

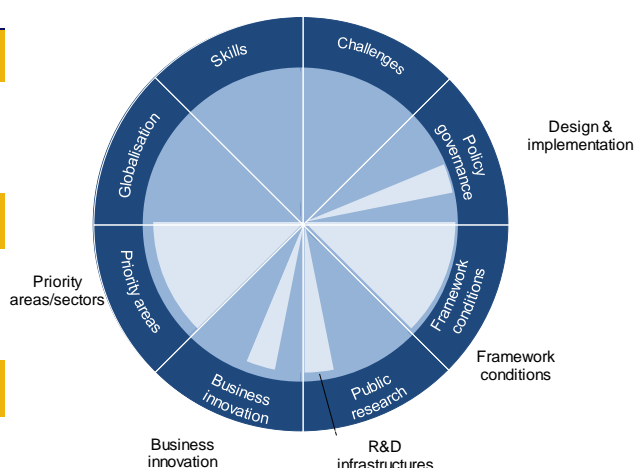
SLOVENIA

In less than two decades, Slovenia has become a market-based economy. It has integrated with world markets and has joined the EU, the European Monetary Union and the OECD. It leads central and eastern European transition countries in GDP per capita and on a range of innovation-related indicators.

Table 1. Gross domestic expenditure on R&D (GERD)

	SVN	OECD
GERD		
USD million PPP, 2014	1 496	1 181 495
As a % of total OECD, 2014	0.1	100
GERD intensity and growth		
As a % of GDP, 2014	2.39	2.38
(annual growth rate, 2009-10)	(+5.8)	(+2.3)
GERD publicly financed		
As a % of GDP, 2014	0.53	0.61
(annual growth rate, 2009-14)	(-2.3)	(+2.5)

Figure 1. Major STI policy priorities, 2016



Hot issues

Improving the design and implementation of STI

The Research and Innovation Strategy of Slovenia 2011-20 (RISS) and the National Higher Education Programme 2011-20 (NHEP) support close links between research, technology development, innovation and higher education. They also proposed measures for necessary reforms of the national innovation system and measurable implementation targets. To implement these strategies, legal documents are being prepared. They include a new (or significantly amended) Research and Development Act as well as a Higher Education Act and a Smart Specialisation Strategy (SSS). In 2012, the government's budget for R&D (GBAORD) amounted to EUR 190 million, accounting for 0.54% of GDP. It remained unchanged in 2013. For 2012-13, the government also allocated USD 216 million (EUR 130 million) from the EU Structural and Social Funds for R&D to implement the strategies.



Improving the framework conditions for innovation (including competitiveness)

The Slovenian government endeavours to create a legislative environment conducive to innovation and to strengthen incentives for innovation, notably by implementing and supporting the protection and management of IPR. This is considered necessary for accumulating innovation capabilities in companies, promoting innovation in services and encouraging the international orientation of business R&D.

Encouraging business innovation and innovative entrepreneurship

BERD as a share of GDP is above the OECD median (Figure 5^d). It reached 1.99% in 2012, up from 1.83% in 2011. Overall, BERD has expanded rapidly in recent years, in spite of the recession and a slow recovery. Much of it is concentrated in a small number of firms, with two pharmaceutical firms accounting for a large share. The services sector performs less R&D than in other OECD countries (figure 6). Triadic patents filed and trademark applications fall short of the OECD median (Figure 5^{f,g}). Venture capital per GDP is at the bottom of the OECD middle range (Figure 5^h). To foster business R&D and innovation, measures are being implemented to strengthen the leveraging effect of public funds on private R&D investments, to support the employment of researchers in the business sector, to encourage business R&D investments through generous R&D tax incentives, to support start-up and fast-growing innovative companies. Slovenia's policy for SMEs and entrepreneurship was set out in the Programme of Measures to Promote Entrepreneurship and Competitiveness (2007-13). R&D carried out by SMEs increased markedly in 2009 relative to 2006 (figure 6).

