

# EUROPEAN INNOVATION SCOREBOARD

## What is the European Innovation Scoreboard?

The annual [European Innovation Scoreboard](#) (EIS) provides a comparative assessment of research and innovation performance and the relative strengths and weaknesses of national research and innovation systems. It covers the EU Member States as well as Iceland, Israel, the Former Yugoslav Republic of Macedonia, Norway, Serbia, Switzerland, Turkey, and Ukraine. On a more limited number of globally available indicators, the EIS also rates Australia, Brazil, Canada, China, India, Japan, the Russian Federation, South Africa, South Korea, and the United States.

The EIS allows policy-makers to assess relative strengths and weaknesses, track progress, and identify priority areas to boost innovation performance.

## What are the indicators used for the Scoreboard?

The measurement framework of the EIS 2017 is composed of 27 indicators, distinguishing between ten innovation dimensions in four main categories (for full overview of indicators, see Table 1 in the Annex):

- **Framework conditions** capture the main drivers of innovation performance and cover three innovation dimensions: human resources, attractive research systems, and innovation-friendly environment.
- **Investments** include public and private investment in research and innovation, distinguishing between external finance and support, and own-resource investments.
- **Innovation activities** capture the innovation efforts at the company level, covering three dimensions: innovators, linkages, and intellectual assets.
- **Impacts** illustrate how innovation translates into benefits for the economy as a whole: employment impacts and sales effects.

For the 2017 edition, the analytical framework of the EIS has been refined. Results are therefore **not directly comparable with previous editions**. However, to allow performance to be tracked over time, the new methodology has also been applied to data from previous years.

The decision to refine the methodology was based on the need to better reflect the latest developments in policy priorities, economic theory and data availability as well as improve the quality and timeliness of the indicators, and better capture digitisation and entrepreneurship.

In addition to performance indicators, tables with **contextual data** on the economic structure, business indicators and socio-demographic indicators are included in all country profiles in order to illuminate possible impacts of structural differences on countries' performance.

Furthermore, a forward-looking section explores recent developments and **expected changes** in innovation performance. It discusses EU developments on

19 indicators, and compares overall trends in EU innovation performance with main competitors.

Methodological details are available in the [EIS 2017 Methodology Report](#).

### **What are the key drivers of innovation?**

The EIS 2017 confirms that the most innovative countries perform best on all measures. To achieve a high level of innovation performance, countries need a **balanced innovation system** performing well across all dimensions. They need an appropriate level of public and private investment in education, research and skills development, effective innovation partnerships among companies and with academia, as well as an innovation-friendly business environment, including strong digital infrastructure.

The EU as a whole is making good progress in academic education and research as well as in broadband infrastructure and ICT training. By contrast, venture capital investments and the number of SMEs introducing innovations have been declining in recent years. Adult lifelong learning – a key to empowering citizens in a rapidly changing world – is stagnating. In essence, **Europe still lacks the market-creating innovation** which is needed to turn the best ideas into new businesses and high-quality jobs.

The Commission is taking decisive action to improve conditions for innovation through initiatives such as the [Investment Plan for Europe](#), [the New Skills Agenda](#), and [the Start-up and Scale-up Initiative](#) (for further details, refer to the final section of the FAQs).

### **Four different performance groups of EU countries:**

Based on their scores, EU countries fall into four performance groups:

- **Innovation Leaders** – Denmark, Finland, Germany, the Netherlands, Sweden, and the United Kingdom perform 20% or more above the EU average;
- **Strong Innovators** – The innovation performance of Austria, Belgium, France, Ireland, Luxembourg, and Slovenia is above or close to the EU average;
- **Moderate Innovators** – Croatia, Cyprus, the Czech Republic, Estonia, Greece, Hungary, Italy, Latvia, Lithuania, Malta, Poland, Portugal, Slovakia, and Spain show an innovation performance below the EU average;
- **Modest Innovators** – The innovation performance of Bulgaria and Romania is well below 50% of the EU average.

