CHAPTER 1.5

FRAMEWORK CONDITIONS

Framework conditions have a significant role to play in shaping investment behaviour and the innovation capacity of economies. Favourable framework conditions are expected to positively affect innovative investments and their impact on productivity as they help to allocate and reallocate resources towards innovative activities that support productivity growth.

The definition of good and supportive framework conditions encompasses different dimensions. In this chapter, we characterise and analyse four of those, namely: (1) the existence of robust and well-functioning public institutions; (2) the efficiency of the products market; (3) the functioning of the labour market; and (4) the extent to which financial markets grant access to resources to innovative businesses.

A business environment characterised by over-regulation and inadequate levels of competition will reduce the opportunities to invest and increase the probability of a misallocation of resources which has a negative effect on the ability of innovative companies to grow. For new firms to be created and for non-productive firms to exit the market when they are no longer competitive, institutional and legal settings are crucial as they speed up the process of business creation and destruction. An effective legal framework, coupled with an efficient business environment, sets the right incentives for investment and reduces the scope for rent-seeking behaviour.

Similarly, a well-functioning labour market should facilitate the reallocation of workers towards activities with higher knowledge content and productivity prospects, making it easier for companies to hire and reducing the burden in case of failure. At the same time, job security can positively affect productivity growth via the economy's capacity to attract and retain high-skilled employment, while job losses may be harmful and costly for displaced workers and for their ability to keep up with the skills required in the market. Therefore, a good balance between flexibility, efficiency and security is fundamental.

Last but not least, an efficient reallocation of resources towards more productive activities requires financial markets that work correctly in support of innovative investments, from start-ups to scaling up. Constraints in access to credit for those activities with higher productivity and innovative prospects are harmful for long-term sustainable economic growth, although they may favour the survival of low-productivity but established companies.

CHAPTER I.5-A: THE FUNCTIONING OF INSTITUTIONS

The World Bank's 'Ease of doing business' index ranks economies by the attractiveness of their regulatory frameworks for the creation of new businesses. It encompasses several dimensions of the regulatory environment and provides an aggregate measure of regulations for starting and running a business. The index is expressed as the distance from the frontier on a scale 0-100, where a value of 100 represents the best possible outcome in each single dimension: the higher the aggregate value, the more business-friendly regulations a country has[1].

During the last years, driven by efforts by the EU and its Member States towards deepening the internal market[2,3] and with an increased reform momentum following the crisis, Europe seems to have managed to create more favourable conditions for businesses and a catching-up process can be observed in those Member States distant from the frontier.

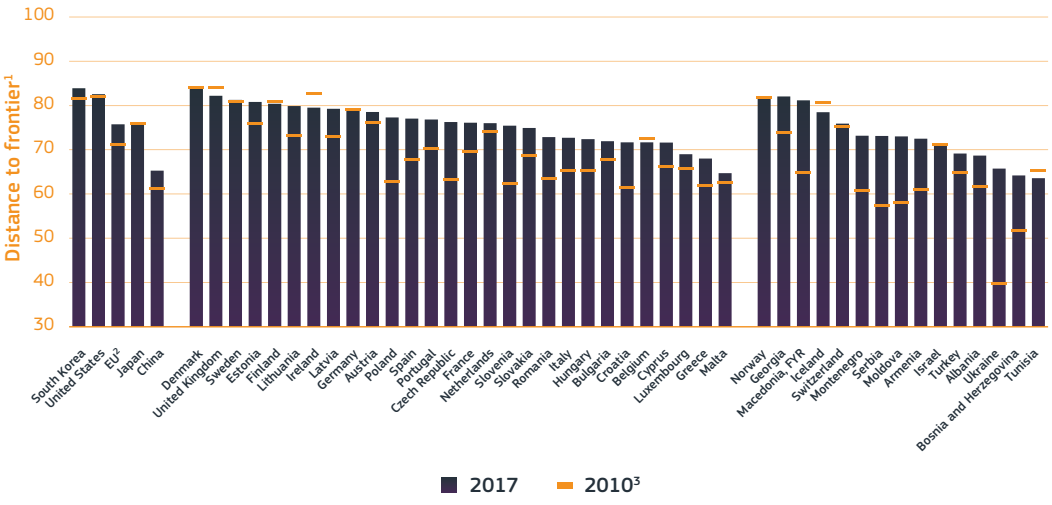
The most significant improvements are visible in eastern European countries, notably those that joined the EU relatively recently, such as Romania (2007), the Czech Republic, Poland, Slovenia and Croatia (2013), hinting at the positive effect of accession to the EU internal market (Figure I.5-A.1). Similarly, the countries most affected by the crisis experienced an improvement in the ease of doing business, with the exception of Ireland. This trend might reflect these countries' efforts to apply market-friendly reforms to the regulatory framework in the years following the latest economic crisis.

1 Please note that the Ease of Doing Business 2018 report was used. In particular, the index is the result of the aggregation of 10 different dimensions, namely: starting a business, dealing with construction permits, getting electricity, registering property, getting credit, protecting minority investors, paying taxes, trading across borders, enforcing contracts, and resolving insolvency. For further details, see: http://www.doingbusiness.org/~/media/WBG/DoingBusiness/Documents/Annual-Reports/English/DB2018-Full-Report.pdf.

2 European Commission (2015). Upgrading the Single Market: more opportunities for people and business, COM(2015) 550 final.

