BUSINESSEUROPE

REFORM BAROMETER SPRING 2017

STRENGTHENING LONG-TERM GROWTH IN EUROPE

2013 2014 2015 2016 2017

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Who are we?

BusinessEurope's is the leading advocate for growth and competitiveness at the European level, standing up for companies across the continent and campaigning on the issues that most influence their performance. A recognised social partner, we speak for all-sized enterprises in 34 European countries whose national business federations are our direct members.

What is the Reform Barometer?

BusinessEurope's Reform Barometer looks at the global competitiveness performance of Europe on the basis of key indicators covering taxation and public finances, business environment, innovation and skills, access to finance and financial stability, and labour market. Based on a survey of BusinessEurope's member federations, the report evaluates the recommendations for structural reforms made under the European Semester, assesses progress in implementing them and identifies priorities for future reforms.

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Foreword

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Amidst the political shocks that took place in 2016, the steady recovery of the European economy during the year is in danger of being overlooked. Growth was once again around 2%, with businesses responsible for the majority of the 3 million jobs created during the last 12 months.

At the same time, it is clear the EU's economic recovery continues to be supported by temporary factors, notably the ECB's monetary support and a relatively low euro/dollar exchange rate. There remains much to be done to raise the EU's long-term sustainable growth rate, reduce the still unacceptably high unemployment levels and increase the EU economy's resilience in an increasingly uncertain global political environment.

But rather than using the supportive growth environment to press ahead with long-term economic reforms, as our report highlights, business federations across the EU believe that reform is actually slowing. Whether due to the electoral cycle or complacency, many Member States are taking their foot off the reform throttle at exactly the time that rapid changes in the global economy, combined with Europe's competitiveness and public finances challenges, mean reform remains a matter of urgency.

As well as identifying the many policy areas in fields ranging from innovation to infrastructure and technical skills, where Europe has fallen behind our global competitors, this year's Reform Barometer looks in depth at the quality of Member States public expenditure. Our analysis shows that EU Member States could do much more to orientate their public spending towards areas likely to boost growth, with the US public sector spending a greater share of GDP on growth-enhancing categories than the EU, despite the EU having much higher levels of public expenditure. Next, in areas such as health and education, similar levels of public spending are delivering vastly differing outcomes, emphasising the huge scope for efficiency gains in many Member States.

The European business community remains convinced that open global markets are a key driver of growth and prosperity. But for Europe to maximise the benefits of open markets and ensure they are widely spread means stepping up our reforms to increase competitiveness and employment. As we celebrate 60 years since the beginnings of the EU, we call on the EU to use all its available tools to support Member States in their reforms, which must catalyse private investment around innovation, technological development and digital transformation, to build an economy fit for the next 60 years.

Emma Marcegaglia
President

Markus J. Beyrer
Director General

Executive Summary

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PART 1: EU COMPETITIVENESS IN THE GLOBAL ECONOMY

During 2016 we saw the continuation of the EU economic recovery, with growth expected to have been 1.8% compared to 2.2% in 2015. More than 3 million jobs were created with unemployment falling from 9.4% in 2015 to 8.5% in 2016.

Despite these positive headline numbers, it is also clear that a number of temporary factors continued to provide significant support to growth.

The US economic recovery since the depths of the crisis remains much stronger than the EU's. EU per capita growth averaged just 0.9% between 2011 and 2016, a quarter of a percentage point below that of the US.

1. BUSINESS ENVIRONMENT

- The **cost of starting a business** in the EU is more than triple that of the US, while it takes businesses about twice as long to set up a company in the EU.
- **Industrial energy prices** are more than twice as high in the EU than in the US.

Policy recommendations

1. Achieve a truly integrated single market, in particular in the areas of digital economy, telecoms, energy and services.
2. Ensure that regulation, at EU and national level, is well designed and properly enforced, with a minimum of administrative burdens.
3. Energy prices must allow EU businesses to be competitive in international markets. Targeted measures (e.g. reforming taxes and levies, liberalising energy markets, etc.) to address the energy-price differential with major competitors and to ensure energy security should be introduced.
4. Trans-European (and national) infrastructure must be expanded. Remaining regulatory, administrative and technical barriers in all modes of transport, and energy infrastructure, need to be removed to ensure access to adequate infrastructure facilities.

2. INNOVATION AND DIGITAL TRANSFORMATION

- EU **R&D spending** (2% of GDP) is well below Japan (3.6%) and the US (2.7%).
- In 2013, **investment in broadband infrastructure** on a per capita basis was €90 in the EU, compared to €226 in Canada, €226 in Japan and €178 in the US. In fact, the EU is the only economy where per capita investment fell between 2008 and 2013.

- The EU is lagging behind other major economies with regards to **wireless broadband subscriptions** (45% below Japan and 34% below the US on a per capita basis). **Fast fibre connections** are much more common in Japan (73% of subscriptions), South Korea (71%) than in the EU (8%).

- **Patent applications** have stagnated in the EU over the last 14 years compared to strong increases in the US (where applications increased by over 70%). US applications are now three times higher than those in the EU.

Policy recommendations

1. EU Member States should increase R&D spending to the 3% commitment in the EU growth strategy.

2. Innovation policies must be more business-orientated, with targeted initiatives that stimulate private R&D investment and strike the right balance between direct and indirect R&D promotion via tax subsidies. Incentives for cooperation between companies and research institutes in networks and clusters should be improved.

3. Ensure a level playing field to eliminate barriers hampering cross-border e-commerce, prevent forced data localisation measures, and to address legal fragmentation in areas of consumer legislation, taxation, copyright and data protection rules.

3. ACCESS TO FINANCE AND FINANCIAL STABILITY

- The volume of **bank loans** is 8% below the levels we saw in 2012, with the growth rate of new business loans still negative, while credit demand adjusts to the economic recovery.

- **Non-performing loans** account for about 5% of bank lending in the Euro-area, well above the pre-crisis level of below 2% and with uneven cross-country distribution. An ECB analysis suggests that if the capital tied up to support NPLs could be deployed to support new lending then 'total credit volume' in the Euro-area could increase by at least 2.5% overall, and at least 6% in the six Member States with the highest concentration of NPLs.

- For every €10 borrowed by European enterprises, around €8 come from banks and only €2 from capital markets. In the US, it is the opposite situation.

- Whereas in 2016 Europe accounted for only 12% of global **venture capital investment**, the US made up 55%.

Policy recommendations

1. Reinforce and implement the Capital Markets Union proposals to ensure that the EU establishes a genuine single market in financial services, and develops complementary sources of finance to bank lending, in order to offset the consequences of banks deleveraging on companies' access to credit, in particular SMEs.

2. Following the publication of the comprehensive impact assessment on financial regulation, take action to ensure prudential rules strike the right balance between increasing financial stability and supporting companies' financing needs for investment and business activities.

3. Put a comprehensive banking union in place without further delay, including through making decisions on further development of a single resolution mechanism and, following asset quality reviews for all relevant banks, a deposit insurance scheme.

4. Address the high levels of non-performing loans in many European banks in a way which increases new lending and maintains financial stability.

4. LABOUR MARKET AND SKILLS

- The share of the EU **workforce that moved** to another Member State was only 0.2% in 2012, while 2.7% of the US workforce moved across borders.

- The average **tax wedge** on low income earners is in the EU almost 30% higher than in the US and over 20% higher than in Japan.

- The EU's average **PISA score** in science, mathematics, and reading was well behind that in Japan, Canada and South Korea.

Policy recommendations

1. To ensure open, dynamic and mobile labour markets, reforms must be implemented to stimulate job creation, in particular for young people, and employment participation.

2. In order to maintain and increase global competitiveness, the labour market regulatory framework needs to be clear, simple and flexible.

3. Reduce non-wage labour costs through targeted cuts in employer social security contributions to stimulate demand by encouraging employers to hire more staff.

4. To address serious skill shortages and mismatches, education and training systems need to be tailored to labour market needs. More STEM graduates (science, technology, engineering and maths) are needed as well as people with digital skills.

5. Reforms are required to encourage people to stay in the workforce longer, make pension systems sustainable in the long term, and ensure we properly integrate legal migrants into the workforce.

5. TAXATION AND PUBLIC FINANCE

- **Public debt levels** which remained well above the 60% of GDP Maastricht threshold at around 86% of GDP in 2016 (91.6% in the Euro-area), came only slightly down from their 2014 peak of 88.5% (94.4% in the Euro-area).

- In the early years of the financial crisis, **deficits** were driven up by spikes in government expenditure. Between 2011 and 2013 there was excessive focus on deficit reductions via tax hikes. Since 2014, the focus has been more on expenditure reductions rather than tax increases.

- The **overall tax burden** in the EU remains 50% higher than in the US and over 20% higher than in Japan.

Policy recommendations

1. Member States must further demonstrate their commitment to sustainable public finances, focusing primarily on reductions in public expenditure in unproductive areas while enhancing public and private productive investment, rather than tax rises.

2. Proper enforcement of the Stability and Growth Pact (SGP) is essential to help Member States put their public finances on a stronger footing, and in particular bring down debt levels which in many Member States remain well above the 60% of GDP Maastricht threshold. But it is also essential that the SGP offers the fullest support possible to governments who wish to orientate their budgets towards investment and growth-supporting expenditure. There should also be full consistency between the short-term costs of structural reforms, the time needed to reap their benefits and the application of the flexibility foreseen by SGP rules.

3. Tax reforms should reduce taxation on labour and capital, including corporation tax on investment, which are particularly damaging to growth and employment.

4. Member States should continue their efforts to ensure the administration of their tax systems becomes simpler, more transparent and user-friendly.

PART 2: STRUCTURAL REFORM PROGRESS - MEMBER FEDERATIONS' ASSESSMENT

- If countries were to move to best practice in product and labour market policy settings, **aggregate output in the Euro-area could rise by more than 6% by 2025, halving the per-capita gap with the US by 2030**.

- But while **member federations believe that through its country-specific reform recommendations (CSRs), the EU is focusing on the right issues, Member States still demonstrate unacceptable implementation levels**. Our members find that only 17% of CSRs have been implemented satisfactorily, even poorer than our observations for 2015 (20%) and 2014 (22%).

- In terms of **future reform priorities**, member federations maintain very similar reform priorities to those in previous years, with tax reforms and improvements to the general business environment continuing to be key for businesses.

- **It is essential that the European Semester has an increased focus on implementation**, with the EU using all available tools to support Member States in their reform efforts.

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PART 1:
EU COMPETITIVENESS IN THE GLOBAL ECONOMY

Introduction: EU growth increasing, but reform needed to lock-in the recovery

During 2016 we saw the continuation of the EU economic recovery, with growth expected to have been 1.8% compared to 2.2% in 2015. More than 3 million jobs were created with unemployment falling from 9.4% in 2015 to 8.5% in 2016.

Despite these positive headline numbers, it is also clear that a number of temporary factors, notably the ECB's expanded asset purchase programme, and a relatively low euro effective exchange rate, continued to provide significant support to growth.

This report considers the underlying strength of the EU economy, and in particular the extent to which EU Member States have been undertaking the structural reforms needed to secure the recovery in the long term, once temporary support subsides.

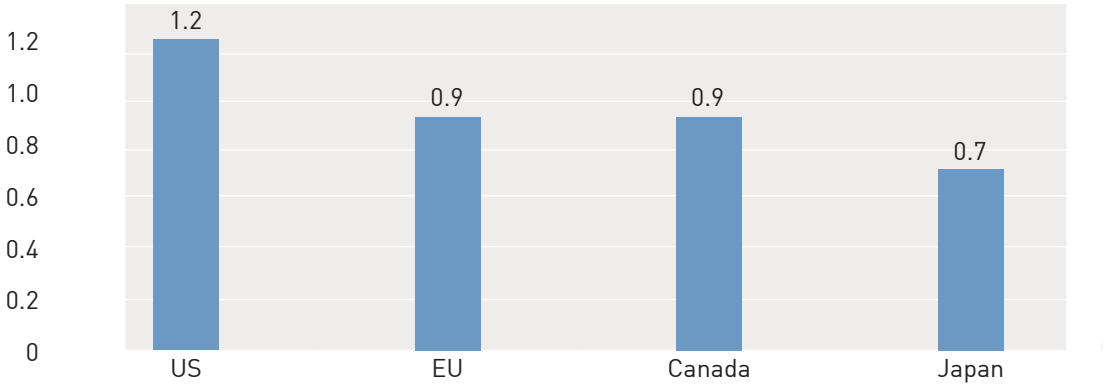
- **Chapter 1** considers how the EU compares to our major competitors in a number of key areas (the overall business environment particularly around regulation, innovation and digital transformation, access to finance and financial stability, labour market and skills, and taxation and public finances) crucial to businesses being able to provide the platform for growth, prosperity and employment creation.

