Innovation performance: EU Member States and international competitors compared

Brussels, 07 May 2015

This fact sheet explains the objectives of the Innovation Union Scoreboard and provides an overview of the research and innovation performance of EU Member States and some associated and neighbouring countries, as measured by the Innovation Union Scoreboard 2015.

What is the Innovation Union Scoreboard (IUS)?

The Innovation Union Scoreboard provides a comparative assessment of the research and innovation performance of the EU Member States and the relative strengths and weaknesses of their research and innovation systems. It helps Member States assess areas in which they need to concentrate their efforts in order to boost their innovation performance. In addition, the IUS covers Serbia, Former Yugoslav Republic of Macedonia, Turkey, Iceland, Norway and Switzerland. On a more limited number of indicators, available internationally, it also covers Australia, Brazil, Canada, China, India, Japan, Russia, South Africa, South Korea and the US.

What are the indicators used for the Innovation Union Scoreboard?

The Innovation Union Scoreboard, following the methodology of the previous editions, captures a total of 25 different indicators (see Figure 1 below and table at end of the document), distinguishing between eight innovation dimensions and three main categories of indicators:

**Enablers:** the basic building blocks which allow innovation to take place - human resources, open, excellent and attractive research systems, and finance and support.

**Firm activities:** which capture innovation efforts in European firms - firm investments, linkages and entrepreneurship, and intellectual assets.

**Outputs:** show how this translates into benefits for the economy as a whole - innovators and economic effects.

For more methodological explanations please refer to chapter 7 of the Innovation Union Scoreboard 2015.

**Figure 1: Framework of the Innovation Union Scoreboard**
Four different performance groups for Member States

The Innovation Union Scoreboard 2015 places Member States into four different performance groups (Figure 2 below):

- Denmark (DK), Finland (FI), Germany (DE) and Sweden (SE) are “Innovation Leaders” with innovation performance well above that of the EU average.

- Austria (AT), Belgium (BE), France (FR), Ireland (IE), Luxembourg (LU), Netherlands (NL), Slovenia (SI) and the United Kingdom (UK) are “Strong innovators (Innovation followers)” with innovation performance above or close to that of the EU average;

- The performance of Croatia (HR), Cyprus (CY), Czech Republic (CZ), Estonia (EE), Greece (GR), Hungary (HU), Italy (IT), Lithuania (LT), Malta (MT), Poland (PL), Portugal (PT), Slovakia (SK) and Spain is below that of the EU average. These countries are “Moderate innovators”;

- Bulgaria (BG), Latvia (LV) and Romania (RO) are “Modest innovators” with innovation performance well below that of the EU average.

Figure 2: EU Member States’ innovation performance
Fastest growing innovators
The fastest growing innovators are Malta (MT), Latvia (LV) and Bulgaria (BG). Compared to last year, innovation performance has increased most rapidly in these Moderate and Modest innovator countries, underscoring a gradual convergence of innovation performance across EU Member States.

Figure 3: Increase in innovation performance since last year

What makes innovation leaders successful?
The most innovative countries perform well and clearly above the EU average in all areas: from research and higher education systems, through business innovation activities and intellectual assets up to innovation in SMEs and economic effects, reflecting balanced national research and innovation systems.

Have Member States improved their innovation performance?
Innovation performance has declined for 13 Member States, in particular for Romania, Cyprus, Estonia, Greece and Spain. For the EU at large innovation performance has not changed and for 15 Member States it has improved, most notably for Malta, Latvia and Bulgaria.

Over the eight-year period 2007-2014, the EU average annual growth rate of innovation performance has reached 1.0% with most Member States improving their innovation performance.
Is the innovation performance of Member States converging?

Innovation performance among the Member States is converging but performance differences between Member States are still at a relatively high level due to a significant increase in performance differences 3 years ago. This process of convergence is also observed within the groups of the Strong innovators (Innovation followers) and Moderate innovators, but for the Innovation leaders differences between countries in this group have remained the same and for the Modest innovators differences between countries have increased.

In which dimensions has Europe improved most?

Growth has not been equally strong across all dimensions and indicators (Figure 4). In particular, in Open, excellent and attractive research systems growth has been strong. Growth in this dimension has been driven by high growth in International scientific co-publications. The EU innovation system is becoming more networked both between the Member States and at the global scale. Also in Human resources and Intellectual assets growth has been relatively strong. Growth in Firm investments and Economic effects has also been above average while growth in Linkages & entrepreneurship has been moderate.

Growth in Finance and support has been very negative due to a strong decline in Venture capital investments. Negative growth is also observed in Innovators due to declining performance in SMEs that introduced product or process innovations and SMEs that introduced marketing or organisational innovations.

Figure 4: EU growth performance over 2007-2014

Taking into account European countries outside the EU, Switzerland confirms its position as overall Innovation leader by continuously outperforming all European countries. However, Switzerland's innovation performance has improved at a much slower pace than that of the EU.

At global level (Figure 5), South Korea and the US defend their positions as top international
innovators. Together with Japan these countries keep a performance lead over the EU. While the gap between the EU and both the US and Japan is decreasing, it widens with South Korea.