3 For more details and the progress towards the internal market, see Figure I.5-B.11 below.

Figure I.5-A.1 Ease of doing business - distance to frontier (0 = lowest performance to 100 = frontier)[1], 2010 and 2017



Science, Research and Innovation performance of the EU 2018

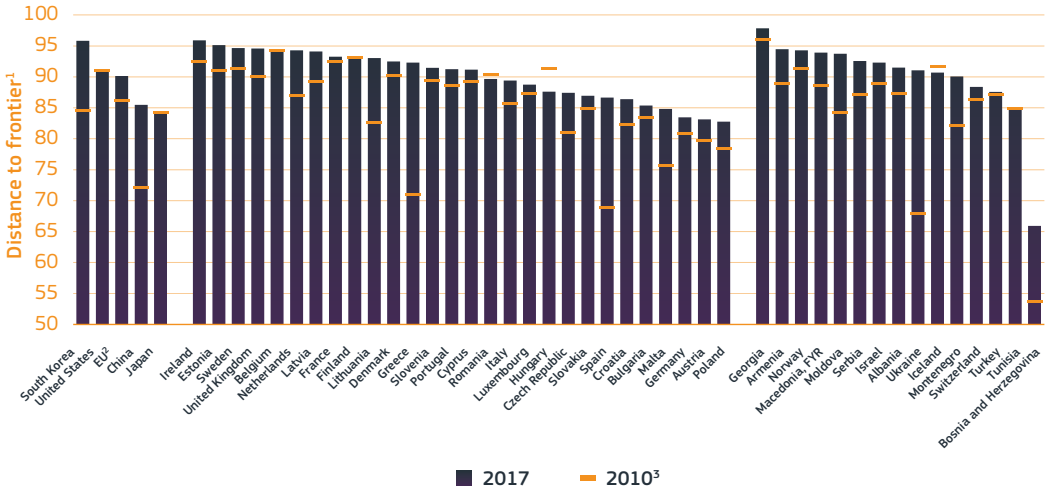
Source: DG Research and Innovation - Unit for the Analysis and Monitoring of National Research and Innovation Policies
Data: Ease of Doing Business Indicator (World Bank)
Notes: [1]The distance to frontier score illustrates the distance of an economy to the 'frontier' which represents the best performance observed across all economies. The highest scores represent the friendliest regulatory environments for doing business. [2]EU is the unweighted average of the available data for Member States and does not include Malta for 2010. [3]MT: 2012; US, JP, CN: 2014.
Stat. link: https://ec.europa.eu/info/sites/info/files/srip/parti/i_5_figures/f_i_5-a_1.xlsx

This is reflected by general improvements in the reduction of costs and bureaucratic burdens to start a business or in simplifying the resolution of insolvency procedures.

With the exception of Hungary, Romania (with a slight decrease), Finland and Belgium (no evolution), all Member States improved their conditions for starting a business, leading to the EU as a whole slowly catching up with the United States, while both have been overtaken by South Korea. This trend is shown in Figure I.5-A.2, which plots the World Bank indicator measuring the costs, time and number of procedures needed to set up a company, which is one of the 10 dimensions used to compose the aggregate ease of doing business index. Compared to 2010, an overall improvement can be observed across almost all European economies, without the emergence of a clear divide within the EU.

The EU has also achieved significant improvements in facilitating the procedures to allow businesses to leave the market, with a slow catch-up process to leading countries such as Japan, South Korea and the United States, as well as associated countries such as Norway and Iceland. Furthermore, a convergence trend can be observed within the EU. Indeed, while Eastern and Southern Member States show significant progress (with the exception of Lithuania), the Northern and Central European countries, like Finland, Denmark, Belgium, the Netherlands, the UK, Sweden and Ireland, show a relative decline in the efficiency of their insolvency proceedings. The trend is shown in Figure I.5-A.3, which plots the corresponding dimension of the World Bank index.

Figure I.5-A.2 Ease of starting a business - distance to frontier (0 = lowest performance to 100 = frontier)[1], 2010 and 2017



Science, Research and Innovation performance of the EU 2018

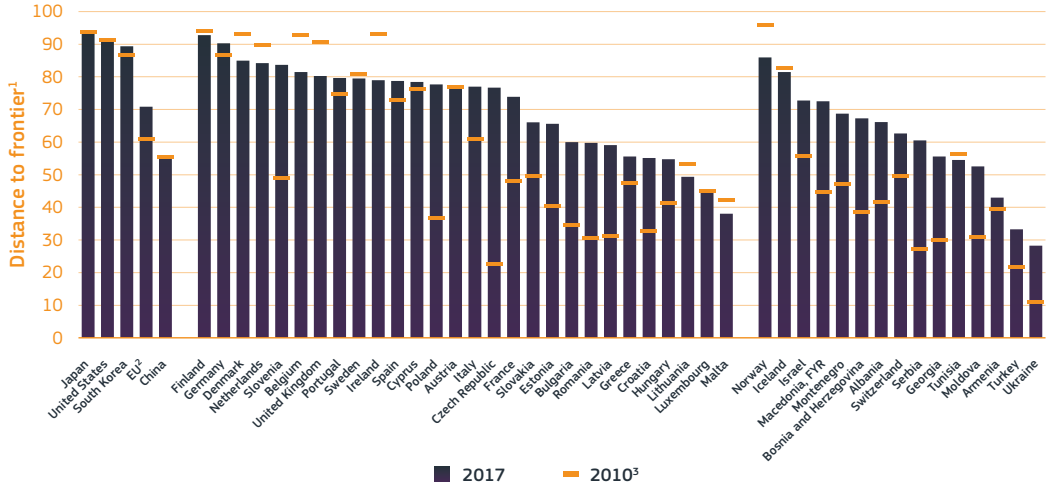
Source: DG Research and Innovation - Unit for the Analysis and Monitoring of National Research and Innovation Policies

Data: Ease of Doing Business Indicator (World Bank)

Notes: [1]The distance to frontier score illustrates the distance of an economy to the 'frontier' which represents the best performance observed across all economies. The highest scores represent the friendliest regulatory environments for incorporating and formally operating a business. [2]EU is the unweighted average of the available data for Member States and does not include Malta for 2010. [3]MT: 2012; US, JP, CN: 2014.

