EUROPEAN COMMISSION

MEMO

Brussels, 4 March 2014

Innovation performance: EU Member States, International Competitors and European Regions compared

This Memo 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 at national and regional levels, as measured by the Innovation Union Scoreboard 2014 and the Regional Innovation Scoreboard 2014.

What is the Innovation Union Scoreboard (IUS)?

The annual 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 Scoreboard 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.

Every two years the Innovation Union Scoreboard is accompanied by a Regional Innovation Scoreboard. The Regional Innovation Scoreboard 2014 provides a comparative assessment of innovation performance across 190 regions of the European Union, Norway and Switzerland using a limited number of research and innovation indicators.

What are the main 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 (Figure 1 (below) and Table 1 (end of 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.

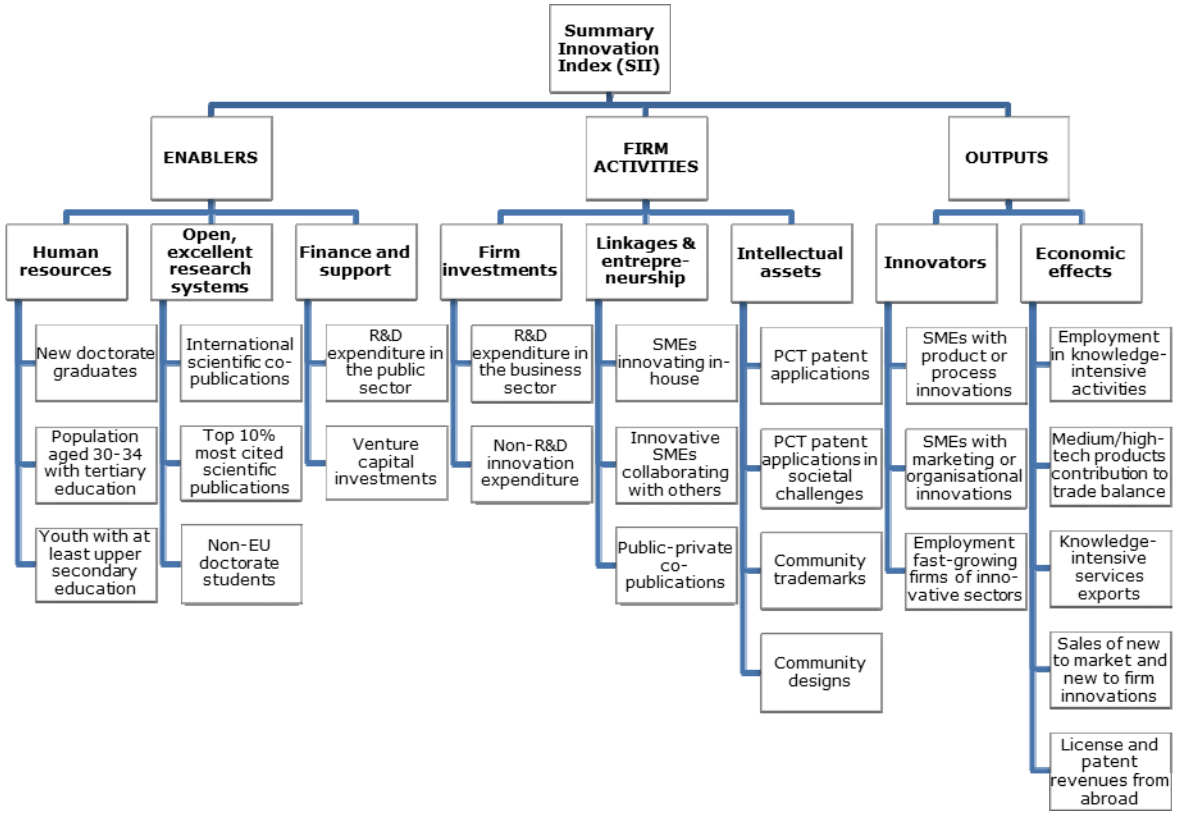
In this year's edition, the place holder for the 25th indicator has been filled in with "Employment in fast growing firms of innovative sectors" indicator, which is a component of the recently published innovation output indicator.

As regards the Regional Innovation Scoreboard, for many indicators used in the IUS regional data are not available either because these data are not collected at the regional level for all countries or because they are not collected at all.

The Regional Innovation Scoreboard (RIS) is therefore limited to using regional data for 11 of the 25 indicators used in the IUS.

For more methodological explanations please refer to chapter 6 of the Innovation Union Scoreboard 2014 and Chapter 2 of the Regional Innovation Scoreboard 2014.

Figure 1: Framework of the Innovation Union Scoreboard



Have Member States improved their innovation performance?

Overall, the EU annual average growth rate of innovation performance reached 1.7% over the analysed eight-year period 2006-2013 with all Member States improving their innovation performance. Portugal, Estonia and Latvia are the innovation growth leaders, i.e. the countries with the highest rate of innovation performance improvement. The lowest innovation growth rates were recorded in Sweden, the UK and Croatia.

Is the innovation performance of Member States converging? In which areas are the largest differences?

Altogether, this year's results show that innovation performance among the Member States is converging but the convergence process slowed down. As a consequence the convergence level in innovation performance went back to the level of 2009.

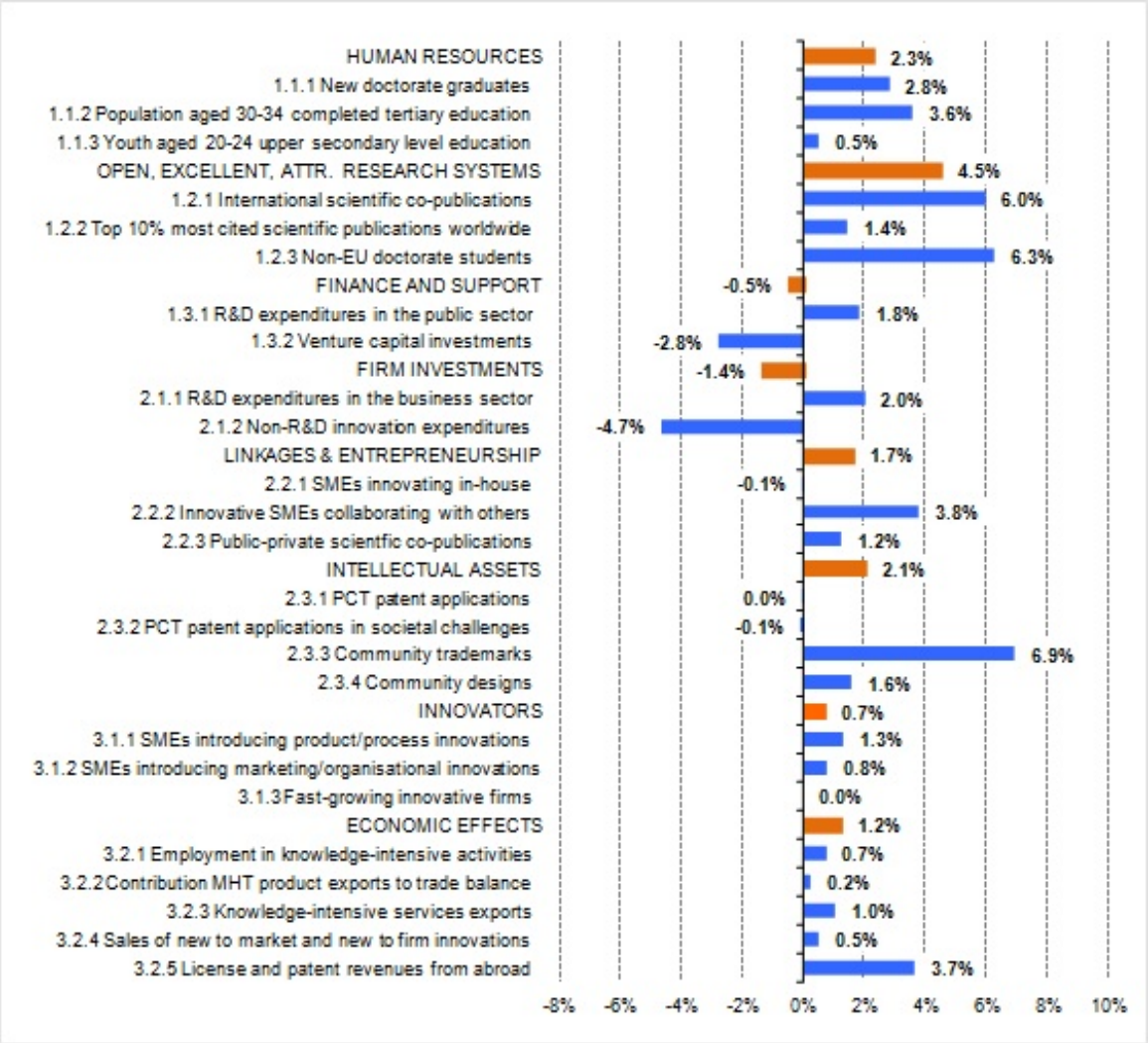
The differences in performance across all Member States are smallest in Human resources, where the best performing country (Sweden) is performing more than three times as well as the least performing country Malta. However, particularly large differences are in the international competitiveness of the science base (Open, excellent and attractive research systems), and business innovation cooperation as measured by Linkages & entrepreneurship. In both dimensions the best performing country (Denmark) is performing more than nine and seven times better than the least performing countries, Latvia and Romania respectively.

