



Innovation Union Scoreboard 2015

Annex H. Performance per indicator

EUROPEAN COMMISSION

Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs
Directorate – Industrial Property, Innovation & Standards
Unit – Innovation Policy for Growth

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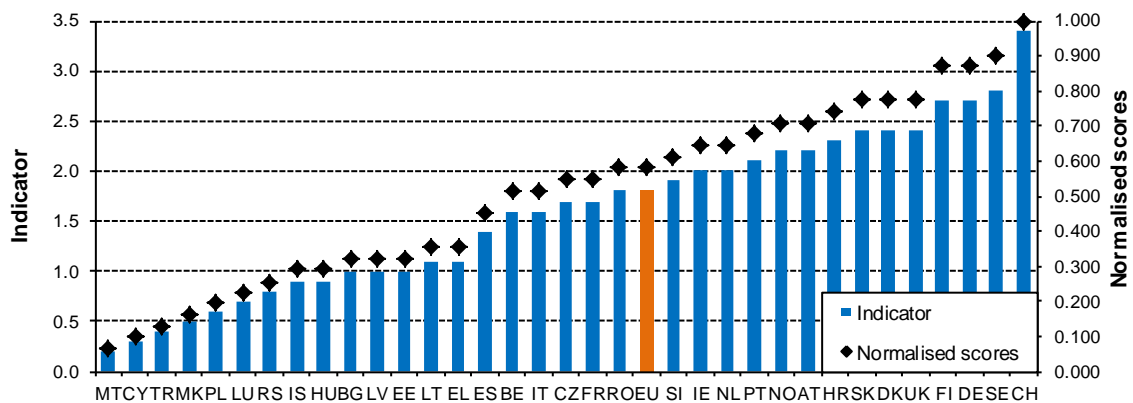
Annex H. Performance per indicator

This annex shows the static and dynamic performance for each of the indicators. In the static graphs real data and normalised scores are shown. Normalised scores are obtained by transforming real data such that the minimum value across all countries and years equals zero and the maximum value equals one.

1.1.1 New doctorate graduates (ISCED6) per 1000 population aged 25-34

The indicator is a measure of the supply of new second-stage tertiary graduates in all fields of training. For most countries ISCED 6 captures PhD graduates only, with the exception of Finland, Portugal and Sweden where also non-PhD degrees leading to an award of an advanced research qualification are included.

New doctorate graduates per 1000 population aged 25-34



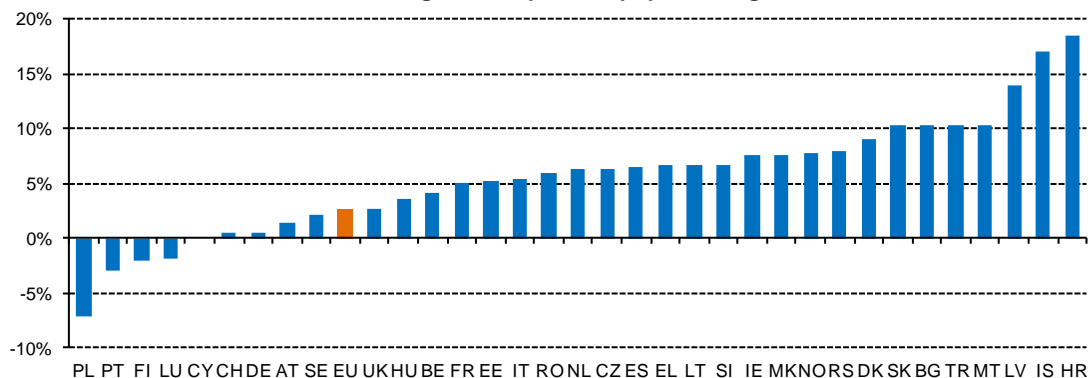
Statistical outlier: Switzerland.

In 2012 on average 1.8 new PhD degrees were awarded in the EU per 1000 population aged 25-34. This compares to more than 2.5 in Switzerland, Sweden, Germany and Finland. In Cyprus, Malta and Turkey performance is relatively weak with less than 0.5 new PhD graduates per 1000 population aged 25-34.

Growth performance

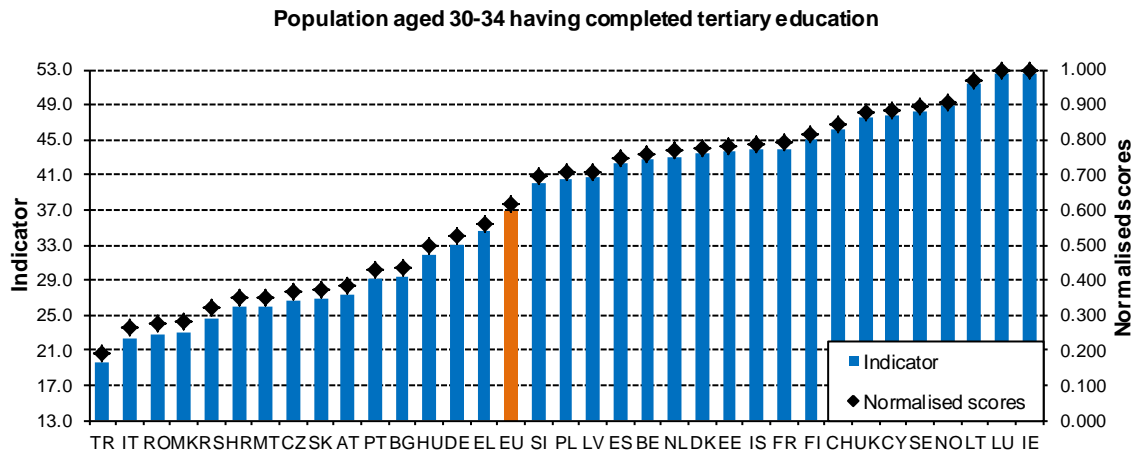
Croatia, Iceland and Latvia have been rapidly increasing their graduation rates at an annual growth rate above 10% over the last 8 years. Graduation rates have declined significantly in Poland, Portugal, Finland and Luxembourg.

Average annual growth rate for New doctorate graduates per 1000 population aged 25-34



1.1.2 Percentage population aged 30-34 having completed tertiary education

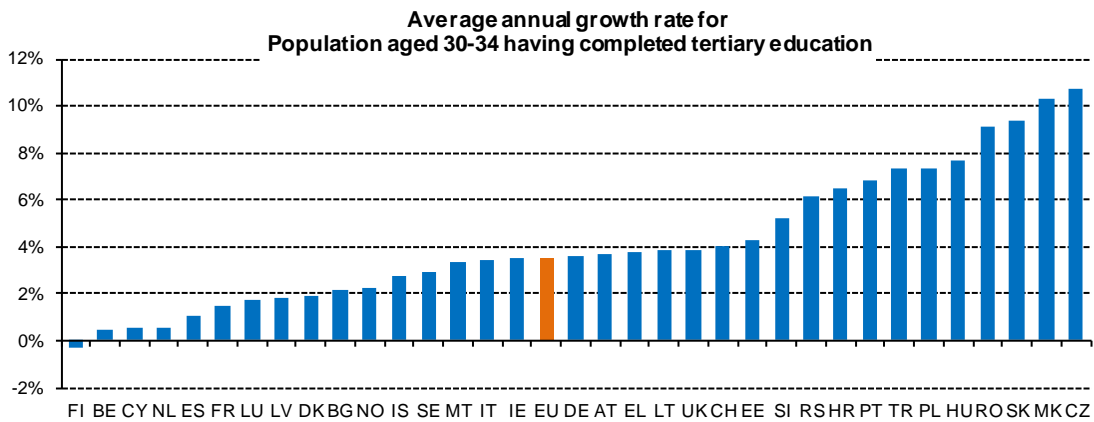
This is a general indicator of the supply of advanced skills. It is not limited to science and technical fields because the adoption of innovations in many areas, in particular in the service sectors, depends on a wide range of skills. International comparisons of educational levels however are difficult due to large discrepancies in educational systems, access, and the level of attainment that is required to receive a tertiary degree. The indicator focuses on a narrow share of the population aged 30 to 34 and will more easily and quickly reflect changes in educational policies leading to more tertiary graduates.



On average 36.9% of the EU population aged 30 to 34 have completed tertiary education. But there is room for improvement as shown by the large differences between countries with more than 50% having completed tertiary education in Ireland, Luxembourg and Lithuania, more than 45% in Norway, Sweden, Cyprus, UK, Switzerland and Finland, but less than 25% in Turkey, Italy, Romania, the Former Yugoslav Republic of Macedonia and Serbia.

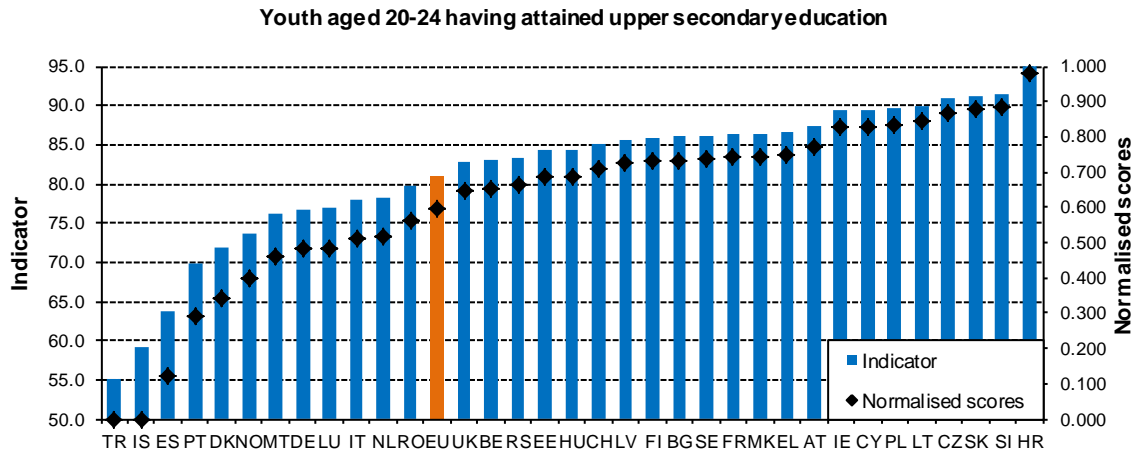
Growth performance

An increasing share of the European population aged 30 to 34 has completed tertiary education. On average this rate has been increasing at 3.6% but in some countries the increase is much higher. In Czech Republic, the Former Yugoslav Republic of Macedonia, Slovakia and Romania it is above 9%.



1.1.3 Percentage youth aged 20-24 having attained at least upper secondary level education

The indicator measures the qualification level of the population aged 20-24 years in terms of formal educational degrees. It provides a measure for the “supply” of human capital of that age group and for the output of education systems in terms of graduates. Completed upper secondary education is generally considered to be the minimum level required for successful participation in a knowledge-based society and is positively linked with economic growth.

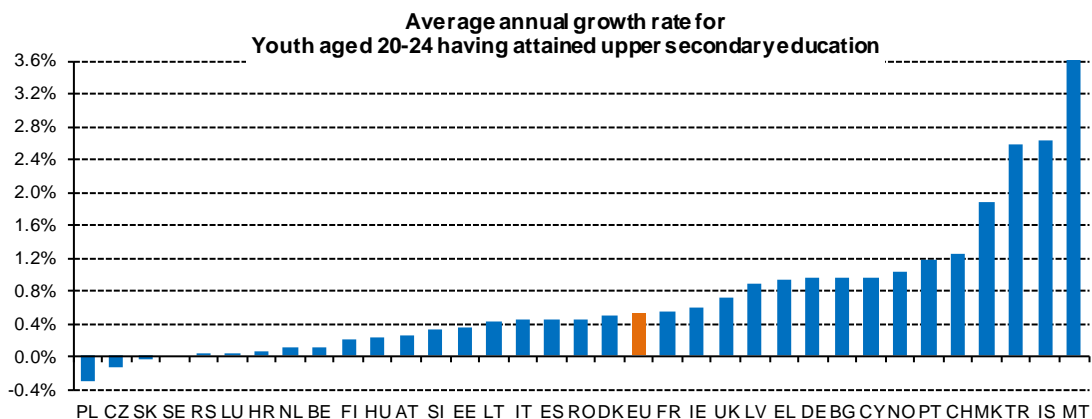


Statistical outliers: Iceland and Turkey.

More than 80% of EU youth aged 20-24 has attained at least upper secondary education and in Croatia, Slovenia, Slovakia, Czech Republic and Lithuania this share is 90% or more. In Turkey, Iceland and Spain less than 65% of the population aged 20-24 have attained at least upper secondary education.

