



From:
**OECD Science, Technology and Industry Outlook
2014**

Access the complete publication at:
http://dx.doi.org/10.1787/sti_outlook-2014-en

European Union

Please cite this chapter as:

OECD (2014), "European Union", in *OECD Science, Technology and Industry Outlook 2014*, OECD Publishing.
http://dx.doi.org/10.1787/sti_outlook-2014-81-en

This work is published on the responsibility of the Secretary-General of the OECD. The opinions expressed and arguments employed herein do not necessarily reflect the official views of the Organisation or of the governments of its member countries.

This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

EUROPEAN UNION

The European Union's 28 member states account for 25% of world GDP and 15% of world trade (excluding intra-EU trade) as well as nearly 31% of OECD-area GERD. EU members are at different stages of economic development and their STI capabilities also differ, as do their industrial and trade structures. The EU's Horizon 2020, adopted at the beginning of 2014, sets the strategic direction for EU research and innovation policy and investment until 2020.

Hot issue 1: Improving the design and implementation of STI policy. Assessing national research and innovation policy and reform programmes is a key function of the European Commission's Directorate General for Research and Innovation. As part of the Europe 2020 Strategy, the Commission introduced the European semester mechanism to undertake detailed analyses of members' economic and structural policy and reform efforts, including research and innovation (R&I) policy, and to provide recommendations for the following 12-18 months. It also monitors the performance of R&I in member states with a focus on the impact of R&I investments and reforms on economic growth and prosperity and progress towards the Europe 2020 R&I goals.

Hot issue 2: Addressing societal challenges (including inclusiveness). Horizon 2020, the new EU Framework Programme for Research and Innovation, focuses on major societal challenges (health and ageing, energy efficiency, sustainable transport, etc.). It facilitates the transfer of innovative ideas to the marketplace by financing relevant research and innovation projects.

Hot issue 3: Improving the framework conditions for innovation. The Innovation Union flagship, launched in 2010, tackles weaknesses in framework conditions for innovation. The initiative focuses on reducing the barriers to and improving the conditions for: strengthening the knowledge base and reducing fragmentation; getting good ideas to market; maximising social and territorial cohesion; pooling forces, e.g. through European Innovation Partnerships, to achieve breakthroughs; leveraging policies externally; and monitoring implementation of Innovation Union commitments.

Hot issue 4: Reforming the public research system (including university research). The European Research Area (ERA)

aims to strengthen members' S&T research, competitiveness and capacity to address grand challenges collectively by enabling researchers, PRIs and businesses to collaborate freely across borders. A 2012 EC communication, *A Reinforced European Research Area Partnership for Excellence and Growth*, aims to improve Europe's research performance. It recommended measures that are currently being implemented to complete the ERA by 2014, as called for by the European Council. The ERA will also address members' public research issues, including competitive funding, transnational research funding and trans-border use of research infrastructures. Last year, the ERA Progress Report started to cover ERA reforms and implementation. The report is an essential element of the ERA policy monitoring system and relates to the European Semester policy cycle mentioned above.