Stat. link: https://ec.europa.eu/info/sites/info/files/srip/parti/i_5_figures/f_i_5-a_2.xlsx

Figure I.5-A.3 Ease of resolving insolvency - distance to frontier (0 = lowest performance to 100 = frontier)[1], 2010 and 2017



Science, Research and Innovation performance of the EU 2018

Source: DG Research and Innovation - Unit for the Analysis and Monitoring of National Research and Innovation Policies

Data: Ease of Doing Business Indicator (World Bank)

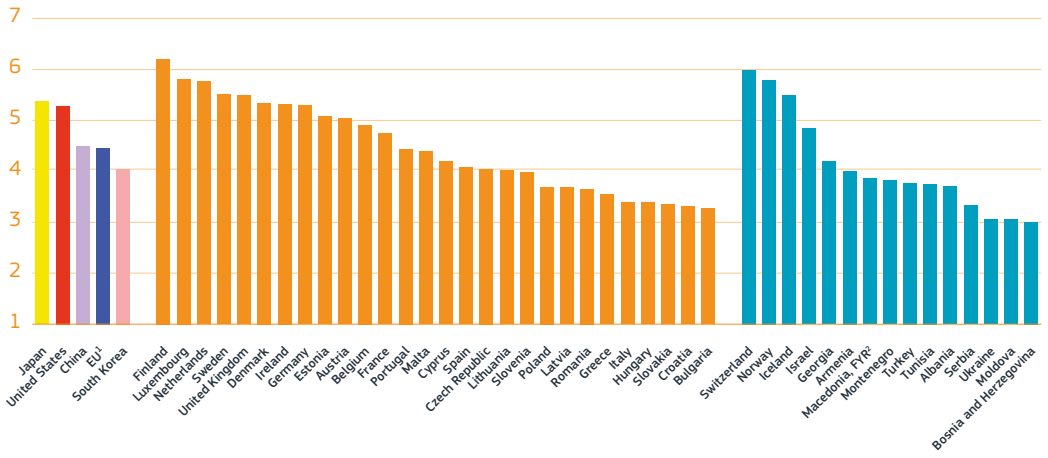
Notes: [1]The distance to frontier score illustrates the distance of an economy to the 'frontier' which represents the best performance observed across all economies. The highest scores represent the easiest regulatory environments for resolving insolvency. [2]EU is the unweighted average of the available data for Member States and does not include Malta for 2010. [3]MT: 2012; US, JP, CN: 2014.

Stat. link: https://ec.europa.eu/info/sites/info/files/srip/parti/i_5_figures/f_i_5-a_3.xlsx

However, significant improvements can still be made to raise businesses' perception of the efficiency of public institutions in the EU. a clear divide can be observed between the Northern European countries and the Southern and Eastern ones.

According to business opinion, expressed in a yearly survey by the World Economic Forum, public institutions in the EU perform significantly less well than in Japan, the United States, Switzerland, Norway, Iceland and Israel, but only slightly below China (Figure I.5-A.4). Only Finland ranks higher than all these extra-EU countries, while Luxembourg, the Netherlands, Sweden and the UK perform better than Japan and the United States but still fall short of Switzerland. The index encompasses, amongst others, questions relating to government efficiency and trustworthiness, the perceived bureaucratic burdens imposed by regulation and the efficiency of the legal framework. While most of these burdens are not directly linked to entrepreneurship, they are signs that businesses perceive public processes as more cumbersome and riskier in Southern and Eastern European countries, which may have an impact on investment decisions.

Figure I.5-A.4 Global Competitiveness Index - public institutions, 2017
values are on a scale of 1 to 7 (best)



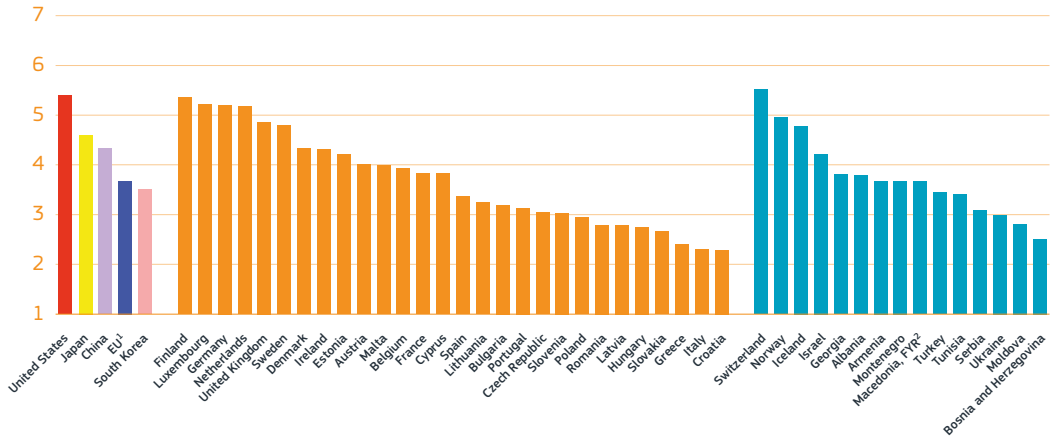
Source: DG Research and Innovation - Unit for the Analysis and Monitoring of National Research and Innovation Policies
Data: World Economic Forum. The Global Competitiveness Index dataset 2017-2018
Notes: [1]EU is the unweighted average of the values for the EU Member States. [2]MK: 2016.
Stat. link: https://ec.europa.eu/info/sites/info/files/srip/parti/i_5_figures/f_i_5-a_4.xlsx

The perceived underperformance of public institutions is mirrored and driven by perceived inefficiencies at the government level, a sub-indicator of the aforementioned public institutions index.

