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Slovak Republic

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SLOVAK REPUBLIC

The Slovak Republic is one of Europe's most dynamic economies. The economy is projected to grow, with high export demand boosting exports and investment. However, it has so far made limited progress towards an advanced STI system.

Hot issue 1: Improving the governance of innovation. The governance structure of the Slovak STI system changed little over the last decade, but important reforms are under way on the procedural side, in planning, decision making, organisation, management, monitoring and control in view of the implementation of the newly adopted Research and Innovation Strategy for Smart Specialisation of the Slovak Republic (RIS3 SK) (2014-20). Key changes in governance include: legislative changes, especially in the central state administration; amendments of the statute of the Government Council for Science, Technology and Innovation (GCSTI); creation of a GCSTI Standing Committee for the RIS3 SK; and creation of additional technology and research agencies. A first Action Plan to implement the RIS3 SK is being prepared by a working party chaired by the Slovak Government Office.

Hot issue 2: Encouraging innovation in firms and supporting entrepreneurship and SMEs. While the Ease of Entrepreneurship Index (Panel 1^j) shows that the business environment has significantly improved, business R&D investment and innovation outputs are still among the lowest in the OECD area (Panel 1^{d, f, g}). Competitive grants are the main public funding instrument, with USD 179 million (EUR 91 million) in 2012, a strong increase from USD 13 million in 2009 (EUR 6.6 million). Measures to encourage innovative entrepreneurship include: the JEREMIE Initiative, which provides SMEs with equity for seed, start-up and development phases as well as loan guarantees; Boosting the Innovation of Small and Medium Enterprises in Slovakia (BISMES), which provides analysis and information on funding available for SMEs; the Ministry of Economy's (MoE) Innovative Deed of the Year and Young Designer competitions, which aim to motivate young innovators. In addition, the Operational Programme Research and Development allocated some USD 1 351 million (EUR 689 million) over 2007-13 to support knowledge transfer and the building of an innovation culture in firms. A Risk Capital Programme has been operating since 2006.

Hot issue 3: Strengthening industry-science linkages. Links between science and industry are weak: the share of business-funded R&D in universities and government labs, an indicator of industry-science relations, is below the OECD median (Panel 1^o). A strong policy 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. They will focus on world-class research in biotechnology, biomedicine, IT, materials and energy. In addition, an independent National Technology Transfer Centre will serve as a central contact point for technology transfer.

Hot issue 4: Innovating to address social challenges (including inclusiveness). Eco-innovation is part of the country's innovation strategy and its strategy to address social and environmental challenges. Support for eco-innovation comes mainly from non-reimbursable grants from EU Structural Funds, which are administered by the Slovak Innovation and Energy Agency. The National Action Plan for Green Public Procurement (2011-15) aims to increase green procurement to 65% of all public procurement at the central government level and to 50% at the level of the self-governing regions and cities by 2015.

Hot issue 5: Addressing globalisation of STI and increasing international co-operation. In the Phoenix Strategy the government adopted a package of measures to improve researchers' mobility and attract and retain leading foreign researchers. Mobility centres, the National Scholarship Programme, and the EC EURAXESS portals offer opportunities to access global networks. In addition, the Slovak Republic's Research and Development Agency (SDRA) supports various international co-operation projects. In accordance with EU regulations, the government uses investment incentives to attract FDI and MNE, including in R&D activities.

