

## Slovak Republic

The Slovak Republic is one of Europe's most dynamic economies. Yet, along with other post-communist countries, the country still faces major challenges in the field of innovation and in moving towards a knowledge-based economy.

Business and public R&D remain well below the OECD average. Although gross domestic expenditure on R&D (GERD) has grown steadily (at an annual rate of 16.3% over the period 2009-2014), investment in R&D as a share of GDP is far below OECD norms (table 1). Publicly financed R&D reached 0.39% of GDP in 2014, which is about 60% of the average in OECD economies.

Improvements in governance and reforms to the public research sector have continued in recent years. The current major STI policy priorities are R&D and business innovation, enhancing the transfer and impact of public research, and improving policy governance.

### **Hot Issues: Promoting structural adjustment and new approaches to growth**

The Regional Innovation Strategy for Smart Specialisation of the Slovak Republic (RIS3SK), approved in 2013, is currently the main strategy for stimulating structural change in the Slovak economy based on innovation and excellence in research. The first objective of this strategy is to deepen economic integration and the embeddedness of major industries, increasing their value added through development of the supply chain and transformation into competitive clusters. The second objective is to increase the contribution of research to growth. The third is to create a dynamic, open and inclusive innovative society, as a precondition for raising living standards. And the last objective is to improve the quality of human resources for a more innovative country. The Operational Programme Research and Innovation (OPRI), approved by the European Commission in October 2014, articulates the granting of support from the European Structural and Investment Funds (ESIF) for EUR 2.2 billion for implementation of the RIS3SK for the period 2014-2020. The Research and Innovation programme aims to create an innovation-friendly environment and strengthen the research and innovation system in order to reinforce competitiveness and growth.

### **Fostering sustainable/green growth**

Energy efficiency is an important issue, as the country has only limited primary energy resources (mainly brown coal) and depends heavily on imports of foreign raw materials (e.g. crude oil). The main potential for green growth lies in agriculture and the renewable energy sector. The government has launched several initiatives in recent years to address green growth and sustainability concerns. For instance, the Slovak Innovation and Energy Agency - in line with Slovakia's Innovation Strategy and Innovation Policy 2013 - offers support for activities to increase energy efficiency in production and consumption, and provides expertise on energy-related matters. The National Action Plan for Green Public Procurement (GPP NAP II) is a governmental initiative, adopted in 2012, which aims to increase the level of green public procurement to 65% in all tendering procedures for central government bodies and 50% for self-governed regions and cities by 2015.

### **Strengthening the public research system**

There is a great concern to strengthen the impact and transfer of publicly funded research. The MINERVA 2.0 competitiveness strategy contains the main tools for promoting co-operation between academic and business sector organisations. This includes creation of a unified national system for technology transfer to support and manage the commercialisation of intellectual property generated in academia, and support for R&D infrastructure. Furthermore, a strong element of the RIS3 SK aims to link academics and the business sector in university research parks. A network of national science centres will be built at the largest of these parks.

### **Encouraging business innovation and innovative entrepreneurship**

The Slovak business sector is characterised by a dual economy composed of affiliates of multinational companies with high productivity levels and around 60 000 SMEs, with just a few large domestic companies. This configuration has favoured technology imports and weak investment in in house R&D, which has contracted in recent years. BERD is largely concentrated in large firms, with the contribution of domestic firms slackening since 2007. The participation of foreign firms in BERD has increased to about 40%. Medium- to low-tech manufacturing industries make a larger contribution to BERD than do firms in high-tech manufacturing and knowledge intensive services. Business R&D investment and innovation outputs are still among the lowest in the OECD area. In terms of innovative entrepreneurship, while the ease of entrepreneurship index is high, the country ranks very low in terms of venture capital investment as a share of GDP (in the bottom 5 OECD economies). The current policy basket for business innovation is composed mostly of loans, guarantees and risk-sharing mechanisms (Slovak Investment Holding), competitive grants (managed by the OPRI), innovation vouchers and equity financing and venture capital investment support (JEREMIE Programme). Competitive grants are currently the most relevant policy tool in terms of innovation policy needs. Tax incentives on corporate income for business R&D are also currently in place (recently launched), as are tax incentives on corporate income for intellectual property revenues and other profits (i.e. a patent box). To stimulate demand for innovation, the government has introduced a public programme for procurement for R&D and innovation. Under the Risk Capital Sharing programme (introduced in 2006), risk capital is provided to innovative SMEs, either in the form of equity or quasi-equity investments, or through convertible loans.

### **Targeting priority areas/sectors**

With its smart specialisation strategy, the Slovak Republic took the decision to systematically target research and innovation funding in order to overcome fragmentation. The OPRI defined the set of priority sectors and technologies for the Slovak Republic. The highlighted areas of economic specialisation are: automotive and mechanical engineering; consumer electronics and electrical equipment; ICT and services; and production and the processing of iron and steel. The areas of specialisation from the point of view of available scientific research capacities are: research on materials and nanotechnology; ICT; biomedicine and biotechnology; environment and agriculture; and sustainable energy.