Again, if we examine an indicator measuring perception regarding the efficiency of governments, northern EU Member States outperform the eastern and northern and central European countries. The EU as a whole also ranks behind the United States, Japan, China, Switzerland, Norway, Iceland and Israel, and to a lesser extent behind Georgia and Albania, too (Figure I.5-A.5).

Next to the burdens perceived at the public institutions level, the strength of the legal system appears crucial in providing regulatory safety for firms to rely on, and thereby for reducing the risk to open a business in a particular country. The World Bank constructed an indicator in which the time required for and the costs associated with enforcing a contract are estimated with equal weight, as well as the overall quality of the judicial system based on a set of 'good practices'[4] measures.

Figure I.5-A.5 Global Competitiveness Index - government efficiency, 2017 values are on a scale of 1 to 7 (best)



Science, Research and Innovation performance of the EU 2018

Source: DG Research and Innovation - Unit for the Analysis and Monitoring of National Research and Innovation Policies
Data: World Economic Forum. The Global Competitiveness Index dataset 2017-2018
Notes: [1]EU is the unweighted average of the values for the EU Member States. [2]MK: 2016.
Stat. link: https://ec.europa.eu/info/sites/info/files/srip/parti/i_5_figures/f_i_5-a_5.xlsx

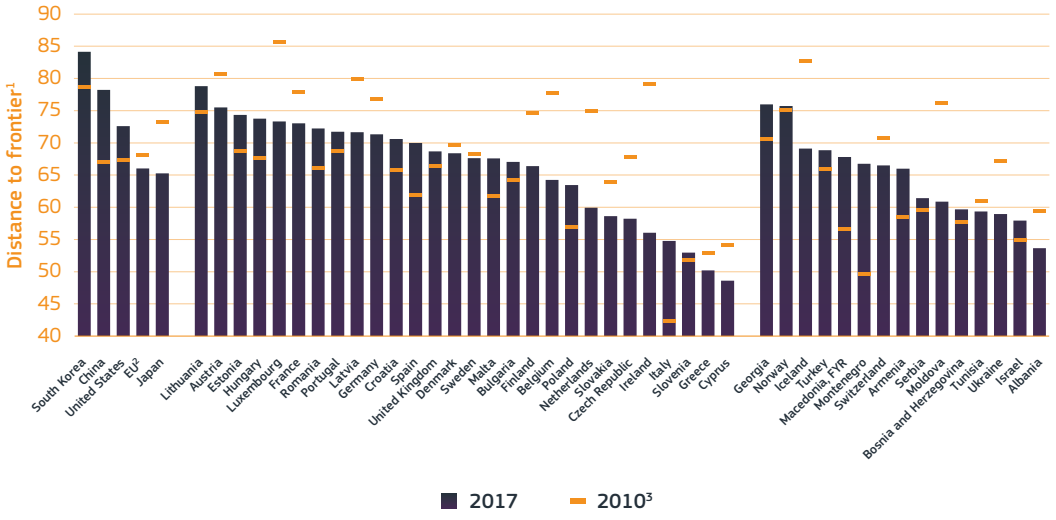
4 'Good practices' are measured based on the evaluation of the availability of a specific list of regulations, services or standards in a judicial system, as defined by the World Bank for the doing business index. It covers four areas: court structure and proceedings, case management, court automation, and alternative dispute resolution.
See: http://www.doingbusiness.org/Methodology/Enforcing-Contracts

A decline in the EU performance on the contract enforcement indicator shows that it falls even further behind South Korea, China, the United States, Norway, Switzerland and Iceland than seen in previous indicators. Convergence, although driven by an aggregate negative trend, can be observed across Member States as the gap between the best performers and the followers has been decreasing over time.

While central European countries are increasing their distance from the frontier, with the biggest gap being visible for Ireland, the Netherlands, Belgium and Luxembourg, the countries in the periphery are catching up, with some exception such as Greece and Cyprus in the south, or the Slovak Republic, Latvia and the Czech Republic in the east (Figure I.5-A.6). Overall, the convergence process within the EU is not driven by a generalised improvement across all countries, but by both a catching up of some of the laggards and a decline in performance of some of the Member States closer to the frontier.

Summing up, the above analysis shows an overall positive evolution of the institutional and legal framework for businesses in the EU. Driven by efforts made to deepen the internal market and pushed by the necessity to make significant reforms in the years following the crisis, the EU's improvement in the ease of doing business index can be explained via the catching up of some Member States which have made significant efforts, amongst others, to ease conditions to start and run business or for companies to leave the market. However, heterogeneity in the efficiency of the legal system persists, and differences in public institutions are still an important factor for explaining the divide between Member States. This underlines the importance for the EU and its Member States to continue their reform efforts and strive to deepen the internal market. Overall, further improvements across all dimensions will be beneficial to the EU as a whole and will contribute to narrowing the gap with international competitors.