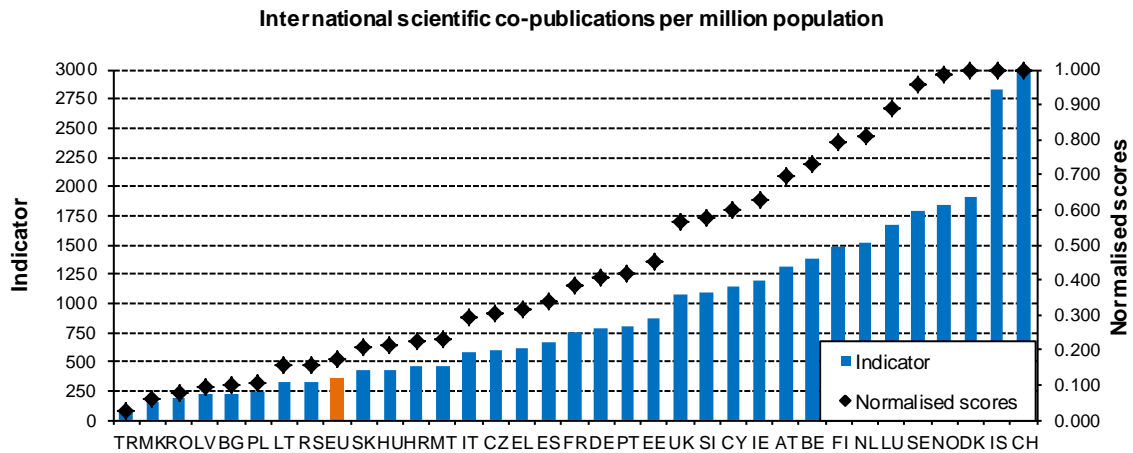
Growth performance

The youth share having attained at least upper secondary education has been growing at a rate of 0.5% for the EU and more than 2% per year in Malta, Iceland and Turkey. Growth has been close to zero for 4 countries and below zero for Czech Republic and Poland.



1.2.1 International scientific co-publications per million population

International scientific co-publications are more highly cited than other publications and are a proxy for the quality and openness of scientific research as collaboration increases scientific productivity.

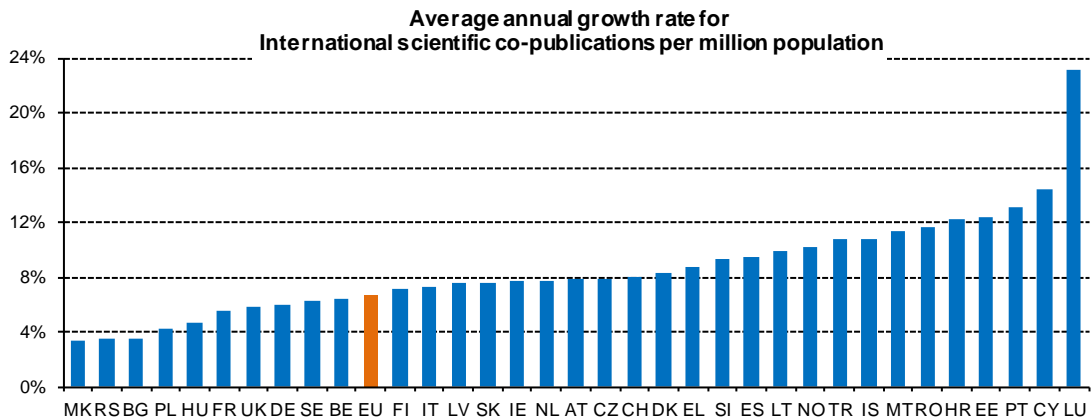


Statistical outliers: Denmark, Iceland and Switzerland.

There is a high spread in performance with Switzerland and Iceland having above 2800 international scientific co-publications per million population. International research cooperation is less well developed in Turkey, the Former Yugoslav Republic of Macedonia, Romania, Latvia, Bulgaria and Poland with less than 250 international scientific co-publications per million population. The EU average is relatively low as here only co-publications with non-EU countries are included.

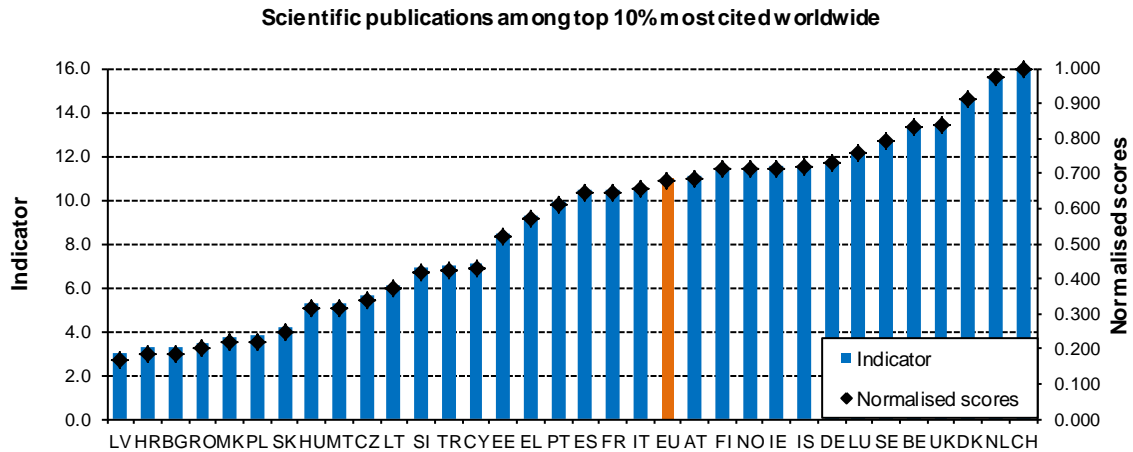
Growth performance

The number of international scientific co-publications has been increasing at high rates. For most countries the average annual rate of increase has been higher than 4% and in 5 countries these rates have been exceptionally high at 12% or more (Luxembourg, Cyprus, Portugal, Estonia and Croatia).



1.2.2 Scientific publications among the top-10% most cited publications worldwide as percentage of total scientific publications of the country

The indicator is a proxy for the efficiency of the research system as highly cited publications are assumed to be of higher quality. There could be a bias towards small or English speaking countries given the coverage of Scopus' publication data. Countries like France and Germany, where researchers publish relatively more in their own language, are more likely to underperform on this indicator as compared to their real academic excellence.

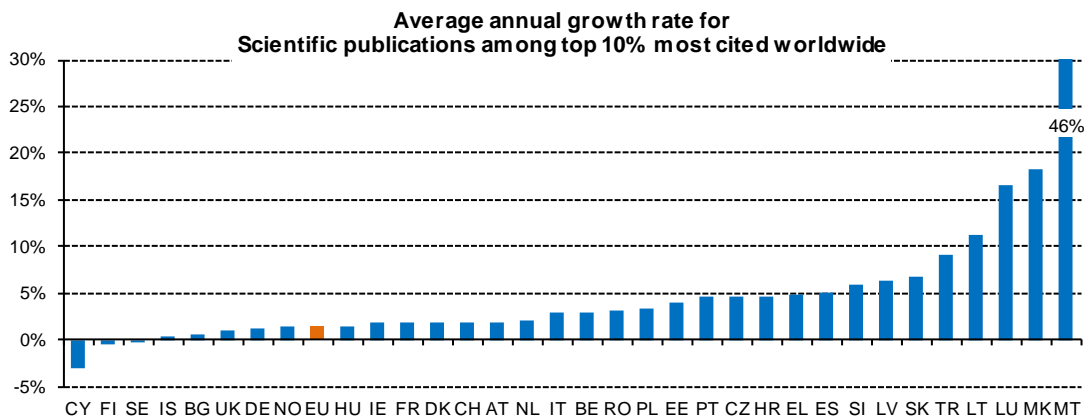


No data for Serbia. Statistical outlier: Switzerland.

The best performance is observed for Switzerland, Netherlands and Denmark where more than 14% of publications are among the top-10% most cited publications worldwide. Performance in Latvia, Croatia, Bulgaria, Romania, the Former Yugoslav Republic of Macedonia and Poland is relatively weak with less than 4% of publications among the top-10% most cited publications worldwide.

Growth performance

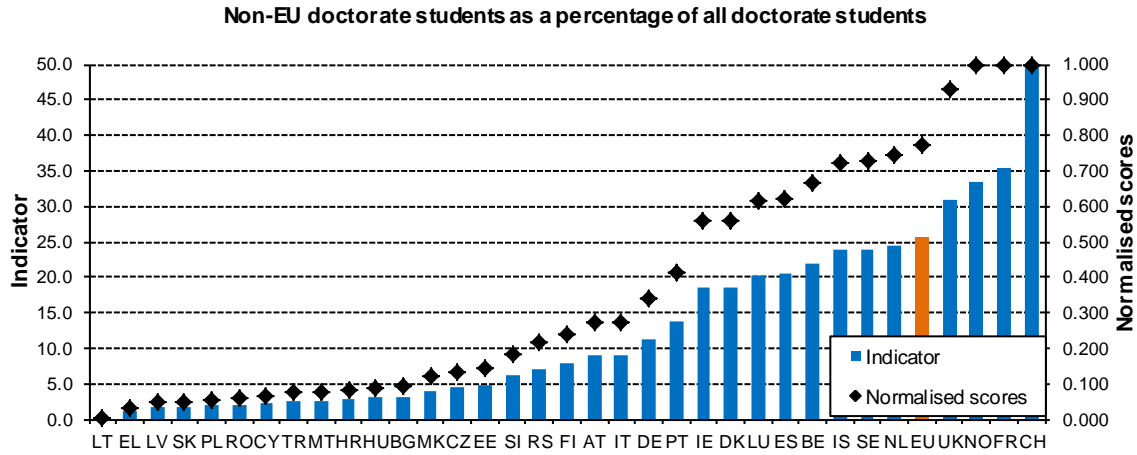
The indicator values have been increasing in most countries, in particular in Malta, the Former Yugoslav Republic of Macedonia, Luxembourg, Lithuania and Turkey. In Cyprus, Finland and Sweden growth has been negative.



No data for Serbia.

1.2.3 Non-EU doctorate students as percentage of all doctorate students

The share of non-EU doctorate students reflects the mobility of students as an effective way of diffusing knowledge. Attracting high-skilled foreign doctorate students could add to creating a net brain gain and could secure a continuous supply of researchers. There might also be a benefit for the 'donor' country if these students return to their home country after their graduation.

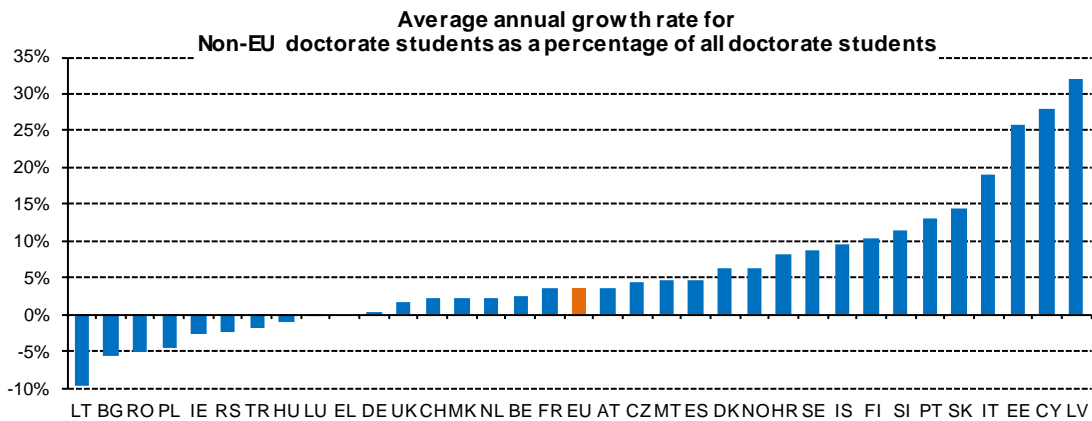


Statistical outliers: France, Norway, Switzerland. For non-EU countries the indicator shows the share of non-domestic doctorate students.

The average share of non-EU doctorate students is 25.5% and in France and the UK this share is more than 30%. In Switzerland almost 1 out of 2 doctorate students is a non-Swiss student and in Norway 1 out of 3 doctorate students is a non-Norwegian student. In the New Member States the shares of non-EU doctorate students are still small at rates below 5% with the exception of Slovenia.

Growth performance

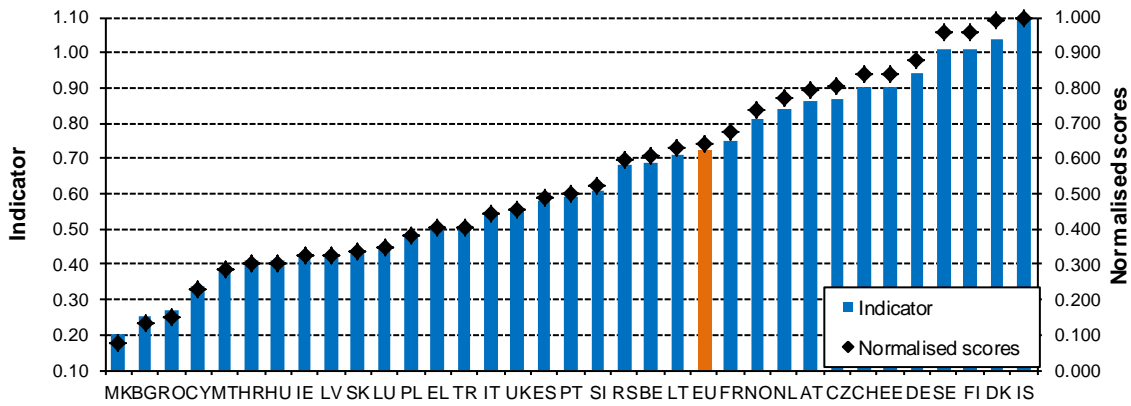
Growth performance is diverse with increases over time in 24 countries and decreases in 9 countries. Growth has been very strong in Latvia, Cyprus and Estonia with average annual increases above 25%. The share of non-EU doctorate students has been declining rapidly in Lithuania, Bulgaria, Romania and Poland at 5% or more per year.