In which dimensions has Europe improved most?

When looking at individual dimensions, Open, excellent and attractive research systems contributed most to the overall innovation performance over the last eight years, followed by growth in Human resources. Looking at individual indicators, Community trademarks contributed most to the increase of the innovation performance, followed by Non-EU doctorate graduates and International scientific co-publications. Relatively good performance improvement is also observed in Innovation collaboration of SMEs and commercialisation of knowledge as measured by License and patent revenues from abroad.

In two dimensions the overall change of performance was negative: Firm investments and Finance and support. In particular, the positive growth of public R&D expenditures (1.8%) was offset by a continuous decline in venture capital investments (-2.8%). In addition, a positive improvement in Business R&D expenditure (2.0%) was negatively offset by firms' Non-R&D innovation expenditures (-4.7%), (Figure 3).

Figure 3: EU growth performance (individual indicators)



How does the EU fare in comparison to its international partners?

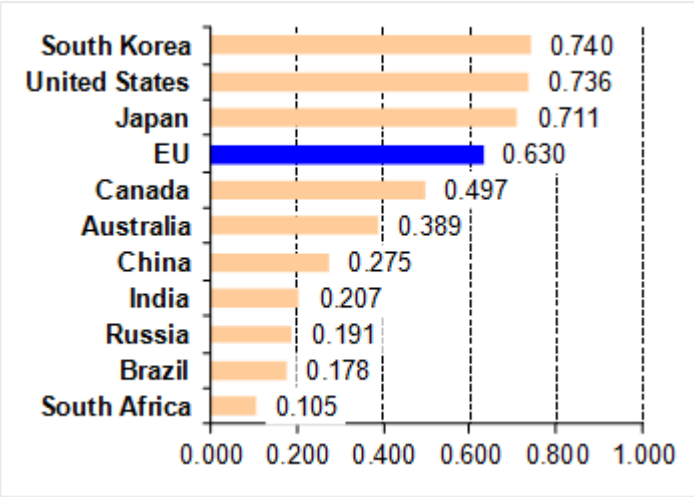
Taking into account European countries outside the EU, also this year Switzerland confirms its position as the overall Innovation leader by continuously outperforming all EU Member States. Iceland is one of the Innovation followers with an above EU-average performance, Norway and Serbia are Moderate innovators and the Former Yugoslav Republic of Macedonia and Turkey are Modest innovators.

When looking at performance of innovation systems in a global context, South Korea, the US and Japan have an innovation performance lead over the EU. The United States and South Korea outperform the EU both by 17% and Japan by 13%. While the gap between the US and Japan is decreasing, it widens with South Korea.

The top innovation leaders US, Japan and South Korea are particularly dominating the EU in indicators capturing business activity as measured by R&D expenditures in the business sector, Public-private co-publications and PCT patents but also in educational attainment as measured by the Share of population having completed tertiary education.

As compared with other key international partners, the EU continues to have a performance lead over Australia and Canada that score at 62% and 79% of the EU level respectively. The performance lead is even larger compared to the BRICS countries (Brazil, Russia, India, China and South Africa). This lead is stable or even increasing for almost all BRICS countries, except for China. China's current innovation performance is at 44% of the EU level, and continues to reduce the gap by improving faster and at a higher rate than the EU (Figure 4).

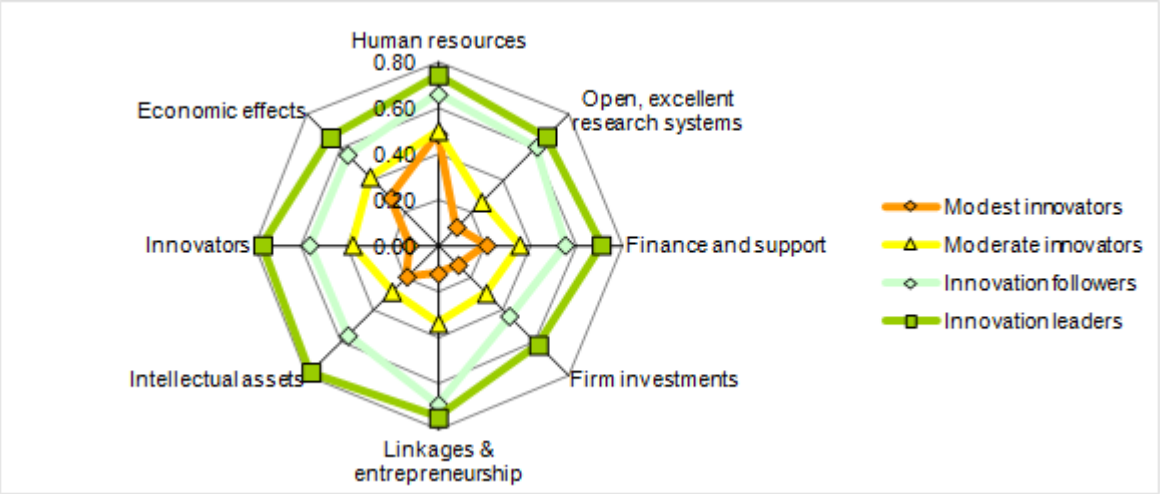
Figure 4: EU Innovation performance compared to main global competitors



What are the main conclusions of the Innovation Union Scoreboard 2014?

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. Reflecting balanced national research and innovation systems, the performance of the Innovation leaders, Sweden, Denmark, Germany and Finland, is not too different in all dimensions. 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*, does Germany score slightly below the EU average.