Targeting priority areas/sectors

Slovenia's Smart Specialisation Strategy (SSS) has been developed through a public consultation process. It is based on comparative advantages and takes into account previous investments in capacity and scientific excellence. Its goal is to support the further development of the public and business R&D potential in chosen areas and thus to enable Slovenia to become a technology leader in its priority fields. On the basis of comparative analyses of Slovenian competencies and potentials the following horizontal priority areas were identified: materials and technologies; electrical and electronic components and devices; tools, building blocks; and technologies for the management of process systems. The priority areas of Slovenia's SSS are: healthy working and living environment, natural and traditional resources for the future, industry 4.0. Slovenia will concentrate a portion of domestic and international public funds on the priority areas in order to ensure competences and advantages in the relevant fields of science and business innovation. The allocation of the majority of EU Structural Funds and part of the national budget for R&D is, and will be, linked to the SSS. To implement the SSS, Slovenia has recently established Strategic Research Innovation Partnerships. The partnerships shall facilitate the promotion of a system-wide and long-term cooperation of stakeholders within an individual area, namely cooperation between stakeholders, cooperation of stakeholders with other entities, and cooperation with the government. Partnerships are responsible to promote internationalisation, the integration and development RDI initiatives, to develop human resources and strengthen framework conditions for innovation. Each partnership will develop an action plan.

Strengthening public R&D capacity and infrastructures

Slovenia has good universities (Figure 5^b) and good performance in scientific publications in high-impact journals (Figure 5^c). Unlike other transition economies, Slovenia has not only maintained but strengthened its PRIs. HERD was 0.29% of GDP and GOVERD around 0.34% of GDP in 2012. In the past five years, numbers of researchers and R&D personnel have increased steadily. However, the share of tertiary-educated population is below the OECD (Figure 5^b) and EU averages. Recognising the importance of developing human resources, Slovenia devoted USD 56.7 million (EUR 34 million) from the national R&D budget and USD 23.3 million (EUR 14 million) from EU Structural Funds in 2012 to support young researchers and PhD students. The Research Infrastructure Roadmap (2011-20) sets out priorities for investments in research infrastructure. Slovenia allocated USD 75 million (EUR 45 million) from the national R&D budget and USD 23.3 million (EUR 14 million) from EU Structural Funds for research infrastructures in 2012.



Some key STI performance indicators

Figure 2. Economic performance

Labour productivity, GDP per hour worked, index 2005=100

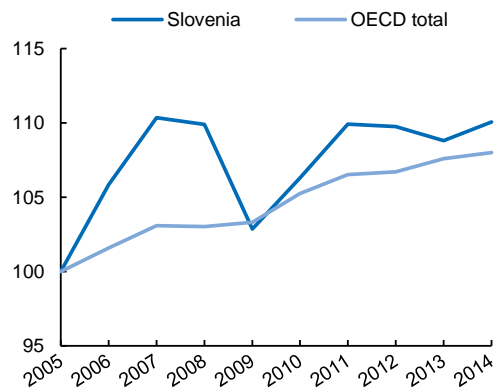


Figure 3. Environmental performance

Green productivity, GDP per unit of CO₂ emitted, index 2005=100

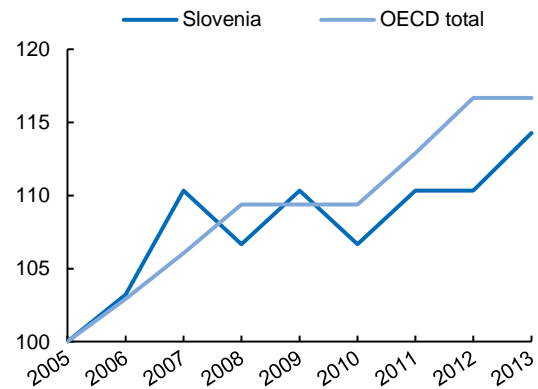
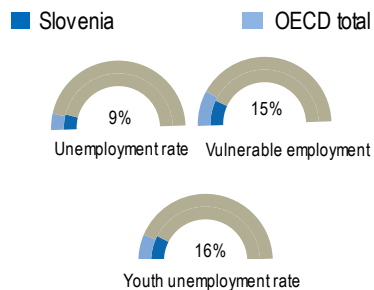