Highlights of the EU STI system

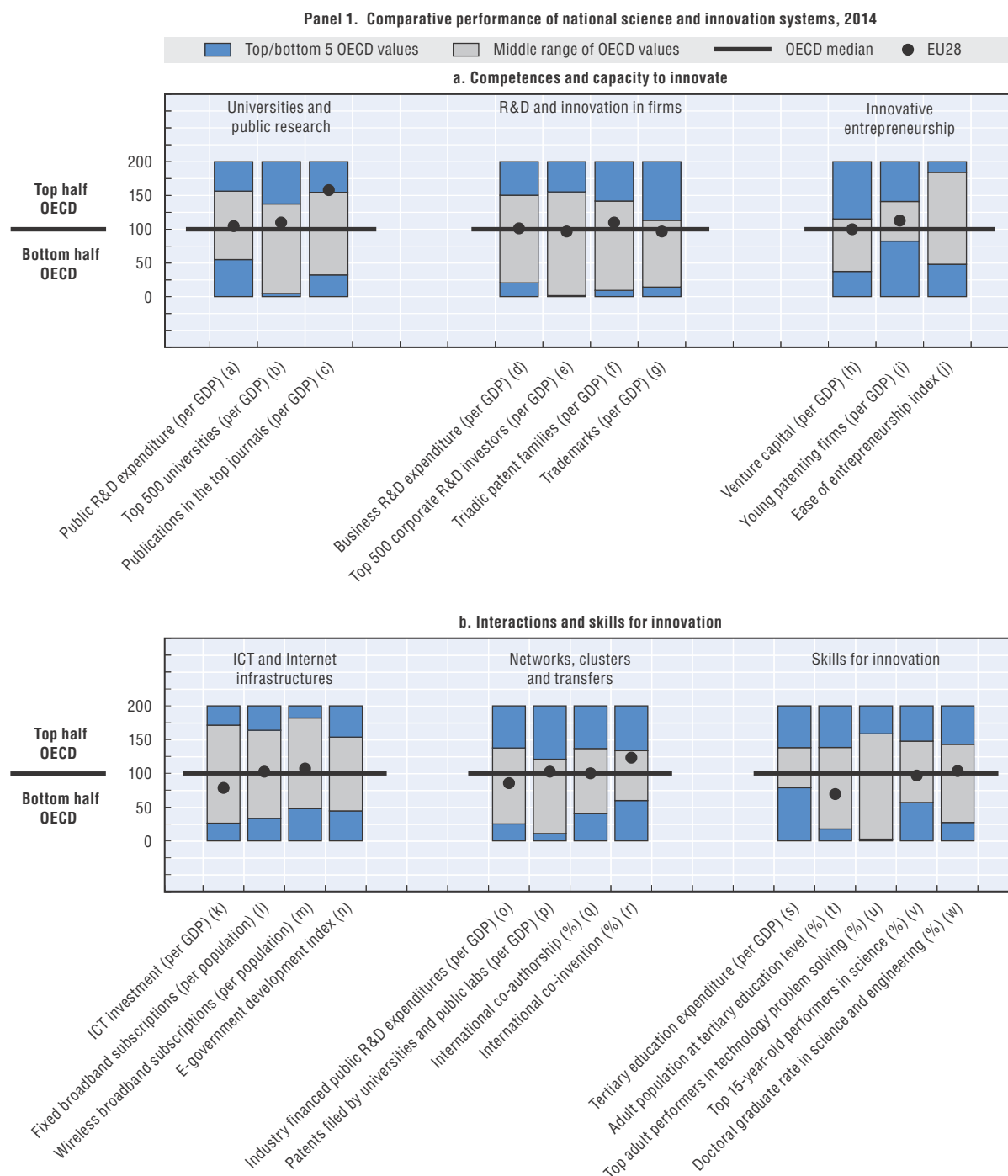
STI policy governance: The governance of Horizon 2020 is an open and simple structure that reduces red tape so that participants can focus on what is really important. The approach aims to get new projects off the ground quickly. DG Research and Innovation has recently strengthened the use of foresight for priority setting by creating a unit responsible for Science Policy, Foresight and Data. The Horizon 2020 evaluation system includes cross-cutting impact indicators for assessing the wider long-term impacts, including socio-economic, of research and innovation funding.

New challenges: The EU considers research essential for addressing major societal challenges. Although Europe's national research programmes are among the most advanced in the world, it is recognised that they are insufficient to tackle the major societal challenges Europe faces today. EU joint programming aims to pool national research efforts to make more efficient use of Europe's public R&D resources and to tackle common challenges more effectively. To address societal challenges, Horizon 2020 has a budget of USD 35.4 billion (EUR 29.7 billion) that will support the development by innovative enterprises of viable products with real market potential. This market-driven

Key figures, 2013

Economic and environmental performance	EU28	OECD	Gross domestic expenditure on R&D	EU28	OECD
Labour productivity			GERD		
GDP per hour worked, USD PPP, 2013	47.6	47.7	Million USD PPP, 2012	341 485	1 107 398
(annual growth rate, 2008-13)	n.a.	(+0.8)	As a % of total OECD, 2012	30.8	100
Green productivity			GERD intensity and growth		
GDP per unit of CO ₂ emitted, USD, 2011	n.a.	3.0	As a % of GDP, 2012	2.07	2.40
(annual growth rate, 2007-11)	n.a.	(+1.8)	(annual growth rate, 2007-12)	(+2.3)	(+2.0)
Green demand			GERD publicly financed		
NNI per unit of CO ₂ emitted, USD, 2011	4.0	3.0	As a % of GDP, 2011	0.70	0.77
(annual growth rate, 2007-11)	(+3.1)	(+1.6)	(annual growth rate, 2007-11)	(+2.8)	(+2.8)

Figure 9.47. Science and innovation in the European Union



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

approach will include creating partnerships between the private sector and member states to bring together the needed resources.

Universities and public research: Created in 2007, the European Research Council (ERC) is the first pan-European funding agency for cutting-edge research. It has funded 4 500 projects and generated 20 000 articles over 2007-13. It is now part of Horizon 2020, with a budget of USD 15.8 billion (EUR 13.1 billion) for 2014-20. It accounts for 17% of the overall Horizon 2020 budget and represents an increase of 60% in real terms from the 7th Framework Programme (2007-13).