Figure 5: Country groups: innovation performance per dimension

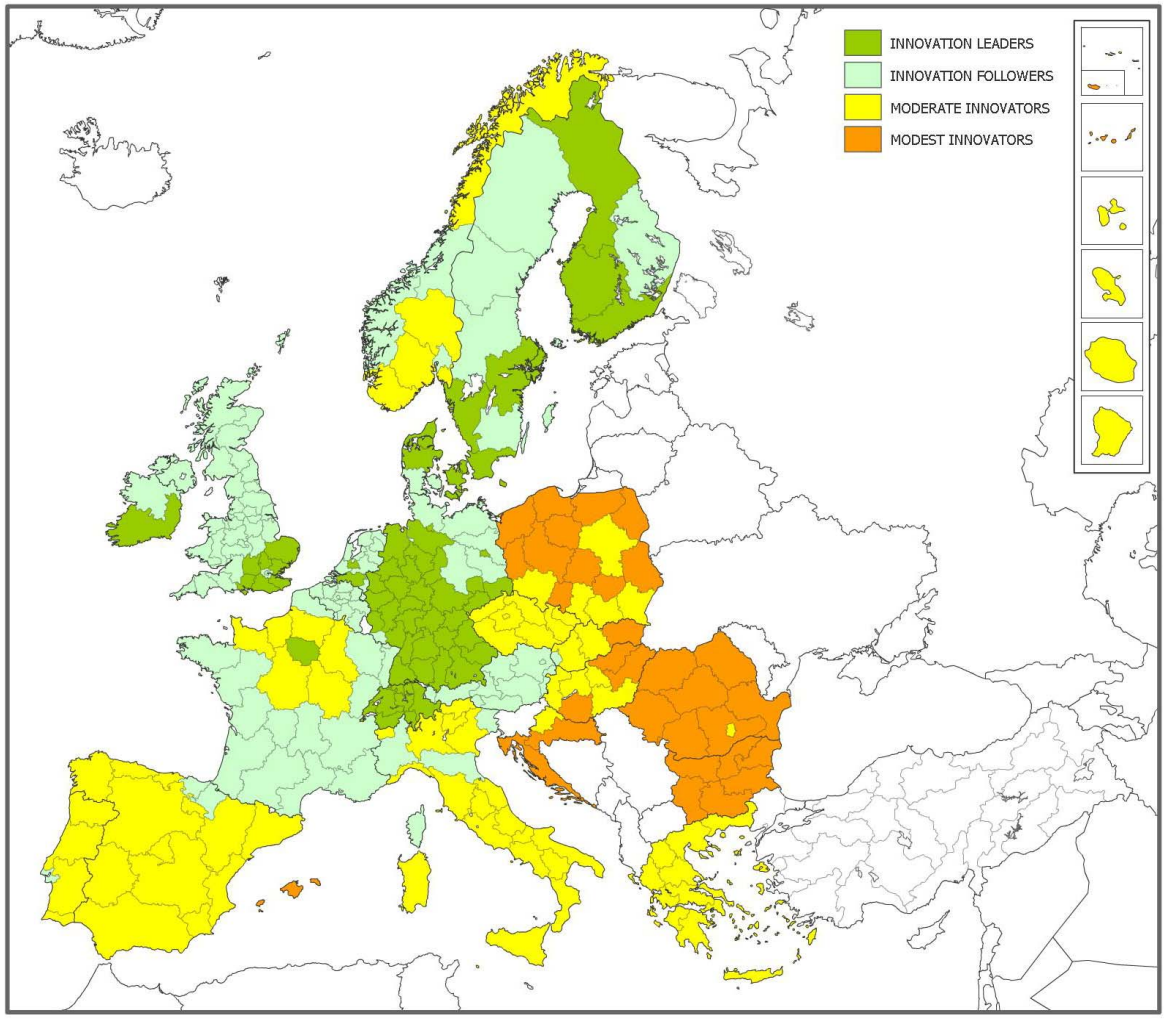


How innovative are the European regions: The Regional Innovation Scoreboard 2014

Every second year the Innovation Union Scoreboard is accompanied by a Regional Innovation Scoreboard. The Regional Innovation Scoreboard 2014 (RIS 2014) provides a comparative assessment of how European regions perform with regard to innovation. The report covers 190 regions across the European Union, Croatia, Norway and Switzerland.

As with the Innovation Union Scoreboard, in which countries are classified into four different innovation performance groups, Europe's regions have also been classified into Regional Innovation leaders (34 regions), Regional Innovation followers (57 regions), Regional Moderate innovators (68 regions) and Regional Modest innovators (31 regions) (Figure 6)

Figure 6: Regional innovation performance groups (RIS 2014)



Where are the most innovative regions?

Despite the fact that there is variation in regional performance within countries, regional performance groups do match the corresponding IUS country performance groups quite well. Most of the regional innovation leaders and innovation followers are located in the IUS Innovation leaders and followers and most of the regional moderate and modest innovators are located in the IUS Moderate and Modest innovators.

However, 14 countries have regions in two performance groups and four Member states, France, Portugal, Slovakia and Spain, have regions in three different regional performance groups, which indicate more pronounced innovation performance differences within countries. Only Austria, Belgium, Bulgaria, Czech Republic, Greece and Switzerland show a relatively homogenous innovation performance as all regions in those countries are in the same performance group.

All the EU regional innovation leaders (27 regions) are located in only eight EU Member States: Denmark, Germany, Finland, France, Ireland, Netherlands, Sweden and United Kingdom. This indicates that innovation excellence is concentrated in relatively few areas in Europe.

Is the innovation performance of the European regions improving?

An analysis over the seven-year period 2004-2010 shows that innovation performance has improved for most regions (155 out of 190).

For more than half of the regions (106) innovation has grown even more than the average of the EU. At the same time innovation performance worsened for 35 regions scattered across 15 countries. For four regions performance even declined at a very sharp rate of more than -10% on average per year.

How do regions use EU funding for innovation?

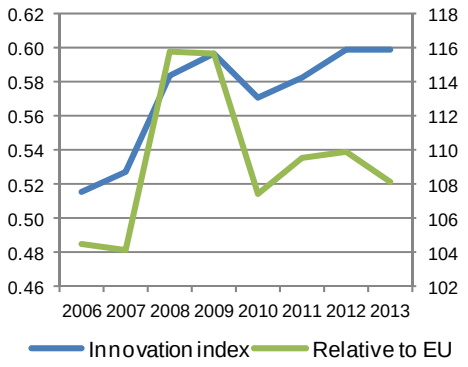
The analysis of the use of EU funding for research and innovation in the last programming period 2007-2013 distinguishes among five typologies of regions: Framework Programme (FP) leading absorbers (15.85%); Structural Funds (SFs) leading users targeting research and technological activities (3.66%); Structural Funds leading users prioritising services for business innovation and commercialisation (6.10%); Users of SF for both types of RTDI priorities with similar medium-to-high amounts of SF committed to projects targeting both of the above fields (3.66%); and regions with low use of Structural Funds, which make up the majority of regions included in the analysis (71%).

A further analysis shows that, while there are several regions that can be classified as pockets of excellence in terms of their FP participation and regional innovation capacity, only a few of the regions that are using EU funds for business innovation more intensely are above average innovation performers. The greatest majority of the EU regions in the analysed sample are low absorbers of FP funding and SFs and exhibit moderate to modest levels of innovation. These findings point to the fact that the "regional innovation paradox" continues to be a dominant feature of the European regional innovation landscape that calls for more policy attention in the future programming period.

Innovation situation per EU Member State

For additional country profiles and relevant figures please refer to Chapter 5 of the Innovation Union Scoreboard. Countries are placed in alphabetical order according to English version of country name.

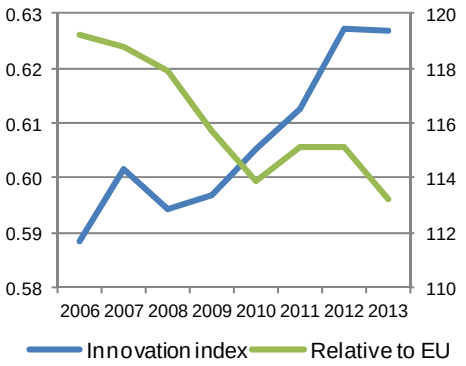
Austria is an Innovation follower. Innovation performance was increasing until 2009, declined in 2010, due to lower shares of product or process innovators, marketing or organisational innovators, SMEs innovating in-house and SMEs collaborating with others. Since then, innovation performance has fully recovered. The performance relative to the EU peaked at 116% in 2008 and 2009 and has since declined to 108% in 2013.



Relative strengths in performance are in International scientific co-publications, Community designs and Innovative SMEs collaborating with others. Relative weaknesses are in Non-EU doctorate students and Venture capital investments.

Strong increases in growth are observed for Community trademarks, International scientific co-publications and Community designs. Strong declines in growth are observed in Non-R&D innovation expenditures and SMEs with Marketing and/or Organisational innovations.

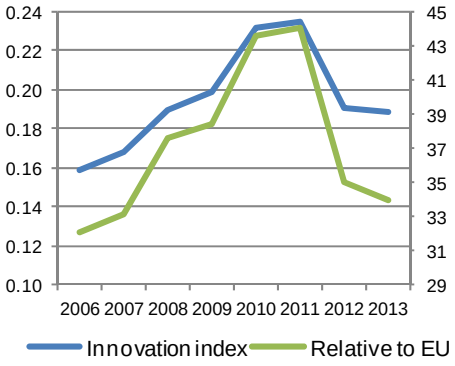
Belgium is an Innovation follower. Innovation performance has been steadily increasing over time until 2012 after which it remained steady in 2013. But the increase in the country's performance has been below that of the EU which resulted in Belgium's relative performance declining from almost 20% above average in 2006 to 14% above average in 2013.



Strong indicators where Belgium is performing well above the average EU performance include International scientific co-publications, Innovative SMEs collaborating with others and Public-private co-publications. Relatively weak indicators include Sales share of new innovations, Non-EU doctorate students and New doctorate graduates.

Performance has improved most in Community trademarks and International scientific co-publications. Performance has worsened in Non-R&D innovation expenditures and to a lesser extent also in Venture capital investments, SMEs with marketing and/or organisational innovations and Fast-growing innovative firms.

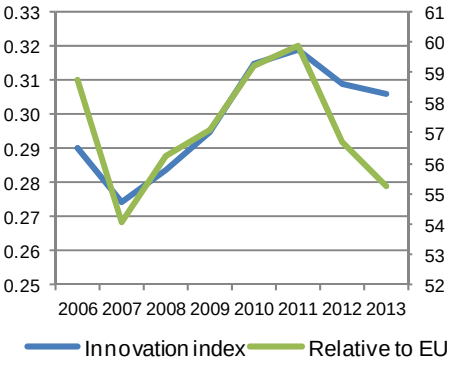
Bulgaria is a Modest innovator. Innovation performance had steadily increased until 2010, but started declining in 2011. As a consequence, the performance relative to the EU has declined from 44% in 2011 to 33% in 2013.



For all indicators, except for Youth with upper secondary level education, Bulgaria has performed below the average of the EU. The weakest indicators are Venture capital investments and Non-EU doctorate students.

However, for some indicators growth has been positive, most notably for Community trademarks and Community designs where the growth rates where respectively 77.4% and 56.4%. These high growth rates were realised because of the very low base from which these indicators started to grow. Other important high growth increases were R&D expenditures in the business sector, Knowledge-intensive service exports and New doctorate graduates. Strong declines in growth performance are observed in Venture capital investment and Non-R&D innovation expenditures.