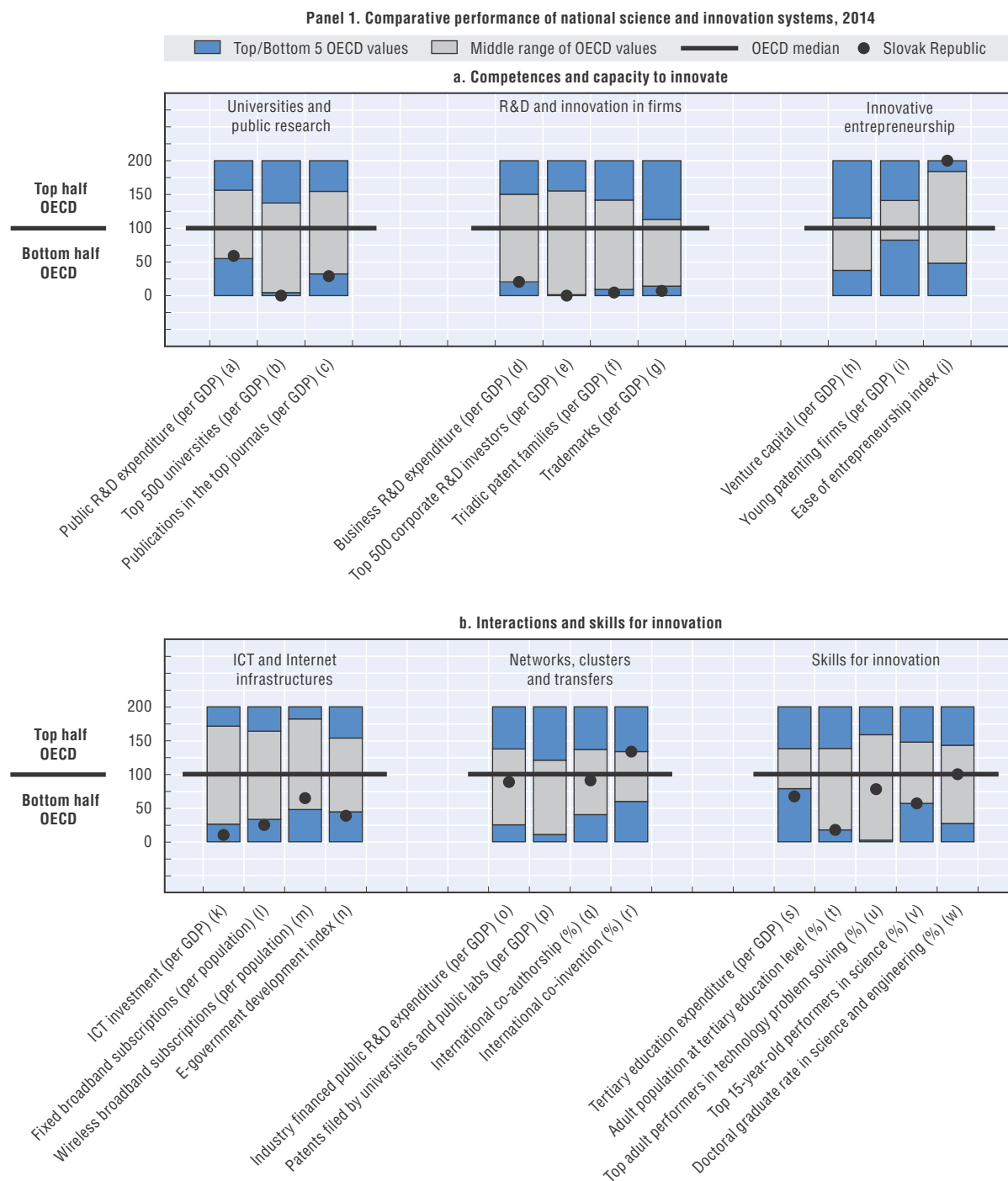
Highlights of the Slovak Republic's STI system

New sources of growth: Based on a SWOT analysis and on analysis of the future development of the Slovak economy, the RIS3 SK has identified areas of specialisation in traditional and fast-growing sectors. R&D priorities are: material science and nanotechnology, ICT, biomedicine and biotech-

Key figures, 2013

Economic and environmental performance	SVK	OECD	Gross domestic expenditure on R&D	SVK	OECD
Labour productivity			GERD		
GDP per hour worked, USD PPP, 2013	36.6	47.7	Million USD PPP, 2012	1 150	1 107 398
(annual growth rate, 2008-13)	(+1.8)	(+0.8)	As a % of total OECD, 2012	0.1	100
Green productivity			GERD intensity and growth		
GDP per unit of CO ₂ emitted, USD, 2011	3.3	3.0	As a % of GDP, 2012	0.82	2.40
(annual growth rate, 2007-11)	(+5.9)	(+1.8)	(annual growth rate, 2007-12)	(+14.5)	(+2.0)
Green demand			GERD publicly financed		
NNI per unit of CO ₂ emitted, USD, 2011	3.1	3.0	As a % of GDP, 2012	0.36	0.77
(annual growth rate, 2007-11)	(+5.8)	(+1.6)	(annual growth rate, 2007-12)	(+9.5)	(+2.8)

Figure 9.38. Science and innovation in the Slovak Republic



nology; technological priorities are manufacturing technologies, sustainable energy, environment and agriculture.