Innovation in firms: One of the features of Horizon 2020 is full integration of innovation in the programme, with a significant increase in resources to support business R&D and innovation. Under Horizon 2020, the industrial leadership and competitive frameworks, with a budget of USD 20.2 billion (EUR 17 billion) and a wide range of actions, will support business research and innovation, with business expected to play a major role.

Innovative entrepreneurship: Horizon 2020 will facilitate the participation of SMEs in the programme. A new instrument, with funds of at least USD 3.6 billion (EUR 3 billion), will support innovative small companies. SMEs can also engage in collaborative projects as part of a consortium. A minimum of 20%, or about USD 10.3 billion (EUR 8.65 billion) of the total combined budgets for Leadership in Enabling and Industrial Technologies and Societal Challenges, is devoted to support for SMEs. Horizon 2020 also aims to remove barriers to innovation and facilitate co-operation between the public and private sectors.

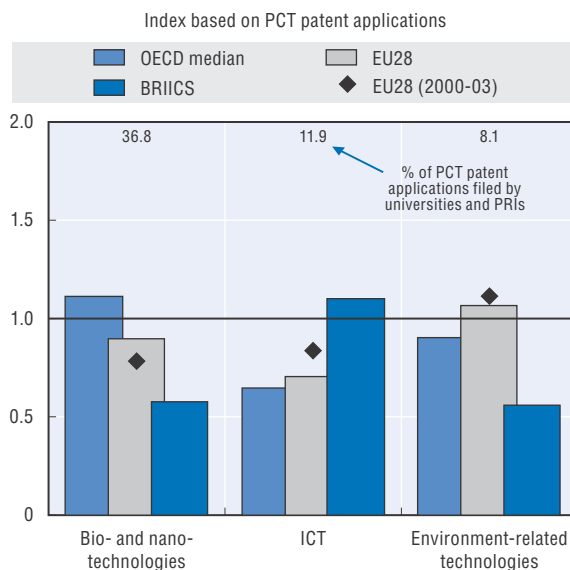
Clusters and smart specialisation: The Regions of Knowledge programme, under the 7th Framework Programme, pro-

motated cross-border co-operation by research-driven clusters with a budget of USD 150 million (EUR 126 million) over 2007-13. Within the EU's new Cohesion Policy, one *ex ante* condition makes smart specialisation a condition for any future investment in Research and Innovation and the Digital Agenda. It aims to boost regional innovation by enabling regions to focus on their strengths. This initiative is supported through the future European Structural and Investment Funds (ESIF) with USD 96.4-130 billion (EUR 80-100 billion). DG Research and Innovation works closely with DG for Regional and Urban Policy to ensure that smart specialisation strategies are duly incorporated in the operational programmes and partnership agreements, and that they underpin the investment in R&I proposed by member states and regions in the context of the European Structural and Investment Funds.

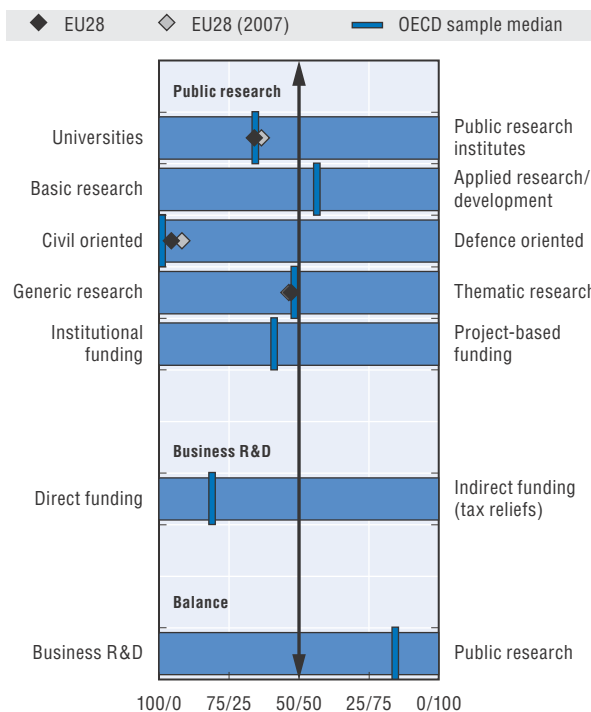
Skills for innovation: The EU considers human resources a key to Europe's future competitiveness. The EURAXESS initiative addresses the mobility of researchers and seeks to make research careers attractive, while the European Partnership for Researchers aims at improving career prospects for researchers in Europe, stimulating young people to embark on research careers and helping retain European talent and attract researchers from other world regions. New EU measures are being prepared under the Innovative Doctoral Training Principles.

