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Russian Federation

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RUSSIAN FEDERATION

The Russian Federation has long-standing strengths in science and technology but they need to be better exploited in order to diversify the economy and reduce its reliance on natural resources. Presidential Decrees in 2012 set major goals for Russian STI policy, including increasing GERD to 1.77% of GDP by 2015.

Hot issue 1: Reforming and improving the public research system (including university research). Russia has a large public science base, dominated by industrial research institutes and the institutes of the State Academies of Sciences (RAS). In 2013, the latter were extensively reorganised. A new Federal Agency for Scientific Organisations was also established to administer the property of the RAS, to evaluate and oversee the activities of the RAS institutes and to distribute public funding to them. New arrangements for performance assessment of public scientific organisations in the civil sector were also introduced in 2013 to improve accountability. In 2013 a new Russian Research Foundation was set up and distributed on a competitive basis USD 2.06 billion (RUB 48 billion) in the form of research grants during 2013-16.

Russia has few internationally renowned universities and its researchers publish little in high-impact international S&T journals (Panel 1[b, c]). Several important measures since 2010 seek to further develop research capabilities in universities. Most recently, a new competition for public institutional grants, known as Programme 5/100/2020, will provide USD 2 billion (RUB 40 billion) during 2014-16 to selected universities, which are expected to enter the world's top 200 by 2020. Five universities are expected to join the world's top 100 by the same date.

Hot issue 2: Improving returns and impact of science. During 2011-13, 34 technology platforms were established to bring together universities, research institutes and companies to share perspectives and co-operate on science and innovation. Changes have been made in the legislation for intellectual property (IP) exploitation. Decree No. 233 of 2012 assigns IPRs resulting from public research to the Russian Federation and establishes the principle of free transfer of IP to facilitate the transfer of public research results to industry and society. Amendments to federal law in 2013 made it easier for PRIs and universities to create business partnerships for transferring IP on the basis of a licence or commercialisation.