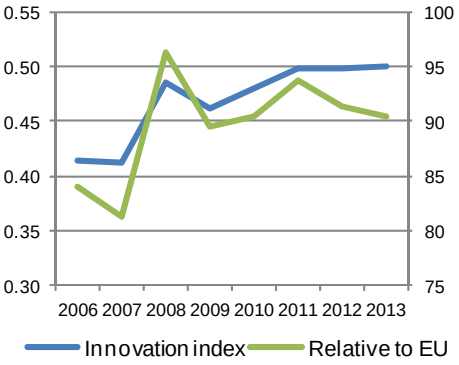
Croatia is a Moderate innovator. After declining in 2007, the Croatian innovation performance improved at about the same rate as that of the EU until 2011. Innovation performance began falling in 2012 (in particular due to a declining sales share of new innovative products), leading to a decrease in the performance relative to the EU from 60% in 2011 to 55% in 2013.



Croatia is performing well below the average of the EU for most indicators, most notably for Community designs, Community trademarks and Non-EU doctorate students. Relative strengths compared to the EU are in International scientific co-publications, Youth with upper secondary level education and Non-R&D innovation expenditures.

High growth is observed for Non-R&D innovation expenditures, New doctorate graduates and International scientific co-publications. Large declines in growth are observed in Community designs, PCT patent applications in societal challenges and in License and patent revenues from abroad.

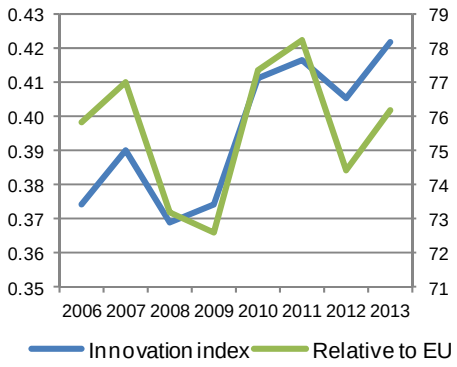
Cyprus is an Innovation follower. Innovation performance increased strongly until 2008 since when it has remained relatively stable except for a small set back in 2009. The performance relative to the EU has been improving over time from 81% in 2007 to just above 90% in 2013. Cyprus also moved from being a Moderate innovator in 2006 and 2007 to being an Innovation follower from 2008 onwards.



Cyprus performs well above the EU average for International scientific co-publications, Non-R&D innovation expenditures, Community trademarks and Innovative SMEs collaborating with others. Performance well below the average is observed in Non-EU doctorate students, License and patent revenues from abroad and New doctorate graduates.

High growth is observed for Community designs, Sales share of new innovations, International scientific co-publications and community trademarks. Large declines in growth are observed in License and patent revenues from abroad, Non-EU doctorate students and PCT patent applications.

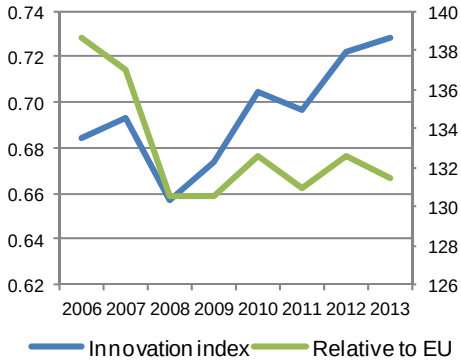
The **Czech Republic** is an Innovation follower. Innovation performance has been quite volatile over the past eight years but over the whole period the innovation index has improved. The performance relative to that of the EU follows the same volatile pattern. The performance was at its highest in 2011 at 78% and after a decline in 2012 it reached 76% of the EU average in 2013.



Relative strengths compared to the EU average are in International scientific co-publications, Non-R&D innovation expenditures and R&D expenditures in the public sector. Relative weaknesses are in Non-EU doctorate students and in Venture capital investments.

High growth is observed for Community trademarks, Community designs and Population with tertiary education. A strong decline is observed in Venture capital investment and Non-R&D innovation expenditures.

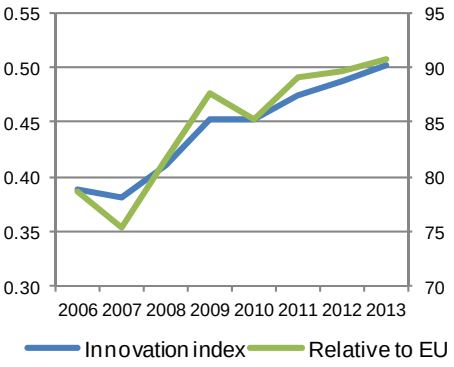
Denmark is an Innovation leader. Innovation performance declined significantly in 2008 (in particular due to lower shares of product and/or process innovators, marketing and/or organisational innovators, innovative SMEs collaborating with others and sales due to new innovative products) but has been increasing since then. The performance drop in 2008 and a slower rate of relative improvement caused a decline in the performance lead to the EU from 40% above average in 2008 to 32% in 2013.



Relative strengths compared to the EU average are in International scientific co-publications, Public-private scientific co-publications, Community designs and R&D expenditures in the business sector. Denmark performs below the EU average for Non-EU doctorate graduates, Youth with secondary level education, Non-R&D innovation expenditures and for the Contribution of Medium and High Tech exports to the trade balance.

High growth is observed for New doctorate graduates and International scientific co-publications. Growth has declined most notably for SMEs with Marketing and/or Organisational innovations and for Innovative SMEs collaborating with others.

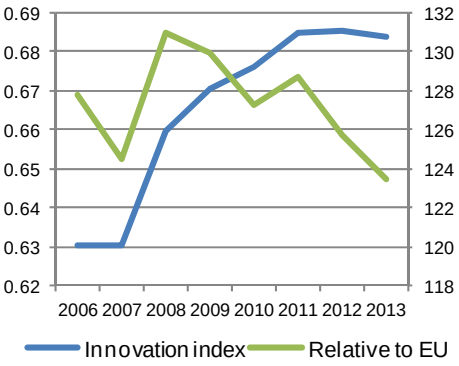
Estonia is an Innovation follower. Innovation performance has been increasing at a steady rate since 2007 although growth has slowed down since 2009. Estonia's performance relative to that of the EU has also been improving passing 90% in 2013, which is just above the threshold between the Innovation followers and Moderate innovators.



Estonia's performance is above the EU average for International scientific co-publications, Non-R&D innovation expenditures, Innovative SMEs collaborating with others and Community trademarks. Performance is well below the EU average for Non-EU doctorate students and License and patent revenues from abroad.

Estonia has experienced growth for most indicators included in the IUS 2014. Highest growth rates are observed for Community designs, Community trademarks and Non-EU doctorate students. Largest growth declines are observed for SMEs with Marketing and/or Organisational innovations, SMEs innovating in-house and Non-R&D innovation expenditures.

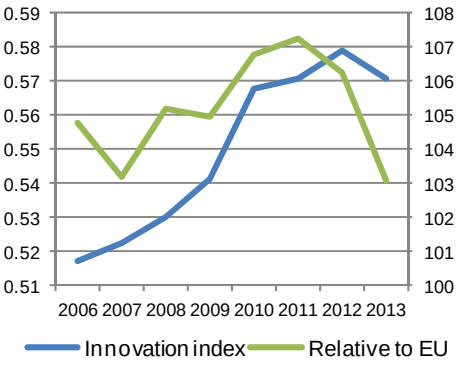
Finland is an Innovation leader. Innovation performance increased until 2011 and remained stable in 2012 and 2013. The performance relative to the EU has been declining from its peak of 131% in 2008 to 123% in 2013.



Finland is performing above the average of the EU for most indicators. Relative strengths are in International scientific co-publications, R&D expenditures in the business sector, New doctorate graduates and License and patent revenues from abroad. Relative weaknesses are in Non-EU doctorate students and Knowledge-intensive services exports.

High growth is observed for Community trademarks and Non-EU doctorate students. Notable declines in growth are observed for New doctorate graduates and Non-R&D innovation expenditures.

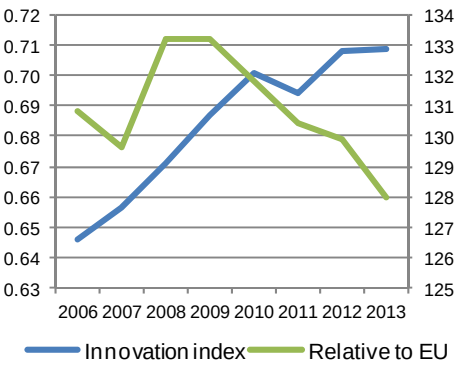
France is an Innovation follower. Innovation performance had been increasing strongly until 2010 after which growth started to slow down until its performance level declined in 2013 (in particular due to a smaller share of fast-growing firms in innovative sectors). The performance level relative to the EU reached a peak of 107% in 2011 but has dropped to just 103% in 2013.