### **Figure 1: Performance of EU Member States' innovation systems**

*Coloured columns show Member States' performance in 2016, using the most recent data for 27 indicators, relative to that of the EU in 2010. The horizontal hyphens show performance in 2015, using the next most recent data for 27 indicators, relative to that of the EU in 2010. Grey columns show Member States' performance in 2010 relative to that of the EU in 2010. For all years the same measurement methodology has been used. The dashed lines show the threshold values between the performance groups in 2016, comparing Member States' performance in 2016 relative to that of the EU in 2016.*

## EU performance leaders in specific areas of innovation:

The countries that have good overall innovation performance, also perform well in most specific areas of innovation. However, some Strong and Moderate Innovators perform well on individual dimensions:

- **Attractive research systems – Luxembourg** is the best performing country, followed by Denmark, the Netherlands, Sweden, the United Kingdom, and Belgium. These countries are open for cooperation with partners from abroad, researchers are well networked at international level, and the quality of research output is very high. Luxembourg also leads in the registration of intellectual assets, followed by Malta, Denmark, Austria, Sweden, and Finland.
- **Innovation in small and medium-sized companies (SMEs) – Ireland** is the leader, followed by Belgium, Germany, Luxembourg, Austria, and Finland. These countries are characterised by high shares of SMEs with innovative products and business processes. Ireland also leads in the employment impacts of innovation, followed by Malta, the United Kingdom, Luxembourg, Sweden, and the Netherlands.
- **Innovation linkages and collaboration – Belgium** is the top performer, followed by the Netherlands, Austria, Germany, the United Kingdom, and Finland. Companies in these countries have more versatile innovation capabilities, as they engage in innovation partnerships with other companies or public-sector organisations. The research systems in these countries are also geared towards meeting the demand from companies, as highlighted by private co-funding of public research.

One of the Moderate Innovators – **Lithuania** – performs above the EU average in four dimensions – *human resources, innovation-friendly environment, finance and support, and linkages*. The country is also the fastest growing innovator in the EU. Lithuania's innovation performance has **increased by 21% since 2010**.

## Have Member States improved their innovation performances?

For the EU as a whole, innovation performance improved by 2% between 2010 and 2016. Overall, innovation performance during this time increased in 15 and decreased in 13 Member States. The Member States advancing the fastest and having improved their innovation performance by more than 8% since 2010 include Lithuania, Malta, the United Kingdom (which has joined the Innovation Leaders group for the first time), the Netherlands, Austria, Latvia, and Slovakia.

### **Figure 2: Change in Member States' innovation performance (2010-2016)**

*The vertical axis shows Member States' performance in 2016 relative to that of the EU in 2010. The horizontal axis shows the change in performance between 2010 and 2016 relative to that of the EU in 2010. The dashed lines show the respective scores for the EU.*

In which dimensions has Europe improved and worsened?

Since 2010, EU performance has improved most in the dimensions of *human resources, innovation-friendly environment, own-resource investments, and attractive research systems*.

In the *human resources* dimension, performance growth has been driven by university graduates and doctorates, while lifelong learning has stagnated. The improvement in the *innovation-friendly environment* dimension is due to a strong increase in broadband penetration, whereas opportunity-driven entrepreneurship has declined.

EU performance has decreased in the dimensions *finance and support* (notably due to a strong decline in venture capital investments), *innovation in SMEs (innovators)* and *linkages*.

**Figure 3: EU performance change by dimension and indicator (2010-2016)**

*Normalised scores in 2016 relative to those in 2010 (=100)*

How does the EU's performance compare to other countries?

Outside the EU, Switzerland has confirmed its position as overall innovation leader in Europe. At global level, South Korea and Japan have an increasing performance lead over the EU, while the EU is catching up with Canada and the United States. China shows the fastest progress in international comparison, while Russia, Brazil, India, and South Africa are catching up with the EU.