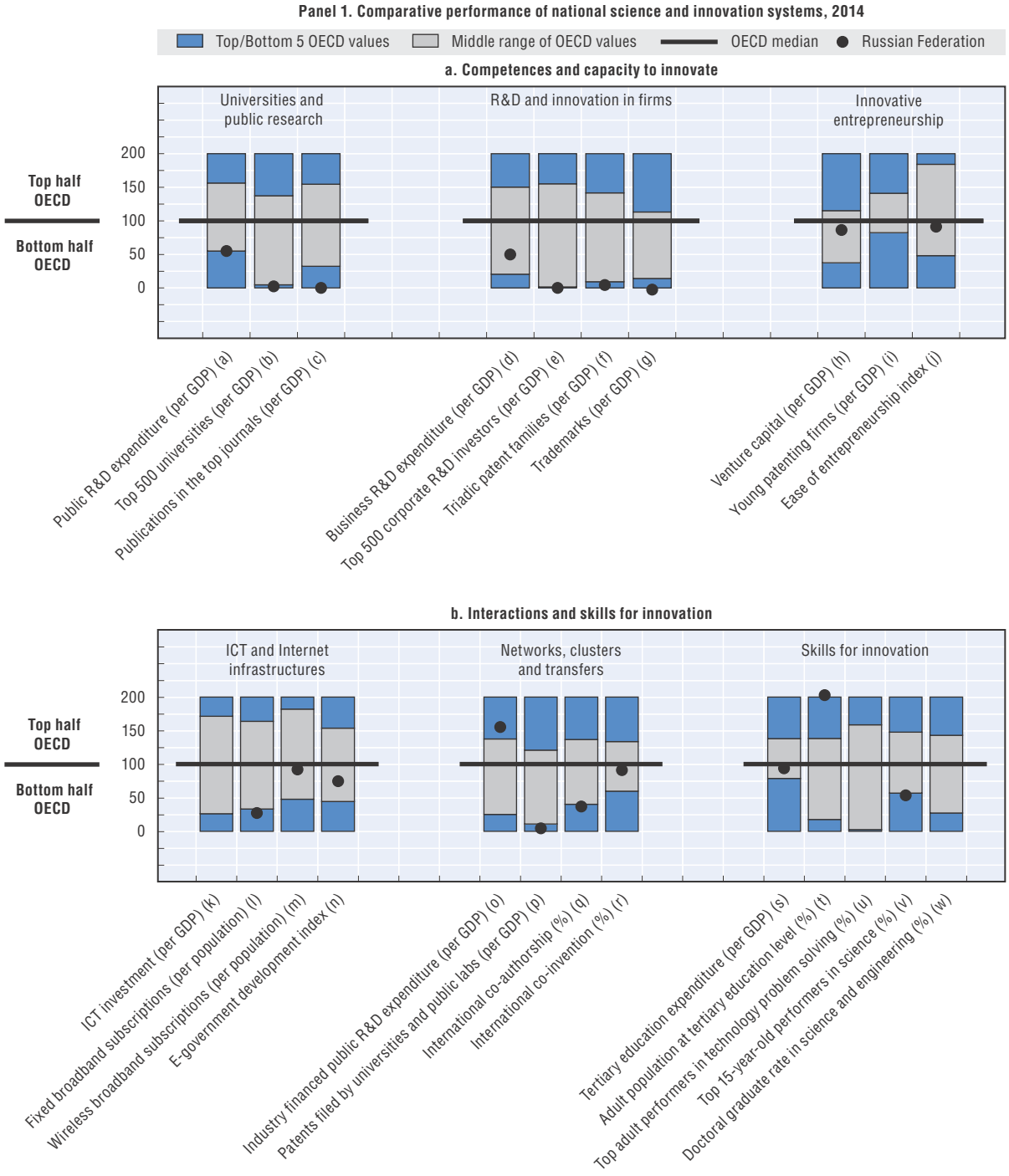
Hot issue 3: Improving the education system. The proportion of the tertiary-qualified population, at 53%, is well above that of any OECD country (Panel 1[t]). Yet, the performance of 15-year-olds in science is below the OECD median (Panel 1[v]). The government has introduced many measures to improve the efficiency of the education system and its ability to meet the skills needs of the country. For example, the 2012 Federal Law On Education in the Russian Federation has raised the standards for PhD qualification and made the process more transparent. Since 2012, the Presidential Programme for Advanced Training of Engineering Personnel has been implemented with total state financing of USD 38.8 million (RUB 750 million) over three years. The goal is to improve the qualification of engineers in Russia's strategic industries and to improve the structure of engineering education by organising training programmes in priority industry sectors (energy and resource efficiency, nuclear technologies, space, medicine, and ICT) and internships in leading research and engineering centres in Russia and abroad.

Hot issue 4: Encouraging innovation in firms and supporting entrepreneurship and SMEs. BERD accounted for 0.66% of GDP in 2012. The federal budget for state-owned enterprises (SoEs) or industrial R&D organisations accounts for the major share of Russian business R&D expenditures. On many measures, the innovation performance of Russian firms lags far behind counterparts in OECD countries (Panel 1[e, f, g]). Several government initiatives seek to stimulate innovative activities in the business sector. The Innovation Development Programme (IDP) targets the largest SoEs, charging them to develop innovation strategies and to co-operate with universities and research institutes. As a result, the R&D and innovation expenditures of the largest SoEs have increased in the last two years. The new Federal Law on Public Procurement (2013) provides specifically for the procurement of high-technology and innovative products. In 2012-13, a number of sectoral programmes were adopted to support priority sectors such as advanced manufacturing, aviation and shipbuilding. To