Figure I.5-A.6 Ease of enforcing contracts - distance to frontier (0 = lowest performance to 100 = frontier)[1], 2010 and 2017



Science, Research and Innovation performance of the EU 2018

Source: DG Research and Innovation - Unit for the Analysis and Monitoring of National Research and Innovation Policies

Data: Ease of Doing Business Indicator (World Bank)

Notes: [1]The highest scores represent the easiest regulatory environments for enforcing contracts. [2]EU is the unweighted average of the available data for Member States and does not include Malta for 2010. [3]MT: 2012; US, JP, CN: 2014.

Stat. link: https://ec.europa.eu/info/sites/info/files/srip/parti/i_5_figures/f_i_5-a_6.xlsx

CHAPTER I.5-B: THE FUNCTIONING OF GOODS, LABOUR AND CAPITAL MARKETS

Product market efficiency

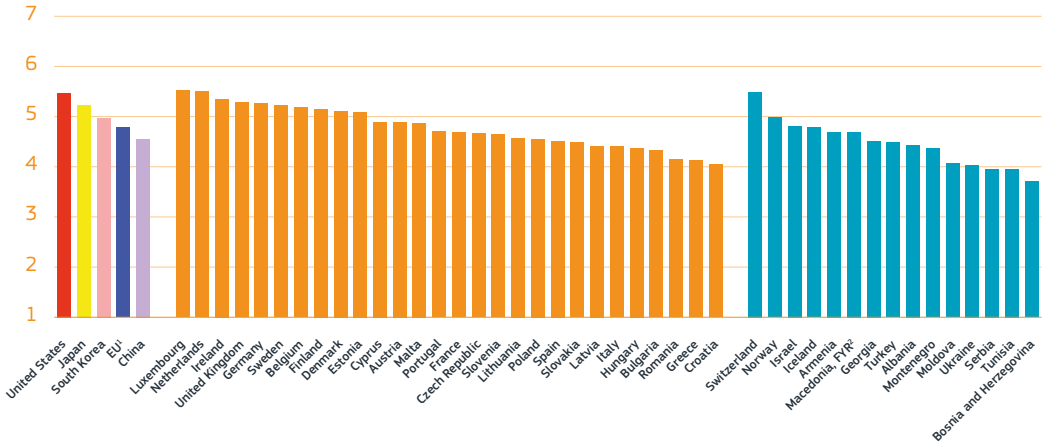
Overall, goods markets are less efficient in the EU compared to the United States, Japan and South Korea, although there are large differences across Member States, with the best-performing countries scoring higher than the United States and many of the Eastern and Southern European economies lagging behind.

Figure I.5-B.1 presents a measure of "goods market efficiency" developed by the World Economic Forum. It is a composite index resulting from the aggregation of 16 indicators from different sources, encompassing the different aspects defining the functioning of the market[5]. Overall, the different indicators can be broadly classified into four main dimensions: the regulatory framework, competition, taxation and demand. The aggregate index provides a summary measure of the efficiency of the market, with the value 7 given to the most- and 1 to the least-efficient markets.

The market is relatively less efficient in countries in the periphery. In the south, Greece, Italy and Spain register among the lowest values, while Portugal is just below the EU average. Among the Eastern European countries, Estonia performs well above average, while others such as Croatia, Romania, Bulgaria and Hungary are at the bottom of the distribution. Among the associated countries, Switzerland and Norway are characterised by a high level of efficiency.

To better understand the driving forces behind the aggregate index, the specific domains underlying the overall performance will be analysed in the rest of this section.

Figure I.5-B.1 Global Competitiveness Index - goods market efficiency, 2017
values are on a scale of 1 to 7 (best)



Science, Research and Innovation performance of the EU 2018

Source: DG Research and Innovation - Unit for the Analysis and Monitoring of National Research and Innovation Policies
Data: World Economic Forum. The Global Competitiveness Index dataset 2017-2018
Notes: [1]EU is the unweighted average of the values for the EU Member States. [2]MK: 2016.
Stat. link: https://ec.europa.eu/info/sites/info/files/srip/parti/i_5_figures/f_i_5-b_1.xlsx

5 For further details on this and following indicators from the Global Competitiveness Index, refer to the Methodological Appendix and to http://reports.weforum.org/global-competitiveness-index-2017-2018/appendix-a-methodology-and-computation-of-the-global-competitiveness-index-2017-2018/

Competition

Competitive markets constitute a level playing field that allows different companies to compete equally, and the most productive ones to enjoy the returns on their investment. Competition promotes equal opportunities for all businesses in the market by reducing the barriers protecting incumbent firms and providing newcomers with an incentive to invest.

The most competitive firms can grow, while the least efficient and productive exit the market, favouring an efficient reallocation of resources and boosting aggregate productivity growth. Higher competition is also a direct source of innovation. a larger number of competitors increase the probability of innovations taking place, providing incentives to incumbent firms to innovate, invest in R&D and adopt technology to "escape competition" and maintain their rents[6]. This argument is very intimately linked to the concept of entry of new firms which are supposed to bring disruptive ideas and technologies that are going to change and/or create new markets[7].

The degree of competition in the EU is lower than in Japan, the United States and China, but slightly above that in South Korea. The landscape in Europe is diverse and clear differences persist between core and peripheral countries.