1.3.1 R&D expenditure in the public sector as percentage of GDP

R&D expenditures represent one of the major drivers of economic growth in a knowledge-based economy. As such, trends in the R&D expenditure indicator provide key indications of the future competitiveness and wealth of the EU. Research and development spending is essential for making the transition to a knowledge-based economy as well as for improving production technologies and stimulating growth.

R&D expenditure in the public sector as percentage of GDP



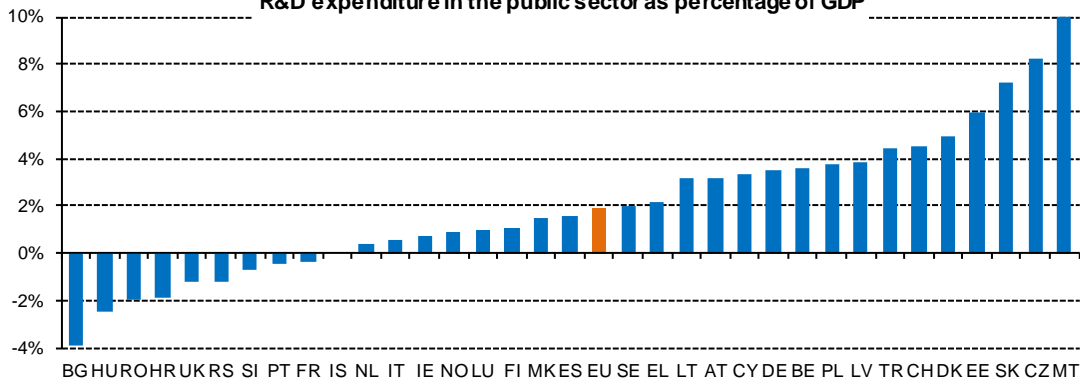
Statistical outlier: Iceland.

The average R&D intensity is 0.72% for the EU. R&D expenditure in the public sector is above 1% of GDP in Iceland, Denmark, Finland and Sweden. In the Former Yugoslav Republic of Macedonia, Bulgaria, Romania and Cyprus R&D intensities are below half that of the EU.

Growth performance

R&D expenditure in the public sector as percentage of GDP has been increasing at almost 2% for the EU. In Malta, Czech Republic, Slovakia, Estonia and Denmark the average annual growth rate has been 5% or more per year. R&D expenditure in the public sector as percentage of GDP has declined rapidly in Bulgaria, Hungary, Romania and Croatia.

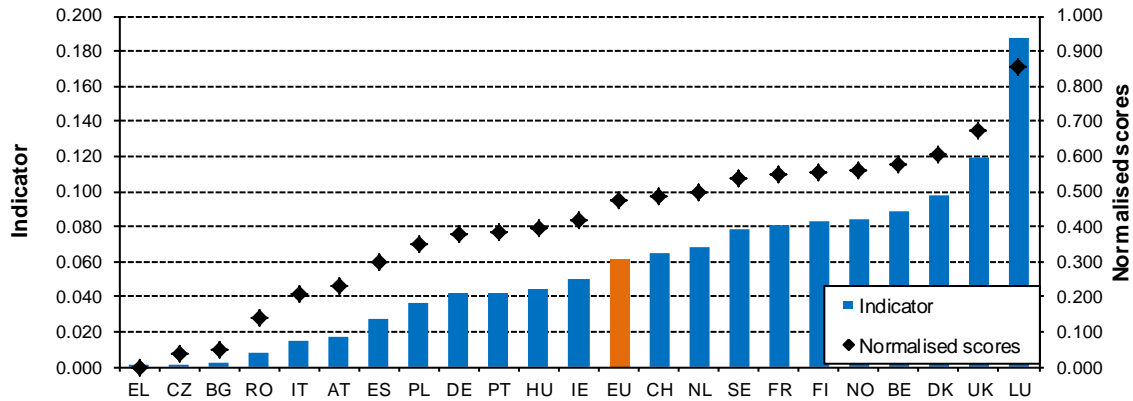
Average annual growth rate for R&D expenditure in the public sector as percentage of GDP



1.3.2 Venture capital investment as percentage of GDP

The amount of venture capital is a proxy for the relative dynamism of new business creation. In particular for enterprises using or developing new (risky) technologies venture capital is often the only available means of financing their (expanding) business.

Venture capital investments as percentage of GDP



No data for Croatia, Cyprus, Estonia, Iceland, Latvia, Lithuania, Former Yugoslav Republic of Macedonia, Malta, Serbia, Slovenia, Slovakia and Turkey. Two-year averages have been used to reduce volatility rates. The indicator is highly skewed and a square root transformation has been used for deriving the normalised scores.

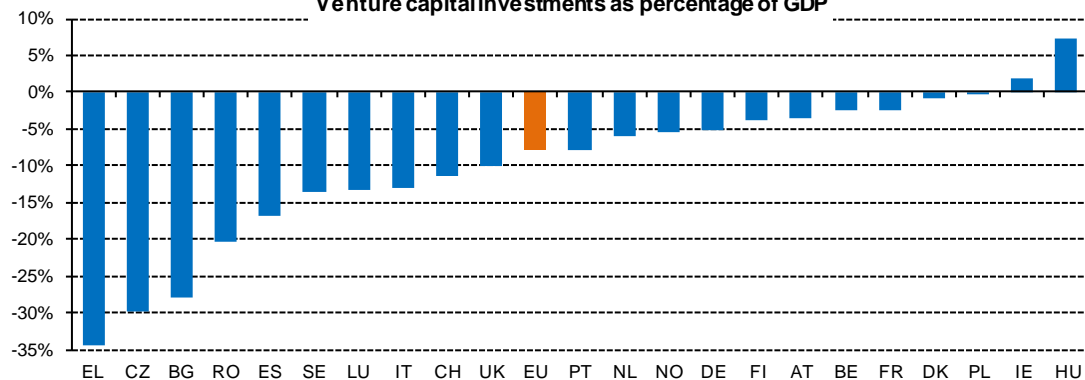
For several countries data are not available as due to the small size of the venture capital market there are no national venture capital associations to collect such data.

Venture capital investments differ widely in Europe. Only in Luxembourg and the UK venture capital represents more than 0.12% of GDP. In Greece, Czech Republic, Bulgaria, Romania, Italy and Austria venture capital represents less than 0.02% of GDP.

Growth performance

Performance has decreased over time in 20 countries plus the EU and has increased in only 2 countries: Hungary and Ireland. Venture capital investments have been declining rapidly in Greece, Czech Republic, Bulgaria and Romania at average annual growth rates of more than 20% per year.

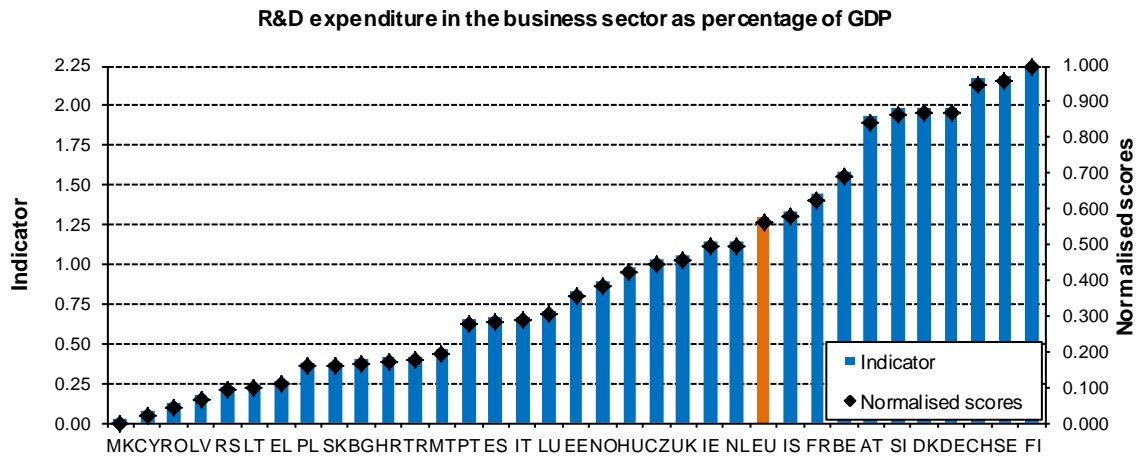
Average annual growth rate for Venture capital investments as percentage of GDP



No data for Croatia, Cyprus, Estonia, Iceland, Latvia, Lithuania, Former Yugoslav Republic of Macedonia, Malta, Serbia, Slovenia, Slovakia and Turkey.

2.1.1 R&D expenditure in the business sector as percentage of GDP

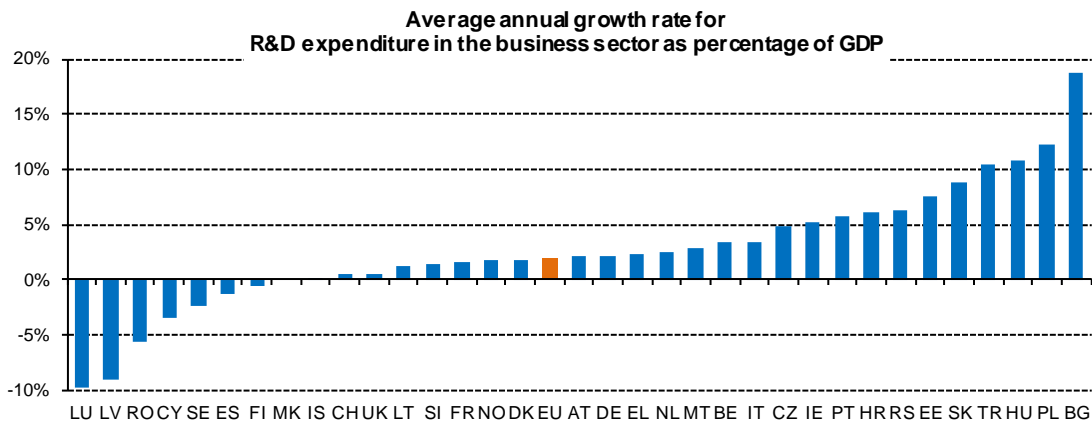
R&D expenditure in the business sector captures the formal creation of new knowledge within firms. It is particularly important in the science-based sector (pharmaceuticals, chemicals and some areas of electronics) where most new knowledge is created in or near R&D laboratories.



The R&D intensity in the business sector is close to or above 2% of GDP in only 7 countries: Finland, Sweden, Switzerland, Germany, Denmark, Slovenia and Austria. The average R&D intensity for the EU is 1.29% and for 13 countries the intensity is below 0.50%, and it is particularly low in the Former Yugoslav Republic of Macedonia, Cyprus, Romania and Latvia.

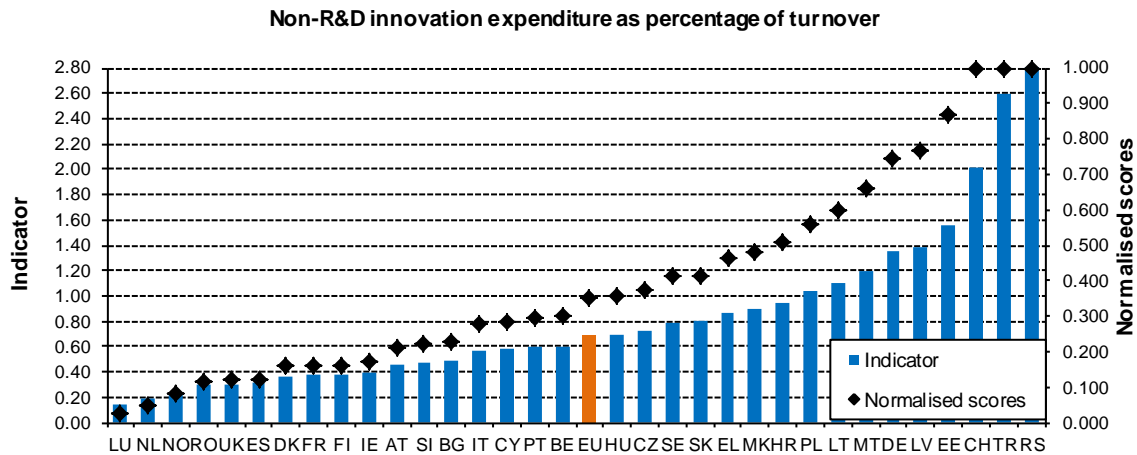
Growth performance

The R&D intensity in the business sector has been increasing for the EU at an average annual rate of 1.9%. There has been an increase in the business R&D intensity for 26 countries, in particular for Bulgaria, Poland, Hungary and Turkey with an average annual growth rate above 10%. In 7 countries however the business R&D intensity has declined, with the strongest declines in Luxembourg, Latvia and Romania.