- **Chapter 2** considers the recent record, as judged by businesses in our member federations across the EU, of Member States implementing the key economic reforms agreed with the European Commission and Council.

At a macro-economic level, alongside continuing high levels of unemployment in many Member States, a number of indicators suggest that there is much more the EU can do to raise competitiveness and growth.

- Firstly, despite a stronger year in 2016, **the US economic recovery since the depths of the crisis remains much stronger than the EU's**. As figure 1 illustrates, EU per capita growth averaged just 0.9% between 2011 and 2016, a quarter of a percentage point below that of the US. As a consequence, EU employment creation since the crisis in 2008 remains much weaker than in the US, with about one million new jobs created in the EU compared to 6 million in the US.

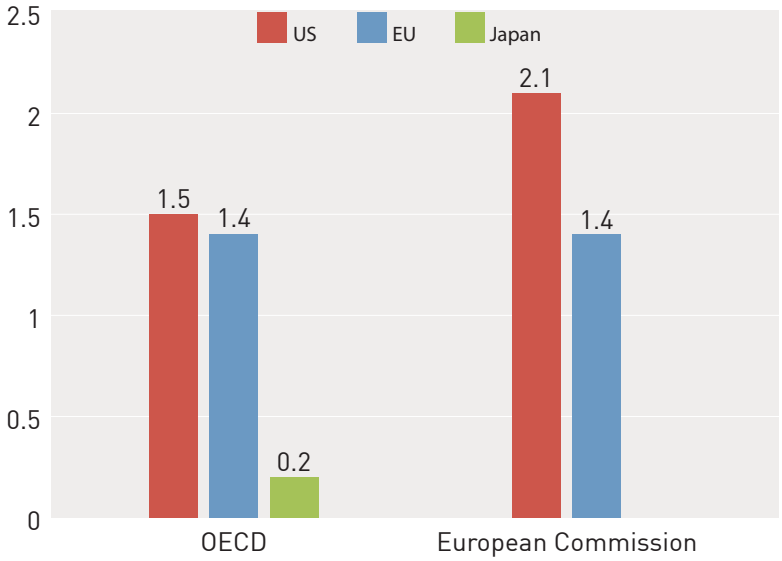
Figure 1 **EU per capita growth on average a quarter below that in the US in 2011-2016**
Average real per capita GDP growth between 2011 and 2016, in %



Source: BusinessEurope calculations based on IMF data (2016 est.) and Ameco

- Reflecting this weaker long-term growth performance, most independent observers suggest that, without reform, **the capacity of the EU's economy to drive long-term growth is below that of our major competitors** (fig. 2).

Figure 2 **EU long-term growth potential remains below our competitors**
Potential GDP growth estimates, averages in 2016-18, in %

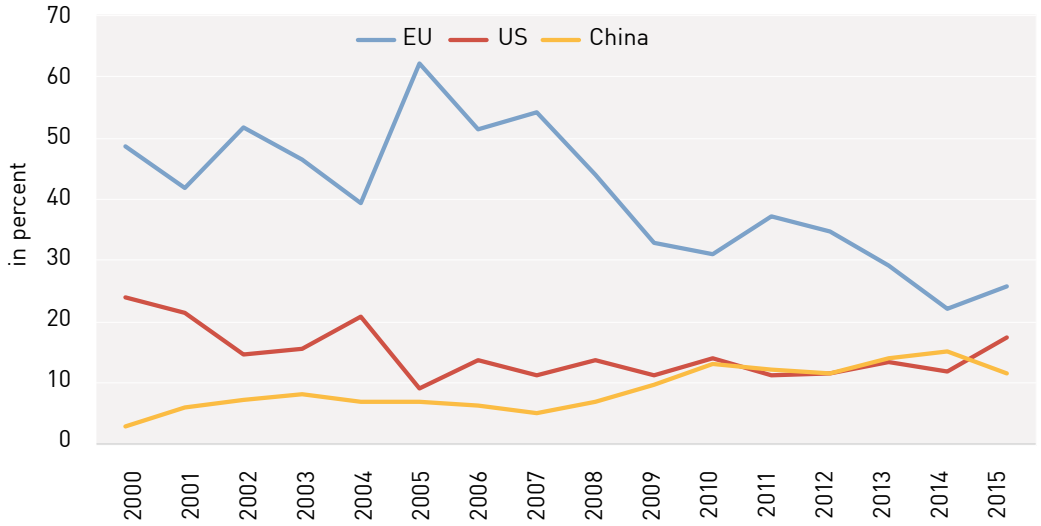


Source: OECD Economic Outlook November 2017 and Ameco Database

- The willingness of those outside the EU to invest in the EU is also a key indicator of the competitiveness of our business environment. Whilst the EU remains the largest global destination for **global FDI inflows**, its importance has fallen in recent years. Between 2000 and 2005 the EU was the recipient of half of the global FDI inflows, but this has fallen to an average of only 30% over the last six years.

Figure 3 **Gradual fall of the EU's share of global FDI inflows**

Foreign direct investment, net inflows in the EU, China and US as a share of global FDI inflows, 2000-2015



Source: BusinessEurope calculations based on World Bank data

I. BUSINESS ENVIRONMENT

KEY POLICY RECOMMENDATIONS

1. Achieve a truly integrated single market, in particular in the areas of digital economy, telecoms, energy and services, in order to enhance job creation and economic growth.

2. Ensure that regulation, at EU and national level, is well designed and properly enforced, with a minimum of administrative burdens in order to support business start-ups and company expansion. Competitiveness proofing, including an SME test, must be an integral part of the ex-ante impact assessment for all legislative proposals.

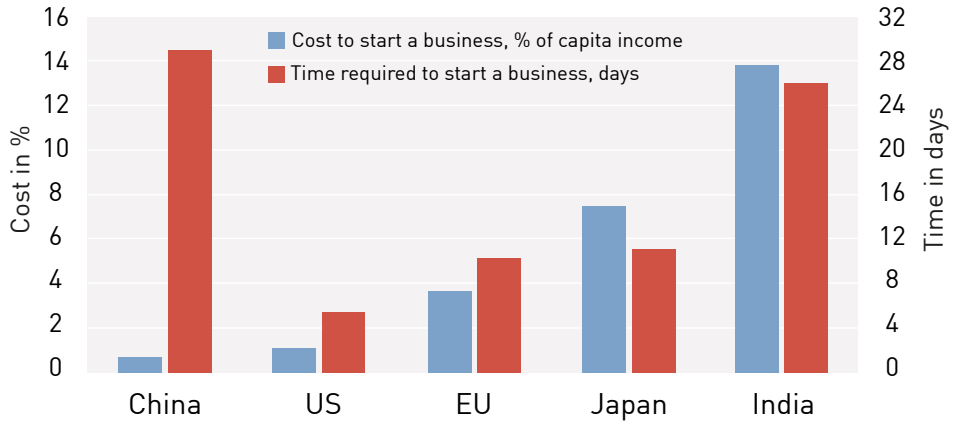
3. Energy prices must allow EU businesses to be competitive in international markets. Targeted measures (e.g. reforming taxes and levies, liberalising energy markets, etc.) to address the energy-price differential with major competitors and to ensure energy security should be introduced.

4. Trans-European (and national) infrastructure must be expanded. Remaining regulatory, administrative and technical barriers in all modes of transport need to be removed to ensure access to adequate infrastructure facilities. Energy infrastructures should be fully interconnected so as to further integrate the internal market.

A competitiveness-friendly business environment is crucial for company start-ups and expansion. Competition and, in turn, productivity growth, rely on open markets with clear and properly enforced rules, as well as legal certainty. In contrast, poorly designed regulation hampers competition and external competitiveness as companies waste time and financial resources on meeting burdensome regulatory requirements.

The time and cost of starting a business, and of getting or renewing operating licences, are key indicators of the overall ease of doing business in an economy. The EU has made significant progress over the last ten years by cutting by half both the average time and cost it takes to start a business. However, administrative hurdles and costs to start up, and operate, a business continue to vary considerably across EU countries, indicating that there is still significant scope to improve. In particular, the cost of starting a business in the EU continues to be more than triple that of the US, while it takes businesses about twice as long to set up a company in the EU (fig 4).

Figure 4 **Further scope for the EU to reduce administrative burdens**
Cost and time to start a business in 2016



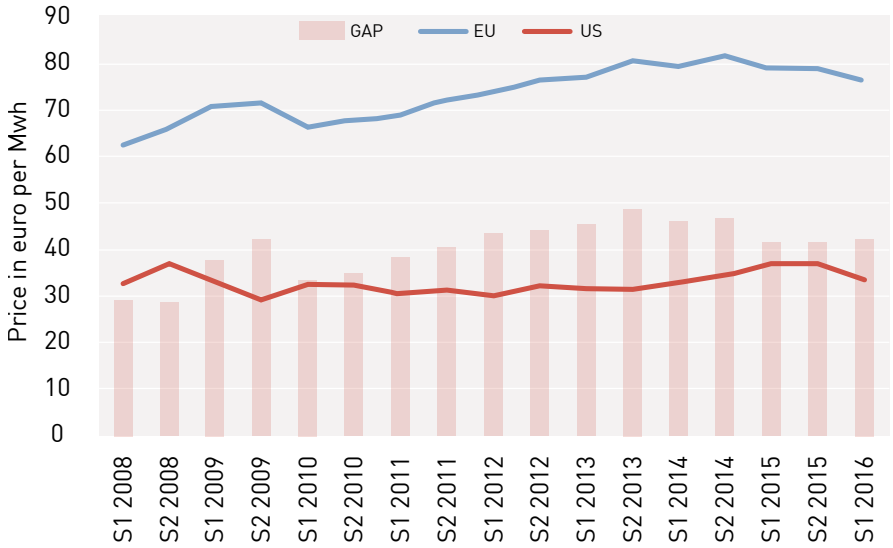
Source: World Bank

Business competitiveness, especially in the manufacturing sector, also depends to a large extent on the secure supply of competitively priced energy. Yet, in the EU, retail prices for energy turn out to be significantly higher than in other major economies, in particular the US. As shown in figure 5, average energy prices for EU industrial producers amounted to €77 per Kwh in the first semester of 2016, which is €43 above the average US price of €34 or, put in another way, more than twice as high. While we have seen a slight reduction of the energy price gap from its peak in late 2013 and 2014, further analysis shows that this development has mainly to do with a strengthening dollar/euro exchange rate which increases the US price when denominated in euro. Only to a lesser extent the reduction of the gap stems from slight improvements in EU competitiveness as some of the costs resulting from a lower euro are borne domestically.

Thus, it remains key that Europe manages to combine climate action with better cost efficiency to ensure that excessive energy prices compared to its partner economies do not hamper EU production. This also requires improved cooperation between EU Member States to build a common energy market.

Figure 5 **Only slight reduction in energy price gap between the EU and US mainly due to fall in euro exchange rate**

Average energy prices for industrial producers in the EU and US, 1st semester 2008 to 1st semester 2016



Source: BusinessEurope calculations based on Eurostat, EIA, and ECB. Methodology from European Commission Energy prices report 2014 & 2016. Does not include confidential rebates.

II. INNOVATION AND DIGITAL TRANSFORMATION

KEY POLICY RECOMMENDATIONS

1. EU Member States should increase R&D spending to the 3% commitment in the EU growth strategy from its current level of around 2%.

2. Innovation policies must be more business-orientated, with targeted initiatives that stimulate private R&D investment and strike the right balance between direct and indirect R&D promotion via tax subsidies. Regulation excessively focused on precaution and risk avoidance will stifle investment in innovation.

3. Incentives for cooperation between companies and research institutes in networks and clusters should be improved in order to facilitate the commercialisation of innovation.