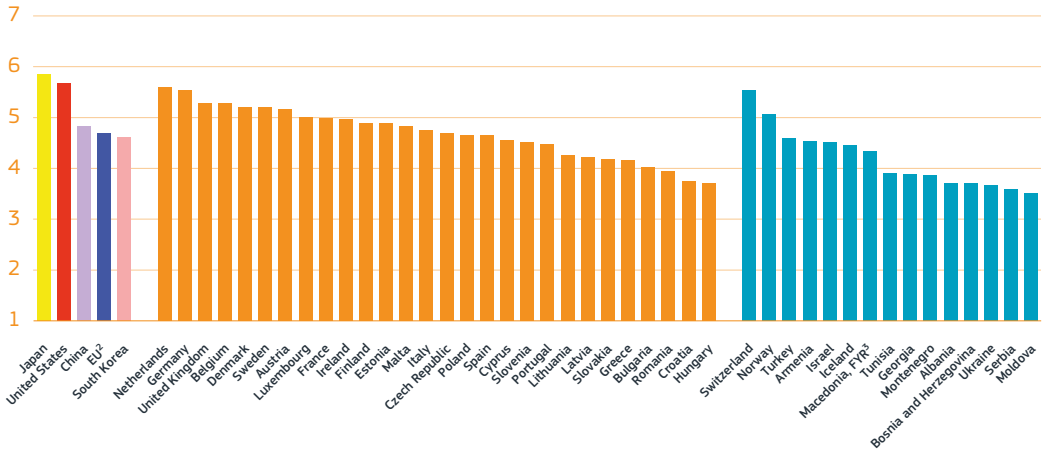
Figure I.5-B.2 plots a summary index of competition, built by aggregating three indicators from the WEF Global Competitiveness Index. In particular, the graph considers the average between the following measures: i) intensity of local competition; ii) extent of market do-minance; and iii) effectiveness of anti-monopoly policy. The index is built on survey data and registers a value of 7 when competition is seen as intense and 1 when it is perceived as very low. The eastern economies are characterised by less-competitive markets, with the notable exception of Estonia which performs above the EU average. Southern Member States take an intermediate position, with Greece lagging behind. Among the associated countries, Switzerland and Norway outperform the others and the EU, too. The level of competition in China's goods market is slightly above that in the EU, while both countries are still considered to be less competitive than in Japan and the United States[8].

6 Aghion, P. and Griffith, R. (2008). Competition and growth: reconciling theory and evidence. MIT press.

7 Cohen, W.M. (2010). Fifty years of empirical studies of innovative activity and performance. Handbook of the Economics of Innovation, 1, 129-213.

8 The lower performance was estimated according to the OECD Product Market Regulation Index. See European Commission (2016, p. 91).

Figure I.5-B.2 Global Competitiveness Index - competition environment[1], 2017
values are on a scale of 1 to 7 (best)



Science, Research and Innovation performance of the EU 2018

Source: DG Research and Innovation - Unit for the Analysis and Monitoring of National Research and Innovation Policies

Data: World Economic Forum. The Global Competitiveness Index dataset 2017-2018

Notes: [1]The indicator is the unweighted average of the following three sub-indicators: 6.01 Intensity of local competition, 6.02 Extent of market dominance, and 6.03 Effectiveness of anti-monopoly policy. [2]EU is the unweighted average of the values for the EU Member States. [3]MK: 2016.

Stat. link: https://ec.europa.eu/info/sites/info/files/srip/parti/i_5_figures/f_i_5-b_2.xlsx

Excessive market concentration can also reduce investment when new entrants' prospects of future competition are low. This is particularly true in markets with a winner-takes-most structure.

The rise of superstar firms may hinder current and future investments in industries where market shares are relatively too high, i.e. concentration rises and competition falls. Concentration in sales and employment, measured as the share of the largest companies in each sector, has been increasing across US industries since 1980. For instance, the top 20 companies account for more than 70% of sales in manufacturing, over 60% in finance, and 64% and 55% in transportation and wholesale trade, respectively[9]. While this trend is also correlated with firms' multifactor productivity growth, suggesting technological gains, excessively low entry rates due to low competition may reduce the need of incumbents to invest more to stay competitive. Recent evidence suggests that greater concentration has reduced investment rates in the United States over the last 30 years, while at the same time increasing profit rates[10] and reducing the labour share[11]. Resources and employment have been reallocated between companies favouring those winning firms which enjoy increased market shares, with an overall rise in profits and a reduction in labour share.

9 Dorn, D., Katz, L.F., Patterson, C. and Van Reenen, J. (2017). Concentrating on the Fall of the Labor Share. *American Economic Review*, 107(5), 180-85. See also Chapter I.1 in this Report.

10 Gutiérrez, G. and Philippon, T. (2016). Investment-less growth: an empirical investigation. NBER Working papers, n.22897.

11 Autor, D., Dorn, D., Katz, L.F., Patterson, C. and Van Reenen, J. (2017). The fall of the Labor Share and the rise of Superstar firms. IZA Discussion Paper Series, n.10756.

Intellectual property rights protection

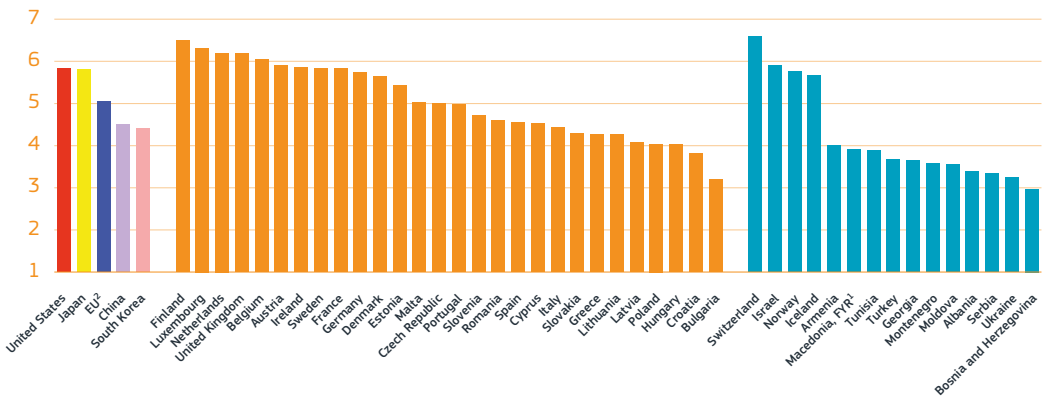
While competition is a driving force behind productivity growth and an efficient reallocation of resources, securing the returns on investment to those companies which engage in innovative projects is crucial to guarantee a proper set of incentives.

