

GERD increased from 1.28% of GDP in 2007 to 1.49% in 2014, mainly thanks to an increase in BERD. Owing to the impact of the recent crisis, public support for R&D and innovation is likely to remain under pressure in the years ahead as the government seeks to further ease the national debt burden.

The Irish government has recently formulated its new Innovation 2020 strategy, which seeks to position Ireland as a "global innovation leader", with a strong, sustainable economy and a better society. More specifically, this translates into excellent research performed in strategically important areas which is relevant and makes an impact on the economy and society; a strong innovative and internationally competitive enterprise base; a renowned pool of talent in Ireland's public research system and industry, which are able to maximise the exchange of talent and knowledge; a coherent joined up innovation eco system that is responsive to emerging opportunities, delivering an enhanced impact through the creation and application of knowledge; and an internationally competitive research system that acts as a magnet and catalyst for talent and industry.

In the context of Innovation 2020, Ireland has recommitted to a research intensity target of 2% of GDP by 2020, which would mean stepping up public investment in R&D to leverage increased private investment.

Hot Issues: Strengthening public R&D capacity and infrastructures
While public R&D expenditures are below the OECD median, Ireland is home to three of the world's top 500 universities and performs well in terms of international S&T publications. In comparison with large EU member states, Ireland has relatively few PRIs, which mostly work on R&D related to natural resources (food, agriculture, forestry and marine) and societal issues (health, energy, the environment). The public research system is therefore heavily skewed towards universities, which are increasingly supported through project-based funding rather than institutional block funding. The competitive allocation of block grants to HEIs has been implemented in part, with up to 10% of funding now allocated on the basis of performance criteria. For the project-based funding component, greater emphasis has been placed on the potential for economic and societal impact, which has seen some reallocation of resources towards more applied research. One major objective of the National Strategy for Higher Education to 2030 is to maximise the excellence and impact of the Irish public research system. To deliver on this objective, the Higher Education Authority (HEA) has established a comprehensive strategic dialogue with each HEI to monitor and drive its performance. The resultant System Performance Framework 2014 16 has led to the agreement of performance compacts between each institution and the HEA across a range of objectives. The strategy also fosters regional clusters, and in some cases mergers, of institutions to build critical mass and to ensure efficiency across the system.

Supporting R&D and innovation in firms

Ireland has a large number of top corporate R&D investors, thanks to the strong presence of high-technology MNEs. Close to two-thirds of Ireland's BERD is performed by foreign affiliates, owing to Ireland's supportive environment for FDI. However, the ease of entrepreneurship index is below the OECD median, owing in particular to a difficult licencing and permit system and complex regulatory procedures. The number of young patenting firms is also well below the OECD median. The National Policy Statement on Entrepreneurship (2014) sets an ambition for Ireland to be among the most entrepreneurial nations in the world. In late 2015, the Department of Jobs, Enterprise and Innovation (DJEI) published its longer-term strategy for enterprise development, Enterprise 2025, which places innovation, or innovativeness, at the core of sustainable enterprise growth and development. It sets out the framework for policy coherence across a range of complementary areas as well as the strategic actions required over the decade to 2025. Ireland has used tax measures for many years as a means of facilitating the establishment and expansion of indigenous and overseas companies. Several adjustments have been made to the R&D Tax Credit following a review in 2013. The government also announced the new Knowledge Development Box (KDB) in its 2016 Budget, which is intended to support and encourage enterprises to undertake R&D in Ireland, to protect the intellectual property that arises, and to benefit from a reduced corporate tax rate of 6.25%. In the context of the Innovation 2020 strategy, Ireland has committed to exploring the potential for extending its new Small Business Innovation Research (SBIR) programme to areas beyond sustainable energy, to include, for example, health. Enterprise Ireland (EI) has introduced a new measure, the Business Innovation Initiative, to support firms in the innovation of business models and services. In an effort to boost innovative entrepreneurship, the Technology Innovation Development Fund, run jointly by EI and Science Foundation Ireland (SFI), is intended to provide one year's support (and approximately USD 118 000 PPP [EUR 100 000]) for the development of ideas with commercial potential.

Improving overall human resources and skills

Ireland has a relatively strong skills base for innovation: the share of the tertiary-qualified adult population, the performance of 15-year-olds in science and doctoral graduates in science and engineering are all above the OECD median. At the same time, the OECD Survey of Adult Skills (PIAAC) signals that the skills of adults in Ireland are lower than in other OECD countries. This relatively poor performance is partly explained by those aged 45 54 and 55 65, who also have relatively low levels of educational attainment. Despite the general improvement in the Irish economy and its labour market, the outflow of university graduates still exceeds the inflow. The productivity prospects of domestic companies, whose ability to hire workers abroad is limited, are more likely to be affected by this net outflow of qualified workers than are multinationals, which are more successful in international recruitment. This risks that the already large productivity gap between domestic firms and multinationals will widen further. The Innovation 2020 strategy contains an action to increase enrolments in masters and PhD programmes to meet the growing demand for talent from Irish businesses. The strategy also seeks both to enhance existing support for the bilateral flow of researchers between academia and industry by increasing awards under the SFI Industry Fellowship Programme and the Irish Research Council's (IRC) Employment-based Postgraduate Programme and Enterprise Partnership Programme, and to increase the share of PhD researchers transferring from SFI research teams to industry from 25% in 2014 to 35% by 2020. The strategy also proposes both to develop a coherent national policy on the structured progression of researchers by identifying and tackling impediments to the career progression and mobility of trained researchers and innovators in the publicly funded research system, and to provide better career support for PhDs and post-docs to ensure that the full spectrum of career possibilities is known from an early stage. Ireland also has underway several initiatives to improve women's participation in research and innovation activities. These include the Aurora and Project Juno initiatives, as well as the Athena Swan Awards, which is an initiative emanating from the United Kingdom that has been extended to Ireland. The HEA is also conducting a major review of gender equality in higher education, and a number of the IRC's competitive funding programmes request applicants to consider gender when compiling funding applications.