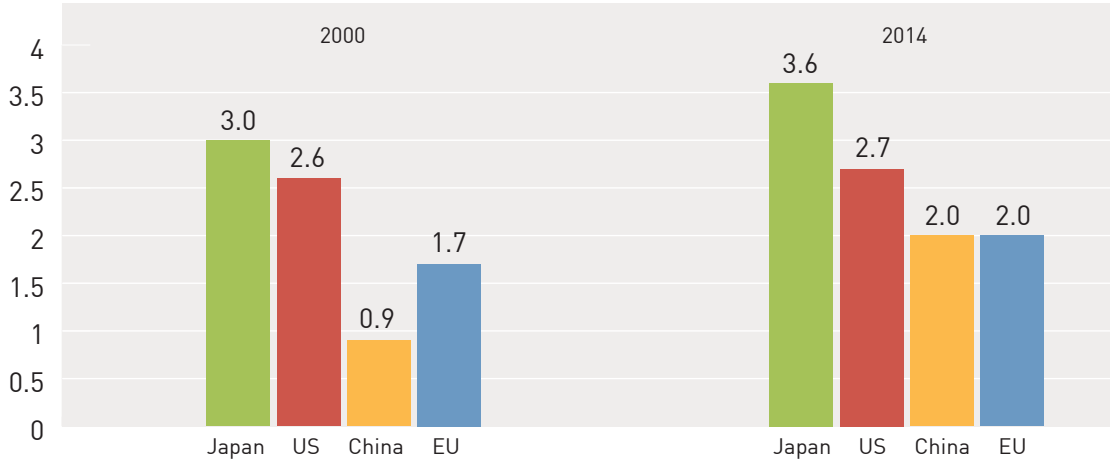
4. The EU has significant work ahead when it comes to adopting the latest technologies enabling businesses to compete globally. This is especially the case when it comes to providing basic infrastructure as well as innovation and R&D to develop its digital economy.

5. Ensuing a digital transformation will require a fully functioning digital single market. This means much more than simply investing in networks, with action needed to ensure a level playing field to eliminate barriers hampering cross-border e-commerce, prevent forced data localisation measures, and to address legal fragmentation in areas of consumer legislation, taxation, copyright and data protection rules.

The EU's innovation and technological capability is fundamental to our ability to attract and retain high-quality, high-productivity jobs, and take forward the digital transformation that is needed across all sectors to ensure we are able to compete successfully in the global economy. Measuring innovation capacity and technological readiness is a complex exercise, but R&D investment, broadband access and patent registrations provide useful pointers in assessing both our current and future capability.

While the EU has slightly increased its share of R&D spending since 2000 (from 1.7% to 2% of GDP), it remains well below the rates in Japan (3.6%) and the US (2.7%), and is just on par with China (2%) which caught up significantly over the past years (fig 6). This also means the EU is a full percentage point behind its own 3% target in the EU growth strategy (Europe 2020).

Figure 6 **EU spending on R&D is well below US & Japanese levels**
R&D intensity as % of GDP in 2014



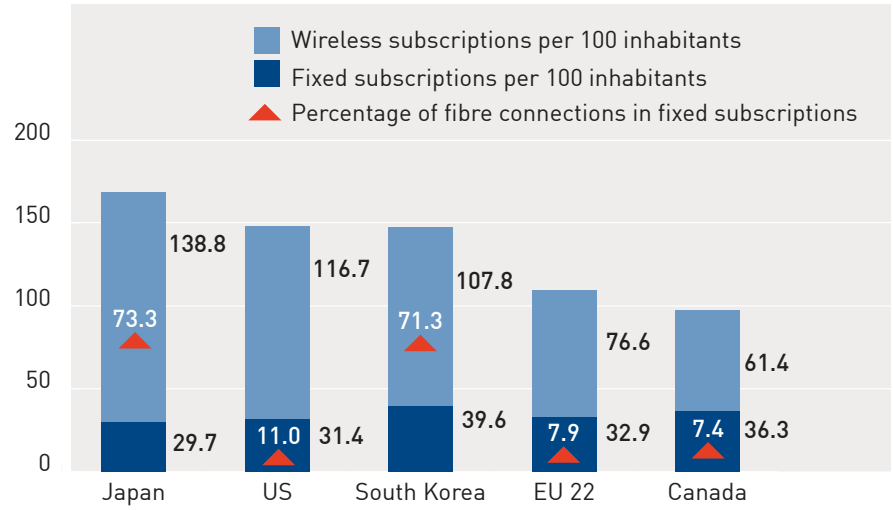
**2013 data instead of 2014 for US.*
Source: Eurostat

Similarly, investment levels in broadband infrastructure are substantially lower in the EU compared to other large economies. In 2013, investment in broadband infrastructure on a per capita basis was €90 in the EU, compared to €226 in Canada, €226 in Japan and €178 in the US. In fact, the EU is the only economy where per capita investment fell between 2008 and 2013.

The repercussions of this low investment are mirrored in the EU lagging behind other major economies with regards to wireless broadband subscriptions and, to a somewhat lesser extent, when it comes to fixed subscriptions (fig. 7). Whilst the EU made some progress over recent years with total subscriptions increasing by about 8%, the increase happened by less than in Japan (11%) and in the US (10%). Fibre connections, enabling quicker connections and disconnections than traditional copper lines, are much more common in Japan (73%), South Korea (71%) and to a lesser extent the US (11%) than in the EU (8%).

Figure 7 **The EU lags behind in the development of (fast) broadband connections**

Fixed and wireless broadband subscriptions per 100 inhabitants and fibre connections as % of fixed subscriptions, 2015

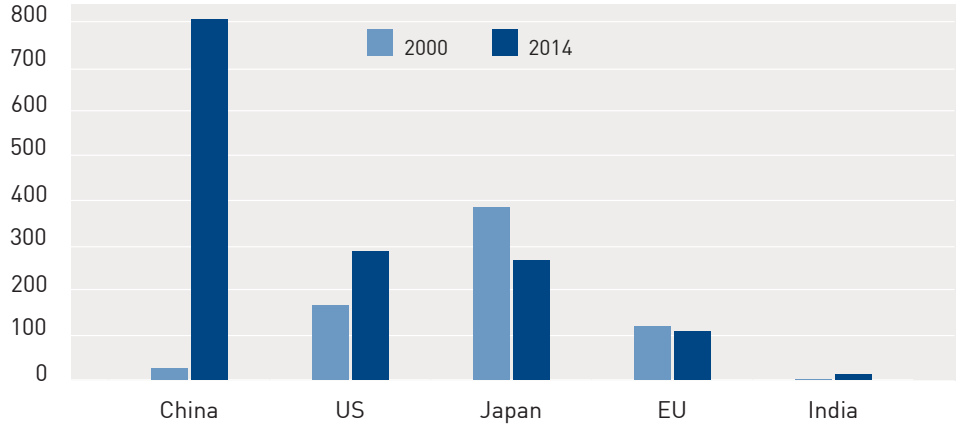


Source: BusinessEurope calculations based on OECD Broadband Portal

Finally, innovation output in the EU appears to be negatively affected by its lack of sufficient R&D and digital infrastructure investment, at least when looking at total patent applications as a proxy. Patent applications stagnated in the EU over 14 recent years compared to strong increases in China (from very low levels) and the US (where applications increased by over 70%). As a result, the patent gap between the EU and US has grown, with US application numbers now three times exceeding those in the EU (fig 8).

Figure 8 **The EU has failed to close the gap of international patent applications**

Total number of patent applications, in thousands



Source: WIPO

III. ACCESS TO FINANCE AND FINANCIAL STABILITY

KEY POLICY RECOMMENDATIONS

1. Reinforce and implement the Capital Markets Union proposals to ensure that the EU establishes a genuine single market in financial services, and develops complementary sources of finance to bank lending, in order to offset the consequences of banks deleveraging on companies' access to credit, in particular SMEs.

2. Following the publication of the comprehensive impact assessment on financial regulation, take action to ensure prudential rules strike the right balance between increasing financial stability and supporting companies' financing needs for investment and business activities.

3. Put a full banking union in place to address the continued fragmentation of EU savings and credit markets. Further decisions need to be taken to complete the single resolution mechanism and, following asset quality reviews for all relevant banks as well as a further reduction of risk in bank balance sheets, a European deposit insurance scheme.

4. Address the high levels of non-performing loans in many European banks in a way which increases new lending and maintains financial stability.

Access to finance on reasonable terms is a pre-condition for companies to thrive and make the investment necessary to drive growth and maintain competitiveness. In order to both provide stability and meet the different financing needs of companies, and in particular of SMEs, finance needs to be available through a variety of different channels.

Financial instability, as illustrated during the crisis, impacts negatively on access to finance, confidence and growth, precluding companies from taking on new investment. The negative feedback loop between sovereign and bank financial positions we saw building up from 2010, which led to political uncertainty and financial market instability, has become less acute since 2012 following strong European Central Bank (ECB) action and the banking union. However, both the legacies of the financial crisis and the increasingly stringent prudential regulation of banks continue to impact upon bank lending to businesses, especially to SMEs, and in those countries hardest hit by the crisis.

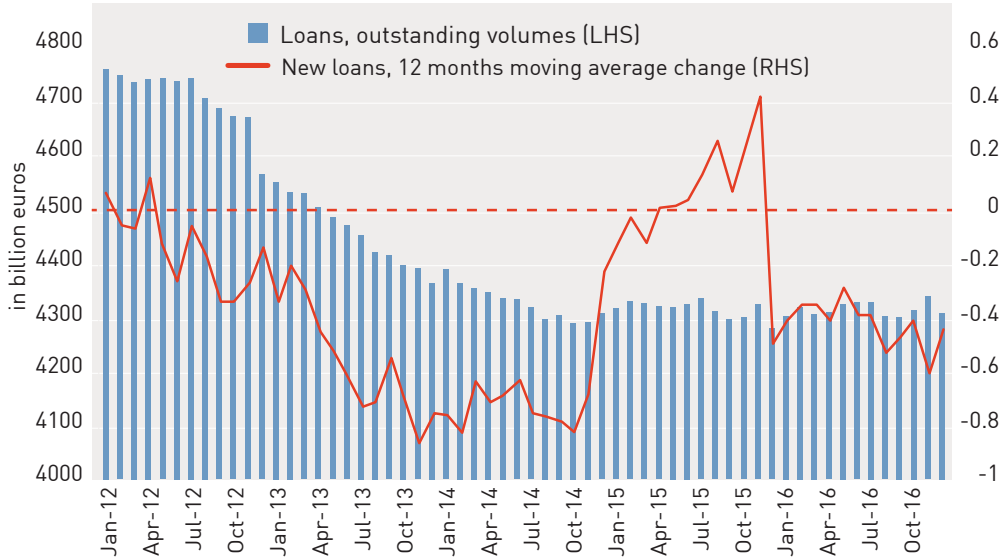
While we have recently seen a gradual convergence (albeit with a few exceptions) towards lower interest rates on business loans across the Euro-area, access to finance remains a key concern for business. BusinessEurope supports the full implementation as agreed by Member States of the Bank Resolution and Recovery Directive. In the context of precautionary recapitalisations, resolution authorities should carefully assess whether to impose on junior creditors on a case-by-case basis, given the risk of a flight of investors which could further hamper EU bank funding.

Although reinforced prudential rules and strengthened supervision restored confidence in financial institutions and made them more resilient, it also put bank lending back under pressure. In particular, with the demand for finance slowly picking up in line with a gradually improving economic outlook, insufficient finance remains a risk to company investment. It will therefore be particularly important that, following the publication of the comprehensive impact assessment on financial regulation, we consider whether further action is required to ensure prudential rules strike the right balance between increasing financial stability and supporting companies' financing needs for investment and business activities.

As figure 9 illustrates, despite the increasing involvement of the ECB, the volume of bank loans remains at around the same level as during the first quarter of 2014 and is about 8% below the levels we saw in 2012. Yet, while the overall stock of loans stabilised at a lower level, the growth rate of new business loans is still negative (except for a short interval in 2015), implying fewer loans are issued to new business, taking into account that, as well as economic growth, employment or investment levels, credit demand has not yet reached pre-crisis levels.

Figure 9 **Bank lending to business shows no signs of recovery**

Outstanding bank loans (left-hand scale) & change in new bank loans (right-hand scale) to Euro-area non-financial corporations, Jan 2012 – Dec 2016



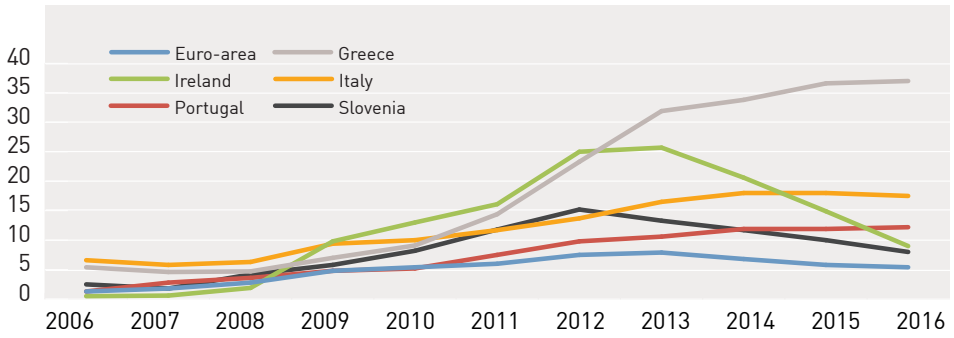
Source: BusinessEurope calculations based on European Central Bank

One particular supply constraint on bank lending may be the continuing high volumes of non-performing loans (NPLs) that banks continue to hold on their balance sheets in a number of Euro-area member states. As figure 10 illustrates in the Euro-area as a whole, whilst the percentage of bank lending which is non-performing has fallen in recent years to about 5%, it remains above the pre-crisis level of below 2%. NPLs continue to increase in Greece (37% of overall lending) and Portugal (12%), and have stabilised at around 18% in Italy.