Figure 4. Unemployment

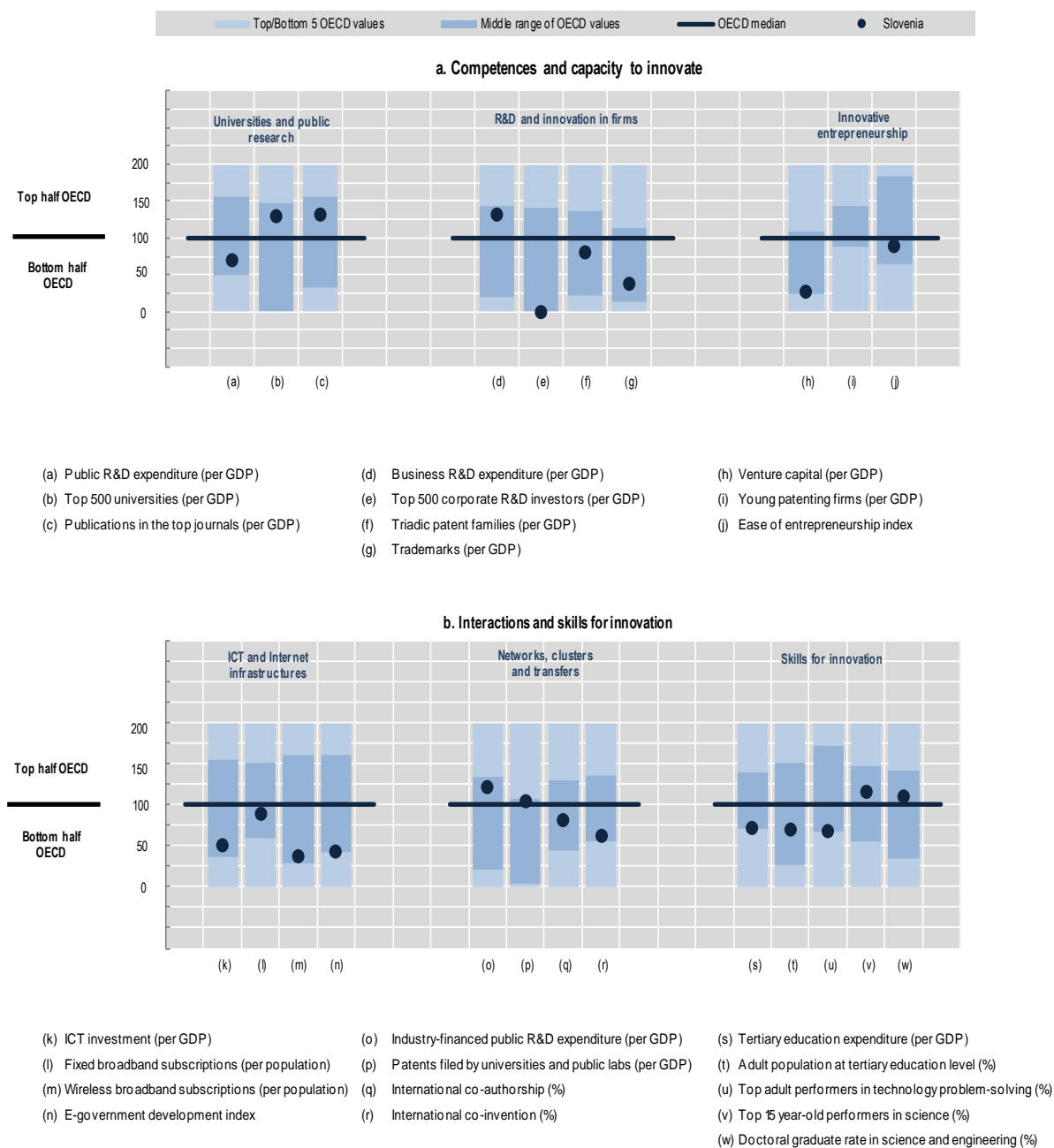
2015 or latest year available, percentages



Benchmarking national STI systems

Figure 5. Science and Innovation in Slovenia

Comparative performance of national science and innovation systems, 2016



Note: Normalised index of performance relative to the median values in the OECD area (Index median=100).