2.1.2 Non-R&D innovation expenditure as percentage of total turnover

This indicator measures non-R&D innovation expenditure as percentage of total turnover. Several of the components of innovation expenditure, such as investment in equipment and machinery and the acquisition of patents and licenses, measure the diffusion of new production technology and ideas. The indicator does not include intramural and extramural R&D expenditures and does not overlap with the indicator on business R&D expenditures.

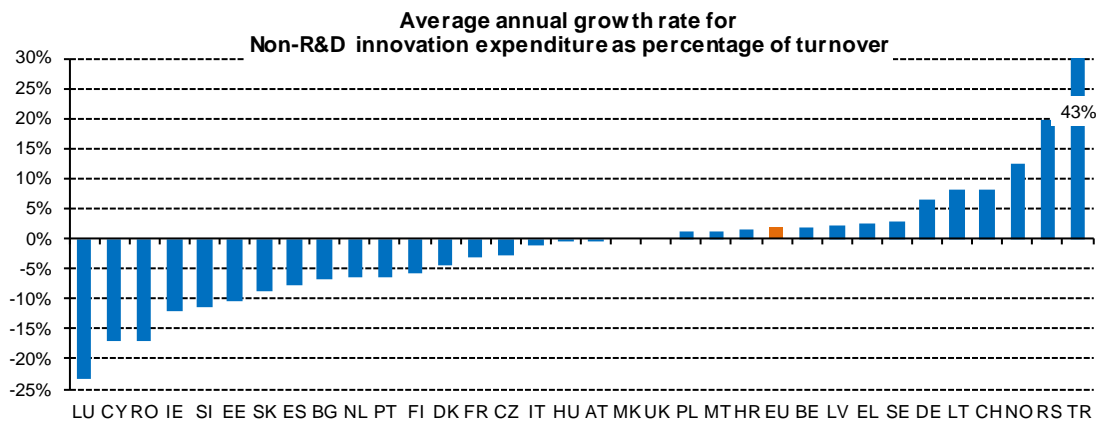


No data for Iceland. Statistical outliers: Serbia, Switzerland and Turkey.

On average 0.69% of enterprises' total turnover is spent on non-R&D innovation activities in the EU. In Serbia, Turkey and Switzerland this share is at or above 2%. In Luxembourg, Netherlands and Norway less than 0.25% of enterprises' total turnover is spent on innovation activities not involving R&D.

Growth performance

The share of non-R&D innovation expenditure has increased in 13 countries of which most strongly in Turkey, Serbia and Norway. The share has declined in 18 countries and in particular in Luxembourg, Cyprus and Romania this share has been declining rapidly at an average annual rate of at least 15%. For the EU the share of non-R&D innovation expenditure has increased at an average annual rate of 1.9%.

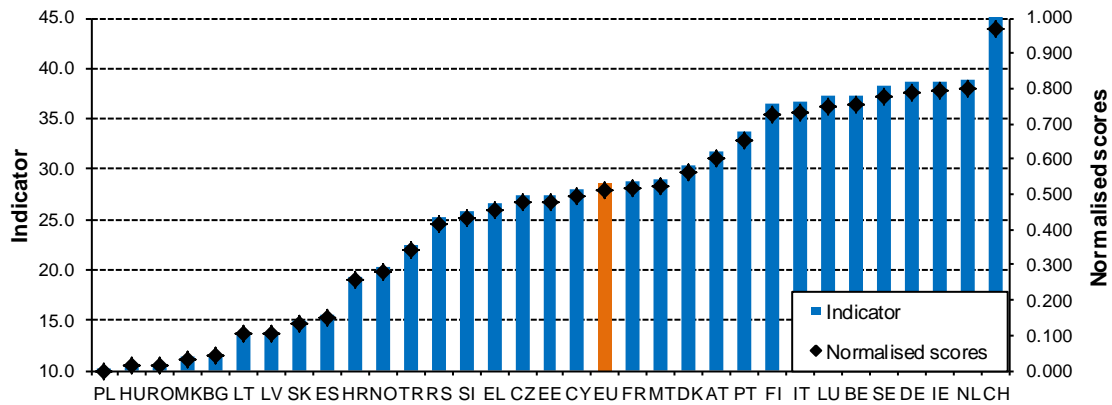


No data for Iceland.

2.2.1 SMEs innovating in-house as percentage of all SMEs

This indicator measures the degree to which SMEs that have introduced any new or significantly improved products or production processes have innovated in-house. The indicator is limited to SMEs because almost all large firms innovate and because countries with an industrial structure weighted towards larger firms tend to do better.

SMEs innovating in-house as percentage of SMEs



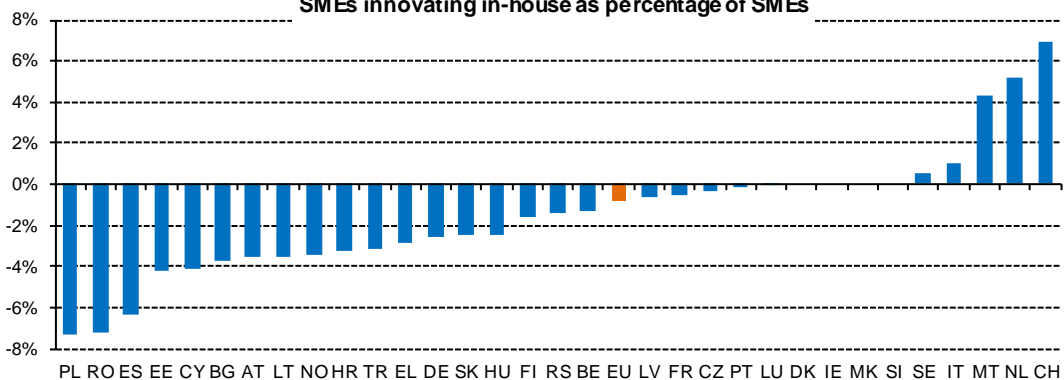
No data for Iceland and UK.

On average 28.7% of SMEs innovate in-house in the EU. Much higher shares are observed for Switzerland where 45% of SMEs innovate in-house. In Poland, Hungary, Romania, the Former Yugoslav Republic of Macedonia, Bulgaria, Lithuania and Latvia less than 15% of SMEs innovate in-house.

Growth performance

Growth performance is weak with increases over time in only 5 countries and decreases in 23 countries and the EU. Growth has been very strong in Switzerland, the Netherlands and Malta at an average annual rate of 4% or more. The share of SMEs innovating in-house has been declining most rapidly in Poland, Romania and Spain. For the EU the average rate of decline was -0.8%.

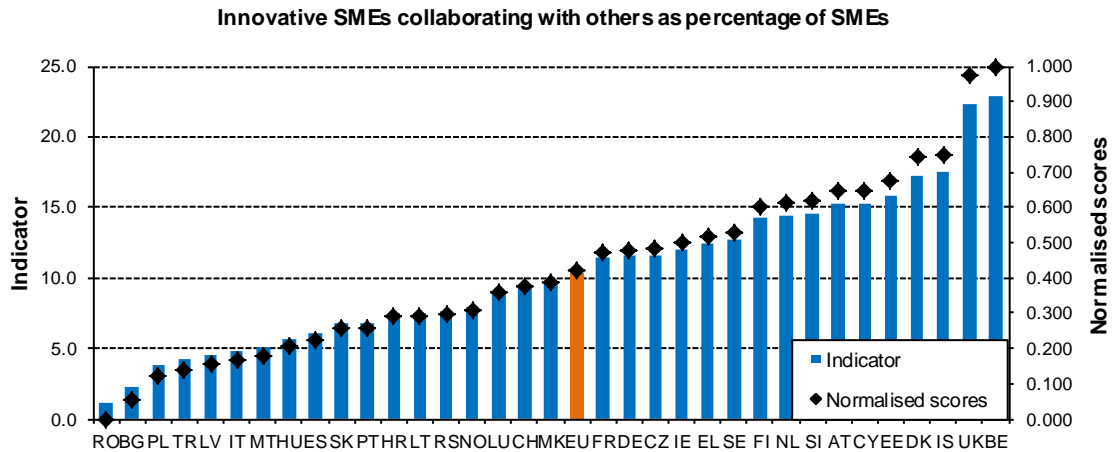
Average annual growth rate for SMEs innovating in-house as percentage of SMEs



No data for Iceland and UK.

2.2.2 Innovative SMEs co-operating with others (percentage of all SMEs)

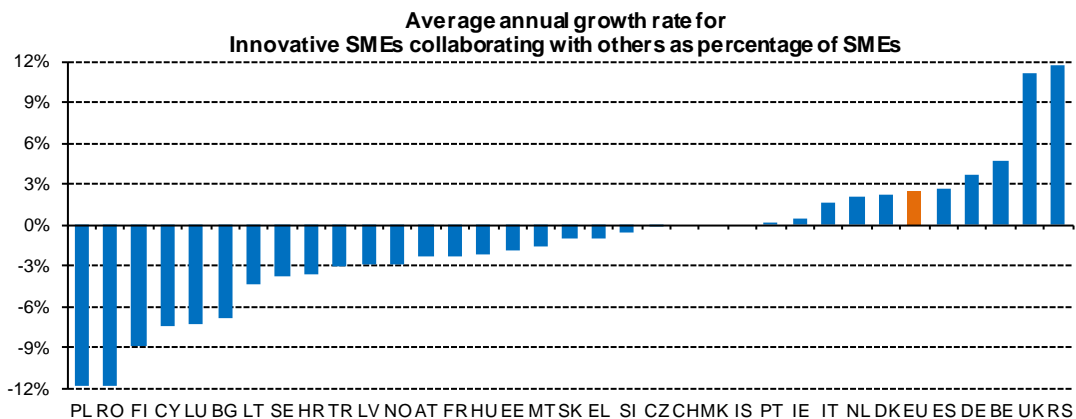
This indicator measures the degree to which SMEs are involved in innovation co-operation. Complex innovations, in particular in ICT, often depend on the ability to draw on diverse sources of information and knowledge, or to collaborate on the development of an innovation. This indicator measures the flow of knowledge between public research institutions and private firms and between firms and other firms. The indicator is limited to SMEs because almost all large firms are involved in innovation co-operation.



About 10% of EU SMEs collaborate with others in their innovation activities. In Belgium and the UK more than 1 out of 5 SMEs collaborate with others, whilst in Romania, Bulgaria, Poland, Turkey, Latvia and Italy this is less than 1 out of 20.

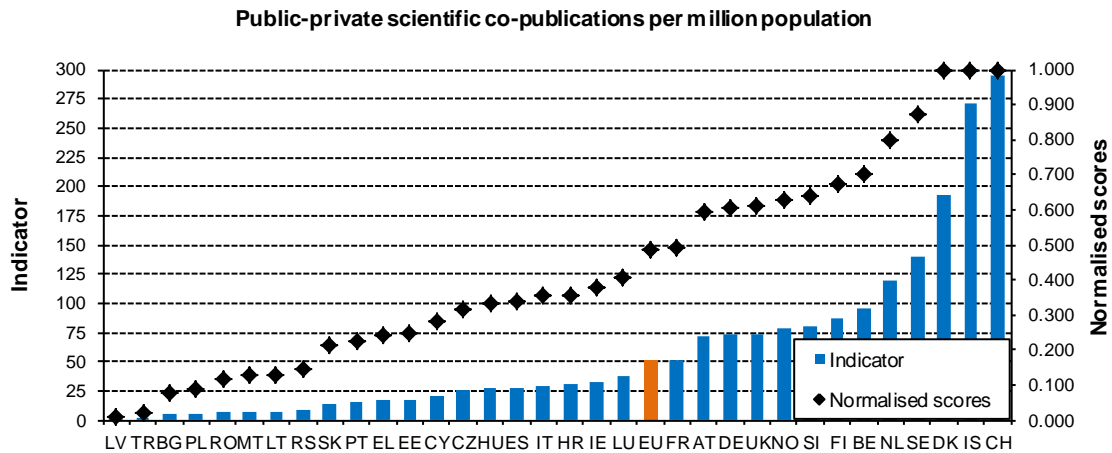
Growth performance

Growth performance is diverse with increases over time in 10 countries and decreases in 21 countries. Growth has been very strong in Serbia and the UK at an annual increase above 10%. In Poland, Romania, Finland, Cyprus, Luxembourg and Bulgaria the share of SMEs collaborating with others has decreased with more than 6% annually. For the EU the rate of increase has been about 2.5% due to increasing performance in large Member States as the UK, Germany and Spain.