The ECB suggests that if the capital tied up to support NPLs could be deployed to support new lending then 'total credit volume' in the Euro-area could increase by at least 2.5% overall, and at least 6% in the six Member States with the highest concentration of NPLs.

Figure 10 **Non-performing loan volumes have not reduced in a number of Euro-area member states**

Bank non-performing loans to total gross loans (%)



Source: World Bank & IMF data

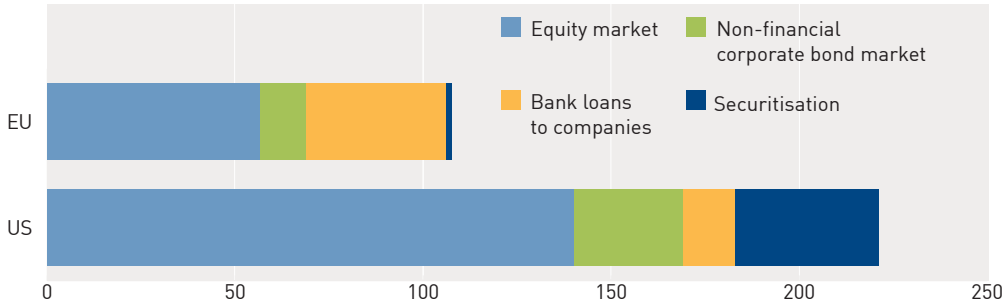
To prevent any funding constraints, it is essential to promote business access to non-bank financing. For every €10 borrowed by European enterprises, around €8 come from banks and only €2 from capital markets. In the US, it is the opposite situation. This is reflected in the historically low stock market capitalisation of the EU which even deteriorated in recent years. While the EU's stock market capitalisation averaged 73% of GDP between 2003 and 2006, it declined to 54% in recent years, at par with China and well behind the 138% in the US. Similarly, the outstanding stock of corporate bonds amounted to 11% of Euro-area GDP (or €1.1 bn) during the first three quarters of 2015, compared to 47% of GDP in the US (or €7.6 bn).

This point is illustrated in figure 11 which shows the much larger (both relative and absolute) role played in funding non-financial corporations, not only by equity, but also by corporate bond and securitisation markets.

Clearly, EU businesses, and SMEs in particular, face more difficult requirements to access capital markets and strong regulatory disincentive when it comes to securitisation, in comparison with the US.

Figure 11 **Capital market funding much less developed in the EU than in the US**

Size of financial intermediation to the non-financial corporate sector as % of GDP



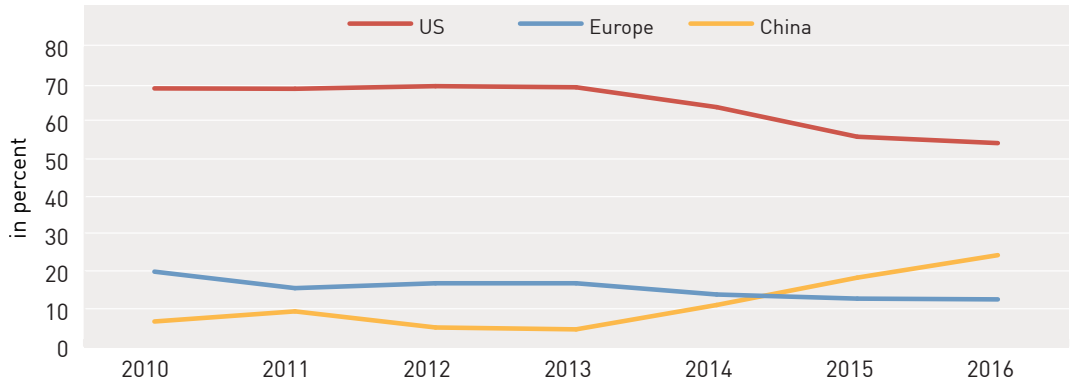
** EU: 2013. US: 2014*
Source: Data from Bruegel policy contribution "Capital Markets Union: A Vision for the long term". Issue 2015/05, April 2015

Expanding the financial support channels can help companies to avoid credit shortfalls and obtain better credit conditions, while at the same time contributing to financial stability by diversifying the risk between banks and other financial institutions.

Venture capital can also be an important source of finance, in particular for growth companies. Even though European venture activity (i.e. deals) in 2016 declined by 28% from 2015 levels, venture capital investment remained quite strong on a historical basis at $15.7 billion (second highest during 7-year record). However, as shown in figure 12, venture capital investment is still a far less important source of finance in the EU than in the US. Whereas in 2016 Europe accounted for only 12% of global venture capital investment, the US made up 55%. Most recently China overtook the EU, holding now a global share of 24% (fig 12). In addition, around 90% of EU venture capital investment is concentrated in only 8 Member States. Rapid progress in implementing the Capital Markets Union is required to address many of these issues.

Figure 12 **EU strongly lags behind the US for venture capital financing and was recently overtaken by China**

Venture capital invested in Europe, the US and China as a share of global venture capital



Source: Ernst & Young (2017). Venture Pulse Q4 2016.

IV. LABOUR MARKET & SKILLS

KEY POLICY RECOMMENDATIONS

1. To ensure open, dynamic and mobile labour markets, reforms must be implemented to stimulate job creation, in particular for young people, and employment participation. The framework conditions on labour markets need to support new and more diverse career paths and smooth transitions between jobs, sectors and employment statuses, while respecting the diversity of industrial relations practices across Europe.

2. In order to maintain and increase global competitiveness, the labour market regulatory framework needs to be clear, simple and flexible. At the same time, labour markets need to ensure that increases in labour costs are consistent with rises in productivity growth.

3. Reduce non-wage labour costs through targeted cuts in social security contributions to stimulate demand by encouraging employers to hire more staff. The tax burden on labour should be reduced to make work more attractive compared to welfare benefits, especially for low-income earners.

4. To address serious skill shortages and mismatches which risk acting as a brake on economic growth in the EU, education and training systems need to be tailored to labour market needs.

5. In particular, more STEM graduates (science, technology, engineering and maths) are needed as well as people with digital skills. A good way to develop digital skills is through e-apprenticeships - apprenticeships in digital and technical-based occupations and which use digital learning platforms.

6. In order to mitigate negative impacts of population ageing on the labour market, reforms are required to encourage people to stay in the workforce longer, make pension systems sustainable in the long term, and ensure we properly integrate legal migrants into the workforce. Social protection systems need to become more effective and economically efficient, which means to focus social investments in areas where they can enhance growth (e.g. skills development, childcare), and to find the right balance between adequacy and sustainability of social safety nets.

Even though there have been some recent improvements, persistent and high unemployment continues to affect many European economies in the aftermath of the financial crisis and underlines the difficulties European labour markets face as a result of underlying structural weaknesses.

Well-functioning labour markets facilitate worker transition between jobs, encourage companies to hire and help match skills supply and demand. In contrast, excessive labour market rigidities make it hard for people to move between jobs, sectors and employment statuses, may lead to a segmented labour market, reduce a country's attractiveness for both domestic and outside investors, and hamper employment creation as well as productivity and economic growth. It is thus important that labour market frameworks are simple, transparent and predictable, while providing for a variety of employment contracts and ensuring the attractiveness of these different contractual forms.

Many Member States are nowadays confronted with the challenge of ensuring clarity at national level on the way in which work opportunities in the context of new business models, such as platform work, qualify in terms of the pre-existing legal definitions of work and self-employment. In some Member States, a key priority is to improve the attractiveness of indefinite duration employment contracts. Both at European level and in the Member States, more work is needed to increase the coherence between EU and national policies aiming to increase the transparency, portability and/or transferability of social entitlements nationally and cross-border.

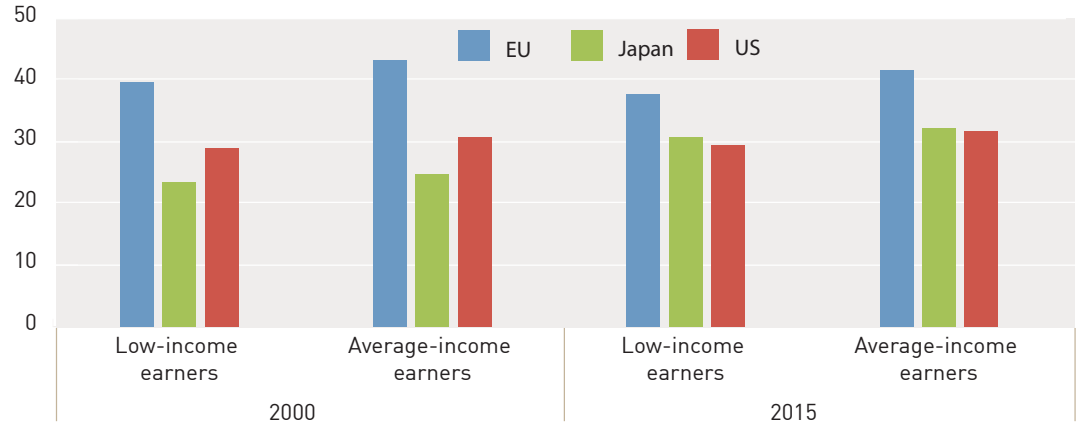
Labour mobility is even more important in the case of a monetary union to ensure that different economies react optimally to a common monetary policy, as it can serve as an adjustment mechanism in response to asymmetric shocks. Despite the efforts to increase the cross-border mobility among European workers, the share of the EU workforce that moved to another Member State was only 0.2% in 2012, while the same figure for the US indicates that 2.7% of the workforce moved cross-border. In 2013, only just over 8 million EU citizens worked and lived in another Member State, representing just 3% of the total EU labour force.[1]

In addition to facilitating labour mobility, the high tax burden across Europe has to be addressed. Both the OECD and the European Commission stress that high levels of labour taxation may have detrimental effects on employment by reducing incentives both for workers to enter the labour market (if net gains after taxes and benefits are small) and employers to hire more staff (if labour costs are very high).

Given that labour demand and supply tend to be more elastic for low-skilled/low-income earners as well as second-earners, high labour taxes will have particularly strong negative consequences for these groups. Thus it is a clear concern that the average tax wedge on low-income earners is in the EU almost 30% higher than in the US and over 20% higher than in Japan (fig 13). Virtually no progress has been made in the EU over the last decade. Reducing the tax wedge must be a key priority to enhance employment rates and economic growth in the EU.

Figure 13 **The tax wedge on income earners in the EU needs to come down**

Tax wedge on low and average income earners (single person), 2000 and 2015



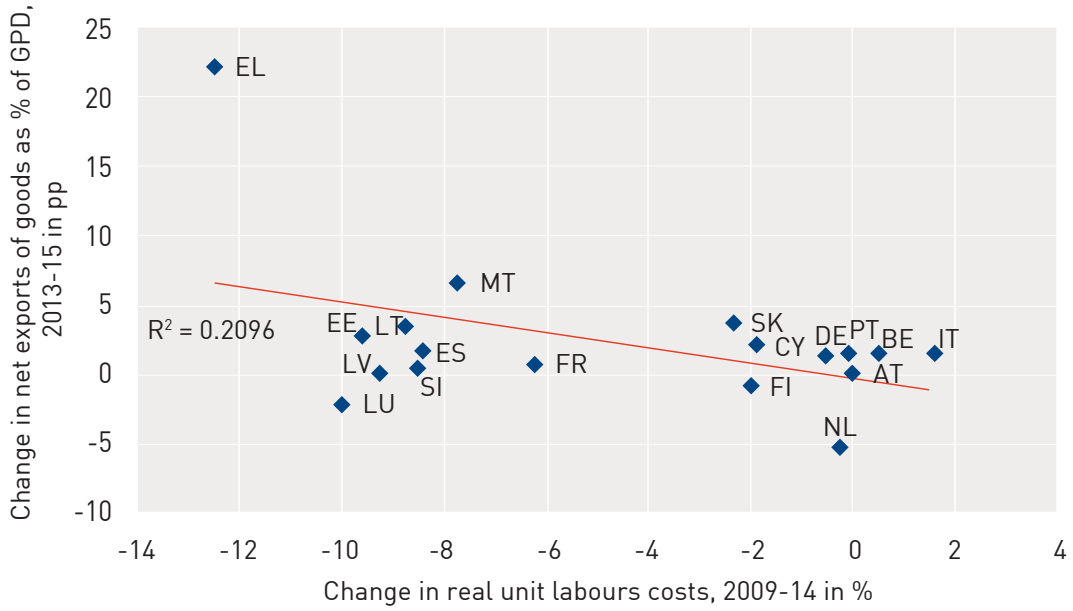
**Data for EU 21*
Source: OECD

[1] European Parliamentary Research Service, "Implementation Appraisal on EURES Labour Mobility Package", June 2015.