**Figure 4: Global performance**

*Bars show countries' performance in 2016 relative to that of the EU in 2010.*

**Figure 5: Change in global performance**

*Change in performance is measured as the difference between the performance in 2016 relative to the EU in 2010 and the performance in 2010 relative to the EU in 2010.*

Compared to earlier editions, the availability of data for the global benchmarking has significantly increased. While only 12 out of 25 indicators (48%) could be globally benchmarked in the EIS 2016, this year's global benchmarking draws on 16 out of 27 indicators (59%). As a consequence, the comparative assessment is more comprehensive, thereby revealing somewhat different performance trends than those identified in the past.

Over the next two years, the EU could catch up with the US, while the performance leads of South Korea and Japan over the EU are likely to increase. Also China is expected to continue improving fast.

In order to stay among the globally leading innovators, the EU needs to boost private investment, further strengthen education and skills, and improve the framework conditions for innovation. The top performing EU countries are already on a par with the US and Japan, and also with the global Innovation Leaders South Korea and Canada, but most Member States need to address some weaknesses to compete against fast-growing innovators in Asia.

## **REGIONAL INNOVATION SCOREBOARD**

### **What is the Regional Innovation Scoreboard?**

The [Regional Innovation Scoreboard](#) (RIS) is a regional extension of the European Innovation Scoreboard. It provides a comparative assessment of regional innovation systems, replicating the EIS methodology and its revision for the 2017 edition to the extent possible.

The RIS 2017 covers 220 regions across 22 EU countries with Cyprus, Estonia, Latvia, Lithuania, Luxembourg, and Malta included at the country level. In addition, the Regional Innovation Scoreboard also covers regions from Norway, Serbia, and Switzerland.

The report uses data for 18 of the 27 indicators applied in the EIS 2017, including the new indicator on lifelong learning. As for the EIS, results are not comparable with previous editions, but to allow performance to be tracked over time, the new methodology has also been applied to data from previous years.

Profiles for all regions are available [online](#). Similar to the EIS country profiles, these also include tables with contextual data on the economic structure, business indicators and socio-demographic to illustrate possible impacts of structural differences on performance scores.

### **What are the most innovative regions?**

Similar to the EIS, Europe's regions have been divided into regional innovation leaders (53 regions), regional strong innovators (60 regions), regional moderate innovators (85 regions), and regional modest innovators (22 regions). Moreover, each RIS performance group is divided into 3 categories: a top one-third (assigned with a '+'), middle one-third, and bottom one-third (assigned with a '-') regions.

The most innovative region in the EU is **Stockholm in Sweden**, followed by **Hovedstaden in Denmark**, and the **South East in the United Kingdom**. The overall most innovative region in Europe is Zürich in Switzerland.

Most regional innovation leaders are located in countries identified as innovation leaders in the EIS, and almost all of the regional moderate and modest innovators are located in countries identified as moderate and modest innovators.

However, regional ‘pockets of excellence’ can be identified in some moderate innovator countries, for instance, **Prague in the Czech Republic, Bratislava in Slovakia, and the Basque Country in Spain.**

**Figure 6: Regional innovation performance groups**

*For Cyprus, Estonia, Latvia, Lithuania, Luxembourg and Malta, performance group membership is identical to that in the European Innovation Scoreboard 2017 report. For these countries, the corresponding colour codes for middle one-third regions have been used.*

**What is the Commission doing to foster innovation in the EU?**

Innovation is of great importance to the Commission. It is crucial for productivity, competitiveness and growth. Innovation also helps tackle societal challenges and at the same time provides new opportunities to companies and encourages job creation.

The Commission is working to foster innovation across sectors and policy areas, e.g. by encouraging the development of energy-efficient technologies, supporting the balanced development of the collaborative economy, encouraging the uptake of mobile health services and connected cars. It is doing so by speeding up the development of common standards in priority areas, such as 5G or the Internet of Things, setting up a European Open Science Cloud reducing the cost of IP protection through a Unitary Patent – to name but a few.

With a €77 billion budget for the 2014-2020 period, [Horizon 2020](#) is the world’s largest research and innovation funding programme. It takes an all-encompassing approach to Research and Innovation, supporting the entire innovation chain from frontier research to close-to-market activities.