Recent developments in STI expenditures: With nearly USD 98.6 billion (EUR 78.6 billion) for 2014-20, Horizon 2020 is one of the few areas of the EU budget with a major increase. Thanks to Horizon 2020, the EU R&D budget for 2014-20 has increased by nearly 30% in real terms from the last programming period (2007-13).

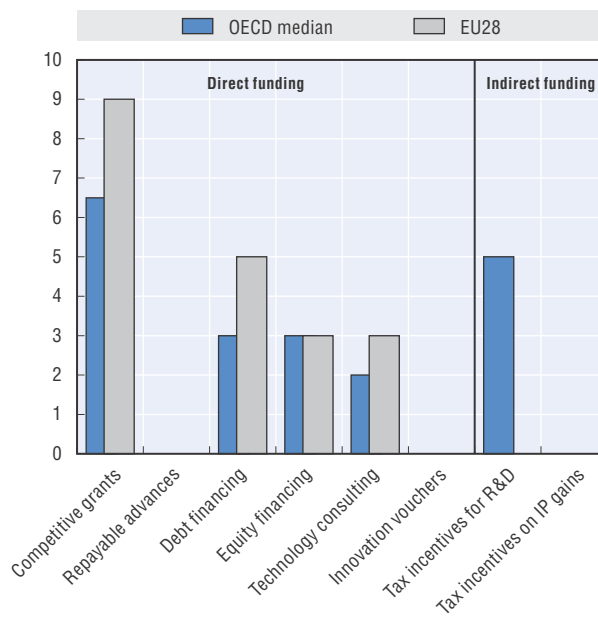
Panel 2. Revealed technology advantage in selected fields, 2009-11



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. European Union's responses are available in the OECD STI Outlook Policy Database, edition 2014 at <http://qdd.oecd.org/Table.aspx?Query=4684D449-1AE3-4C16-B10E-97D433EF213B>.

Source: See reader's guide and methodological annex.

StatLink <http://dx.doi.org/10.1787/888933152479>

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 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	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 (△) 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.

References

General references

- European Commission (EC) (2013), *Monitoring Industrial Research: the 2013 EU Industrial R&D Investment Scoreboard*, European Commission, Luxembourg, <http://iri.jrc.ec.europa.eu/scoreboard13.html>.
- International Energy Agency (IEA) (2013), *CO₂ Emissions from Fuel Consumption*, OECD Publishing, Paris, http://dx.doi.org/10.1787/co2_fuel-2013-en.
- Flanagan, K., E. Uyarra and M. Laranja (2010), "The policy mix for innovation: rethinking innovation policy in a multilevel, multi-actor context", *Munich Personal RePEc Archive (MPRA)* No. 23567, July 2010.
- OECD (2010a), *OECD Science, Technology and Industry Outlook 2010*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264083479-en>.
- OECD (2010b), "Monitoring innovation and policies: developing indicators for analysing the innovation policy mix", internal working document of the Directorate for Science, Technology and Industry (DSTI), OECD, Paris.
- OECD (2010c), *Measuring Innovation: A New Perspective*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264059474-en>.
- OECD (2010d), *SMEs, Entrepreneurship and Innovation*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264080355-en>.
- OECD (2011), *Towards Green Growth: Monitoring Progress: OECD Indicators*, OECD Green Growth Studies, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264111356-en>.
- OECD (2012), *OECD Internet Economy Outlook 2012*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264086463-en>.
- OECD (2013a), *OECD Science, Technology and Industry Scoreboard 2013: Innovation for Growth*, OECD Publishing, Paris, http://dx.doi.org/10.1787/sti_scoreboard-2013-en.
- OECD (2013b), *OECD Skills Outlook 2013: First Results from the Survey of Adult Skills*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264204256-en>.
- OECD (2014a), *OECD Economic Surveys*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/16097513>.
- OECD (2014b), *National Accounts at a Glance 2014*, OECD Publishing, Paris, http://dx.doi.org/10.1787/na_glance-2014-en.
- OECD (2014c), *Education at a Glance 2014: OECD Indicators*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/eag-2014-en>.
- OECD (2014d), *Entrepreneurship at a Glance 2014*, OECD Publishing, Paris, http://dx.doi.org/10.1787/entrepreneur_aag-2014-en.
- OECD (2014e), *Measuring the Digital Economy: A New Perspective*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264221796-en>.
- Van Steen, J. (2012), "Modes of public funding of R&D: Towards internationally comparable indicators", *OECD Science, Technology and Industry Working Papers*, No. 2012/4, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5k98ssns1gzs-en>.