In addition, labour costs in Member States should safeguard their international competitiveness. Whilst there are a number of factors that drive export performance[2], as illustrated in figure 14, Euro-area members that allowed their unit labour costs (ULCs) to rise strongly in the pre-crisis period have generally made progress in reducing ULCs and see positive effects in their trade balance.

Therefore, it is important that Member States continue to implement structural reforms in the labour market to ensure competitiveness. This should include reducing the tax wedge on labour, shifting taxation in a way that will not create market distortions and promote economic growth, as well as making sure collective bargaining structures respond efficiently to changing economic circumstances. In parallel to this, available public resources should be prioritised towards creating the right incentives for people to work, and adapt to changing labour market requirements, rather than on passive spending, thereby moving away from unemployment to employment insurance.

Figure 14 **Countries which adjusted ULCs show improved export performance**
Changes in real unit labour costs (2009-14) and in net exports (2013-15), in %



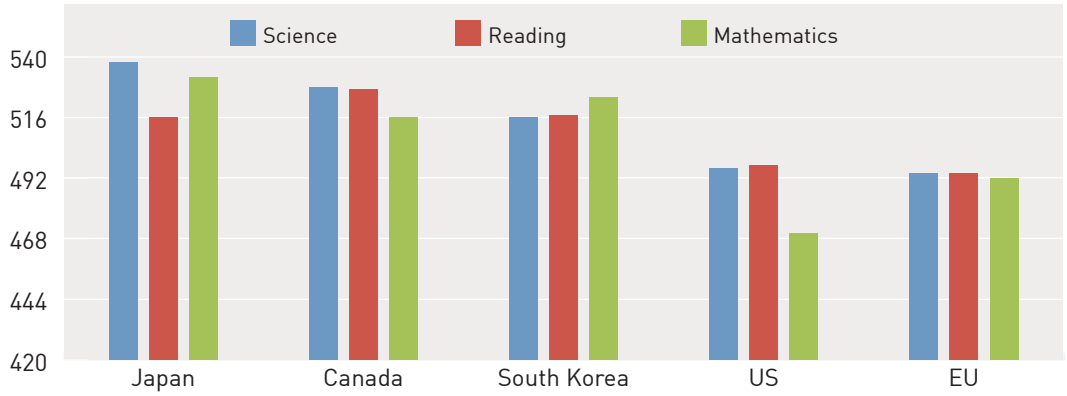
Source: BusinessEurope calculations based on AMECO Database

When it comes to education, the latest OECD PISA results show that EU 15-year-old students underperform in comparison to their international peers (fig 15). The EU's average score in science, mathematics and reading combined was with 493 points well behind that in Japan (529), Canada (524) and South Korea (519), but slightly above that in the US (488).

[2] For example in the case of Greece the result in net exports for 2013-15 is mostly driven by the import and re-export, as refined goods, of fuels.

Figure 15 **EU students underperform in education compared to their international peers**

Overall mean score in PISA 2015 in science, reading and mathematics

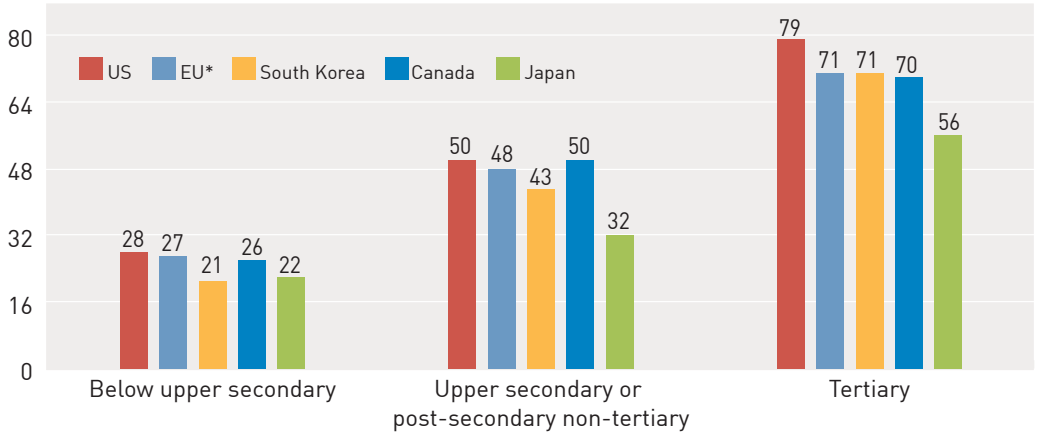


Source: OECD PISA 2015

The comparably weak performance of EU pupils further underlines the importance of continuous education at the workplace. In this regard, it is a positive sign that the EU depicts a relatively high overall participation rate in formal and non-formal education and learning of 25-64 year-olds across educational attainment, only slightly behind that of the US. The EU has in particular room for improvement when it comes to increasing the participation rates of workers with tertiary education degrees.

Figure 16 **EU adult education participation rates only slightly behind the US but above that of other international peers**

Participation in formal and/or non-formal education for 25-64 year-olds by educational attainment (2012 or 2015), in %



**EU weighted average*
Source: BusinessEurope calculations based on OECD Education at a Glance 2016

In some systems, school-based learning is widely complemented by other forms such as workplace learning. Examples of this type of "dual system" can be found in Austria, Germany, Denmark, the Netherlands and Switzerland. One advantage of this practice is that it forms a series of public-private partnerships, allowing employers, in particular, and social partners to be involved in the development of vocational and educational training (VET) programmes, particularly apprenticeship schemes, in which they participate in defining and delivering the curricular programmes. Labour market needs and skills shortages can thus be addressed at an early stage.

Education institutions should open up more to partnerships with companies, in particular to encourage the development of STEM skills. The quality of initial education needs to be ensured by governments and the right framework conditions should be put in place at national level to encourage governments, companies and workers to invest in continuing education on a cost-sharing basis. The role of the European Union should be to support Member States' efforts to reform their education and training systems so as to better align them with labour market needs. This includes looking at how curricula can be adapted over a shorter time period.

V. TAXATION AND PUBLIC FINANCES

KEY POLICY RECOMMENDATIONS

1. Member States must further demonstrate their commitment to sustainable public finances, focusing primarily on reductions in public expenditure in unproductive areas while enhancing public and private productive investment, rather than tax rises. Member States should look to improve the efficiency of delivery of key public services through improved administration and management given budget constraints.

2. Proper enforcement of the Stability and Growth Pact (SGP) is essential to help Member States put their public finances on a stronger footing, and in particular bring down debt levels which in many Member States remain well above the 60% of GDP Maastricht threshold. But it is also essential that the SGP offers the fullest support possible to governments who wish to orientate their budgets towards investment and growth-supporting expenditure. There should also be full consistency between the short-term costs of structural reforms, the time needed to reap their benefits and the flexibility allowed by application of the SGP rules.

3. Tax reforms should reduce taxation on labour and capital, including corporation tax on investment, which are particularly damaging to growth and employment.

4. Member States should continue their efforts to ensure the administration of their tax systems becomes simpler, more transparent and user-friendly.

Sustainable public finances are of key importance for long-term growth. The financial crisis illustrated that falling confidence in a government's ability to repay debt can lead to a vicious cycle whereby increased borrowing levels lead to higher borrowing costs, and in turn require higher taxation.

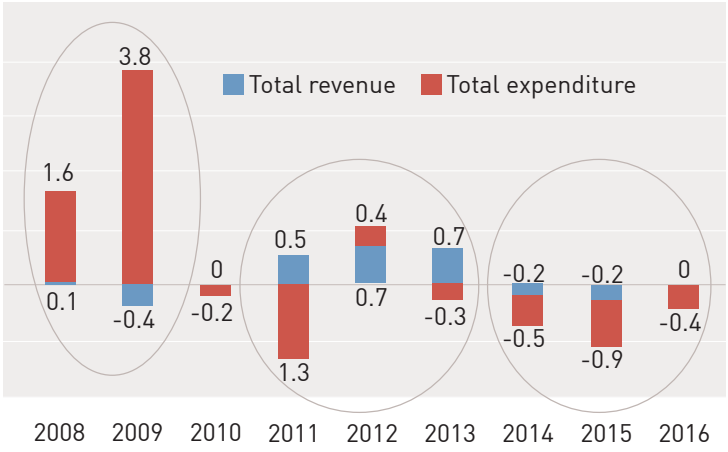
It is positive to observe that EU Member States made further progress in bringing down government deficits, from a high of -6.6% in 2009 (-6.3% in the Euro-area), to an expected -2% in 2016 (-1.8% in the Euro-area). However, there is much more to be done to reduce public debt levels which remained at around 86% of GDP in 2016 (91.6% in the Euro-area), only slightly down from their 2014 peak of 88.5% (94.4% in the Euro-area).

When we look at how changes in public expenditure and revenues impacted deficits in recent years as shown in figure 17, we can distinguish between three different phases. First, in the early years during the financial crisis, deficits where driven up by spikes in government expenditure. Second, between 2011 and 2013 there has been excessive focus on deficit reductions via tax hikes. Third, since 2014, the focus has been more on expenditure reductions than on tax increases. While the optimal approach can vary depending on a number of factors, including country differences, several studies have found that consolidation via expenditure reductions rather than via tax hikes may be more effective.

Looking ahead, proper enforcement of the Stability and Growth Pact (SGP) remains essential to help Member States put their public finances on a stronger footing, and in particular bring down debt levels which in many Member States remainswell above the 60% of GDP Maastricht threshold. However, it is also essential that the SGP offers the fullest support possible to Member States who wish to orientate their budgets towards investment and growth-supporting expenditure.

Figure 17 **Since 2014 fiscal consolidation came mainly via expenditure cuts rather than tax hikes**

Change in government revenue and expenditure compared to the previous year, in percentage points

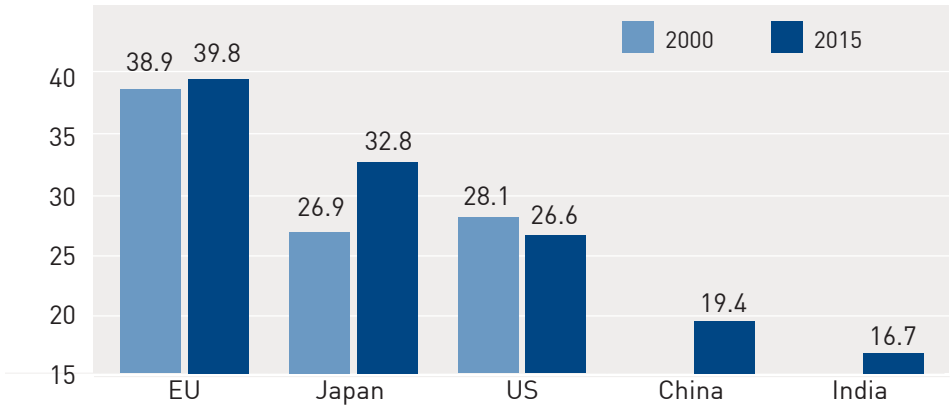


Source: BusinessEurope calculations based on Ameco database

In order to achieve a more growth-friendly composition of fiscal policies, while at the same time reducing still high debt ratios, it is essential that Member States lower the tax burden in a budget-neutral way and cut expenditure in unproductive areas (for a more detailed discussion on the quality of public finances see annex). Unfortunately, there has been virtually no progress made in reducing the tax burden in the EU over the last years. As figure 18 demonstrates, the overall tax burden in the EU remains 50% higher than in the US and over 20% higher than in Japan.

Figure 18 **Overall tax burden in the EU is higher than elsewhere**

Total tax burden as % of GDP, 2014 (including social security contributions)



Source: AMECO and Heritage Foundation for China and India

To some extent the higher tax burden relates to policy choices made at national level to ensure sustainability and adequacy of social protection systems, including the provision of public healthcare, pensions and welfare systems. However, many Member States are at, or approaching, the point where tax levels are harmful for growth by weakening incentives for both investment and workers to enter the labour market. Progress towards fiscal sustainability therefore needs to ensure greater efficiency of the public sector and quality of public finances, with special attention to growth-enhancing investment, while avoiding tax increases.