2.2.3 Public-private scientific co-publications per million population

This indicator captures public-private research linkages and active collaboration activities between business sector researchers and public sector researchers resulting in academic publications.

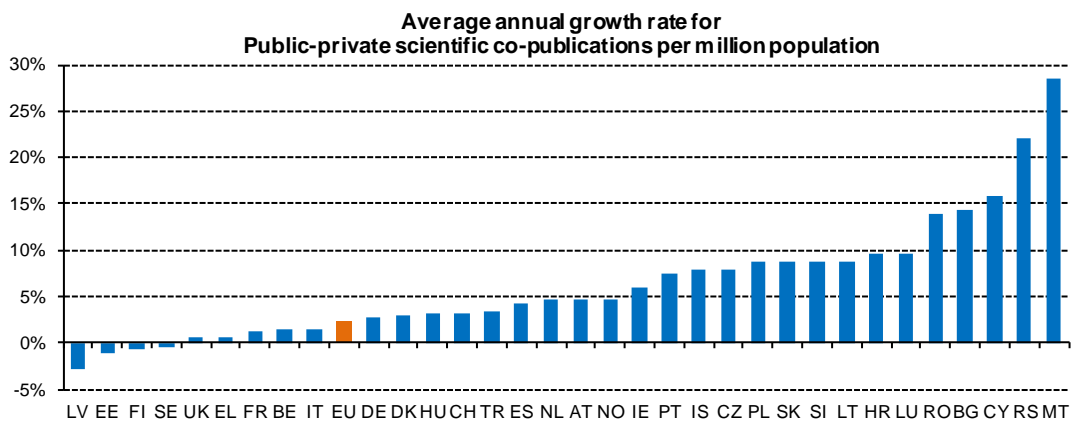


No data for Former Yugoslav Republic of Macedonia. Statistical outliers: Denmark, Iceland, Switzerland. Two-year averages have been used to reduce volatility rates. The indicator is highly skewed and a square root transformation has been used for deriving the normalised scores.

On average there are 50 public-private scientific co-publications per million population in the EU. But there are large differences between countries, with more than 250 co-publications per million population in Switzerland and Iceland and almost 200 co-publications per million population in Denmark. At the other extreme we find less than 5 public-private scientific co-publications per million population in Latvia, Turkey, Bulgaria and Poland.

Growth performance

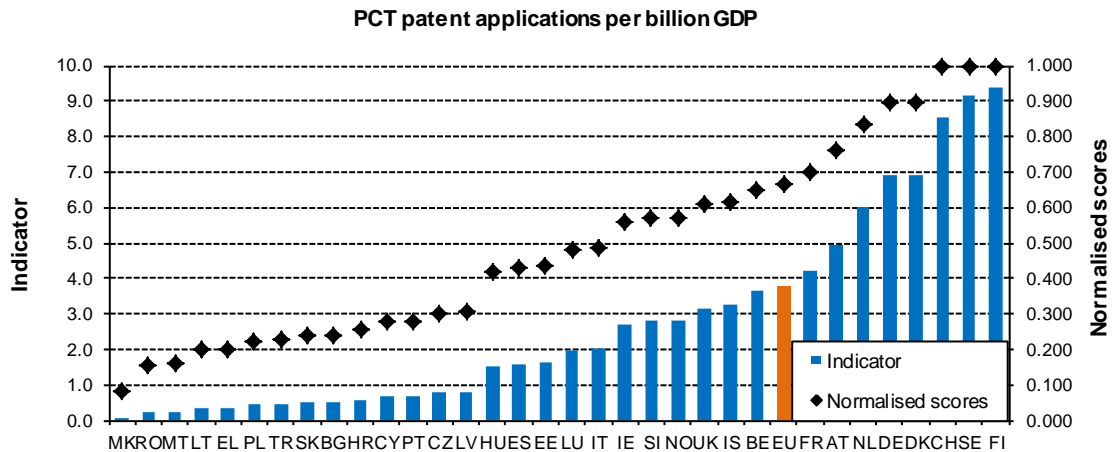
Public-private scientific co-publications have been increasing in almost all countries, in particular in Malta and Serbia. In 4 countries and in particular in Latvia we observe a decline for this indicator. For several countries growth rates are high or small due to small absolute numbers of public-private co-publications. E.g. for Malta the number of co-publications has been between 0 and 4 and for Latvia between 2 and 7 per million population.



No data for Former Yugoslav Republic of Macedonia.

2.3.1 PCT patent applications per billion GDP (in PPP€)

The capacity of firms to develop new products will determine their competitive advantage. One indicator of the rate of new product innovation is the number of patent applications (patent applications are used instead of patents granted, as the former are more timely available). This indicator measures the number of Patent Cooperation Treaty (PCT) patent applications. As this is an international patent filing procedure, it is largely exempt of the so-called home bias effect, whereby inventors file their patents to their national patent office first. PCT based patent statistics are therefore better suited for international comparisons.

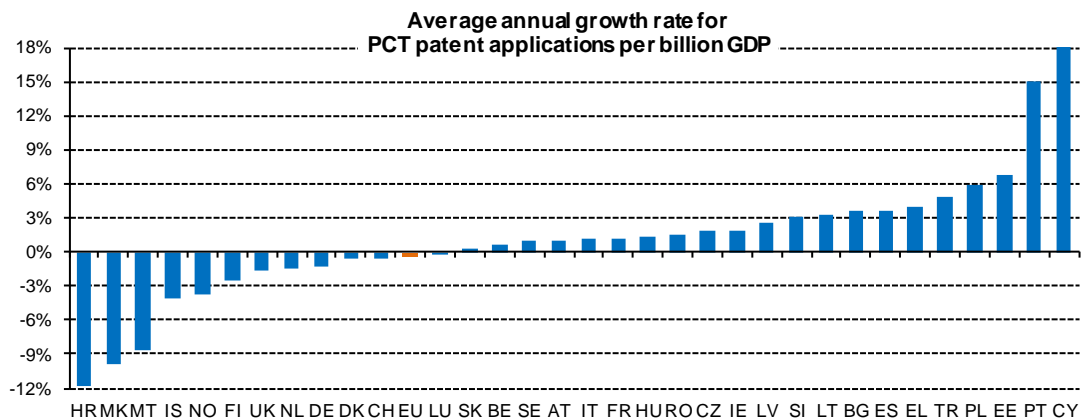


No data for Serbia. Statistical outliers: Finland and Sweden. The indicator is highly skewed and a square root transformation has been used for deriving the normalised scores.

There is a high spread in performance in PCT patent applications. For the EU on average 3.8 PCT patents per billion GDP have been applied for. There are large differences with 8 or more patent applications per billion GDP in Finland, Sweden and Switzerland and less than 1 application per billion GDP in 14 countries.

Growth performance

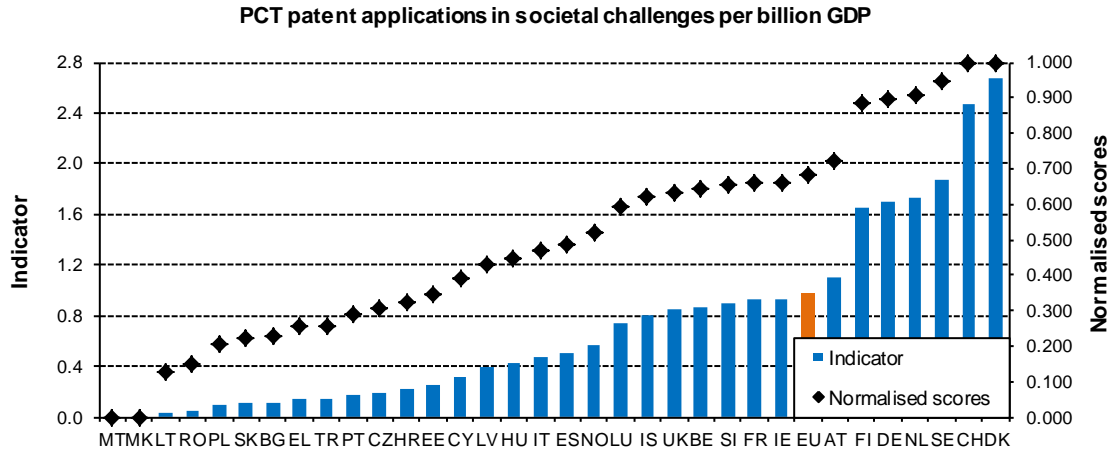
In Cyprus and Portugal PCT patent applications per billion GDP have been growing very rapidly. PCT patent applications have been growing in 21 countries but for the EU there has been a small deterioration. In 12 countries PCT patent applications per billion GDP has been declining, in particular in Croatia, the Former Yugoslav Republic of Macedonia and Malta.



No data for Serbia.

2.3.2 PCT patent applications in societal challenges per billion GDP (in PPP€)

This indicator measures PCT applications in health technology and climate change mitigation. From a policy point of view the indicator on patent applications in societal challenges is highly relevant as increased number of patent applications in health technology and climate change mitigation will be necessary to meet the societal needs of an ageing European society and sustainable growth.

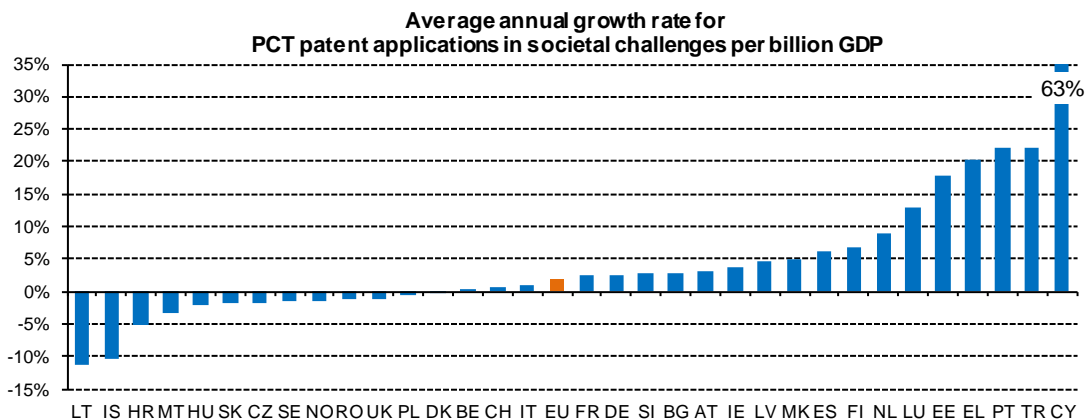


No data for Serbia. Statistical outliers: Denmark and Switzerland. The indicator is highly skewed and a square root transformation has been used for deriving the normalised scores.

There is a high spread in performance in PCT patent applications in societal challenges. Denmark and Switzerland have the highest number of patent applications in societal challenges per billion GDP. In a large number of countries such applications are very low but this can be partly explained by their overall low number of PCT patent applications (cf. indicator 2.3.1).

Growth performance

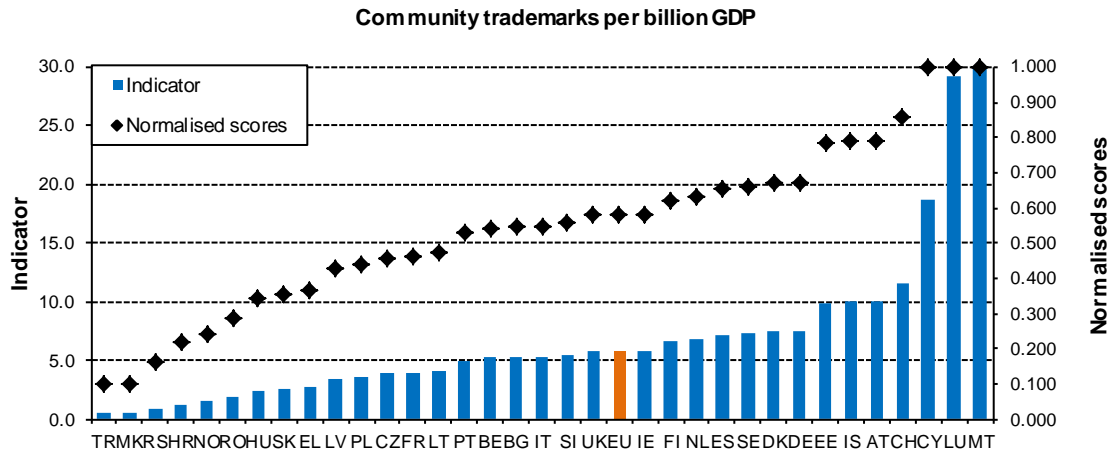
The number of patent applications in societal challenges per billion GDP has been increasing in 20 countries, in particular in Cyprus, Turkey, Portugal and Greece. The indicator has been declining in 13 countries, in particular in Lithuania, Iceland and Croatia. For the EU average annual growth was positive at 2.0%.



No data for Serbia.

2.3.3 Community trademarks per billion GDP (in PPP€)

Trademarks are an important innovation indicator, especially for the service sector. The Community trademark gives its proprietor a uniform right applicable in all Member States of the European Union through a single procedure which simplifies trademark policies at European level. It fulfils the three essential functions of a trademark: it identifies the origin of goods and services, guarantees consistent quality through evidence of the company's commitment vis-à-vis the consumer, and is a form of communication, a basis for publicity and advertising.