Targeting priority areas/sectors

The priority areas identified in the 2011 Research Prioritisation Exercise are still being implemented, primarily through competitive funding programmes. Taking a challenge-centric approach to

innovation, the Innovation 2020 strategy complements these by highlighting the need for research that has the potential to address national and global challenges. These challenges include tackling climate change, reducing Ireland's energy dependency, meeting the forecasted increase in global food demand, delivering efficient and effective public services, and improving health and well-being. On the latter, Ireland has developed a strong revealed technology advantage in biotechnologies over the last decade or so, driven by FDI in pharmaceuticals and medical devices. It has schemes in place, such as Health Innovation Hub Ireland, to promote the medical sector.

Addressing challenges of STI globalisation and increasing international cooperation

The Irish innovation system is well integrated in the international science and innovation landscape. In 2014, 48% of S&T publications and 24% of PCT patent applications involved international collaboration, and funding from abroad accounted for 20% of GERD. Ireland engages in international co operation on STI with a wide range of countries in Europe and beyond, including the United States and China (for example, through SFI's International Strategic Co operation Award programme). SFI's Research Centres Programme remains an important part of the policy mix, aiming to build world-leading, large-scale, theme based research centres that establish and improve linkages between foreign MNEs and Irish SMEs. More recently, the Innovation 2020 strategy contains measures to attract world-leading research professors to Ireland, for example, by engaging the Irish embassy network to promote the SFI Research Professorship awards scheme.

Selected Highlights: STI policy governance

The Innovation 2020 Strategy is being implemented by a whole-of-government approach through a multi-stakeholder Innovation 2020 Implementation Group. This new group replaces three existing groups – the Inter-Departmental Committee on STI, the Research Prioritisation Action Group and the High Level Group overseeing implementation of Ireland's strategy to engage with Horizon 2020 – which have been merged to better streamline policy in the area. Technology Ireland continues to ensure maximum complementarity and coherence between the science and innovation programmes and initiatives of the enterprise agencies (EI, Industrial Development Authority [IDA] Ireland, and SFI) and the HEA. Under the aegis of the DJEI, it will continue to operate alongside the Innovation 2020 Implementation Group with a specific focus on enhancing synergies in initiatives to promote enterprise R&D. The remit of Technology Ireland is also being expanded to incorporate the role of the Industry Horizon 2020 Group to lead a cross agency approach to developing and delivering initiatives aimed at growing industry participation in Horizon 2020. At the same time, the Strategic Research Proposals Group, led by the Chief Scientific Adviser to the government (CSA), will continue to operate, with a focus on catalysing, developing and advising on successful submission of large-scale Horizon 2020 proposals, including proposals where Ireland can take a leading or major role. The Higher Education Research Group, which is led by the Department of Education and Skills, will continue to provide strategic direction for the approach of the higher education sector. Both of these groups will feed into discussions of the Innovation 2020 Implementation Group. Evaluation is becoming increasingly important with the substantial funding increases in RDI investments over the last decade. Evaluations of STI policies and programmes have been carried out principally at the request of the DJEI as a key investor in S&T and innovation. In 2014, the DJEI published evaluations of 12 major R&D supports provided by the enterprise agencies. The Department of Finance also evaluated the R&D tax credit in 2013. There is also an ongoing focus on monitoring Ireland's participation in European Framework Programmes and its impacts, with an ex post evaluation of Ireland's participation in FP7 and an ex ante evaluation of Horizon 2020 due for completion in 2016. In the context of Innovation 2020, Ireland has committed to review the full range of state financial aid for RDI, both direct and indirect. A governance issue that cuts across all research funders and providers in Ireland is that of research integrity. A National Policy Statement on Ensuring Research Integrity in Ireland was adopted in 2014, incorporating international best practices such as the European Code of Conduct for Research Integrity and the OECD Best Practices for Ensuring Scientific Integrity and Preventing Misconduct. SFI is currently piloting a series of Research Integrity audits, and consideration will be given to extending and expanding these audits nationally to include all Irish research performers and funders.

Technology transfers and commercialisation

Irish universities and public research institutes file patents at a rate close to the OECD median (5p), while the proportion of public R&D expenditures financed by the private sector is among the lowest in the OECD (5o). Innovation 2020 sets out a policy framework and direction for knowledge transfer. A national knowledge transfer network has been built up. Enterprise Ireland funds the commercialisation of marketable scientific results and support for start up companies (among other things), while IDA looks after the requirements (including R&D) of multinational firms. Research can initially be funded by SFI and then can be funded subsequently by one of the other two agencies as Technology Readiness Levels rise. A central technology transfer office, known as Knowledge Transfer Ireland, was established in 2013. It maintains directories of experts based primarily in universities and also keeps track of patents and other intellectual property outcomes of research. The universities have recently upgraded their research and technology transfer offices in order to cope with the increased workload caused by the higher proportion of applied research now being undertaken.

Clusters and regional policies

A key goal of Enterprise 2025 is to design a new approach for a National Clustering Initiative in the key sectors of strength, building on the existing initiatives through competitive calls that seed cluster activities to stimulate more extensive clustering on a sustained basis, at a scale and depth that delivers to enterprise policy goals and has visibility and stature in an international context. The establishment of regional clusters also forms part of the implementation of the National Strategy for Higher Education to 2030. The purpose of developing these clusters is to foster greater collaboration in a region between institutions, both universities and institutes of technology, with a view to ensuring an accessible and quality engagement with the institutions, whether that is as a student, an enterprise or other.

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