PART 2:
STRUCTURAL REFORM PROGRESS – MEMBER FEDERATIONS' ASSESSMENT

As Part 1 of this report demonstrates, a failure to take structural reforms forward has had a significant impact on Europe's competitiveness and in turn on its growth and employment performance.

The potential benefits from reform are huge with the OECD[3] suggesting for example that "if countries were to move to best practice in product and labour market policy settings, aggregate output in the Euro-area could rise by more than 6% by 2025". Such an improvement would almost halve the per capita gap with the US by 2030.

In contrast, if we fail to deliver on growth, this would threaten the sustainability of our European social model and make it difficult to uphold our current welfare state system.

Against that background, this chapter analyses the results of a survey of BusinessEurope member federations regarding reform effort over the year, linked to the European Semester.

I. COUNTRY-SPECIFIC RECOMMENDATIONS

With the launch of the European Semester in 2011, the European Commission undertook a detailed analysis of each country's annual plans for budget, macroeconomic and structural reforms to then provide EU governments with country-specific recommendations (CSRs) for the next 12-18 months.

We carry out an annual survey with BusinessEurope member federations regarding their assessment of the implementation of the European Semester, and in particular the CSRs as developed by the Commission and adopted by the Council.

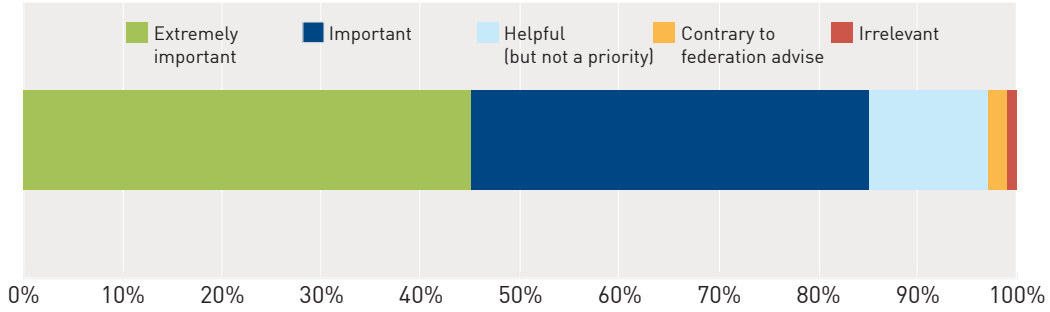
This year's results, as in previous years, show that member federations believe that the CSRs focus predominately on the right issues. As shown in figure 19, our members consider that 85% of the CSRs as extremely important and important and a further 12% as helpful but not a priority.

However, despite the pressing importance of these reforms, Member States are still demonstrating unacceptable implementation levels (fig. 20). Our members find that only 17% of CSRs have been implemented satisfactorily, even poorer than our observations for 2015 (20%) and 2014 (22%). When taking account of the additional proportion of CSRs where mixed (i.e. some) progress has been identified, the figure increases to 62%. But this still leaves 38% of CSRs where progress has been either limited or non-existent.

[3] OECD, "Economic Challenges and Policy Recommendations for the Euro Area". Better Policies Series, 2014.

Figure 19 **Business federations continue to believe CSRs focus on the right issues of reform**

Member federations' assessment of the appropriateness of individual 2016 CSRs



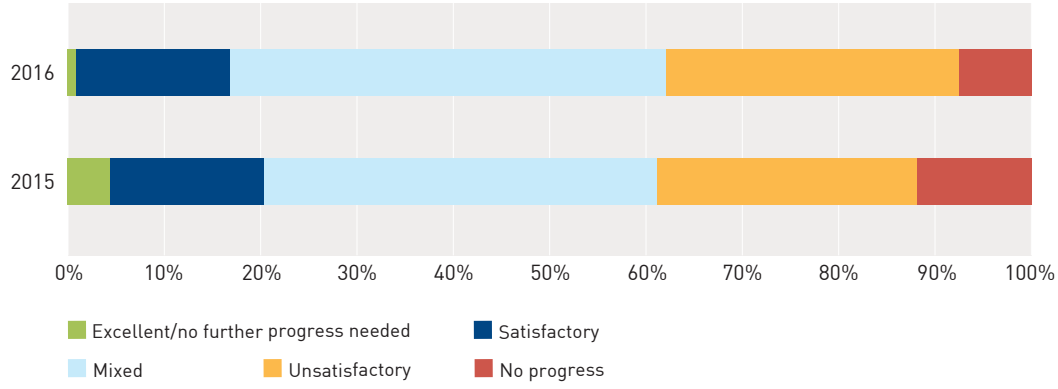
Source: BusinessEurope survey of member federations

A more detailed assessment of the individual country responses (available on the BusinessEurope website) illustrates that whilst in previous years, implementation was generally disappointing, there were often a minority of countries where reform efforts were strong (for example Spain, Italy, Ireland). In 2017, reform effort should be reinforced to avoid that positive effects fall away.

Nevertheless, there remain significant differences in how our members assess reform efforts with business federations in the UK, Netherlands and Ireland more positive about the strength of reform than our member federations in Poland, Greece, Sweden and Germany.

Figure 20 **Business federations point out to an even lower rate of reform implementation by EU Member States**

Member federations' assessment of the effort of Member States to implement individual CSRs



Source: BusinessEurope survey of member federations

II. PROGRESS BY POLICY AREA

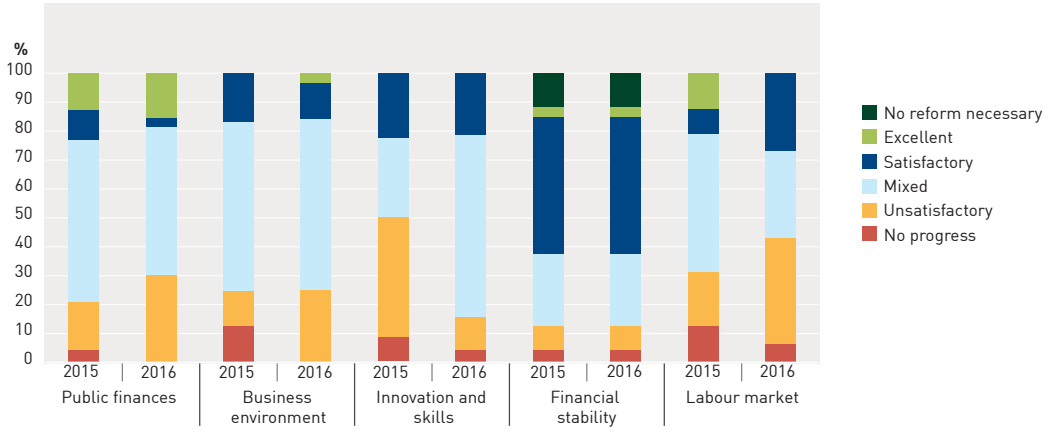
In addition to assessing reform effort in implementing the CSRs, BusinessEurope's member federations have assessed reform progress in five broad policy areas that correspond to the areas analysed in Part 1 of this report (fig 21).

Against the background of a slowing pace of reform in the EU, as highlighted in the previous chapter, business federations are in particular worried about (unsatisfactory) reform in the area of the labour market and public finances.

In contrast, our member federations have noted a considerable improvement in the area of innovation and skills.

Figure 21 **Reform efforts need to be stepped up in particular in the areas of the labour market and public finances**

Member federations' assessment of reform progress by main areas



Source: BusinessEurope survey of member federations

III. PRIORITIES

We have also surveyed our member federations regarding reform priorities for 2017, with the results summarised in figure 22.

Figure 22 **Reform priorities did not change significantly from last year**
Member federations' assessment of priorities for reform in 2017

	Difference from 2016
1. Business environment	+1
2. Tax reforms	-1
3. Labour market mismatch and labour mobility	+1
4. Pension and health care reforms	-1
5. R&D and innovation	=
6. Public-sector efficiency	+1
7. Public investment	+1
8. Market integration - Openness to trade and investment	-2
9. Making work pay: interplay of tax and benefit system	+3
10. Consolidation of public expenditures	=

Source: BusinessEurope survey of member federations

Overall, it is striking that federations maintain very similar reform priorities to those in previous years, with tax reforms and improvements to the general business environment continuing to be key for businesses. Addressing the high cost of doing business and the tax burden are vital in strengthening the internal market, economic growth and job creation. Members have also highlighted the need for active measures in the public sector, concerning its efficiency and investment as well as promoting R&D and innovation.

IV. NEXT STEPS

It is essential that the European Semester has an increased focus on implementation, with the EU using all available tools to support Member States in their reform efforts. We have welcomed the greater prioritisation of CSRs introduced by the Commission in 2015, but this needs to be accompanied by a greater focus on delivery. The country-specific recommendations (CSRs) should be accompanied by a clear roadmap for implementation with specific and measurable milestones.

Finally, the Commission should make full use of the flexibility that exists within the SGP to support and incentivise Member States in implementation structural reforms, particularly where the growth and public finance benefits may take some time to emerge fully.

ANNEX:
IMPROVING THE QUALITY OF EU PUBLIC EXPENDITURE

KEY POLICY RECOMMENDATIONS

- All EU Member States should review the composition of their public expenditure to make it more supportive of growth. No EU country comes close to the US' share of growth-friendly expenditure/ total public expenditure (44%), with an average of 30% in the EU. In absolute terms the US spends a greater proportion (16.8%) of GDP on growth-friendly items than the EU (14.5%), despite having a lower share of public expenditure to GDP.

- The EU must support Member States in making difficult political choices regarding prioritising public investment and growth-friendly investment. It is essential that the SGP gives the full support possible to Member States who wish to orientate their budgets towards investment and growth-supporting expenditure.

- But achieving strong performance in growth-friendly areas such as health and education requires much more than throwing money at the problem. International comparisons show that a number of Member States could be achieving more desirable outcomes in key areas such as education, innovation and infrastructure by improving the efficiency and effectiveness of their spending.

- Drawing on public/private partnerships and opening the provisions of public services to some private sector provision can be an important way to increase the effectiveness of government expenditure and help boost long-term growth.

A combination of low growth, ageing populations, and associated rising pension and health care costs as well as the need for governments to bring down high debt levels are likely to increase pressure on public finances in the years to come.

Ensuring the government expenditure is efficient, and suitably focussed on raising long-term growth will be a major challenge for governments in the coming years.

This box considers the quality of public expenditure in different EU Member States. First, we consider the extent to which EU Member States' public expenditure is focused on growth enhancing areas. Secondly, we examine the efficiency of expenditure in key areas including education, health and research and development in delivering desired outcomes.

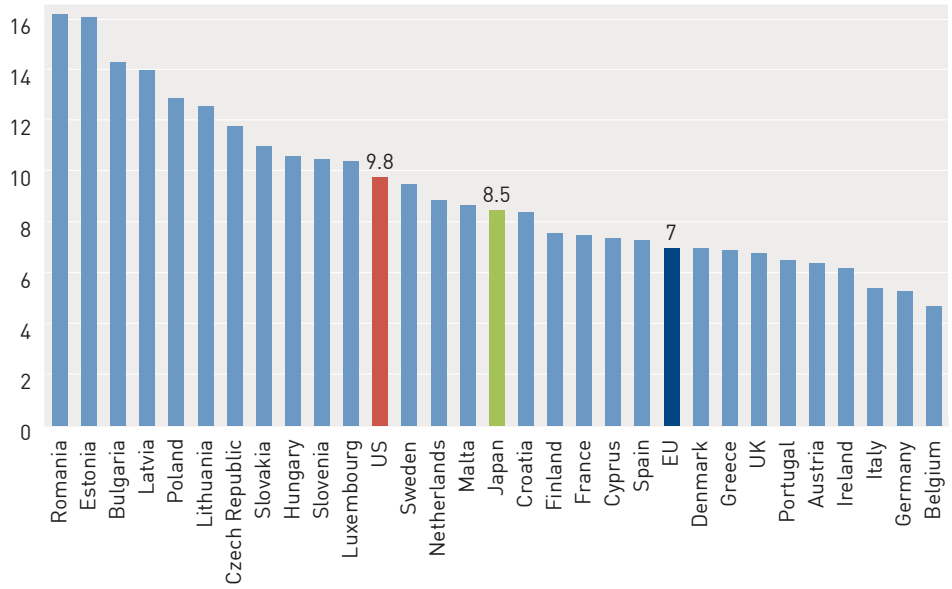
Part 1. **THE COMPOSITION OF PUBLIC EXPENDITURE**

A starting point in considering to what extent the composition of public expenditure is focused on more growth enhancing areas is to consider the proportion that goes towards physical investment. By definition, citizens will only benefit from the use of public investment in the longer term so there is a clear incentive for governments seeking short-term electoral gains to reduce public investment to fund either tax cuts or welfare transfers.