Key figures, 2013

Economic and environmental performance	RUS	OECD	Gross domestic expenditure on R&D	RUS	OECD
Labour productivity			**GERD**		
GDP per hour worked, USD PPP, 2013	23.9	47.7	Million USD PPP, 2012	37 854	1 107 398
(annual growth rate, 2008-13)	(+1.2)	(+0.8)	As a % of total OECD, 2012	3.4	100
Green productivity			**GERD intensity and growth**		
GDP per unit of CO_2 emitted, USD, 2011	1.3	3.0	As a % of GDP, 2012	1.12	2.40
(annual growth rate, 2007-11)	(+1.5)	(+1.8)	(annual growth rate, 2007-12)	(+2.0)	(+2.0)
Green demand			**GERD publicly financed**		
NNI per unit of CO_2 emitted, USD, 2011	1.8	3.0	As a % of GDP, 2012	0.77	0.77
(annual growth rate, 2007-11)	(+1.7)	(+1.6)	(annual growth rate, 2007-12)	(+3.5)	(+2.8)

Figure 9.37. **Science and innovation in the Russian Federation**



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

support SMEs, the SMEs Development Programme provides USD 8 billion (RUB 155 billion) over 2013-20 and other support measures.

Highlights of the Russian STI system

STI policy governance: The Presidential Council for Science and Education and the Presidential Council for Economic Modernisation and Innovative Development have been established to improve policy co-ordination on science and innovation. Two programmes, the Development of Science and Technology (DST) (2013-20) and Economic Development and Innovative Economy (2013-20), approved in 2013, are to organise and co-ordinate systematically all major federal budget-funded initiatives in science and innovation. In terms of strategic policy intelligence, foresight studies, e.g. in the framework of the Interdepartmental Commission on Technology Foresight, are increasingly used in the selection of national and sectoral STI priorities. The Long-term S&T Foresight Towards 2030, which identifies promising S&T areas, is a major input to strategic planning and policy formulation in the area. Evaluation of government programmes has also been reinforced.

ICT and Internet infrastructures: ICT infrastructures are comparatively weak, with 14.5 subscribers to fixed broadband networks per 100 inhabitants (Panel 1[l]). Public research infrastructure is expected to improve through several initiatives, including a Mega-Science Infrastructure Projects programme within the DST (2013-20) for the creation and development of very large research facilities. It provides competitive funding for infrastructures to both public and private research institutes and universities.

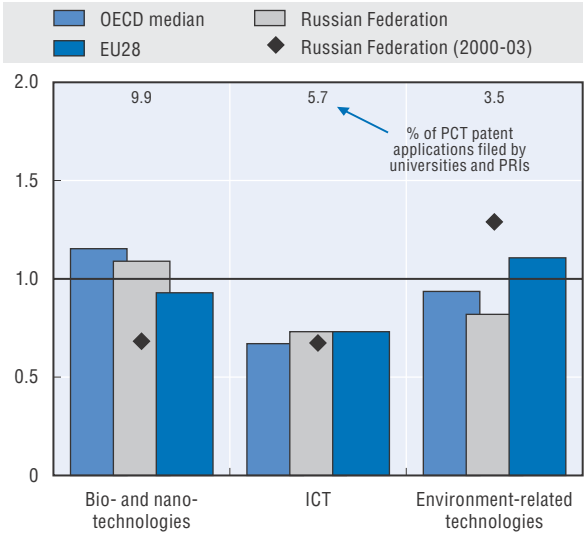
Clusters and smart specialisation: The government launched a new nationwide programme in 2012 to support pilot innovative clusters, and 25 were established in six strategic sectors: nuclear and radiation technology; aircraft and space vehicles manufacturing; shipbuilding; pharmaceutical, biotechnology and medical industries; new materials; chemicals and petrochemicals; and information technology and electronics. In 2013, a federal subsidy of USD 67 million (RUB 1.3 billion) was allocated to support the pilot clusters, and up to USD 154 million (RUB 3.1 billion) is expected to be available annually over 2014-16.