Investing in risky R&D projects is indeed a process with uncertain outcomes and one that requires adequate financial means. R&D activities are often characterised by non-excludability and potential spillover effects to competitors in the wider economy. Therefore, benefits act as leverage for innovation and call for a balance between adequate framework conditions that ensure a competitive market economy and the protection of intellectual property rights.

Intellectual property rights protection in the EU is higher than in South Korea and China, but lags behind Japan and the United States.

Within Europe, several countries have better protection than Japan, Finland being the best performer, followed by Luxembourg, the Netherlands and the UK (Figure I.5-B.3[12]). There are significant differences between Member States. In the periphery, countries' intellectual property rights protection is perceived as weaker. In Bulgaria, for instance, the index scores around half of that reported for Finland, while Estonia and the Czech Republic perform better, just below Germany and Denmark. For associated countries, intellectual property rights protection is weaker than in the EU, with the exception of Switzerland, Israel, Norway and Iceland which perform at a similar level to the highest European standards.

Figure I.5-B.3 Global Competitiveness Index - intellectual property protection, 2017 values are on a scale of 1 to 7 (best)



Science, Research and Innovation performance of the EU 2018

Source: DG Research and Innovation - Unit for the Analysis and Monitoring of National Research and Innovation Policies

Data: World Economic Forum. The Global Competitiveness Index dataset 2017-2018

Notes: [1]MK: 2016. [2]EU is the unweighted average of the values for the EU Member States.

Stat. link: https://ec.europa.eu/info/sites/info/files/srip/parti/i_5_figures/f_i_5-b_3.xlsx

12 Effective intellectual property rights protection is measured here via a survey for business representatives. See World Economic Forum (2017). The Global Competitiveness Index dataset 2016-2017, for further details.

Labour market efficiency

Efficient labour markets that reduce frictions in the allocation of the workforce towards more innovative and productive activities, within and across sectors and firms, are crucial to foster innovation.

New emerging sectors may require new competences or a greater supply of highly skilled workers to move from less to more productive activities or companies. An efficient labour market should facilitate this reallocation process, making it easier for companies to hire and reducing the burden in case of failure. In addition, in a market economy the growth of real wages should follow productivity developments, while labour taxation should not be detrimental to work and business activities. Similar to the conditions in the goods market, the above arguments are particularly relevant for sectors that are knowledge-intensive, characterised by riskier investments and more uncertainty in the results, while the speed of change in the technological content is faster.

Flexible employment relationships can enhance the ability of firms to adapt quickly to changes in the market and respond better to demand fluctuations, especially for small firms or new entrants. Furthermore, the capacity to attract and retain talent and inclusive labour markets contributes to boosting an economy's innovation potential.

Excessive rigidities, such as hiring and firing practices which are too burdensome and high redundancy costs, may hinder the efficient allocation of the labour force, affect the innovation potential of the economy and eventually productivity growth, especially for new innovative firms[13]. Similarly, high taxation on labour can negatively affect the incentives to hire and to work, while a country which is unable to attract and retain highly skilled workers will have a lower innovation potential and reduced prospects of productivity growth. Figure I.5-B.4 shows the degree of efficiency in the labour market. The indicator used is one of the components of the Global Competitiveness Index and accounts for several labour market characteristics, including the flexibility of wage determination, hiring and firing practices, redundancy costs, the link between wages and productivity, the effect of taxation on incentives to work, the alignment between productivity and wages, the inclusion of women in the labour force, and the capacity of countries to attract and retain human capital[14]. Overall, the aim of the index is to define the efficiency of the labour markets by including indicators of flexibility and the efficient use of human capital.

The degree of labour market efficiency in the EU ranks behind that of the United States, Japan and China, but performs slightly better than South Korea. Switzerland, Norway and Iceland are the best performers among the associated countries. Within the EU, the labour markets in the periphery are perceived as less efficient than those in core countries, with the exception of Latvia, Estonia and the Czech Republic.

The UK and Denmark rank at the top of the distribution, followed by the Netherlands and Germany. Italy and Greece are at the bottom, despite the recent reforms after the last economic crisis. In particular, reforms to increase labour market flexibility have been undertaken to reduce the segmentation between temporary and open-ended contracts, reducing the cost and uncertainty of dismissals in Spain[15],