Highlights of the Slovenian STI system

New sources of growth

The Smart Specialisation Strategy will address relevant green innovations and technologies. Positive environmental impact and low carbon economy (efficient use of energy, renewable sources of energy, less use of environmentally harmful substances and emissions, recycling) are criteria in most public calls for support for research and innovation. SID Bank (Slovenska izvozna in razvojna banka) offers favourable credit lines for environmental projects and Ecofund funds initial investments in environmental technologies. The new Programme of financial support of MoEDT 2015-2020 was adopted by the Ministry of Economic Development and Technology and it represents the central action document for implementation of the measures set in Operational Programme 2014-2020 and Smart Specialisation Strategy. It focuses on the development of lagging Slovenian regions and on the promotion of internationalisation in Slovenian SMEs

STI policy governance

In the past, a multidisciplinary approach in scientific research was hindered by the discipline-oriented allocation of R&D funding. The Slovenian Research Agency therefore established the Interdisciplinary Research Council to evaluate and allocate public funds for atypical or multidisciplinary or interdisciplinary research. The Agency has earmarked some 10% of public funds for such research projects. The outcomes of the former National Research and Development Programme (NRDP) evaluation as well as OECD analyses and Open Method of Coordination (OMC) peer reviews significantly influenced the preparation of the Research and Innovation Strategy of Slovenia (RISS). Furthermore, the final version of the RISS was prepared on the basis of the above mentioned documents and their consideration in expert and public debates. RISS implementation is monitored and reported regularly to National Assembly. Evaluation practices in Slovenia are mainly institutionalised through the Slovenian Research Agency (SRA), which is the principal funding agency in the field of public scientific research. The latest report on the implementation of the Research and Innovation Strategy of Slovenia (RISS) pointed out that Slovenia needs more systemic approach towards institutionalisation of evaluation practices. The main challenges are in setting up the institutional evaluation of PRIs and universities which have to rely on independent external peer review processes.

Universities and public research

In line with the Research and Innovation Strategy of Slovenia (RISS) 2011-20, which initially set the objective of increasing responsibility and autonomy of PRIs, a new system of institutional evaluation should be established to support more differentiated, performance based institutional funding of PRIs. Furthermore, the essence of the institutional evaluation should consist of performing independent external evaluation, implemented by both foreign and national reviewers, which would not exclusively depend on quantitative data.

Skills for innovation

The supply of future science and innovation skills appears good, judging by the above-median scores of 15-year-olds on the science PISA test in 2012 and the share of doctoral graduates in science and engineering (Figure 5^{vv}). A measure to foster human resources in science and innovation, “Scientists at the beginning of a research career”, was introduced in 2013. The main objective is to connect PRIs with the business sector by co-funding post-doctoral researchers. The Resolution on the National Higher Education Programme 2011-20 (NHEP) encourages everyone who is interested and capable to enter tertiary education and provides conditions for successful completion of their studies. According to the amendments to the Higher Education Act, the state covers the expenses of an individual’s studies for the first and second study cycle irrespective of age, at any time in an individual’s life if he or she has not yet obtained this level of education and if his or her study at his level has not yet been funded by the state. The amendment of the HE Act (2012) enabled universities to change their study programmes faster to respond to the needs of the labour market and to