Globalisation: While international co-patenting is close to the OECD median, Russian science is much less well integrated internationally (Panel 1[r, q]). A number of administrative barriers hamper deeper and more efficient international STI co-operation, including visa issues and misalignment of funding procedures with foreign and international funding agencies. In 2013, the government announced two major STI funding programmes that include provisions that support international co-operation: R&D in Priority Fields of Russia's S&T Complex 2014-20 and R&D Personnel for Innovative Russia 2014-20.

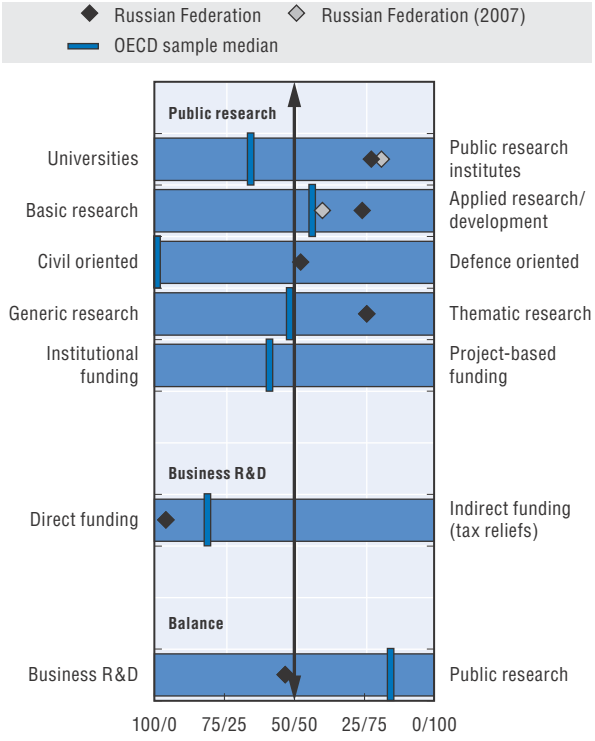
Recent developments in STI expenditures: GBAORD has increased considerably in the last five years. The Federal Budget Plan for 2014-15 predicts a slight decrease in budget appropriations for civil R&D in 2014. Nevertheless, government funding is predicted to remain the main source of GERD until 2030, despite important recent initiatives to stimulate business R&D and innovation. HERD is set to increase from 9% to 13.5% of GERD by 2018, reflecting the government's goal to enhance the research capacities of universities.

Panel 2. Revealed technology advantage in selected fields, 2009-11

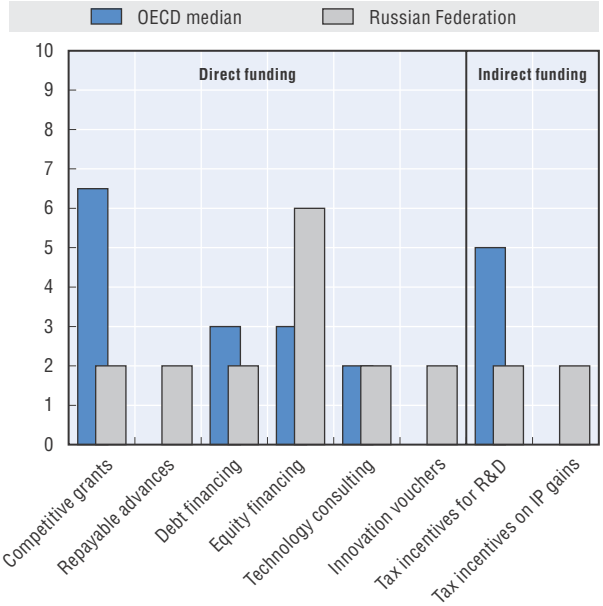
Index based on PCT patent applications



Panel 3. Allocation of public funds to R&D, by sector, type and mode of funding, 2012



Panel 4. Most relevant instruments of public funding of business R&D, 2014



Note: Policy information comes from country responses to the OECD STI Outlook policy questionnaires 2014 and 2012. The Russian Federation's responses are available in the *OECD STI Outlook Policy Database*, edition 2014 at *http://qdd.oecd.org/Table.aspx?Query=E7DE044B-7994-456D-B3D9-BBB3FF44EA0E*.
Source: See reader's guide and methodological annex.