As shown in figure 23, EU (gross) public investment rates as a share of total expenditure (7.0%) lag significantly behind those in both the US (9.8%) and Japan (8.5%). It is also noticeable that a large share of public investment in many of the EU Member States that perform most strongly on this measure is funded in part through EU funds.

Figure 23 **EU public investment as a share of total expenditure lags behind that in the US and Japan**

Average gross public investment as % of total public expenditure in 2010-15



Source: AMECO database

When using net investment rates that take into account capital depreciation, it is a particular concern that a number of EU Member States (Germany, Italy, the Czech Republic and Greece) actually have negative rates.

Moreover, public expenditure is only classified as being investment if it is physical. Current expenditure that is aimed at increasing future output, for example expenditure on teachers or doctors salaries, is classified as consumption rather than investment. To overcome this, statisticians have therefore developed an alternative way of measuring public expenditure according to its function.

Within this classification, economic literature usually regards spending on education (human capital investment), transport and communication (infrastructure investment), R&D (innovation and technological development) as most growth enhancing, with health expenditure also considered by some to be growth-enhancing (see Box 1 for further discussion).

Box 1 What is Growth-friendly public expenditure?

In economic literature spending on education, R&D and public infrastructure is usually considered growth-enhancing, while some studies also include spending on health (e.g. see Barrios S. and Schaechter A. (2008))[4]. Similarly, Irmen A. and Kuehnel J. (2008)[5] note that "it is widely recognized that public expenditure on infrastructure [...] public research spending and the provision of basic education and medical services raises the economic potential of an economy." In a similar vein, a study by Gemmell N., Kneller R. and Sanz I. (2014)[6] provides "strong evidence that reallocating total spending towards infrastructure and education would be positive for long-run income levels [while] increasing the share of social welfare spending (and away from all others pro-rata) may be associated with, at most, modestly lower long-run GDP levels."

This is in line with the methodology used in the Eurogroup Note "Quality of Public Expenditure" (2016), which defines expenditure on education, health, transport and communication and R&D as more growth-friendly as these support growth by improving the economy's endowment of production factors (i.e. labour and capital) as well as their productivity.

- First, education and training, together with other spending categories such as active labour market policies are associated directly with improving human capital and skills.
- Second, spending on health is associated with increasing the lengths of years of healthy life and thereby both the productivity and quantity of labour.
- Third, spending on transport and communication are public infrastructure investment in for example roads and communication networks. They should be particularly beneficial by creating favourable conditions for private investments, but also by addressing market failures.
- Finally, spending of R&D is associated with technological development and innovation, setting the conditions for higher potential growth.

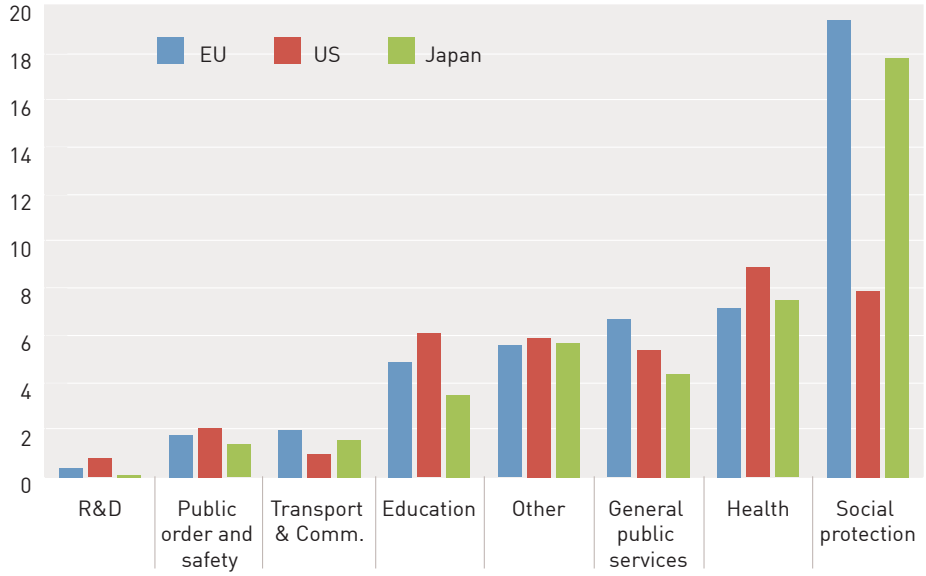
One should however note that there is no uncontroversial list as other categories of expenditure may also contribute to growth, even if in a more indirect way (e.g. public order and the judicial system by ensuring the rule of law and enforcing property rights).[7] In addition, heterogeneity between countries may also impact on the optimal expenditure allocation.

[4] "The quality of public finances and economic growth". Economic Papers 337, European Commission.
[5] "Productive Government Expenditure and Economic Growth". University of Heidelberg.
[6] "Does the composition of government expenditure matter for long-run GDP levels?" University of Oxford.
[7] For a more in-depth discussion see European Commission, "The Quality of Public Expenditures in the EU", Occasional Papers 125, 2012.

As can be seen in figure 24, there is a distinct difference in the composition of public expenditure between the EU and Japan, on the one hand, and the US, on the other, with the US having a much greater focus on education, health and R&D expenditure, compared to the EU's focus on social protection (19% of public expenditure, compared to 8% in the US).

Figure 24 **Social protection is by far the largest expenditure category in the EU and Japan in contrast to the US**

Public expenditure by function (COFOG) in the EU, US and Japan, as % of GDP in 2014



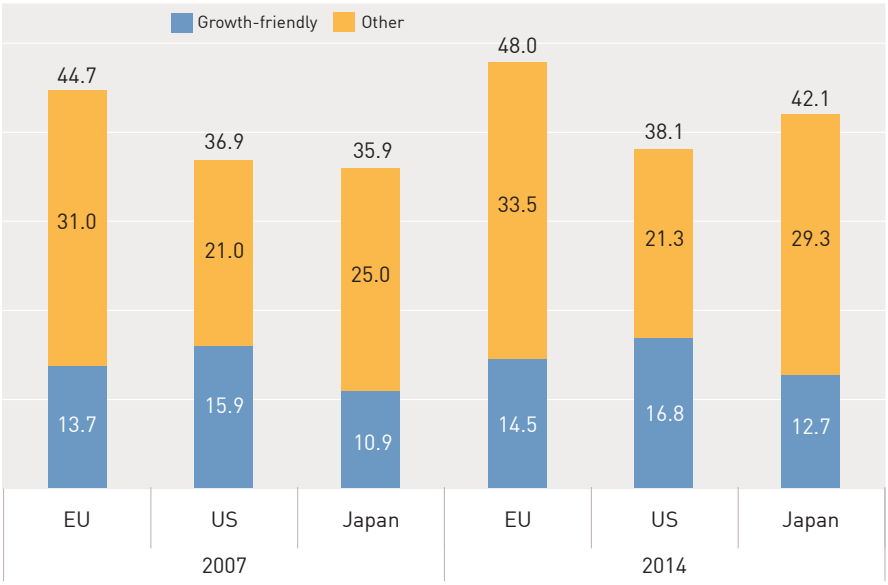
Source: Eurostat and OECD COFOG databases, Bureau of Economic Analysis for US R&D, transport and communication spending

Overall the US spends more as a share of GDP (16.8%) on items considered more growth-friendly than the EU (14.5%) and Japan (12.7%), despite having a lower overall share of public expenditure in GDP (fig 25). More specifically, the US devotes roughly 44% of its public expenditure on growth-friendly items, compared to around just 30% in the EU and Japan.

While the share of public expenditure went up in all of the three economies (even though slightly less in the US), the general pattern holds that even before the financial crisis the US spend already more on growth-friendly items than the EU (15.9% vs. 13.7%).

Figure 25 **The US spends a higher amount on growth friendly-items than the EU and Japan despite overall lower spending**

Public expenditure by function (COFOG) as % of GDP in 2014: More vs. less growth-friendly

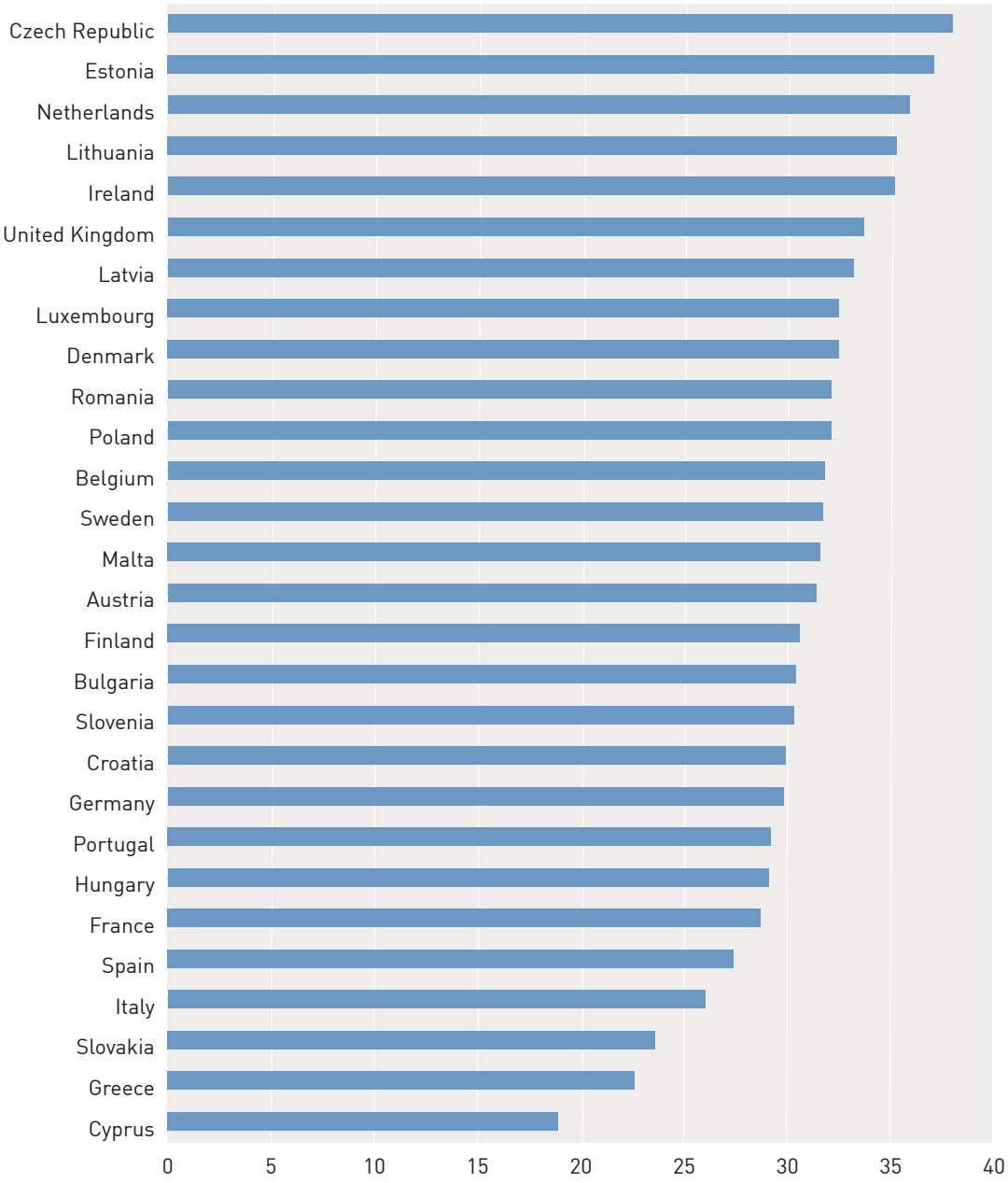


Expenditure assumed to be growth-enhancing: education, R&D, health, transport & communications
Source: Eurostat and OECD COFOG databases, Bureau of Economic Analysis

However, there are large differences between EU countries when it comes to the share of growth-friendly public spending in overall expenditure. While the Czech Republic, Estonia, the Netherlands, Lithuania and Ireland spend more than 35% of their total public expenditure on categories considered more growth-friendly, Slovakia, Greece and Cyprus spend less than 25% in 2014 (fig 26). But no EU Member State comes close to the 44% of the US.