The Commission is constantly improving synergies between the [European Structural and Investment Funds](#) and other EU-led financial instruments and venture capital funds, to assist companies, and therefore the economy, to grow and prosper. These funds target key investment areas to enhance growth in EU countries and regions. In 2014-2020, the Funds contribute €121 billion to smart growth, including research & innovation. The ESI envelope for this period, with national co-financing, represent an investment effort of €638 billion, including €181 billion dedicated to “smart growth”, with investments in Research & Innovation, digital technologies and direct support to over two million small businesses.

The [Horizon 2020 Policy Support Facility](#) and the [Smart Specialisation Platform](#) help EU countries and regions in reforming their research and innovation systems. Smart specialisation helps Member States and regions identify and capitalise on their competitive assets, attract private sector investments and strategically prioritise EU and public investments in R&I. Such reforms are crucial to improving the performance of countries as well as their framework conditions for innovation. Horizon 2020 also contributes to the revitalisation of the EU’s industrial base by supporting innovation activities or procurement of innovative solutions.

Thematic Smart Specialisation Platforms help countries and regions team up around shared innovation priorities. The platforms offer hands-on support to regions, to foster interregional cooperation based on matching smart specialisation priorities in the fields of energy, industrial modernisation or agri-food. They aim to create an investment pipeline of mature projects in new growth areas across the EU, by providing tailored advice and helping regions establish links with the business and research communities.

Access to finance, both on the debt and equity side, remains a critical issue for SMEs, start-ups and young entrepreneurs who want to succeed and grow in the EU. Many entrepreneurs leave Europe because they can't raise the capital they need and SMEs cannot access a broader range of financing solutions. That's why in addition to providing Horizon 2020 and other EU funding instruments, the Commission is improving companies' access to private finance through [Juncker Plan's](#) European Fund for Strategic Investments (EFSI), [the Capital Markets Union](#), [the Single Market Strategy](#) and the [Start-up and Scale-up Initiative](#).

The Commission is launching a [Pan-European Venture Capital Fund of Funds](#) and is gearing up support to breakthrough innovators in the EU's Horizon 2020 research and innovation framework programme under the working title [European Innovation Council](#).

## ANNEX 1

### **Table 1 – European Innovation Scoreboard: dimensions and indicators**

#### **FRAMEWORK CONDITIONS**

##### **Human resources**

1.1.1 New doctorate graduates

1.1.2 Population aged 25-34 with tertiary education \*\*

1.1.3 Lifelong learning \*

##### **Attractive research systems**

1.2.1 International scientific co-publications

1.2.2 Top 10% most cited publications

1.2.3 Foreign doctorate students \*\*

##### **Innovation-friendly environment**

1.3.1 Broadband penetration \*

1.3.2 Opportunity-driven entrepreneurship \*

#### **INVESTMENTS**

##### **Finance and support**

2.1.1 R&D expenditure in the public sector

2.1.2 Venture capital expenditures

### **Firm investments**

2.2.1 R&D expenditure in the business sector

2.2.2 Non-R&D innovation expenditures

2.2.3 Enterprises providing training to develop or upgrade ICT skills of their personnel \*

## **INNOVATION ACTIVITIES**

### **Innovators**

3.1.1 SMEs with product or process innovations

3.1.2 SMEs with marketing or organisational innovations

3.1.3 SMEs innovating in-house

### **Linkages**

3.2.1 Innovative SMEs collaborating with others

3.2.2 Public-private co-publications

3.2.3 Private co-funding of public R&D expenditures \*

### **Intellectual assets**

3.3.1 PCT patent applications

3.2.2 Trademark applications \*\*

3.2.3 Design applications

## **IMPACTS**

### **Employment impacts**

4.1.1 Employment in knowledge-intensive activities

4.1.2 Employment fast-growing enterprises of innovative sectors \*\*

### **Sales impacts**

4.2.1 Medium and high tech product exports

4.2.2 Knowledge-intensive services exports \*\*

4.2.3 Sales of new-to-market and new-to-firm product innovations



- \* Indicator newly introduced in the EIS 2017 measurement framework
- \*\* Indicator revised for the EIS 2017 measurement framework

See also [IP/2017/1673](#)