Universities and public research: Public R&D expenditures are below the OECD median at 0.48% of GDP (Panel 1^a), as is scientific output (Panel 1^c). Slovakian researchers are reasonably networked internationally (Panel 1^q). Public research and higher education reforms will continue. Long-term institutional funding will be based on the results of periodical evaluations of universities and PRIs, expected to be modelled on the British Research Assessment Exercise. New rules for short-term institutional funding, which are subject to annual adjustment, will be specified in the revised Act on the State R&D Support Mechanism in 2014. A roadmap is being prepared to strengthen high-impact research at centres of excellence.

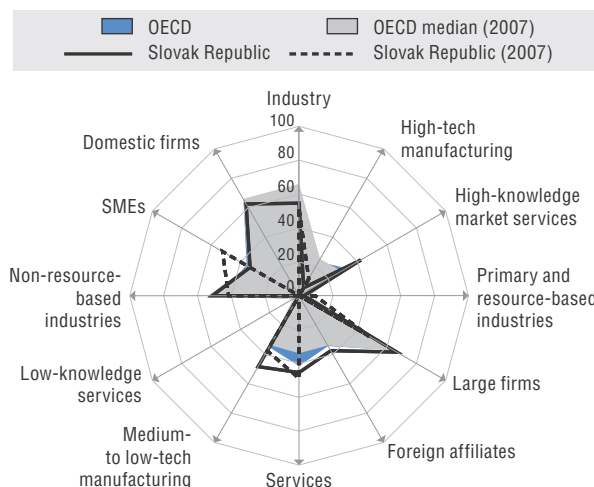
Clusters and smart specialisation: A Smart Strategy for the Bratislava Region was approved by the government in 2012. The RIS3 SK has been developed as a national smart specialisation in line with the EU Research and Innovation Strategies for Smart Specialisations Guideline.

Skills for innovation: In the Slovak Republic 18.6% of the adult population has tertiary education compared to 27% for the EU28, and adult performance in technology problem solving is below the OECD median (Panel 1^{t, u}). The performance of 15-year-olds in sciences is below the OECD median (Panel 1^v). One of the main priorities of the Phoenix Strategy is to popularise S&T among youth and the RIS3 SK includes measures to support mobility of human resources in science and innovation.

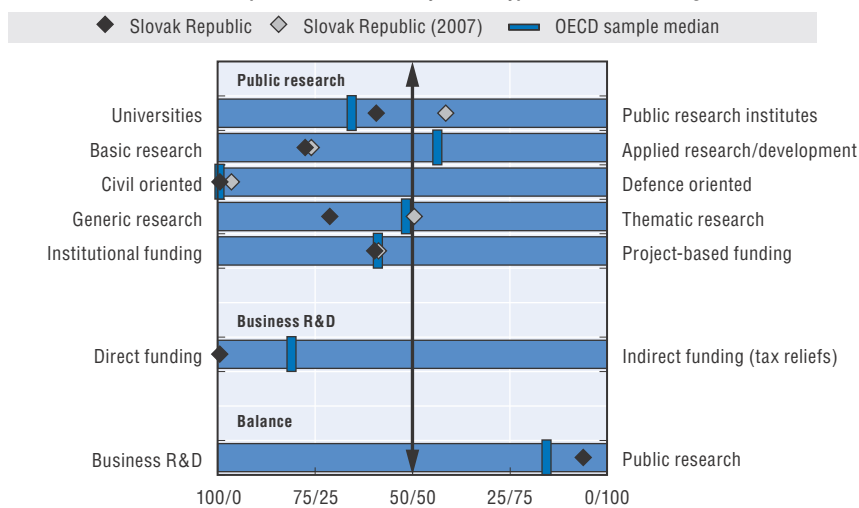
Recent developments in STI expenditures: In spite of the economic crisis, GERD rose from 0.46% of GDP in 2007 to 0.82% of GDP in 2012, by an average annual growth of 14.5% between 2007 and 2012. Government expenditure on R&D increased from 0.16% to 0.20% of GDP between 2008 and 2012, a trend expected to continue in the coming years. Having bottomed out at 0.18% of GDP in 2007, BERD increased to 0.34% of GDP in 2012. If current growth rates are maintained, it will be possible to reach GERD of 1.2% of GDP by 2020, a target set by the RIS3 SK.