StatLink http://dx.doi.org/10.1787/888933152376

STI country profiles reader's guide

The country profiles (CPs) in the 2014 *OECD STI Outlook* (STIO) are designed to provide a concise overview of science, technology and innovation (STI) policy and performance in OECD members and selected non-OECD economies. Each country profile is based on information gathered from the country's response to the OECD STIO policy questionnaires 2012 and 2014, as well as various additional OECD and non-OECD sources.

Headings in the country profiles are linked to the STIO policy profiles, which examine the main global STI policy trends across countries. Issues featuring in both the policy and country profiles are: *i)* innovation policy governance; *ii)* new sources of growth; *iii)* new challenges; *iv)* universities and public research; *v)* innovation in firms; *vi)* innovative entrepreneurship; *vii)* technology transfer and commercialisation; *viii)* clusters and smart specialisation; *ix)* globalisation; and *x)* skills for innovation.

The table of key figures presents indicators on the country's economic performance (labour productivity), environmental performance (green productivity and demand), the size of its R&D system as measured by gross domestic expenditure on R&D (GERD), the degree of public commitment to S&T as measured by the share of GERD that is publicly financed, and the changes in these indicators over the past five years. In the text, all amounts are given both in USD in purchasing power parities (PPP) of the relevant year (if available) and in national currencies.

Panel 1 contains a double figure that sheds light on the strengths and weaknesses of the country's STI performance. It uses indicators on the country's national innovation system and performance with respect to: universities and public research, business R&D and innovation, innovative entrepreneurship, information and communication technology (ICT) and Internet infrastructure, networks, clusters and transfers, and skills for innovation. The dot for each indicator positions the country relative to the OECD median and to the top and bottom five OECD countries. Non-OECD countries are also compared to the OECD benchmarks, and may fall out of the range indicated in the figure (e.g. below the lowest OECD country). All indicators are normalised (by GDP and population cohorts) to take account of the size of the economy and the relevant population cohorts, and are presented as indices (OECD median = 100) for benchmarking purposes.

Panel 2 shows the structural composition of business expenditure on R&D (BERD) in terms of performance of the main industry sectors, firm size and firms' national affiliation. It reflects the country's industry structure and its business innovation efforts. Panel 3 presents the country's revealed technological advantage (RTA), as measured by international patent applications filed under the Patent Cooperation Treaty (PCT) in three key technology fields (bio- and nano-technology, ICTs, and environment-related technologies). It also shows the number of patents filed by universities and public research institutions in these fields.

Panel 4 gives an overview of the country's policy mix for public R&D, i.e. the orientation and funding modes of public research. It also illustrates changes in the policy mix for R&D over the past five years. Finally, Panel 5, a new feature in STIO 2014, reflects the balance and relative importance of various government measures to support business R&D and innovation. It is based on the country's self-assessment in its reply to the OECD STIO 2014 policy questionnaire.

Further details on the methodology, data sources and descriptions of indicators used in the country profile are provided in Annex 9.A. Data, metadata as well as the original sources and databases of the indicators used in the STIO 2014 are accessible at the statistical portal IPP.Stat (cut-off date: 8 July 2014).