### **Selected Highlights: STI policy governance**

In 2013, major changes were introduced to improve the governance and organisation of STI policy. The introduction of the Slovak Government Council for Research, Development and Innovations (SGCSTI) provided a high-level structure that brings together the main ministries responsible for research and innovation policy and the main research performer, the Slovak Academy of Sciences (SAS). An update of the Long-term Plan for Science and Technology Policy, in 2011, also stressed the need to improve governance. Emphasis was given to reducing information inequality and increasing transparency, as well as improving the efficiency of public R&D investment. There is no independent evaluation agency. Acknowledging the contribution of science to sustainable economic growth, the government has committed to create a Chief Science Officer (CSO) position. The CSO will be mandated to ensure that publicly-funded science is fully available to the public, that scientists are able to speak freely about their work, and that scientific analyses are considered when the government makes decisions.

### **ICT and Internet infrastructures**

The Data Centre for R&D was created in 2009 to store, process and provide access to information and scientific data used by researchers, while ensuring a high level of accessibility and security. The Data Centre is expected to increase the ability of R&D institutions to co-operate intensively with industrial and social partners through the development of ICT infrastructure for electronic communication in the area of science and research. In June 2010, the Data Centre was officially opened in the premises of the University of Žilina, together with a backup data centre in Bratislava.

### **Universities and public research**

At 0.48% of GDP, public R&D expenditure is below the OECD median, as is scientific output. Slovakian researchers are reasonably well networked internationally. In terms of international co authorship, the Slovak Republic ranks at the OECD median, but in terms of international co invention, above the OECD median. Public research and higher education reforms will continue. The role of universities in the Slovak public research sector has increased in importance over the years. Most public research is oriented towards basic research, as opposed to the OECD average, which places greater importance on applied/experimental research. The importance of institutional block funding in public research is higher than in most OECD countries, where more balance exists between institutional and project-based funding. Links between science and industry remain weak: the share of business-funded R&D in universities and government labs, an indicator of industry-science relations, is at the OECD median. Long-term institutional funding is expected to adopt performance-based criteria following the British Research Assessment Exercise.

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### **Clusters and regional policies**

In the Slovak Republic, the main purpose of promoting clusters is to increase R&D efficiency and balanced regional growth. The OPRI recently introduced a number of measures to support clusters. This support will be implemented over the period 2016 2020. The objective is to increase and link the innovation capacity of firms, universities and research organisations and consolidate clusters. The RIS3-SK has been developed as a national smart specialisation programme in line with the EU Research and Innovation Strategies for Smart Specialisations Guideline.

### **Globalisation**

The government has sought to expand the international mobility of researchers and linkages with global research networks. The Phoenix Strategy, approved in 2011, is a package of policy measures to support the international mobility of human resources in public research. It also supports co-operation with foreign institutions, specifically the establishment of joint study programmes in Slovakia, as well as programmes between Slovak universities and world-class foreign universities. In particular, the Phoenix Strategy aims to increase the participation by Slovak research teams in relevant EU programmes, in the context of the Mobility Centres, the EURAXESS Network of European mobility portals, and the Marie Curie mobility support framework programme.

### **Skills for innovation**

The Slovak Republic needs to improve the level of skills available for innovation. In several indicators, the country ranks in the bottom half of OECD economies, especially in terms of the share of the adult population with tertiary education level. The performance of 15 year olds in science is below the OECD median. However, the Slovak Republic does score highly in terms of doctoral graduates in science and engineering, ranking in the top half of OECD countries.

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[4] <http://innovationpolicyplatform.org/STICharting/RTA.htm?iso=SK>

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[6] [https://www.innovationpolicyplatform.org/system/files/STIO%20Key%20messages\\_0.pdf](https://www.innovationpolicyplatform.org/system/files/STIO%20Key%20messages_0.pdf)

[7] [http://www.oecd-ilibrary.org/science-and-technology/oecd-science-technology-and-innovation-outlook-2016/slovak-republic\\_sti\\_in\\_outlook-2016-84-en](http://www.oecd-ilibrary.org/science-and-technology/oecd-science-technology-and-innovation-outlook-2016/slovak-republic_sti_in_outlook-2016-84-en)

[8] [http://www.oecd-ilibrary.org/science-and-technology/oecd-science-technology-and-innovation-outlook-2016/sti-country-profiles-reader-s-guide\\_sti\\_in\\_outlook-2016-44-en](http://www.oecd-ilibrary.org/science-and-technology/oecd-science-technology-and-innovation-outlook-2016/sti-country-profiles-reader-s-guide_sti_in_outlook-2016-44-en)

[9] [http://www.oecd-ilibrary.org/science-and-technology/oecd-science-technology-and-innovation-outlook-2016/methodological-annex-to-the-2016-oecd-sti-outlook-country-profiles\\_sti\\_in\\_outlook-2016-95-en](http://www.oecd-ilibrary.org/science-and-technology/oecd-science-technology-and-innovation-outlook-2016/methodological-annex-to-the-2016-oecd-sti-outlook-country-profiles_sti_in_outlook-2016-95-en)

[10] <https://www.innovationpolicyplatform.org/system/files/sti-outlook-2014-slovak-republic.pdf>