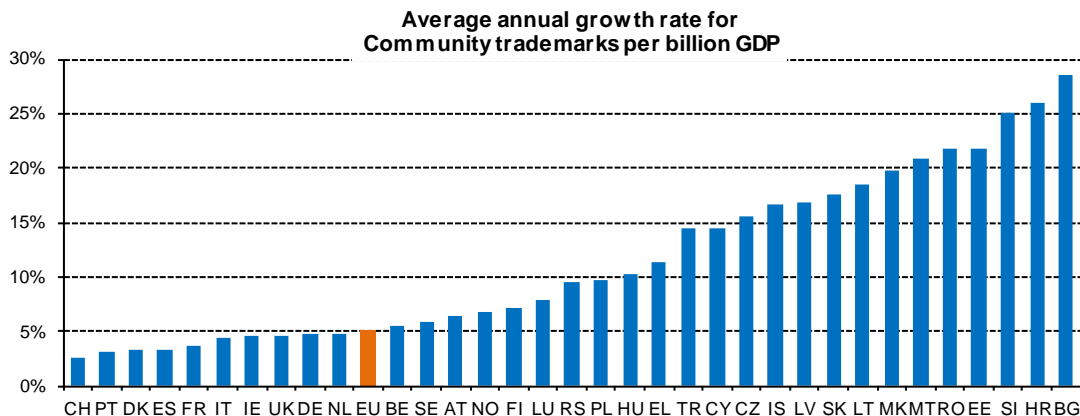


Statistical outliers: Cyprus, Luxembourg and Malta. Two-year averages have been used to reduce volatility rates. The indicator is highly skewed and a square root transformation has been used for deriving the normalised scores.

There is a high spread in performance in community trademarks per billion GDP. High numbers of community trademarks close to 30 per billion GDP are found in Malta and Luxembourg. Trademark applications per billion GDP are the lowest in Turkey, the Former Yugoslav Republic of Macedonia and Serbia.

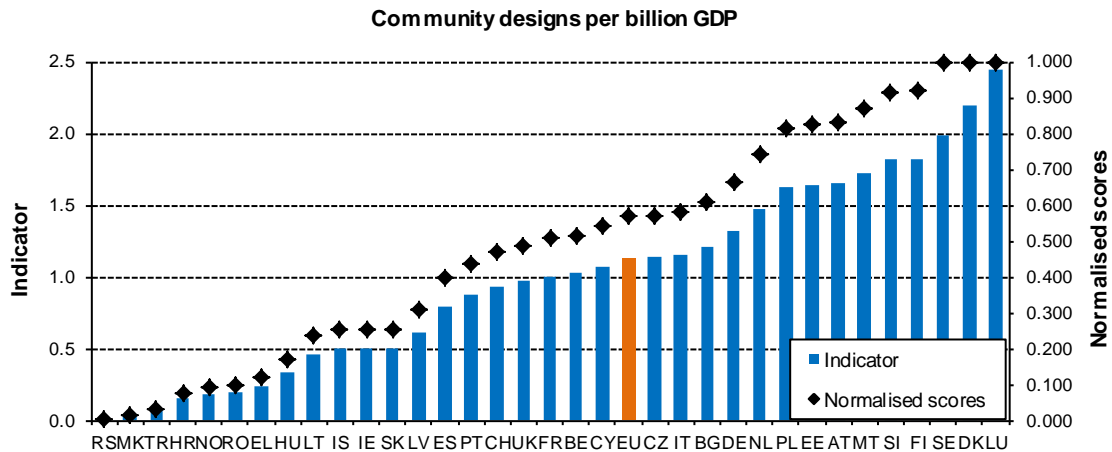
Growth performance

Trademark applications have been growing in all countries, in particular in Bulgaria, Croatia, Slovenia, Estonia, Romania and Malta. For the EU the increase was relatively modest at 5.1% per year.



2.3.4 Community designs per billion GDP (in PPP€)

A design is the outward appearance of a product or part of it resulting from the lines, contours, colours, shape, texture, materials and/or its ornamentation. A product can be any industrial or handicraft item including packaging, graphic symbols and typographic typefaces but excluding computer programs. It also includes products that are composed of multiple components, which may be disassembled and reassembled. Community design protection is directly enforceable in each Member State and it provides both the option of an unregistered and a registered Community design right for one area encompassing all Member States.

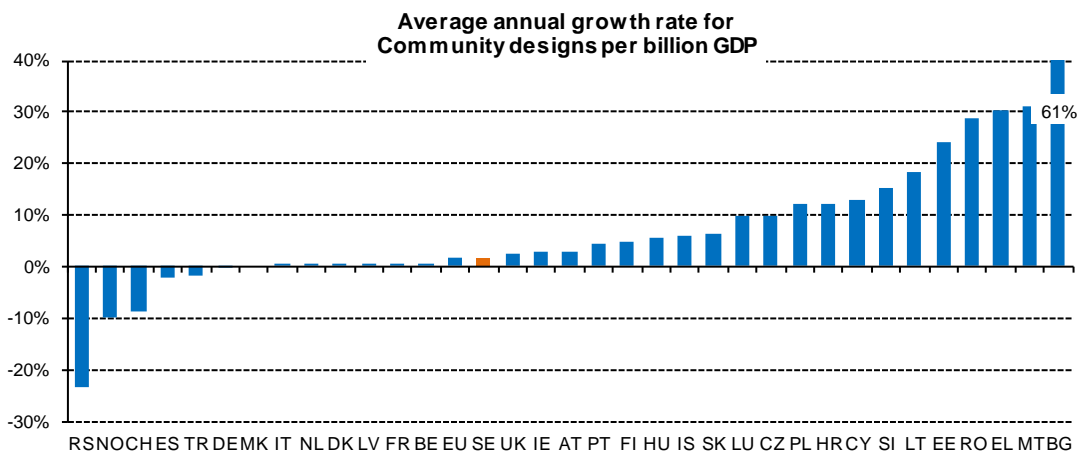


Statistical outliers: Denmark and Luxembourg. Two-year averages have been used to reduce volatility rates.

There is a high spread in performance in community designs per billion GDP. The number of community designs is very high in Luxembourg and Denmark. Design applications are very low in Serbia, the Former Yugoslav Republic of Macedonia and Turkey.

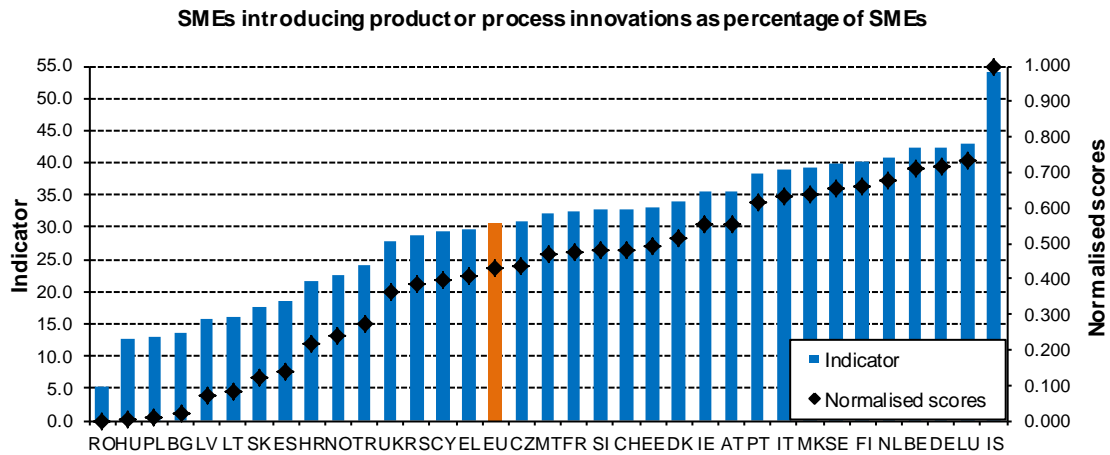
Growth performance

Design applications have been growing in 27 countries but have declined in 6 countries. On average there is only a modest increase of 1.7% for the EU in the number of designs per billion GDP. Strongest increases are seen in Bulgaria, Malta, Greece and Romania, whereas performance has decreased strongest in Serbia, Norway and Switzerland.



3.1.1 SMEs introducing product or process innovations as percentage of SMEs

Technological innovation, as measured by the introduction of new products (goods or services) and processes, is a key ingredient to innovation in manufacturing activities. Higher shares of technological innovators should reflect a higher level of innovation activities.

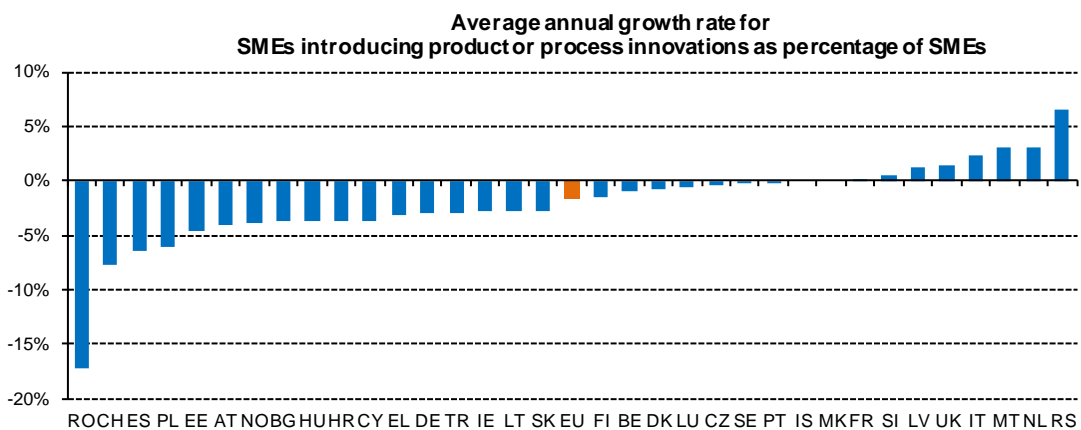


Statistical outlier: Romania.

About 30% of EU SMEs have innovated by introducing a new or significantly improved product or process. In Iceland more than 50% and in Luxembourg, Germany, Belgium, Netherlands and Finland more than 40% of SMEs have introduced a product or process innovation. In Romania this share is only 5% and in Hungary, Poland, Bulgaria, Latvia, Lithuania, Slovakia and Spain it is below 20%.

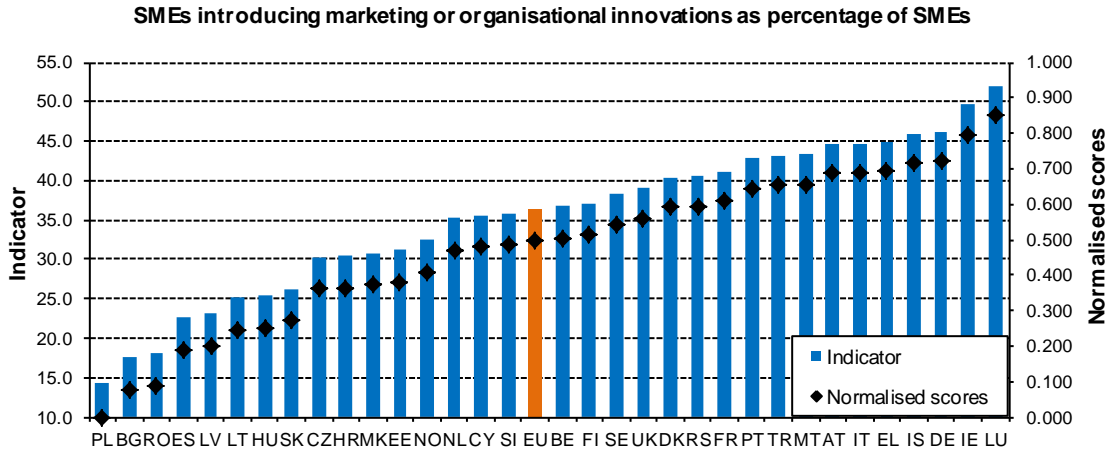
Growth performance

In only 8 of the countries the share of SMEs with product or process innovations has increased, in particular in Malta, the Netherlands and Serbia. A decrease is observed in as many as 24 countries. In particular in Romania, Switzerland, Spain and Poland the share of SMEs with product or process innovation has decreased significantly. For the EU the decrease in the share of SMEs with product or process innovations was 1.7% per year.



3.1.2 SMEs introducing marketing or organisational innovations as percentage of SMEs

Many firms, in particular in the services sectors, innovate through so-called non-technological forms of innovation. Examples of these are marketing and organisational innovations. This indicator tries to capture the extent that SMEs innovate through non-technological innovation.