Figure 26 **The share of growth-friendly public spending differs strongly between EU Member States**

Share of growth-friendly public spending in overall spending in 2014, in %



Source: Eurostat COFOG database

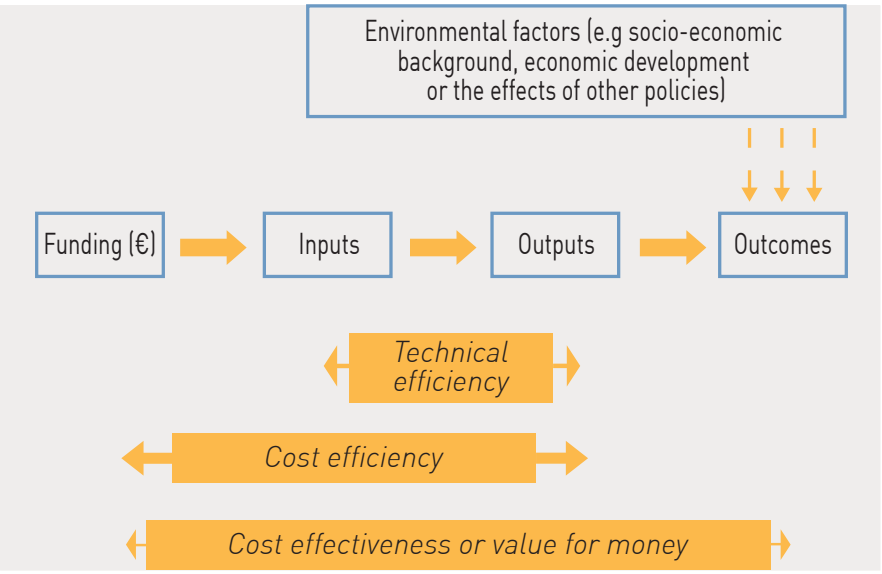
Part 2. **EFFICIENCY OF PUBLIC EXPENDITURES**

Whilst the overall composition of public expenditure is important, it is also critical to look at the efficiency and effectiveness of spending by countries in achieving policy goals.

In this context, as illustrated in figure 27, efficiency relates to the rate at which public expenditure is transformed into outputs such as educational attainment, cured patients or life expectancy. Finally, these outputs should be closely related with a government's ultimate policy objectives (outcomes) such as higher quality of life, faster technical progress or higher labour productivity. Of course, a number of external factors will also impact on outputs and outcomes alongside public expenditure. For example, educational outcomes will clearly be dependent upon the home environment.

Our analysis looks at the efficiency of spending and attempts to choose indicators that are considered relatively strongly affected by spending and less so by environmental factors. The assessment is thus intended to give a broad picture of public expenditure performance in three areas (education, health and R&D) which merits further in-depth discussions.[8]

Figure 27 **The concepts of efficiency and effectiveness**



Source: European Commission Economic Papers 337, September 2008

[8] Our analysis extends on the methodology used in Eurogroup Working Group's note on the "Quality of Public Expenditure" in 2016 and also includes the US and Japan as comparator countries.

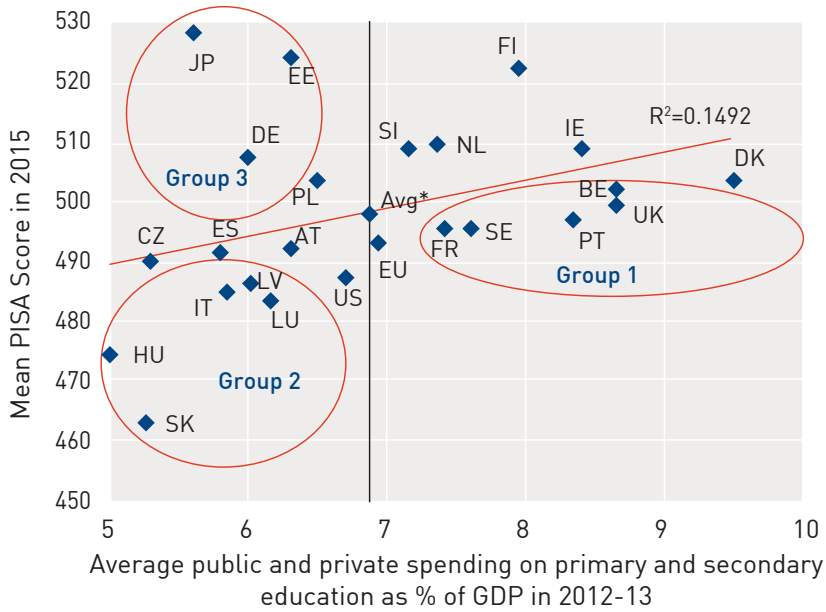
a) Education

As an assessment of the efficiency of spending on primary and secondary education,[9] we consider country performances according to the OECD's PISA 2015 study, which tests around 540 thousand 15-year-old students in 72 countries on science, reading, maths and collaborative problem-solving.[10]

The strong performance of countries such as Japan, Estonia and Germany which devote relatively few resources to education, illustrates that whilst proper funding of education systems is important in developing a highly educated workforce, throwing money at the issue alone will not deliver results, or as the OECD notes "money is necessary to secure high and equitable performance in schools, but is not sufficient".

Figure 28 which compares expenditure to performance suggests on the one hand that a number of countries (group 1) such as Portugal, where performance is below that expected given expenditure, may have the greatest scope for improving the efficiency of their education systems. Similarly, countries in group 2, such as Hungary and Slovakia, have relatively low educational attainment which may be linked to both a lack of expenditure and efficiency, whilst countries in group 3, such as Germany with relatively efficient systems but lower than average expenditure might explore if prioritising a greater share of public expenditure on education can deliver even stronger outcomes.

Figure 28 **Total average spending on education in 2012-13 and countries' average PISA 2015 results**



Source: OECD

[9] We use an average of both public and private spending for this purpose as both are expected to affect education outcome, while their composition is likely to differ between countries.
[10] For our analysis, we calculate countries' mean scores for solely the categories science, reading and maths.

b) Health

To assess the efficiency of health systems we consider both 'amenable death rates' and 'increases life expectancy'. In particular, estimates of amenable mortality, defined as deaths that, in theory, could have been avoided through optimal quality health care, is often proposed as a useful proxy to assess the effectiveness of healthcare systems.[11]

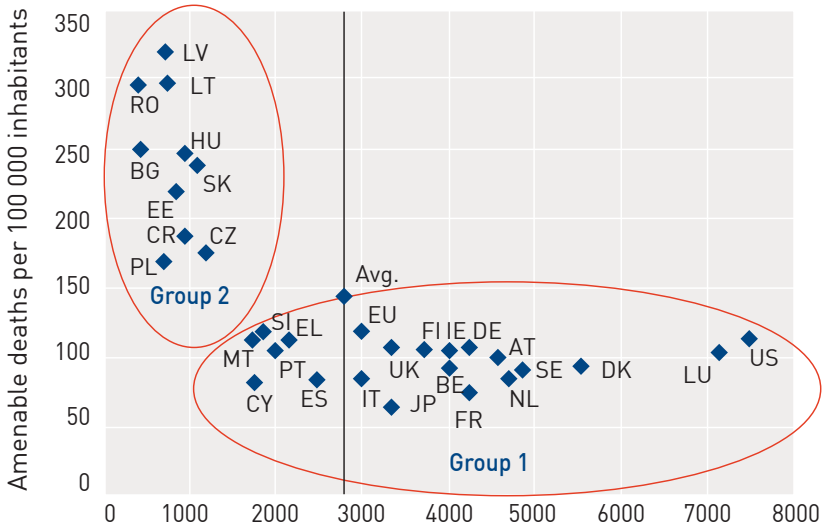
On both measures, two groups of EU countries are apparent, one with relatively low rates of expenditure and outcomes and another with both higher expenditure and stronger outcomes (fig 29 & 30).

Thus whilst shifting from the low outcome to the high outcome group may require significant expenditure, there are also differences in efficiency rates within both of the two groups. For example, within the lower expenditure groups, Poland and Latvia have similar levels of expenditure, but vastly different health outcomes.

Beyond an average per-capita spending of roughly €1,700 per year, the positive impact of simply spending more becomes much less clear, emphasising the importance of how the money is spent. For example, Italy spends about €1,000 less than Belgium per capita and €1,700 less than the Netherlands but has a similar amenable deaths rate and better life expectancy outcome.

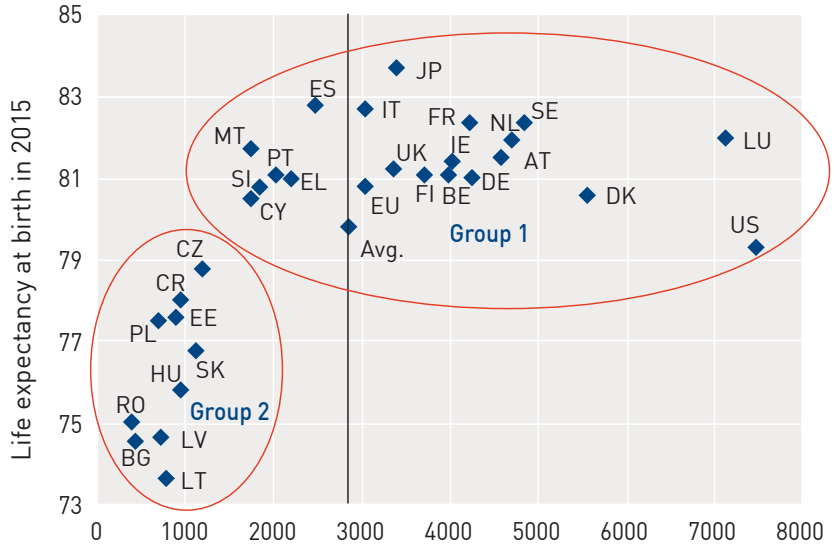
[11] See for example: Fantini M. P., et al. (2012). "Amenable mortality as a performance indicator of Italian health-care services". BMC Health Services Research.

Figure 29 Total average spending on health in 2002-12 and amenable death rates



Source: Eurostat and OECD

Figure 30 Total average spending on health in 2004-14 and average life expectancy at birth in 2015



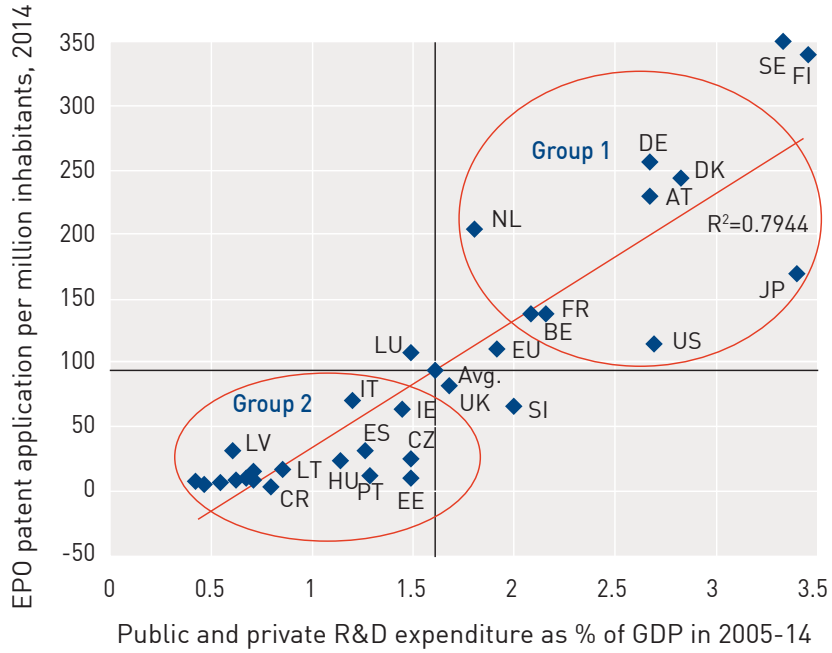
Source: Eurostat and OECD

c) Research and Development

Finally, the number of patent applications per (million) inhabitants is a useful proxy to assess the efficiency of R&D spending. [12] [13]

The results show that there is a pretty strong correlation between R&D expenditure and patent application (R^2 of 0.79) (fig 31). This indicates that those countries with relatively low R&D expenditure shares (group 2) may benefit simply by increasing their expenditure in this area. For those countries in group 1 which spend already above average on R&D, it may still be beneficial to review the efficiency of their spending, with countries showing greater variation within this group.

Figure 31 Public and private R&D spending and EPO patent application



Source: Eurostat & World Bank

[12] Prodan, I. (2005). "Influence of research and development expenditures on number of patent applications: Selected case studies in OECD countries and Central Europe, 1981-2001." Applied Econometrics and International Development.
[13] Again the sum of public and private R&D spending was used instead of just public spending as the output of R&D is also influenced by private spending.

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