France is performing for most indicators around the EU average. Relative strengths are in International scientific co-publications, Non-EU doctorate students and Population with tertiary education. Relative weaknesses are in Non-R&D innovation expenditures, Community trademarks and in Knowledge-intensive service exports.

France has experienced growth for most indicators, particularly in Community trademarks, International scientific co-publications and New doctorate graduates. The largest growth decline is observed for Non-R&D innovation expenditures.

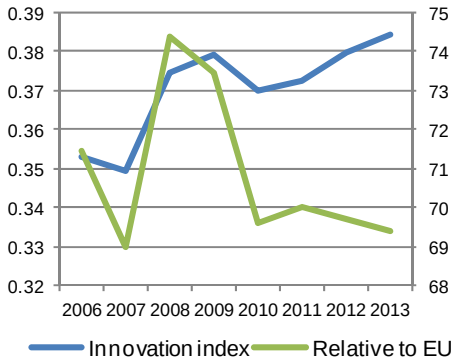
Germany is an Innovation leader. Innovation performance has risen over the 2006-2013 period with only a temporary decline in 2011. The performance relative to the EU has declined from being 33% above average in 2008 and 2009 to 28% in 2013.



Germany is performing well above the EU average, especially for International scientific co-publications, New doctorate graduates, Non-R&D innovation expenditures and Community designs. Relative weaknesses are in Non-EU doctorates students, Venture capital investments and License and patent revenues from abroad.

Strong increases in growth are observed in Innovative SMEs collaborating with others and Community trademarks. Most notable growth declines are observed in Non-R&D innovation expenditures, Venture capital investments and Sales share of new innovations.

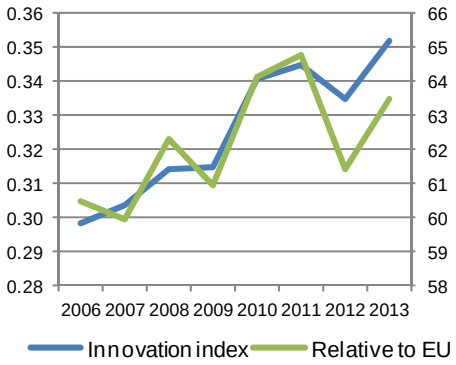
Greece is a Moderate innovator. Over time its innovation performance has been improving. The country did experience a slowdown in 2010 but the innovation performance has since been increasing again and in 2013 the innovation index reached a new peak. Growth however is below that of the EU. The relative performance to the EU has dropped from 74% in 2008 to almost 69% in 2013.



For most indicators, Greece performs below the EU average, particularly for Non-EU doctorate students, Community designs, Venture capital investments and R&D expenditures in the business sector. Greece performs above the EU average on International scientific co-publications, Sales share of new innovations and SMEs with Marketing and/or Organisational innovations.

Growth on the other hand has been improving for most indicators in Greece. Highest growth rates are observed for Community designs, Community trademarks, Sales share of new innovations and International scientific co-publications. Growth has declined in Non-R&D innovation expenditures and Venture capital investments.

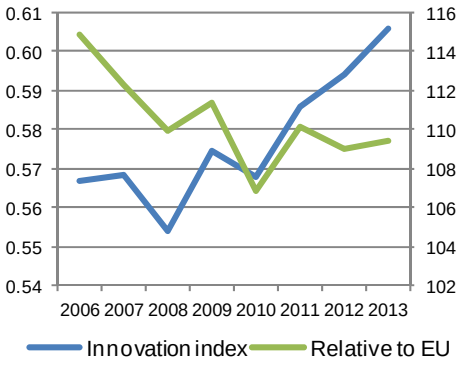
Hungary is a Moderate innovator. The country's innovation performance, despite some fluctuations, improved between 2006 and 2013. The performance relative to the EU increased to 63% in 2013 from around 60% in 2006.



Hungary performs below the EU average for most indicators, especially for Non-EU doctorate students and Community designs. Relative strengths are observed in License and patent revenues from abroad, International scientific co-publications and Fast-growing innovative firms.

High growth is observed for Community trademarks, R&D expenditures in the business sector and Sales share of new innovations. A large decline in growth is observed for Non-R&D innovation expenditures. Other notable declines are in R&D expenditures in the public sector, SMEs innovating in-house and Community designs.

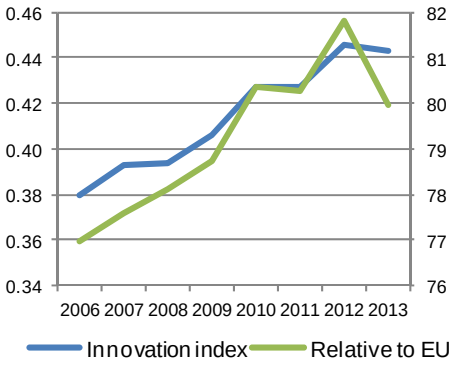
Ireland is an Innovation follower. The Irish innovation performance has experienced some declines in the period considered but the general trend has been upward. Although Ireland experienced an increase in its innovation performance, the growth rate was below that of the EU. This means performance relative to that of the EU has declined, from 115% in 2006 to 110% in 2013.



Ireland performs well above the EU average on International scientific co-publications and License and patent revenues from abroad. Other strong performing indicators are Population with tertiary education, Employment in knowledge intensive-services and Knowledge-intensive services exports. Relative weaknesses are in Community designs and Non-R&D innovation expenditures.

Growth has increased considerably in License and patent revenues from abroad, New doctorate graduates and International scientific co-publications. Most notable growth declines are observed in Non-R&D innovation expenditures, Community designs and Innovative SMEs collaborating with others.

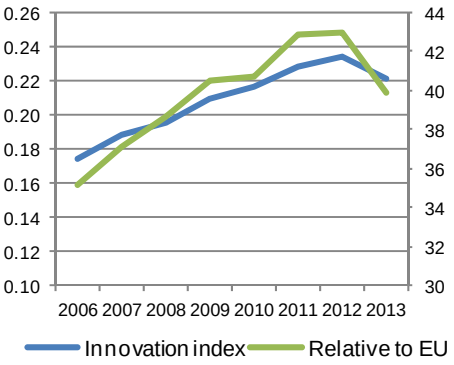
Italy is a Moderate innovator. Its innovation performance increased steadily until 2012 and experienced a small decline in 2013. Italy has been improving its innovation performance relative to the EU, reaching 80% in 2013.



Italy performs below the average of the EU for most indicators. Relative weaknesses are in Non-EU doctorate students and Innovative SMEs collaborating with others. Relative strengths are in International scientific co-publications and Community designs.

Italy has experienced growth for most indicators. High growth is observed for Non-EU doctorate students, License and patent revenues from abroad, International scientific co-publications and community trademarks. Growth declines are observed in Venture capital investments, Non-R&D innovation expenditures, Community designs and Employment in knowledge-intensive activities.

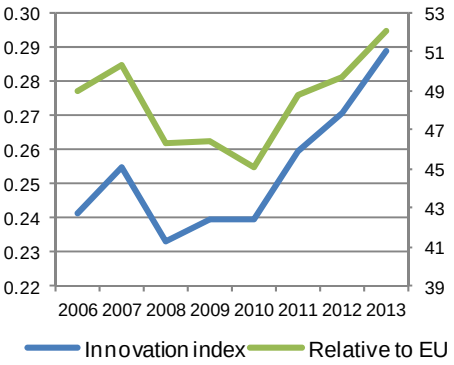
Latvia is a Modest innovator. Innovation performance had been increasing at a steady rate until 2012 but dropped in 2013, in particular due to a worsened performance in patent applications. Nonetheless, Latvia has improved its relative performance to the EU, from 35% in 2006 to 40% in 2013.



Latvia performs below the average of the EU for most indicators, most particularly for Non-EU doctorate students, R&D expenditures in the business sector, Public-private scientific co-publications. Relative strengths are in Youth with upper secondary level education and in Population with completed tertiary education.

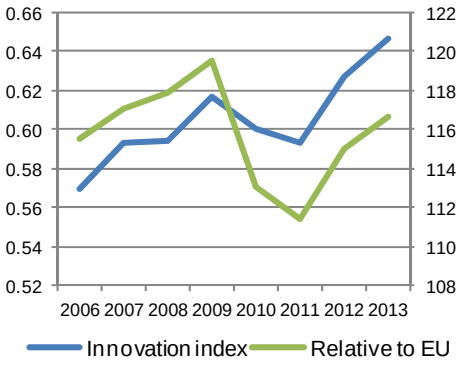
Despite the fact that Latvia performs below the average of the EU for almost all indicators, growth is increasing for a number of indicators. High growth is observed for Community trademarks, New doctorate graduates, Population with completed tertiary education and Community designs. A large decline in growth is observed for Non-R&D innovation expenditures. Other strong declines are in R&D expenditures in the business sector, Innovative SMEs collaborating with others and License and patent revenues from abroad.