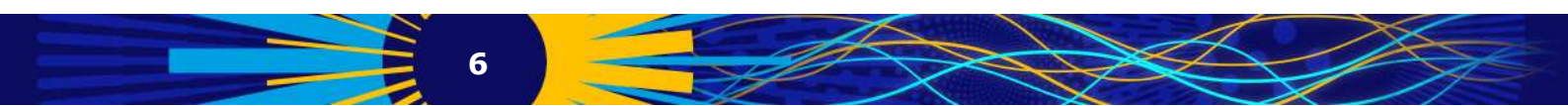
improve quality. The amendments to the Higher Education Act abolish the procedure of reaccreditation of study programmes by the Slovenian Quality Assurance Agency for Higher Education every seven years and give universities and other higher education institutions full autonomy and responsibility regarding the quality of study programmes. .

Technology transfer and commercialisation

There are several new mechanisms to foster knowledge flows. The centres of excellence (CoE) involve partnerships between industrial partners and academia and seek to strengthen quality and co-operation, build critical mass and link up with top centres abroad. Competence centres (CCs) link science and industry and give a strong role to industrial partners, applied research and industrial networks. USD 188 million (EUR 112.8 million) has been allocated for these two types of centres for 2010-14. Technology transfer offices have recently been established in major universities and R&D institutions (University of Ljubljana, University of Maribor, Jožef Stefan Institute, National Institute of Chemistry).

Recent developments in STI expenditures

Slovenia's GERD reached 2.63% of GDP in 2012. Industry contributes 62.2% of GERD and government 28.7%, with 8.6% from abroad. National targets are 1.5% of GDP for public R&D and an ambitious 3.6% of GDP for GERD by 2020. However, the central government budget for R&D decreased over 2009-13. In 2013 GBAORD was approximately the same as in 2008. In contrast, EU Structural Fund and Social Funds for R&D increased in recent years.



Structural aspects and specialisation

Figure 6. Structural composition of BERD, 2013 or latest year available
As a % of total BERD or sub-parts of BERD