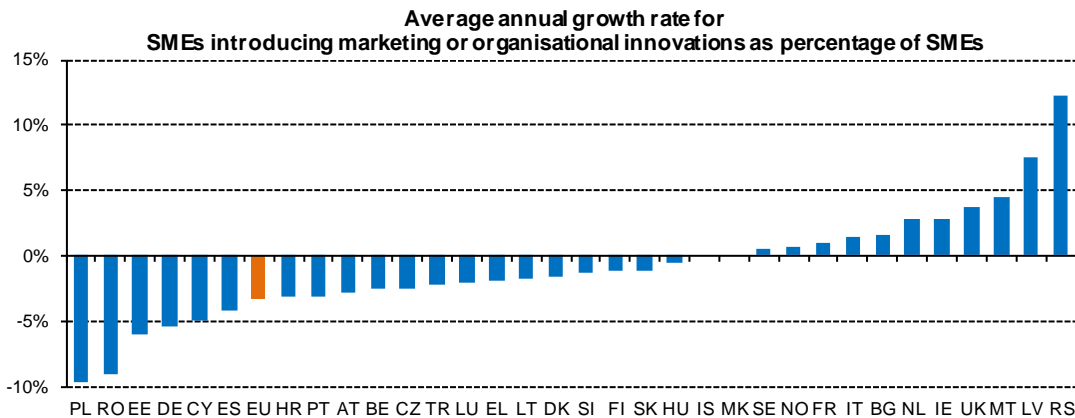


No data for Switzerland.

About 36% of EU SMEs have innovated by introducing a marketing or organisational innovation. In Luxembourg and Ireland close to or above 50% of SMEs have introduced such innovations, in Poland, Bulgaria and Romania this share is below 20%.

Growth performance

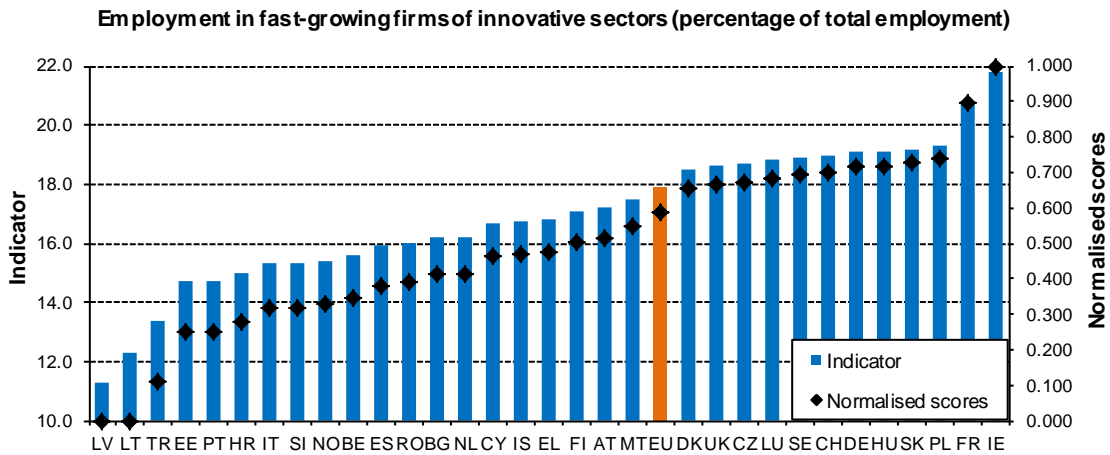
The share of SMEs that have introduced marketing or organisational innovations has been declining for 20 countries, in particular Poland and Romania. In 11 countries the share of SMEs that have introduced marketing or organisational innovations has increased. Serbia and Latvia have experienced the highest average annual growth. For the EU the decrease in the share of SMEs with marketing or organisational innovations was 3.3% per year.



No data for Switzerland.

3.1.3 Employment in fast-growing firms of innovative sectors

This indicator provides an indication of the dynamism of fast-growing firms in innovative sectors as compared to all fast-growing business activities. It captures the capacity of a country to transform rapidly its economy to respond to new needs and to take advantage of emerging demand.

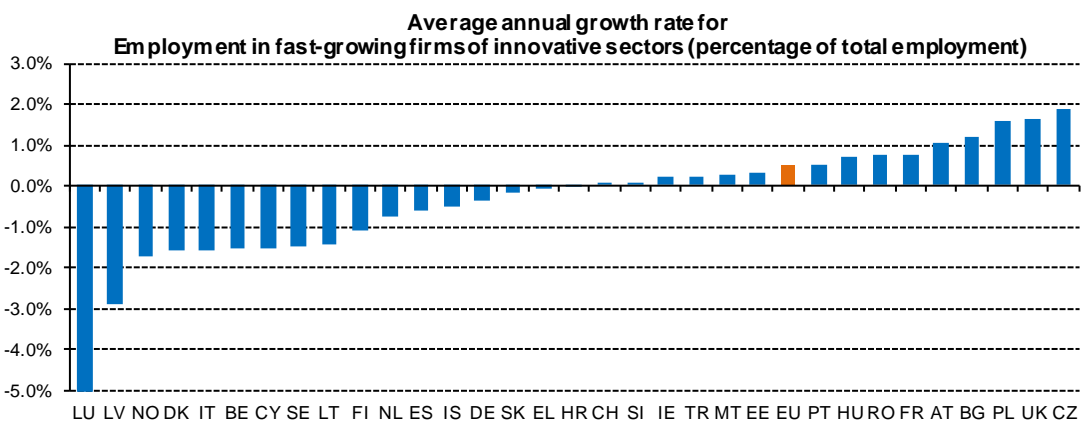


No data for Serbia and Former Yugoslav Republic of Macedonia. Statistical outlier: Latvia.

The average employment share in fast-growing firms of innovative sectors is 17.9%. Highest employment shares are seen in Ireland and France at 20% or more. Shares are relatively low in Latvia, Lithuania and Turkey.

Growth performance

The indicator has been newly developed as part of the new innovation output indicator¹ and data are only available for 2010 and 2012. Growth thus captures the change between these years. For 16 countries performance has worsened, in particular in Luxembourg and Latvia. In 15 countries performance has improved, with the highest growth in Czech Republic, United Kingdom and Poland. Employment in fast-growing firms of innovative sectors has improved at an average annual rate of 0.5% for the EU.



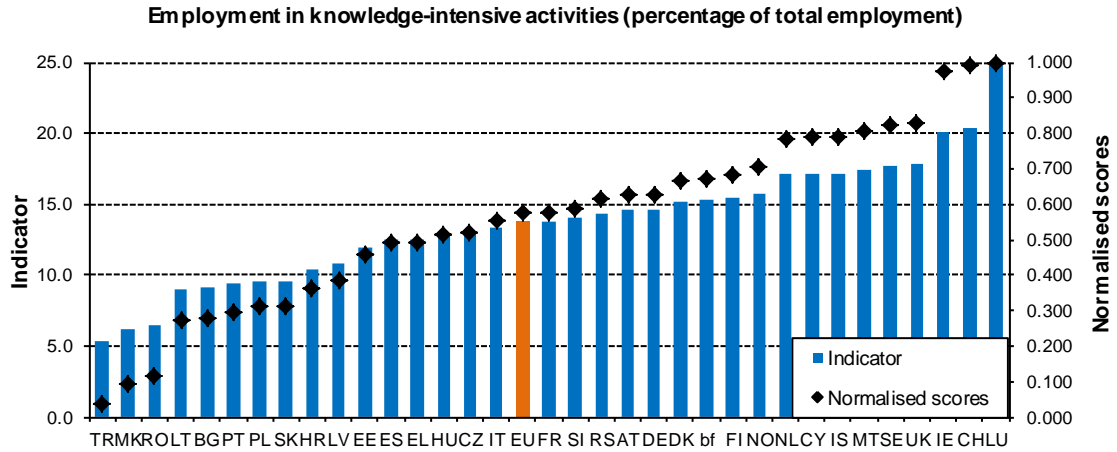
No data for Serbia and Former Yugoslav Republic of Macedonia.

¹ http://ec.europa.eu/research/press/2013/pdf/indicator_of_innovation_output.pdf

http://ec.europa.eu/research/press/2013/pdf/staff_working_document_indicator_of_innovation_output.pdf

3.2.1 Employment in knowledge-intensive activities as percentage of total employment

Knowledge-intensive activities are defined as those industries where at least 33% of employment has a university degree (ISCED5 or ISCED6) and which provide services directly to consumers, such as telecommunications, and provide inputs to the innovative activities of other firms in all sectors of the economy.

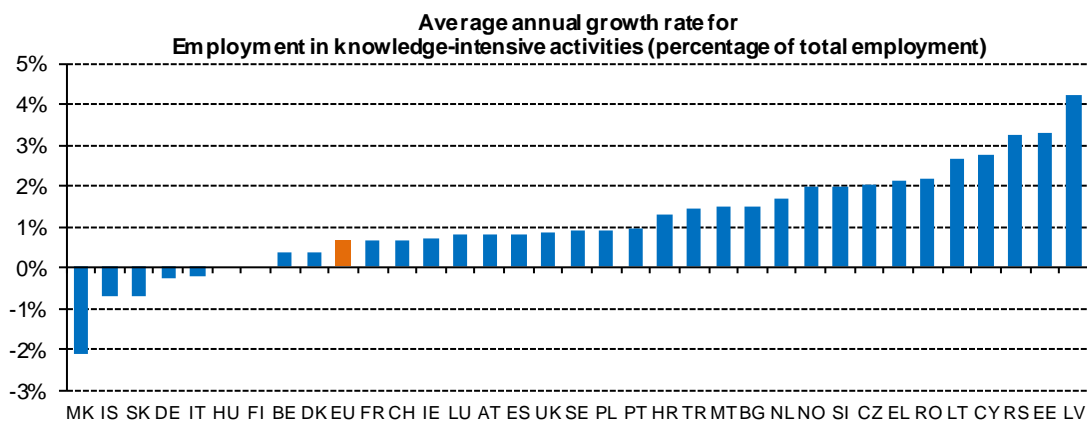


Statistical outlier: Luxembourg.

The average value for the indicator is 13.8%. Countries with high employment shares in knowledge-intensive activities include Luxembourg, Switzerland and Ireland. In Turkey, the Former Yugoslav Republic of Macedonia and Romania the employment share in knowledge-intensive activities is lowest and below or close to half that of the EU.

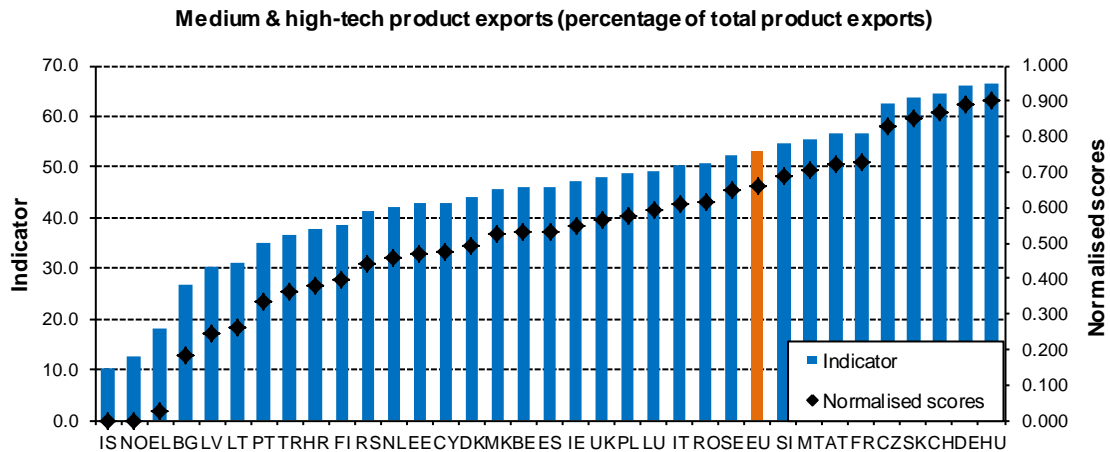
Growth performance

Employment in knowledge-intensive activities has been growing for the EU and for 27 countries. Growth has been strongest in Latvia, Estonia and Serbia. The employment share has decreased in 5 countries with the rate of decline being highest in the Former Yugoslav Republic of Macedonia, Iceland and Slovakia.



3.2.2 Medium and high-tech product exports as percentage of total product exports

The indicator measures the technological competitiveness of the EU i.e. the ability to commercialise the results of research and development (R&D) and innovation in the international markets. It also reflects product specialisation by country. Creating, exploiting and commercialising new technologies are vital for the competitiveness of a country in the modern economy. Medium and high-technology products² are key drivers for economic growth, productivity and welfare, and are generally a source of high value added and well-paid employment.