Lithuania is an Innovation follower. Despite some fluctuations the overall innovation performance has been improving between 2006 and 2013. The performance relative to the EU has been improving also, moving the country to the group of Moderate innovators. Due to rapid rates of improvement from 2011 to 2013 Lithuania is currently performing at 52% of the average for the EU.



Lithuania performs below the average of the EU for most indicators, in particular for Non-EU doctorate students, R&D expenditures in the business sector, License and patent revenues from abroad and Community designs. Performance above average is observed for Non-R&D innovation expenditures, Population with completed tertiary education and Youth with upper secondary level education. High growth is observed for Community trademarks, Most cited scientific publications and International scientific co-publications. The largest growth decline is in Non-EU doctorate students. Other large declines are observed for Innovative SMEs collaborating with others and Sales share of new innovations.

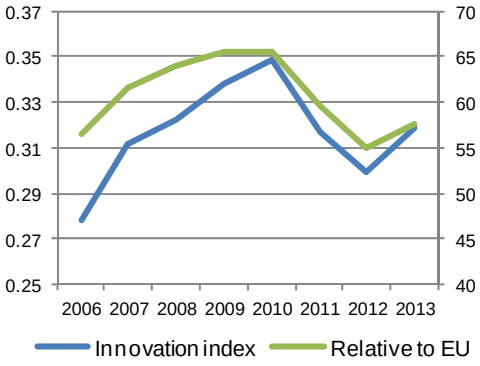
Luxembourg is an Innovation follower. Performance declined strongly in 2010 and 2011 (due to a much worse performance in non-R&D innovation expenditures) and fully recovered in 2012. The performance relative to the EU has declined from almost 120% in 2009 to 117%% in 2013.



Relative strengths are in International scientific co-publications, community trademarks, Venture capital investments and in Community designs. Luxembourg performs well below the average for Non-R&D innovation expenditures and New doctorate graduates.

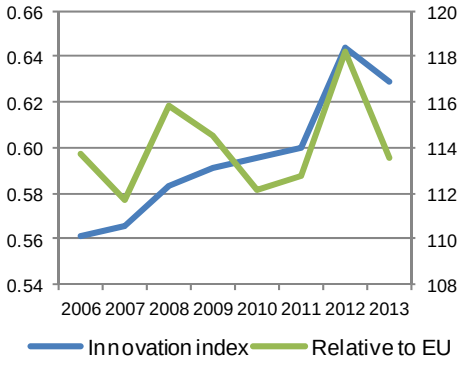
High growth is observed for International scientific co-publications, Most cited scientific publications and R&D expenditures in the public sector. Strong declines are observed in Non-R&D innovation expenditures, Sales share of new innovations and R&D expenditures in the business sector.

Malta is one of the moderate innovators with a below average performance.



Relative strengths are in Economic effects. Relative weaknesses are in Human resources and Finance and support.

Malta has experienced the fastest growth of all Member States for Most cited publications, Public-private co-publications and SMEs introducing product or process innovations. High growth is also observed for New doctorate graduates. A strong decline is observed for PCT patent applications, Community designs, Sales of new-to-market and new-to-firm innovations and License and patent revenues from abroad. Growth performance in Open, excellent and attractive research systems is well above average and in Firm investments and in Economic effects well below average.

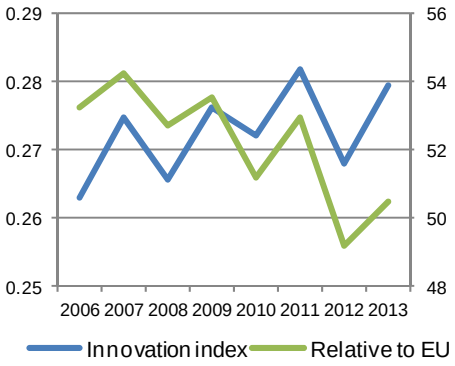


The **Netherlands** is an Innovation follower. Performance improved steadily up until 2011, increased strongly in 2012 (among other factors, due to a much higher share of product and/or process innovators) and declined in 2013 (among others, due to reduced license and patent revenues from abroad). The performance relative to the EU has been more volatile, reaching a peak of 118% in 2012 before falling to 114% in 2013.

The Netherlands is performing above the EU average for most indicators, most notably for International scientific co-publications, Public-private scientific co-publications and Most cited scientific publications. Relative weaknesses are in Knowledge-intensive services exports and in the Sales share of new innovations.

High growth is observed for Non-R&D innovation expenditures, Community trademarks, International scientific co-publications and New doctorate graduates. Strong declines in growth are observed for License and patent revenues from abroad and Knowledge-intensive services exports.

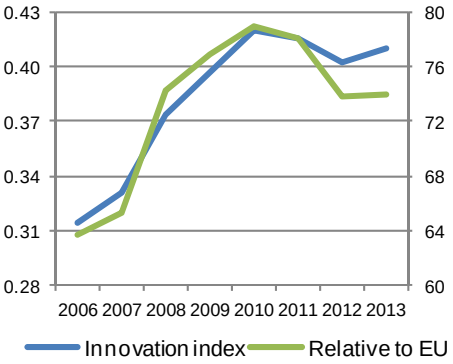
Poland is a Moderate innovator. Innovation performance has been quite volatile within a relatively narrow range, improving only marginally between 2006 and 2013. Due to a more rapidly increasing performance for the EU the relative performance to the EU has been declining from 54% in 2007 to about 50% in 2013. This has resulted in Poland virtually dropped from being a Moderate innovator up until 2011 to being a Modest innovator in 2012.



Poland is performing below the average of the EU for most indicators. Relative weaknesses are in Non-EU doctorate students, PCT patent applications in societal challenges and License and patent revenues from abroad. Relative strengths are in Non-R&D innovation expenditures and Youth with upper secondary level education.

High growth is observed for Community designs, Community trademarks and R&D expenditures in the business sector. Strong declines in growth are observed in Innovative SMEs collaborating with others, New doctorate graduates, SMEs innovating in-house and Sales share of new innovations.

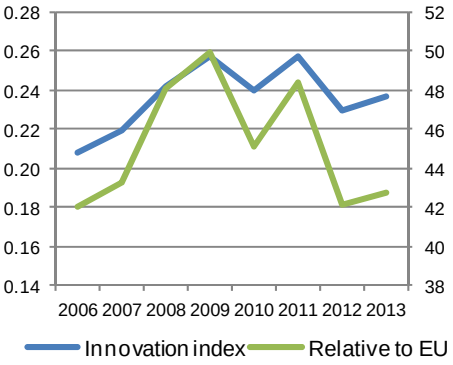
Portugal is a Moderate innovator. Innovation performance increased until 2010 after which it has remained relatively steady. Portugal managed to improve its performance relative to the EU from 64% in 2006 to 79% in 2010 before falling to 74% in 2013.



Portugal performs below the EU average for most indicators, most notably for License and patent revenues from abroad, PCT patent applications and PCT patent applications from societal challenges. Relative strengths are in International scientific co-publications, SMEs with Product and/or Process innovations and SMEs with Marketing and/or Organisational innovations.

Most indicators are growing positively in Portugal, in particular Community designs, R&D expenditures in the business sector and International scientific co-publications. Large declines in growth are observed in Non-R&D innovation expenditures, New doctorate graduates and Venture capital investments.

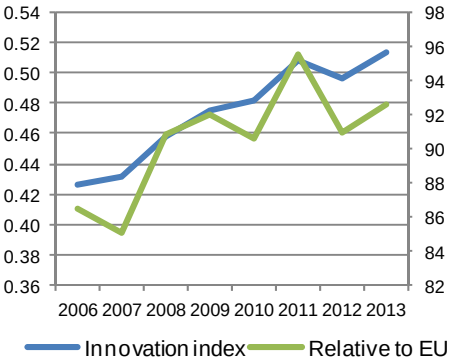
Romania is a Moderate innovator. Innovation performance increased up until 2009, since when it has fluctuated. Relative performance to the EU has worsened from being close to 50% in 2009 to 43% in 2013.



Romania is performing well below the average of the EU for almost all indicators. Very weak performance is observed for Non-EU doctorate students and R&D expenditures in the business sector. Romania performs similar to the EU for New doctorate graduates and Knowledge-intensive services exports.

High growth in Romania is observed for Community designs, Community trademarks, New doctorate graduates and International scientific co-publications. Strong declines are observed Non-R&D innovation expenditures, R&D expenditures in the business sector, Non-EU doctorate students and Venture capital investments.