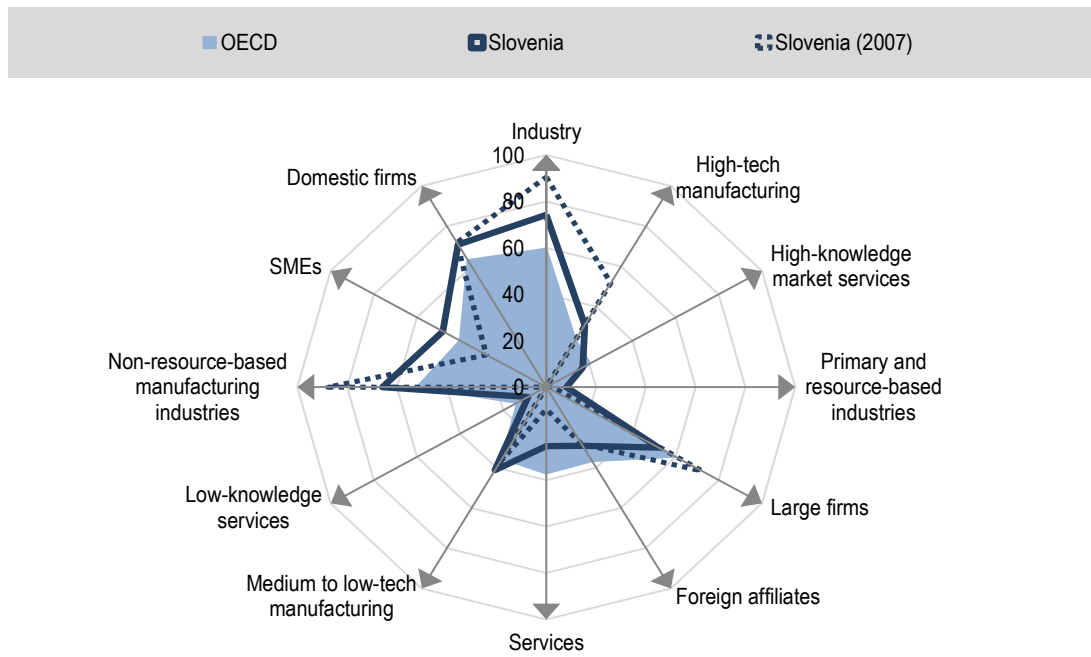
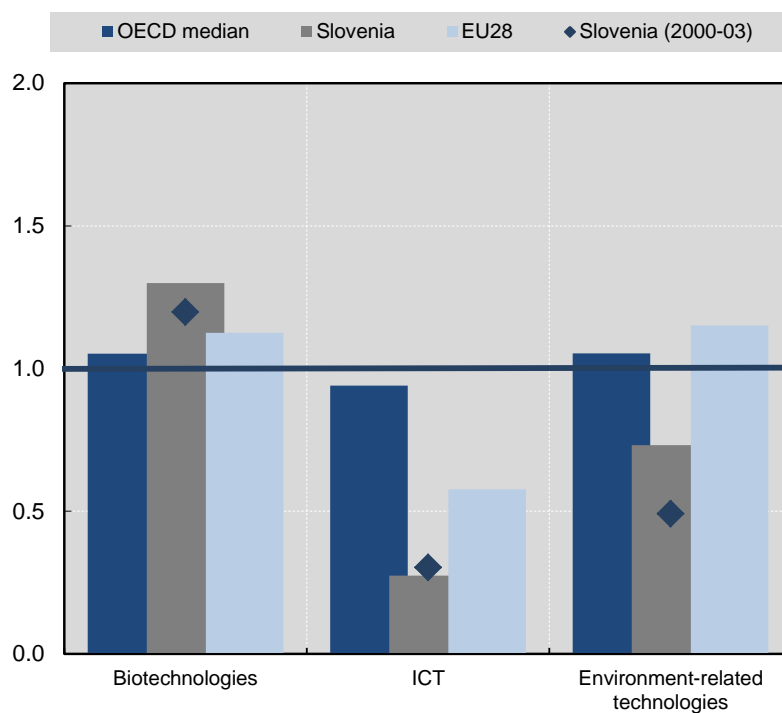
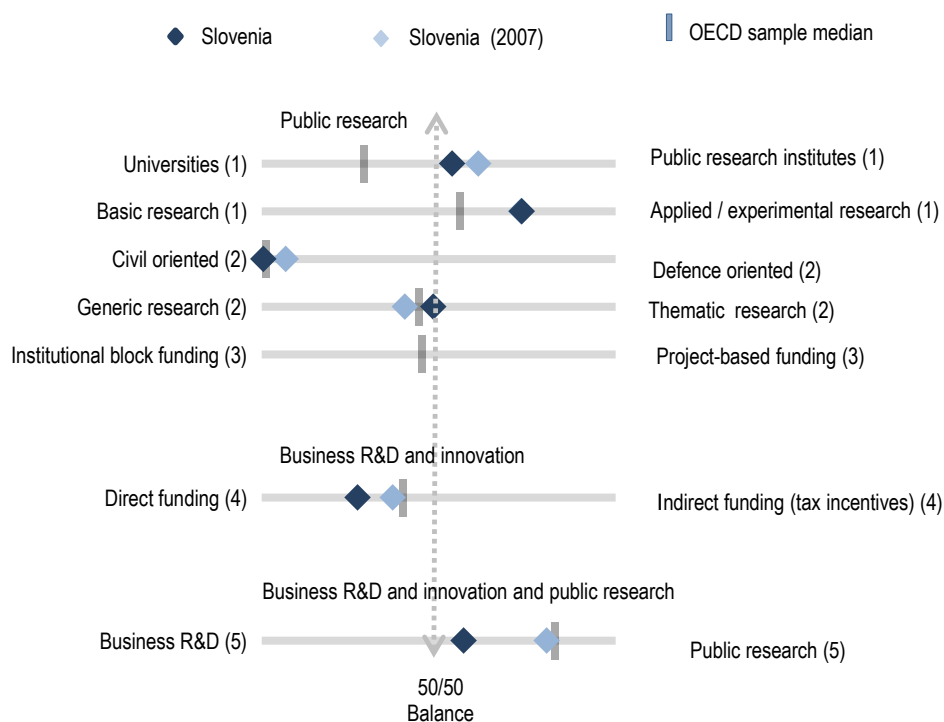