Abbreviations used in the country profiles

BERD: Business expenditure on research and development

EU: European Union

FDI: Foreign direct investment

GDP: Gross domestic product

GERD: Gross expenditure on research and development

HEIs: Higher education institutions

IPRs: Intellectual property rights

MNEs: Multinational enterprises

PRIs: Public research institutes

R&D: Research and development

S&E: Science and engineering

SSS: Smart specialisation strategy (also known as 3S)

STI: Science, technology and innovation

S&T: Science and technology

3S: See SSS

STEM: Science, technology, engineering and mathematics

USD: United States dollars
(converted using the purchasing power parities of the relevant year)

VC: Venture capital

Synthetic table

Table 9.1. **Comparative performance of national science and innovation systems, 2014**

Country relative position: in the top 5 OECD or above (★), in the middle range on par or above OECD median (▲), in the middle range below OECD median (Δ) and in the bottom 5 OECD or below (○)

		Competences and capacity to innovate									
		Universities and public research			R&D and innovation in firms				Innovative entrepreneurship		
		Public R&D expenditure (per GDP)	Top 500 universities (per GDP)	Publications in the top-quartile journals (per GDP)	Business R&D expenditure (per GDP)	Top 500 corporate R&D investors (per GDP)	Triadic patent families (per GDP)	Trademarks (per GDP)	Venture capital (per GDP)	Young patenting firms (per GDP)	Ease of entrepreneur-ship index
		PUB_XGDP	UNI500_GDP	PUB25_GDP	BE_XGDP	CORPRD500_GDP	PTRIAD_GDP	TRDMRK_GDP	VC_XGDP	PTYG_GDP	EASE_I
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
Argentina	ARG	Δ	Δ	○	○	○	○	○			
Australia	AUS	▲	▲	▲	▲	Δ	Δ	▲	Δ		▲
Austria	AUT	▲	★	▲	▲	▲	▲	Δ	Δ	★	▲
Belgium	BEL	Δ	▲	▲	▲	Δ	▲	Δ	▲	Δ	Δ
Brazil	BRA		Δ	○		Δ	○	○			Δ
Canada	CAN	▲	▲	▲	Δ	Δ	▲	★	★	○	▲
Chile	CHL	○	Δ	○	○	○	○	Δ			Δ
China	CHN	Δ	Δ	○	▲	Δ	Δ	○			○
Colombia	COL	○	○	○	○						
Costa Rica	CRI	○	○	○	○	○					
Czech Republic	CZE	▲	Δ	Δ	Δ	Δ	Δ	Δ	○		Δ
Denmark	DNK	★	▲	★	▲	★	▲	▲	▲		▲
Estonia	EST	▲		▲	▲	○	Δ	Δ	▲		▲
Finland	FIN	★	★	▲	★	★	★	▲	★	★	▲
France	FRA	▲	Δ	Δ	▲	▲	▲	▲	▲	Δ	▲
Germany	DEU	★	▲	Δ	▲	▲	★	▲	▲	★	▲
Greece	GRC	○	Δ	Δ	○	Δ	○	○	○		Δ
Hungary	HUN	○	Δ	Δ	Δ	Δ	Δ	○	Δ		Δ
Iceland	ISL	★	○	★	▲	▲	Δ	★			Δ
India	IND	Δ	○	○	○	○	Δ	○			○
Indonesia	IDN		○	○	○		○	○			Δ
Ireland	IRL	Δ	▲	▲	Δ	▲	▲	▲	★	○	Δ
Israel	ISR	Δ	★	▲	★	▲	▲	▲	★		○
Italy	ITA	Δ	Δ	Δ	Δ	Δ	Δ	Δ	○	▲	★
Japan	JPN	▲	Δ	○	★	▲	★	Δ	Δ	○	▲
Korea	KOR	▲	Δ	Δ	★	▲	▲	▲	▲		Δ
Latvia	LVA	Δ	○	○	○		Δ				
Lithuania	LTU	Δ	○	○	○		Δ				
Luxembourg	LUX	○	○	Δ	Δ	★	▲	★	Δ		Δ
Malaysia	MYS	Δ	Δ	○	Δ	Δ					
Mexico	MEX	○	○	○	○	○	○	Δ			○
Netherlands	NLD	▲	▲	★	▲	▲	▲	▲	▲	▲	★
New Zealand	NZL	Δ	★	▲	Δ	Δ	Δ	★	Δ		★
Norway	NOR	▲	▲	Δ	Δ	▲	Δ	Δ	Δ	▲	Δ
Poland	POL	Δ	Δ	Δ	○	○	Δ	○	○		○
Portugal	PRT	Δ	▲	▲	Δ	Δ	Δ	Δ	Δ		▲
Russian Federation	RUS	Δ	○	○	Δ	Δ	○	○	Δ		Δ
Slovak Republic	SVK	Δ	○	○	○	○	○	○			★
Slovenia	SVN	Δ	▲	▲	▲	Δ	Δ	Δ	Δ		Δ
South Africa	ZAF	○	Δ	○	Δ	Δ	Δ	Δ	Δ		○
Spain	ESP	Δ	Δ	Δ	Δ	Δ	Δ	Δ	○	○	○
Sweden	SWE	★	★	★	★	★	★	▲	▲	★	Δ
Switzerland	CHE	▲	▲	★	▲	★	★	★	▲	★	▲
Turkey	TUR	Δ	○	○	Δ	Δ	○	○			○
United Kingdom	GBR	Δ	▲	▲	Δ	▲	▲	▲	▲	Δ	▲
United States	USA	▲	Δ	Δ	▲	▲	▲	▲	★	○	★
EU28	EU28	▲	▲	★	▲	Δ	▲	Δ	▲	▲	