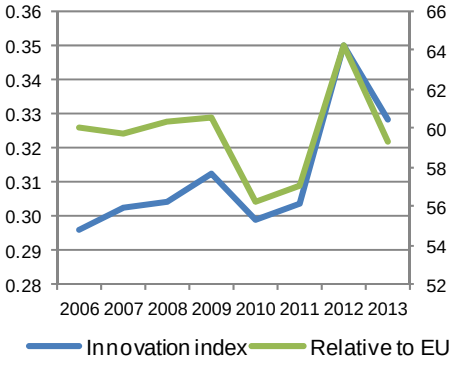
Slovenia is an Innovation follower. Innovation performance has been steadily increasing despite a minor drop in 2012. Slovenia's relative performance to the EU has improved from 85% in 2007 to 93% in 2013. The increase in relative performance has moved the country from the Moderate innovators in 2006 and 2007 to the Innovation followers from 2008 onwards.



Relative strengths are in International scientific co-publications, R&D expenditures in the business sector and Public-private scientific co-publications. Relative weaknesses are observed in Non-EU doctorate students and Knowledge-intensive services exports.

Most indicators are growing in Slovenia. High growth is observed for Community trademarks, Community designs, Non-EU doctorate students and License and patent revenues from abroad. Strong declines in growth are observed in Non-R&D innovation expenditures and Sales share of new innovations.

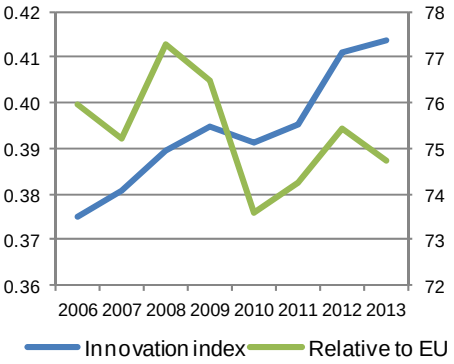
Slovakia is a Moderate innovator. Innovation performance increased between 2006 and 2009, declined in 2010 and then rose steeply in 2012, in particular due to improvements in new doctorate degrees and product or process innovators. This was followed by a sharp decline in 2013, due to a decline in new doctorate degrees. The performance relative to the EU reached a peak in 2012 at 64% but fell to 59% in 2013.



Slovakia performs below the EU average for most indicators. Relative strengths are in Sales share of new innovations, Youth with upper secondary level education and International scientific co-publications. Relative large weaknesses are in Non-EU doctorate students, License and patent revenues from abroad and PCT patent applications in societal challenges.

Most indicators are growing in Slovakia. High growth is observed for Community trademarks and Community designs. Large declines in growth are observed in License and patent revenues from abroad, PCT patent applications in societal challenges and Non-R&D innovation expenditures.

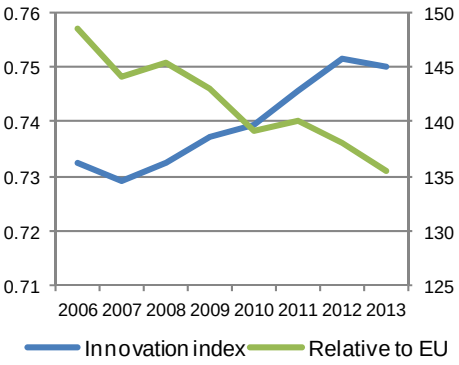
Spain is a Moderate innovator. Innovation performance has improved between 2006 and 2013. However, the country's performance gap to the EU has increased. In 2008 the relative performance level was 77% whereas in 2013 it was 75%.



Spain is performing, for most indicators, below the average of the EU. Relative weaknesses are in License and patent revenues from abroad and Knowledge-intensive services exports. Relative strengths are in International scientific co-publications, Sales share of new innovations and Community trademarks.

High growth in Spain is observed for International scientific co-publications, Sales share of new innovations and PCT patent application in societal challenges. The largest growth decline is observed for Venture capital investment. Other notable declines are in SMEs innovating in-house and in Community designs.

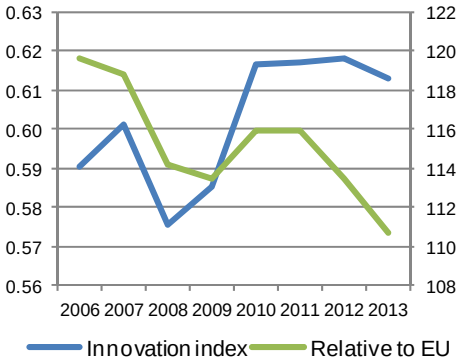
Sweden is an Innovation leader. Innovation performance increased until 2012 but declined slightly in 2013, in particular due to declining venture capital investments. The performance relative to the EU has been declining over the whole period from 148% in 2006 to 135% in 2013.



Sweden is performing above the average of the EU for most indicators especially for International scientific co-publications, R&D expenditures in the business sector, Public-private scientific co-publications and PCT patent applications in societal challenges. Relative weaknesses are in Sales share of new innovations and Knowledge-intensive services exports.

High growth in Sweden is observed for Community trademarks and Non-EU doctorate students. Strong declines in growth are observed for Venture capital investments and Sales share of new innovations.

The **United Kingdom** is an Innovation follower. After a decline in 2008 performance improved strongly in 2009 and in 2010, in particular due to increases in Innovative SMEs collaborating with others. Since 2010 performance has been stable with a small decline in 2013. The performance relative to the EU has declined from almost 120% in 2006 to 111% in 2013.



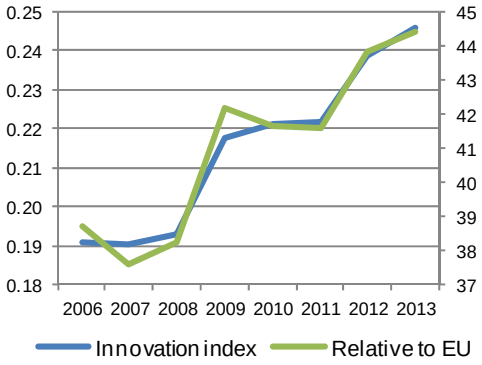
Relative strengths for the United Kingdom are in International scientific co-publications, Innovative SMEs collaborating with others and New doctorate graduates. Relative weaknesses are in Sales share of new innovations and SMEs with Product and/or Process innovations.

Performance in terms of growth has improved most for Innovative SMEs collaborating with others and International scientific co-publications. Strong declines in growth are observed in Sales share of new innovations and SMEs with Product and/or Process innovations.

Non-EU countries

(In alphabetical order according to English version of country name)

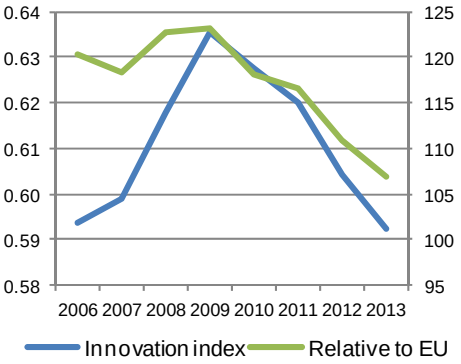
The **Former Yugoslav Republic of Macedonia** is a Moderate innovator. Innovation performance has been increasing between 2006 and 2013. The country has been catching up to the performance level of the EU: its relative performance improved from 38% in 2008 to 44% in 2013.



The Former Yugoslav Republic of Macedonia is performing well below the EU average. Relative strong weaknesses are in Public-private scientific co-publications, Community designs and R&D expenditures in the business sector and Community trademarks. Relative strengths are in Non-R&D innovation expenditures and Youth with upper secondary level education.

Performance in terms of growth has increased significantly for Community trademarks, New doctorate graduates and Most cited scientific publications. Other high growing indicators are Non-EU doctorate students and Population with completed tertiary education. Strong declines in growth are observed in R&D expenditures in the business sector, PCT patent applications and Public-private scientific co-publications.

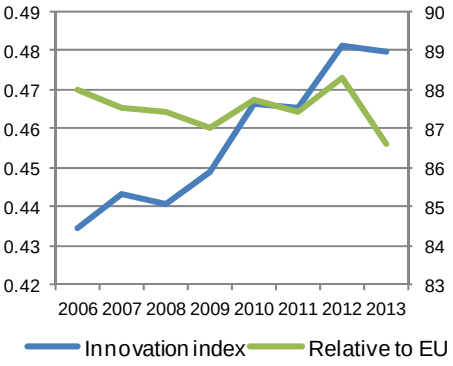
Iceland is an Innovation follower. Performance has been improving strongly until 2009 after which it started to decline, mainly due to drops in Patent applications and Community trademarks. In 2013 innovation performance has dropped to its level in 2006: Iceland is the only country for which innovation has not improved over the 2006-2013 period. The performance relative to the EU has declined from being 123% in 2008 and 2009 to 107% of the EU average in 2013.