Panel 2. Structural composition of BERD, 2011

As a % of total BERD or sub-parts of BERD



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



Note: Policy information comes from country responses to the OECD STI Outlook policy questionnaires 2014 and 2012. Slovak Republic's responses are available in the OECD STI Outlook Policy Database, edition 2014 at <http://qdd.oecd.org/Table.aspx?Query=6E4E6EC1-49FD-4034-A4FB-4137368297A8>.

Source: See reader's guide and methodological annex.

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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 (△) 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 entrepreneurship 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	△	△	○	○	○	○	○			
Australia	AUS	▲	▲	▲	▲	△	△	▲	△		▲
Austria	AUT	▲	★	▲	▲	▲	▲	△	△	★	▲
Belgium	BEL	△	▲	▲	▲	△	▲	△	▲	△	△
Brazil	BRA		△	○		△	○	○			△
Canada	CAN	▲	▲	▲	△	△	▲	★	★	○	▲
Chile	CHL	○	△	○	○	○	○	△			△
China	CHN	△	△	○	▲	△	△	○			○
Colombia	COL	○	○	○	○						
Costa Rica	CRI	○	○	○	○	○					
Czech Republic	CZE	▲	△	△	△	△	△	△	○		△
Denmark	DNK	★	▲	★	▲	★	▲	▲	▲		▲
Estonia	EST	▲		▲	▲	○	△	△	▲		▲
Finland	FIN	★	★	▲	★	★	★	▲	★	★	▲
France	FRA	▲	△	△	▲	▲	▲	▲	▲	△	▲
Germany	DEU	★	▲	△	▲	▲	★	▲	▲	★	▲
Greece	GRC	○	△	△	○	△	○	○	○		△
Hungary	HUN	○	△	△	△	△	△	○	△		△
Iceland	ISL	★	○	★	▲	▲	△	★			△
India	IND	△	○	○	○	○	△	○			○
Indonesia	IDN		○	○	○		○	○			△
Ireland	IRL	△	▲	▲	△	▲	▲	▲	★	○	△
Israel	ISR	△	★	▲	★	▲	▲	▲	★		○
Italy	ITA	△	△	△	△	△	△	△	○	▲	★
Japan	JPN	▲	△	○	★	▲	★	△	△	○	▲
Korea	KOR	▲	△	△	★	▲	▲	▲	▲		△
Latvia	LVA	△	○	○	○		△				
Lithuania	LTU	△	○	○	○		△				
Luxembourg	LUX	○	○	△	△	★	▲	★	△		△
Malaysia	MYS	△	△	○	△	△					
Mexico	MEX	○	○	○	○	○	○	△			○
Netherlands	NLD	▲	▲	★	▲	▲	▲	▲	▲	▲	★
New Zealand	NZL	△	★	▲	△	△	△	★	△		★
Norway	NOR	▲	▲	△	△	▲	△	△	△	▲	△
Poland	POL	△	△	△	○	○	△	○	○		○
Portugal	PRT	△	▲	▲	△	△	△	△	△		▲
Russian Federation	RUS	△	○	○	△	△	○	○	△		△
Slovak Republic	SVK	△	○	○	○	○	○	○			★
Slovenia	SVN	△	▲	▲	▲	△	△	△	△		△
South Africa	ZAF	○	△	○	△	△	△	△	△		○
Spain	ESP	△	△	△	△	△	△	△	○	○	○
Sweden	SWE	★	★	★	★	★	★	▲	▲	★	△
Switzerland	CHE	▲	▲	★	▲	★	★	★	▲	★	▲
Turkey	TUR	△	○	○	△	△	○	○			○
United Kingdom	GBR	△	▲	▲	△	▲	▲	▲	▲	△	▲
United States	USA	▲	△	△	▲	▲	▲	▲	★	○	★
EU28	EU28	▲	▲	★	▲	△	▲	△	▲	▲	