Table 9.1. **Comparative performance of national science and innovation systems, 2014** *(cont.)*

Country relative position: in the top 5 OECD or above (★), in the middle range on par or above OECD median (▲), in the middle range below OECD median (Δ) and in the bottom 5 OECD or below (○)

		Interactions and skills for innovation												
		ICT and Internet infrastructures				Networks, clusters and transfers				Skills for innovation				
		ICT investment (per GDP)	Fixed broadband subscribers (per population)	Wireless broadband subscribers (per population)	E-government readiness index	Industry financed public R&D expenditure (per GDP)	Patents filed by universities and public labs (per GDP)	International co-authorship (%)	International co-invention (%)	Tertiary education expenditure (per GDP)	Adult population at tertiary education level (%)	Top adult performers in technology problem solving (%)	Top 15 year-old performers in science (%)	Doctoral graduate rate in science and engineering (%)
		ICTINV_XGDP	FBBAND_HAB	WBBAND_HAB	EGOV_I	PUB_BEF_XGDP	PATPRI_XGDP	INTCOA_XSA	COPAT_XPCT	TER_XGDP	ADTERPOP_XT	TOPAD_PST_XAD	TOP15_SCI_XT	PHDR_SCIENG_XCOH
		(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)	(v)	(w)
Argentina	ARG		○	○	○	○		Δ	★	▲	○		○	○
Australia	AUS	▲	Δ	★	▲	▲	▲	Δ	Δ	▲	▲	▲	★	▲
Austria	AUT	▲	Δ	▲	Δ	▲	Δ	★	▲	Δ	Δ	Δ	Δ	▲
Belgium	BEL	▲	▲	Δ	Δ	▲	▲	★	★	Δ	▲		▲	▲
Brazil	BRA		○	Δ	○		Δ	○	Δ	○	○		○	○
Canada	CAN	Δ	▲	Δ	▲	▲	▲	Δ	▲	★	★	▲	▲	▲
Chile	CHL		○	○	Δ	○	Δ	▲	Δ	★	○		○	○
China	CHN		○	○	○	▲	Δ	○	○		○			○
Colombia	COL		○	○	Δ			▲	Δ	★	Δ		○	
Costa Rica	CRI		○	○	○			★	★		Δ		○	
Czech Republic	CZE	Δ	Δ	Δ	○	Δ	Δ	Δ	▲	Δ	Δ	Δ	Δ	Δ
Denmark	DNK	★	★	★	★	Δ	★	▲	▲	▲	Δ	★	Δ	▲
Estonia	EST		Δ	▲	Δ	Δ		▲	★	▲	▲	○	★	Δ