Relative strengths for Iceland are in International scientific co-publications, Public-private scientific co-publications and License and patent revenues from abroad. Relative weaknesses are in Community designs and Sales share of new innovations.

High growth is observed in New doctorate graduates and Community trademarks. Large declines in growth are observed in Sales share of new innovations and PCT patent applications in societal challenges.

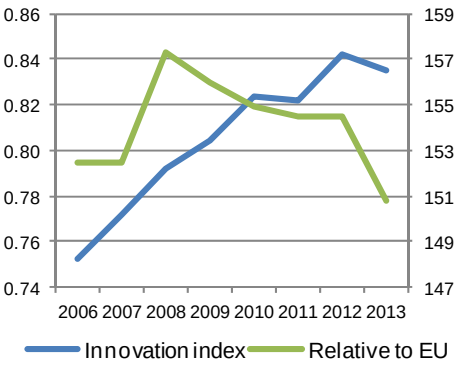
Norway is a Moderate innovator. Norwegian innovation performance has been increasing since 2007 with only small declines in 2008 and 2011. But the growth rate has been just below that of the EU and the relative performance to the EU has declined from 88% in 2006 to 87% in 2013.



Norway is performing below the EU average for most indicators, particularly for Community designs, Non-R&D innovation expenditures and Community trademarks. Relative strengths are in International scientific co-publications and Public-private scientific co-publications.

High growth in Norway is observed for Community trademarks and International scientific co-publications. Large growth declines are observed in Community designs and Venture capital investments.

Switzerland is an Innovation leader and the most innovative country in Europe. Innovation performance has been increasing until 2012 after which it marginally declined.

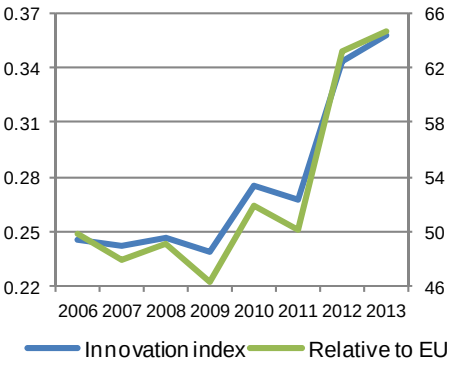


The performance lead over the EU has been declining. The Swiss innovation index was at 157% in 2008, but in 2013 this has reduced to 151% of the EU average.

Switzerland is performing well above the EU average for most indicators, above all for International scientific co-publications, Non-R&D innovation expenditures, Community trademarks and New doctorate graduates. Relative weaknesses are in Knowledge-intensive services exports and Innovative SMEs collaborating with others.

Performance in terms of growth has improved particularly for Community trademarks Non-R&D innovation expenditures and Sales share of new innovations. Strong declines in growth are observed in Knowledge-intensive services exports and Innovative SMEs collaborating with others.

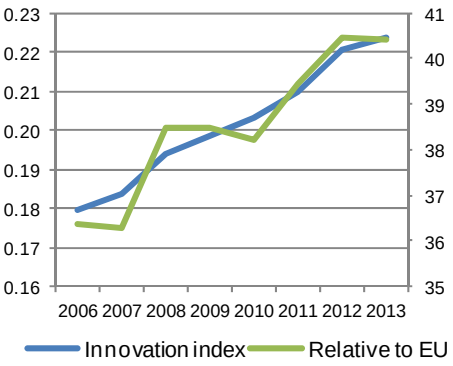
Serbia is a Moderate innovator. Innovation performance has increased over the whole period due to increases in Innovative SMEs collaborating with others, Product and/or process innovators and Marketing and/or organisational innovators. The country relative performance to the EU has improved from 48% in 2007 to 65% in 2013.



Serbia is performing well below the EU average. Relative strengths are in Non-R&D innovation expenditures, Employment in knowledge-intensive activities and Youth with upper secondary level education. Relative strong weaknesses are in Community designs, Community trademarks and R&D expenditures in the business sector.

Performance in terms of growth has been positive in Serbia for most indicators. High growth is observed for Community trademarks, SMEs with Marketing and/or Organisation innovations, Innovative SMEs collaborating with others and R&D expenditures in the public sector. Declines in growth are only observed for Knowledge-intensive services exports and Non-EU doctorate students.

Turkey is a Modest innovator. Turkish innovation performance has been improving at a steady rate between 2006 and 2013. The country is catching up to the EU: its relative performance has improved from 36% in 2006 to 40% in 2013.



Turkey is performing well below the average of the EU for almost all indicators except for SMEs with Marketing and/or Organisational innovations and Sales share of new innovations. Relative strong weaknesses are in License and patent revenues from abroad, Community designs, Community trademarks, Non-EU doctorate students and Public-private scientific co-publications.

Most indicators are positively growing in Turkey. High growth is observed for Community trademarks, PCT patent applications in societal challenges and New doctorates graduates. The few declines in growth are minor, with the largest one in community designs.

Table 1: Indicators for the Innovation Union Scoreboard 2014

Main type / innovation dimension / indicator	Data source: Numerator	Data source: Denominator	Years covered
ENABLERS			
Human resources			
1.1.1 New doctorate graduates (ISCED 6) per 1000 population aged 25-34	Eurostat	Eurostat	2004 – 2011
1.1.2 Percentage population aged 30-34 having completed tertiary education	Eurostat	Eurostat	2005 – 2012
1.1.3 Percentage youth aged 20-24 having attained at least upper secondary level education	Eurostat	Eurostat	2005 – 2012
Open, excellent and attractive research systems			
1.2.1 International scientific co-publications per million population	Science-Metrix (Scopus)	Eurostat	2005 – 2012
1.2.2 Scientific publications among the top 10% most cited publications worldwide as % of total scientific publications of the country	Science-Metrix (Scopus)	Science-Metrix (Scopus)	2004 – 2009
1.2.3 Non-EU doctorate students[1] as a % of all doctorate students	Eurostat	Eurostat	2006 – 2011
Finance and support			
1.3.1 R&D expenditure in the public sector as % of GDP	Eurostat	Eurostat	2005 – 2012
1.3.2 Venture capital investment as % of GDP	Eurostat	Eurostat	2007 – 2012
FIRM ACTIVITIES			
Firm investments			
2.1.1 R&D expenditure in the business sector as % of GDP	Eurostat	Eurostat	2005 – 2012
2.1.2 Non-R&D innovation expenditures as % of turnover	Eurostat (CIS)	Eurostat (CIS)	2004, 2006,

[1] For non-EU countries the indicator measures the share of non-domestic doctoral students.

			2008, 2010
Linkages & entrepreneurship			
2.2.1 SMEs innovating in-house as % of SMEs	Eurostat (CIS)	Eurostat (CIS)	2004, 2006, 2008, 2010
2.2.2 Innovative SMEs collaborating with others as % of SMEs	Eurostat (CIS)	Eurostat (CIS)	2004, 2006, 2008, 2010
2.2.3 Public-private co-publications per million population	CWTS (Thomson Reuters)	Eurostat	2005 – 2011
Intellectual assets			
2.3.1 PCT patents applications per billion GDP (in PPS€)	OECD	Eurostat	2003 – 2010
2.3.2 PCT patent applications in societal challenges per billion GDP (in PPS€) (environment-related technologies; health)	OECD	Eurostat	2003 – 2010
2.3.3 Community trademarks per billion GDP (in PPS€)	Office for Harmonization in the Internal Market	Eurostat	2005 – 2012
2.3.4 Community designs per billion GDP (in PPS€)	Office for Harmonization in the Internal Market	Eurostat	2005 – 2012
OUTPUTS			
Innovators			
3.1.1 SMEs introducing product or process innovations as % of SMEs	Eurostat (CIS)	Eurostat (CIS)	2004, 2006, 2008, 2010
3.1.2 SMEs introducing marketing or organisational innovations as % of SMEs	Eurostat (CIS)	Eurostat (CIS)	2004, 2006, 2008, 2010
3.1.3 Employment in fast-growing firms of innovative sectors	Eurostat	Eurostat	2009, 2010
Economic effects			
3.2.1 Employment in knowledge-intensive activities (manufacturing and services) as % of total employment	Eurostat	Eurostat	2008 – 2012
3.2.2 Contribution of medium and high-tech product exports to the trade balance	United Nations	United Nations	2005 – 2012
3.2.3 Knowledge-intensive services exports as % total service exports	Eurostat	Eurostat	2004 – 2011
3.2.4 Sales of new to market and new to firm innovations as % of turnover	Eurostat (CIS)	Eurostat (CIS)	2004, 2006, 2008, 2010
3.2.5 License and patent revenues from abroad as % of GDP	Eurostat	Eurostat	2005 – 2012