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 (△) 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	○	○	○	○	○		△	★	▲	○		○	○
Australia	AUS	▲	△	★	▲	▲	▲	△	△	▲	▲	▲	★	▲
Austria	AUT	▲	△	▲	△	▲	△	★	▲	△	△	△	△	▲
Belgium	BEL	▲	▲	△	△	▲	▲	★	★	△	▲		▲	▲
Brazil	BRA		○	△	○		△	○	△	○	○		○	○
Canada	CAN	△	▲	△	▲	▲	▲	△	▲	★	★	▲	▲	▲
Chile	CHL		○	○	△	○	△	▲	△	★	○		○	○
China	CHN		○	○	○	▲	△	○	○		○			○
Colombia	COL		○	○	△			▲	△	★	△		○	
Costa Rica	CRI		○	○	○			★	★		△		○	
Czech Republic	CZE	△	△	△	○	△	△	△	▲	△	△	△	△	△
Denmark	DNK	★	★	★	★	△	★	▲	▲	▲	△	★	△	▲
Estonia	EST		△	▲	△	△		▲	★	▲	▲	○	★	△
Finland	FIN	△	▲	★	▲	★	▲	▲	△	★	▲	★	★	★
France	FRA	△	★	△	▲	△	★	▲	△	▲	△		▲	▲
Germany	DEU	△	▲	△	▲	★	▲	△	△	△	△	▲	▲	★
Greece	GRC	○	△	△	△	△	○	△	▲	▲	△		○	△
Hungary	HUN		△	○	△	▲	○	▲	▲	○	△		△	○
Iceland	ISL		▲	▲	△	★		★	▲	○	▲		△	△
India	IND		○	○	○		△	○	▲	○				
Indonesia	IDN		○	○	○			▲	★	○	○		○	○
Ireland	IRL	○	△	▲	△	○	★	▲	▲	▲	▲	○	▲	▲
Israel	ISR		△	△	▲	▲	★	△	△	▲	★		△	▲
Italy	ITA	△	△	△	△	○	△	△	○	○	○		△	△
Japan	JPN	★	▲	▲	▲	△	▲	○	○	▲	★	▲	★	△
Korea	KOR	▲	★	★	★	▲	★	○	○	★	★	○	▲	△
Latvia	LVA		△	△	△	▲		△	★	▲	△		○	△
Lithuania	LTU		△	○	△	★		△	△		▲		△	
Luxembourg	LUX	○	▲	▲	▲	△	△	★	★	○	▲		▲	
Malaysia	MYS		○	○	△			△	△	★	○		○	
Mexico	MEX	○	○	○	○	○	○	△	▲	△	○		○	○
Netherlands	NLD	▲	★	▲	★	★	▲	▲	△	▲	△	★	▲	△
New Zealand	NZL	★	▲	▲	▲	★	△	▲	△	▲	▲		★	▲
Norway	NOR		▲	▲	▲	▲	△	▲	△	▲	▲	★	△	▲
Poland	POL		○	▲	○	△	△	○	★	△	△	○	▲	○
Portugal	PRT	▲	△	○	△	○	○	△	▲	△	○		○	△
Russian Federation	RUS		○	△	△	★	○	○	△	△	★		○	○
Slovak Republic	SVK	○	○	△	○	△		△	▲	○	△	○	△	▲
Slovenia	SVN	△	△	△	△	▲	△	△	△	△	△		▲	▲
South Africa	ZAF		○	○	○	△	△	△	△	○	○			○
Spain	ESP	△	△	△	△	▲	▲	△	△	△	△		△	△
Sweden	SWE	★	▲	★	▲	▲	○	▲	△	▲	▲	★	△	★
Switzerland	CHE	★	★	△	▲	▲	▲	★	★	△	▲		▲	★
Turkey	TUR		○	○	○	▲	○	○	○	△	○		○	○
United Kingdom	GBR	▲	▲	▲	★	△	▲	△	▲	△	▲		▲	★
United States	USA	▲	▲	▲	★	△	▲	○	○	★	★	△	△	△
EU28	EU28	△	▲	▲		△	▲	▲	▲		△		△	▲

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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