Figure 7. Revealed technology advantage in selected fields, 2011-13
Index based on IP5 patent families applications



National STI policy mix

Figure 8. Allocation of public funds to R&D, 2014 or latest year available
By sector, type of R&D and mode of funding



(1). Balance as a share of both higher education (HERD) and government (GOVERD) R&D expenditure.

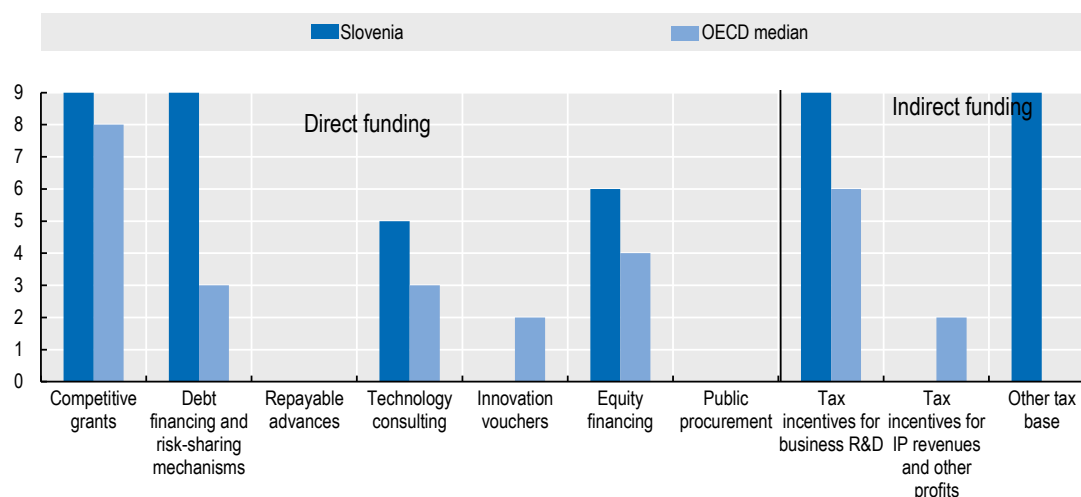
(2). Balance as a share of total government budget appropriations and outlays for R&D (GBAORD).

(3). Balance as a share of total funding to national performers.

(4). Balance as a share of both indirect funding (through R&D tax incentives) and direct funding (through grants, procurement, loans, etc.).

(5). Balance as a share of publicly-funded HERD and GOVERD and components of (4).

Figure 9. Most relevant policy instruments of funding for business R&D, 2016
Country self-assessment, index (9 = high and increasing relevance to 0 = not used)



Note: Policy information comes from country responses to the EC/OECD STI Policy Survey 2016 and 2014. Slovenia's responses are available in the EC/OECD STI Policy Database, edition 2016 at http://qdd.oecd.org/DATA/STIPSurvey/SVN...STIO_2016.

Source: See reader's guide and methodological annex.

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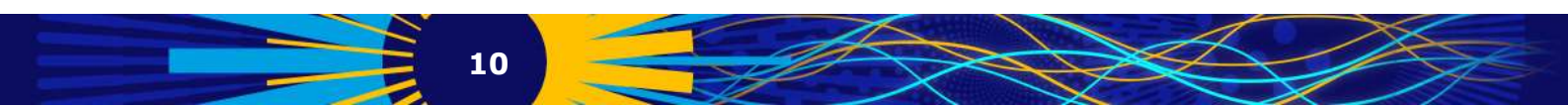
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