Databases and data sources

- Academic Ranking of World Universities (ARWU) (2013), "Shanghai ranking" 2003-13, www.shanghairanking.com.
- Bureau Van Dijk (2011), *ORBIS Database*, Bureau Van Dijk Electronic Publishing.
- Elsevier B.V. (2014), *Elsevier Research Intelligence*, www.elsevier.com/online-tools/research-intelligence/products-and-services/scival (data retrieved online on 31 January 2014).
- Eurostat (2014), *Education and Training (ETR) Databases*, June, <http://epp.eurostat.ec.europa.eu/portal/page/portal/education/data/database>.
- Graham, S. et al. (2013), "The USPTO trademark case files dataset: Descriptions, lessons, and insights", *SSRN Working Paper*, <http://ssrn.com/abstract=2188621>.
- International Energy Agency (IEA) (2013), *IEA CO₂ Emissions from Fuel Combustion Statistics*, <http://dx.doi.org/10.1787/co2-data-en>.

- International Monetary Fund (IMF) (2014), *World Economic Outlook (WEO) Database*, April, www.imf.org/external/pubs/ft/weo/2014/01/weodata/index.aspx.
- International Telecommunication Union (ITU) (2013), *World Telecommunication/ICT Indicators 2013*, www.itu.int/pub/D-IND-WTID.OL.
- National Science Foundation (NSF) (2014), “Academic research and development”, in *Science and Engineering Indicators 2014*, www.nsf.gov/statistics/seind14/index.cfm.
- OECD (2012), *STructural ANalysis (STAN) Database*, November, www.oecd.org/sti/stan.
- OECD (2013), *Activity of Multinational Enterprises (AMNE) Database*, October, www.oecd.org/industry/ind/amne.htm.
- OECD (2013), *Green Growth Indicators Database*, www.oecd.org/greengrowth/greengrowthindicators.htm.
- OECD (2013), “Modes of public funding of R&D: Interim results from the second round of data collection on GBAORD”, internal working document of the Working Party of National Experts on Science and Technology Indicators (NESTI), OECD, Paris.
- OECD (2013), *OECD/NESTI data collection on R&D tax incentives*, April, www.oecd.org/sti/rd-tax-stats.htm.
- OECD (2013), “PISA: Programme for International Student Assessment”, *OECD Education Statistics*, December, www.pisa.oecd.org and <http://dx.doi.org/10.1787/data-00365-en>.
- OECD (2014), *Entrepreneurship Financing Database*.
- OECD (2014), *Main Science and Technology Indicators (MSTI) Database*, June, www.oecd.org/sti/msti.
- OECD (2014), *OECD ANBERD Database*, March, www.oecd.org/sti/anberd.
- OECD (2014), *OECD Broadband Portal*, June, www.oecd.org/sti/broadband/oecdbroadbandportal.htm.
- OECD (2014), *OECD Education Statistics*, June, <http://dx.doi.org/10.1787/edu-db-data-en>.
- OECD (2014), *OECD Educational Attainment Database*, June.
- OECD (2014), *OECD National Accounts Statistics*, April, <http://dx.doi.org/10.1787/naag-data-en>.
- OECD (2014), *OECD Product Market Regulation Database*, March, www.oecd.org/economy/pmr.
- OECD (2014), *OECD Productivity Database*, May, www.oecd.org/std/productivity-stats.
- OECD (2014), *OECD Patent Database*, March, www.oecd.org/sti/ipr-statistics.
- OECD (2014), *OECD Research and Development Statistics (RDS) Database*, March, www.oecd.org/sti/rds.
- OECD (2014), *OECD Science, Technology and Industry Outlook Policy Database*, <http://qdd.oecd.org/subject.aspx?Subject=a2ebc2a0-b8dc-4d1a-82be-3fea780b86a6>.
- UNESCO Institute for Statistics (UIS) (2014), *Education Database*, May, http://data.uis.unesco.org/Index.aspx?DataSetCode=SCN_DS.
- UIS (2014), *Science, Technology and Innovation Database*, June 2014, http://data.uis.unesco.org/Index.aspx?DataSetCode=EDULIT_DS.
- United Nations (UN) (2013), *UN e-Government Survey*, United Nations, NY, <http://unpan3.un.org/egovkb/Reports/UN-E-Government-Survey-2014>.
- World Bank (WB) (2014), *World Development Indicators (WDI) Databank*, <http://wdi.worldbank.org>.