Finland	FIN	Δ	▲	★	▲	★	▲	▲	Δ	★	▲	★	★	★
France	FRA	Δ	★	Δ	▲	Δ	★	▲	Δ	▲	Δ		▲	▲
Germany	DEU	Δ	▲	Δ	▲	★	▲	Δ	Δ	Δ	Δ	▲	▲	★
Greece	GRC	○	Δ	Δ	Δ	Δ	○	Δ	▲	▲	Δ		○	Δ
Hungary	HUN		Δ	○	Δ	▲	○	▲	▲	○	Δ		Δ	○
Iceland	ISL		▲	▲	Δ	★		★	▲	○	▲		Δ	Δ
India	IND		○	○	○		Δ	○	▲	○				
Indonesia	IDN		○	○	○			▲	★	○	○		○	○
Ireland	IRL	○	Δ	▲	Δ	○	★	▲	▲	▲	▲	○	▲	▲
Israel	ISR		Δ	Δ	▲	▲	★	Δ	Δ	▲	★		Δ	▲
Italy	ITA	Δ	Δ	Δ	Δ	○	Δ	Δ	○	○	○		Δ	Δ
Japan	JPN	★	▲	▲	▲	Δ	▲	○	○	▲	★	▲	★	Δ
Korea	KOR	▲	★	★	★	▲	★	○	○	★	★	○	▲	Δ
Latvia	LVA		Δ	Δ	Δ	▲		Δ	★	▲	Δ		○	Δ
Lithuania	LTU		Δ	○	Δ	★		Δ	Δ		▲		Δ	
Luxembourg	LUX	○	▲	▲	▲	Δ	Δ	★	★	○	▲		▲	
Malaysia	MYS		○	○	Δ			Δ	Δ	★	○		○	
Mexico	MEX	○	○	○	○	○	○	Δ	▲	Δ	○		○	○
Netherlands	NLD	▲	★	▲	★	★	▲	▲	Δ	▲	Δ	★	▲	Δ
New Zealand	NZL	★	▲	▲	▲	★	Δ	▲	Δ	▲	▲		★	▲
Norway	NOR		▲	▲	▲	▲	Δ	▲	Δ	▲	▲	★	Δ	▲
Poland	POL		○	▲	○	Δ	Δ	○	★	Δ	Δ	○	▲	○
Portugal	PRT	▲	Δ	○	Δ	○	Δ	▲	▲	Δ	○		○	Δ
Russian Federation	RUS		○	Δ	Δ	★	○	○	Δ	Δ	★		○	○
Slovak Republic	SVK	○	○	Δ	○	Δ		Δ	▲	○	Δ	○	Δ	▲
Slovenia	SVN	Δ	Δ	Δ	Δ	▲	Δ	Δ	Δ	Δ	Δ		▲	▲
South Africa	ZAF		○	○	○	Δ	Δ	Δ	Δ	○	○			○
Spain	ESP	Δ	Δ	Δ	Δ	▲	▲	Δ	Δ	Δ	Δ		Δ	Δ
Sweden	SWE	★	▲	★	▲	▲	○	▲	Δ	▲	▲	★	Δ	★
Switzerland	CHE	★	★	Δ	▲		▲	★	★	Δ	▲		▲	★
Turkey	TUR		○	○	○	▲	○	○	○	Δ	○		○	○
United Kingdom	GBR	▲	▲	▲	★	Δ	▲	Δ	▲	Δ	▲		▲	★
United States	USA	▲	▲	▲	★	Δ	▲	○	○	★	★	Δ	Δ	Δ
EU28	EU28	Δ	▲	▲		Δ	▲	▲	▲		Δ		Δ	▲

Note: Non-OECD countries are also compared to OECD countries and may therefore be out of range (e.g. lower than the lowest OECD country). They appear in this table with top five and bottom five OECD values

Israel: "The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law."

Source: See references and methodological annex of the OECD STI Outlook 2014 country profiles.

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