The EU maintains a performance lead over Australia and Canada and to a greater extent over the BRICS countries (Brazil, Russia, India, China and South Africa). This lead is stable or even increasing for all BRICS countries except for China which continues to reduce the gap by growing faster than the EU.

**Figure 5: EU Innovation performance compared to main global partners**

What are the main conclusions of the Innovation Union Scoreboard 2015?

Apart from the innovation performance of the individual EU Member States as well as their strengths and weaknesses, the key conclusion is that the most innovative countries perform best on all dimensions: from research and innovation inputs, through business innovation activities up to innovation outputs and economic effects, which reflects a balanced national research and innovation system.

Across all dimensions the performance of the Innovation leaders, Sweden, Denmark, Finland and Germany, is thus not too different. The Innovation leaders are also mostly on top and clearly above the EU average. Only in the second dimension *Open, excellent and attractive research system*, Germany scores slightly below the EU average and in the eighth dimension *Economic effects* Finland and Sweden score just below the EU average.

**TABLE: Innovation Union Scoreboard dimensions and indicators**

(see Attachment)

<table>
<thead>
<tr>
<th>Main type / Innovation dimension / Indicator</th>
<th>Data source: Numerator</th>
<th>Data source: Denominator</th>
<th>Years covered</th>
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<td><strong>ENABLERS</strong></td>
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<td>Eurostat</td>
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<td>1.2.1 International scientific co-publications per million population</td>
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<td>Science-Metrix using Scopus data</td>
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<td>Eurostat</td>
<td>Eurostat</td>
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</table>

**Finance and support**
### 1.3.1 R&D expenditure in the public sector as percentage of GDP
- **Source:** Eurostat
- **Time Period:** 2006 – 2013

### 1.3.2 Venture capital investment as percentage of GDP
- **Source:** Eurostat
- **Time Period:** 2008 – 2013

### FIRM ACTIVITIES
#### Firm investments

**2.1.1 R&D expenditure in the business sector as percentage of GDP**
- **Source:** Eurostat
- **Time Period:** 2006 – 2013

**2.1.2 Non-R&D innovation expenditures as percentage of turnover**
- **Source:** Eurostat (CIS), Eurostat (CIS)

### Linkages & entrepreneurship

**2.2.1 SMEs innovating in-house as percentage of SMEs**
- **Source:** Eurostat (CIS), Eurostat (CIS)

**2.2.2 Innovative SMEs collaborating with others as percentage of SMEs**
- **Source:** Eurostat (CIS), Eurostat (CIS)

**2.2.3 Public-private co-publications per million population**
- **Source:** Centre for Science and Technology Studies (CWTS) using Thomson Reuters data
- **Time Period:** 2008 – 2013

### Intellectual assets

**2.3.1 PCT patents applications per Billion GDP (in Purchasing Power Standard €)**
- **Source:** OECD, Eurostat
- **Time Period:** 2004 – 2011

**2.3.2 PCT patent applications in societal challenges (environment-related technologies; health) per billion GDP (in Purchasing Power Standard €)**
- **Source:** OECD, Eurostat
- **Time Period:** 2004 – 2011

**2.3.3 Community trademarks per billion GDP (in Purchasing Power Standard €)**
- **Source:** Office for Harmonization in the Internal Market
- **Time Period:** 2006 – 2013

**2.3.4 Community designs per billion GDP (in Purchasing Power Standard €)**
- **Source:** Office for Harmonization in the Internal Market
- **Time Period:** 2006 – 2013

### OUTPUTS
#### Innovators

**3.1.1 SMEs introducing product or process innovations as percentage of SMEs**
- **Source:** Eurostat (CIS), Eurostat (CIS)

**3.1.2 SMEs introducing marketing or organisational innovations as percentage of SMEs**
- **Source:** Eurostat (CIS), Eurostat (CIS)

**3.1.3 Employment in fast-growing firms of innovative sectors**
- **Source:** Eurostat
- **Time Period:** 2010 – 2012

#### Economic effects

**3.2.1 Employment in knowledge-intensive activities (manufacturing and services) as percentage of total employment**
- **Source:** Eurostat
- **Time Period:** 2008 – 2013

**3.2.2 Medium and high-tech product exports as percentage of total product exports**
- **Source:** Eurostat / United Nations, Eurostat / United Nations
- **Time Period:** 2006 – 2013

**3.2.3 Knowledge-intensive services exports as percentage of total service exports**
- **Source:** Eurostat
- **Time Period:** 2005 – 2013

**3.2.4 Sales of new to market and new to firm innovations as percentage of turnover**
- **Source:** Eurostat (CIS), Eurostat (CIS)

**3.2.5 License and patent revenues from abroad as percentage of GDP**
- **Source:** Eurostat
- **Time Period:** 2006 – 2013

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**General public inquiries:**
Europe Direct by phone 00 800 67 89 10 11 or by email

Attachments
   TABLE Innovation Union Scoreboard dimensions and indicators.pdf