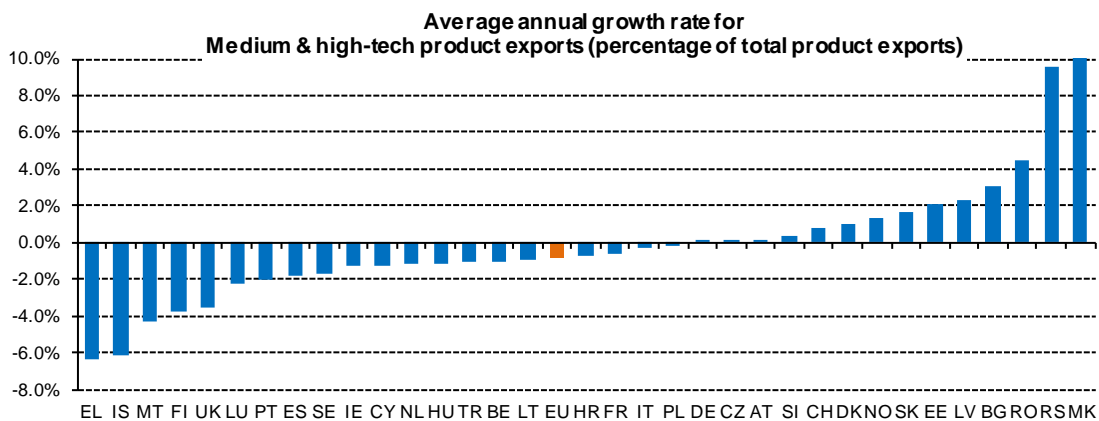


Statistical outliers: Iceland and Norway.

Exports of medium and high-tech products account for 53% of total product exports in the EU. For Hungary, Germany, Switzerland, Slovakia and Czech Republic shares are above 60%. For Iceland, Norway and Greece exports of medium and high-tech products are relatively less important with export shares below 20%.

Growth performance

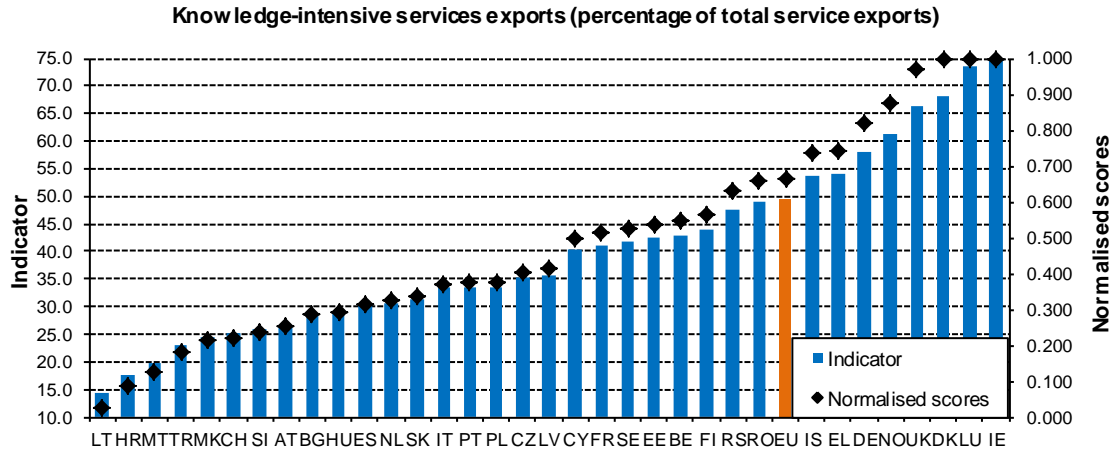
The export share of medium and high-tech products has decreased in 20 countries and the EU. In Greece, Iceland and Malta average annual growth has been below -4%. High growth rates are seen the Former Yugoslav Republic of Macedonia and Serbia.



² MHT exports include exports of the following Standard International Trade Classification (SITC) Rev.3 products: 266, 267, 512, 513, 525, 533, 54, 553, 554, 562, 57, 58, 591, 593, 597, 598, 629, 653, 671, 672, 679, 71, 72, 731, 733, 737, 74, 751, 752, 759, 76, 77, 78, 79, 812, 87, 88 and 891.

3.2.3 Knowledge-intensive services exports as percentage of total services exports

The indicator measures the competitiveness of the knowledge-intensive services sector. Exports of knowledge-intensive services are measured by the sum of credits in EBOPS (Extended Balance of Payments Services Classification) 207, 208, 211, 212, 218, 228, 229, 245, 253, 254, 260, 263, 272, 274, 278, 279, 280 and 284.

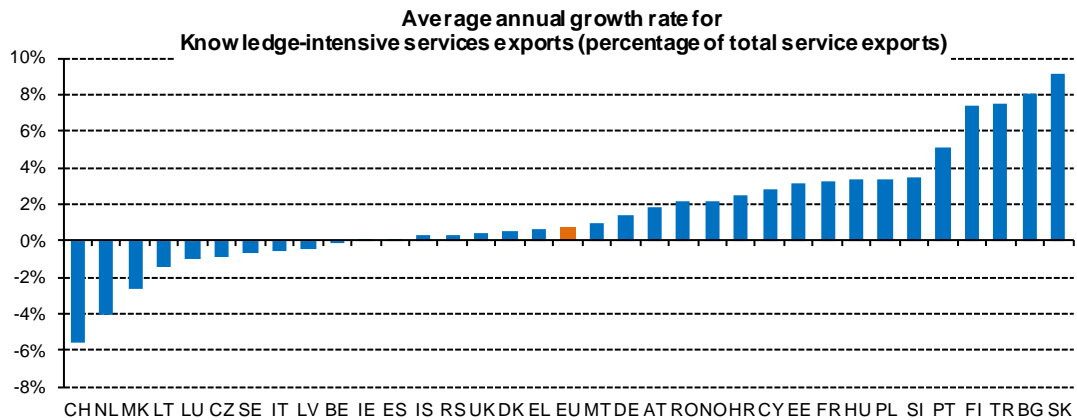


Statistical outliers: Ireland and Luxembourg.

At EU level almost 50% of total services exports are knowledge-intensive. Export shares are more than 65% in Ireland, Luxembourg, Denmark and the UK. Export shares of knowledge-intensive services are very low in Lithuania, Croatia and Malta.

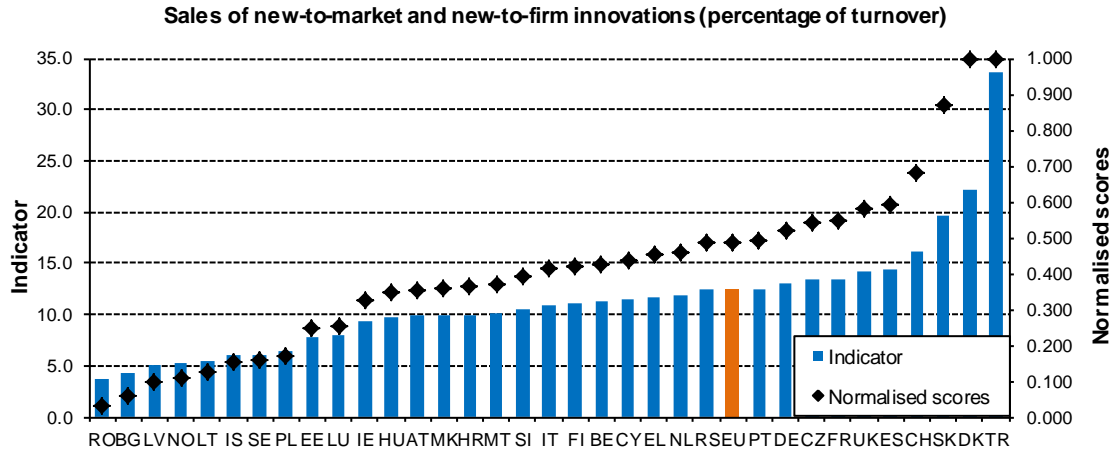
Growth performance

The export share of knowledge-intensive services has been growing at an average rate of 0.7% for the EU. A high growth rate above 7% is observed for Slovakia, Bulgaria, Turkey and Finland. Export shares of knowledge-intensive services have declined in 10 countries and in Switzerland and the Netherlands the average annual growth rate is at or below -4%.



3.2.4 Sales of new-to-market and new-to-firm innovations as % of turnover

This indicator measures the share of turnover accountable to new or significantly improved products and includes both products which are only new to the firm and products which are also new to the market. The indicator thus captures both the creation of state-of-the-art technologies (new to market products) and the diffusion of these technologies (new to firm products).

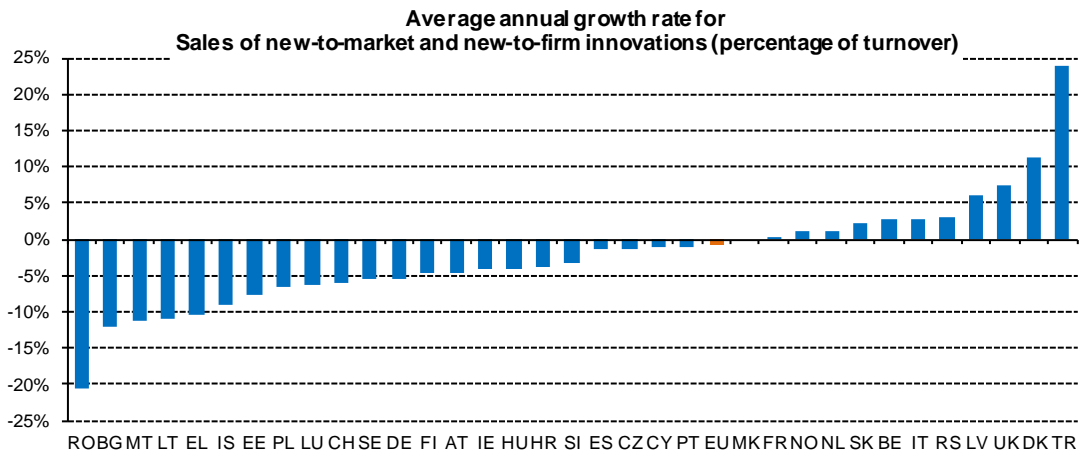


Statistical outlier: Turkey.

The average score for the EU is 12.4% but in Turkey, Denmark and Slovakia shares are high and close to or above 20%. In Romania and Bulgaria the sales share of new or significantly improved products is very small.

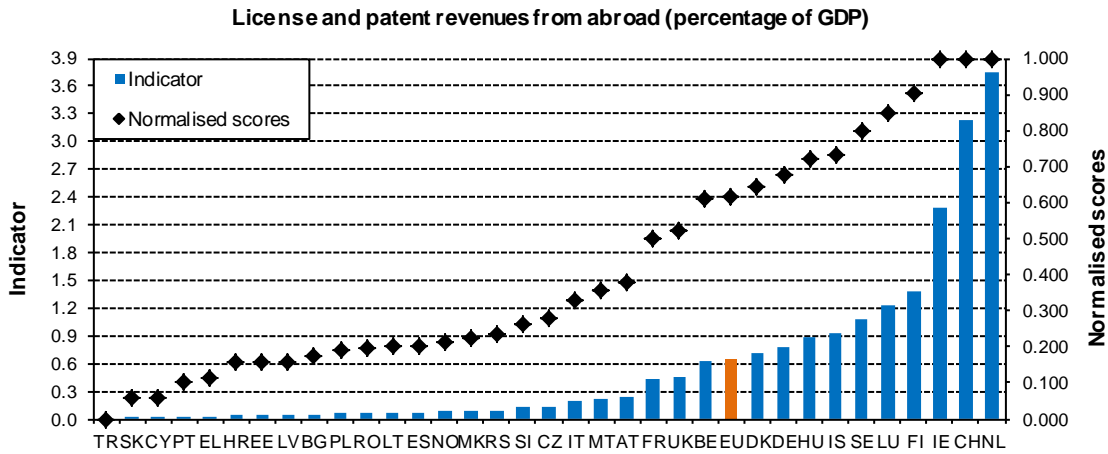
Growth performance

Sales of new-to-market and new-to-firm innovations have increased in 11 countries, in particular in Turkey and Denmark. Such sales have decreased in 22 countries and Romania, Bulgaria, Malta, Lithuania and Greece have experienced negative growth below -10%. For the EU sales of new-to-market and new-to-firm innovations have decreased at an average annual rate of -0.8%.



3.2.5 License and patent revenues from abroad as percentage of GDP

Trade in technology comprises four main categories: Transfer of techniques (through patents and licences, disclosure of know-how); Transfer (sale, licensing, franchising) of designs, trademarks and patterns; Services with a technical content, including technical and engineering studies, as well as technical assistance; and Industrial R&D. License and patent revenues capture disembodied technology exports.



Statistical outliers: Ireland, Switzerland and the Netherlands. The indicator is highly skewed and a square root transformation has been used for deriving the normalised scores.

The performance on license and patent revenues from abroad is highly skewed. The Netherlands (3.75% of GDP), Switzerland (at 3.24% of GDP) and Ireland (2.28%) have very high rates, whereas 16 countries have a rate below 0.1% of GDP.

Growth performance

License and patent revenues from abroad have increased in 22 countries, in particular in Lithuania, Czech Republic, Ireland and Poland. In 11 countries these revenues have decreased relative to GDP. In Slovakia and Cyprus the average annual growth has been below -30%. For the EU license and patent revenues from abroad have increased at an average annual rate of 9.8%.