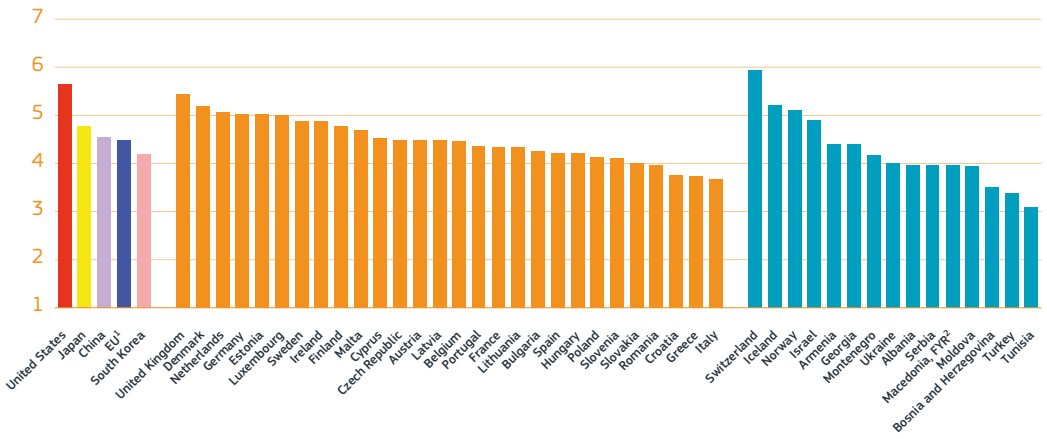
13 See Andrews, D. and Criscuolo, C. (2013). Knowledge-based capital, innovation and resource allocation. OECD Economic Department Working Papers, (1046), 0_1, and Andrews, D., Criscuolo, C., Menon, C. (2014). Do resources flow to innovative firms? Cross country evidence from firm level data. OECD. Economics Department Working Papers.

14 The overall indicator comprises 10 variables, eight of which were obtained via a survey among business representatives.

15 See European Commission (2017a). Country Report Spain.

Italy[16] and Portugal[17]. The relatively low score in Figure I.5-B.4 is mainly due to the low participation of women in the labour market, the effect of taxation on workers' incentives, and the inability to attract and retain talents[18]. Furthermore, these factors more than counteract the flexibility of wage determination characterising labour markets in eastern economies.

Figure I.5-B.4 Global Competitiveness Index - labour market efficiency, 2017 values are on a scale of 1 to 7 (best)



Science, Research and Innovation performance of the EU 2018

Source: DG Research and Innovation - Unit for the Analysis and Monitoring of National Research and Innovation Policies

Data: World Economic Forum. The Global Competitiveness Index dataset 2017-2018

Notes: [1]EU is the unweighted average of the values for the EU Member States. [2]MK: 2016.

Stat. link: https://ec.europa.eu/info/sites/info/files/srip/parti/i_5_figures/f_i_5-b_4.xlsx

At the same time, as far as possible, policy should ensure the security of employment and the adoption of effective active labour market policies to reduce the economic and social impact of job losses, and favour retraining and the potential reinstatement of displaced workers.

Indeed, the overall aim is to increase efficiency and to shift the burden of market functioning from firms and workers to society as a whole, for instance by promoting flexicurity policies, and not to reduce workers' bargaining power and job security per se. Indeed, while flexible labour markets may have a positive effect on the efficient allocation of the labour force, job security can positively affect productivity growth via the capacity of an economy to attract and retain high-skilled[19] employment[20]. In addition, jobs losses are harmful and costly for displaced workers, especially those whose skills endowment becomes obsolete, youth and women[21].

16 See European Commission (2017b). Country Report Italy.

17 See European Commission (2017c). Country Report Portugal.

18 In addition, given that the indicator is built based on a survey and therefore opinion-based, the 'perceived' effects of the reforms might only be visible with a time lag once the changes have had time to take full effect.

19 Education and training play a crucial role in the labour reallocation process. See European Commission (2017d). Reflection paper on the deepening of the economic and monetary Union.

20 Égert, B. (2016). Regulation, Institutions, and Productivity: New Macroeconomic Evidence from OECD Countries. *American Economic Review*, 106(5), 109-113.

21 OECD (2016a). OECD employment outlook. Technical report, OECD, Paris.

BOX 6: Reform fatigue: slowdown in reform adoption

The speed of reforms, which was significant notably for Eastern European and other countries hit hardest by the crisis, seems to have slowed down, losing momentum and signalling reform fatigue.

As can be observed throughout the sections on legal, institutional, product and labour market indices, the overall evolution of framework conditions to conduct business has been positive, although as the worst of the financial and economic crisis is now over, the question is whether the momentum can be maintained. First, the overall positive trend for the EU as a whole hides significant differences between Member States and between different policy areas. While the period immediately following the crisis brought institutional and market pressures providing the necessary momentum for engaging in reforms throughout the EU, a slowdown in policy actions can be observed in recent years, as reported in the yearly policy reform analysis 'Going for Growth' produced by the OECD.

The report provides an index on the reform responsiveness of countries, based on the set of policy priorities understood as necessary to improve business conditions and favour growth. In particular, the assessment is based on a qualitative index being the ratio between the number of policy areas in which reform efforts have been undertaken and the total policy areas identified by the OECD. In the 2017 report[22], a slowdown in the reform responsiveness rate can be observed when comparing the 2015-2016 and the 2013-2014 time periods, even though once again significant differences and opposite trends are visible across the Member States (Figure A). The slowdown is more prominent among those countries which have made the greatest efforts in recent years, such as Greece, Ireland, Portugal, Poland and Spain. However, an acceleration in reform progress can even be seen in some central European countries (Belgium, Austria and France), as well as in Italy. While the negative trend could be due to the efforts needed to implement some of the more cumbersome reforms, it might also hint at more general reform fatigue in some Member States. This can be shown by comparing the responsiveness rates computed in the 2012 OECD report[23] in the period 2010-2011 with those observed in 2015-2016.

Figure B shows that most Member States' efforts have declined compared to the years closer to the crisis, as have those of countries such as the United States and South Korea. Similarly, most of those countries which increased their efforts had a relatively low responsiveness rate in 2010-2011. Now that the perceived pressure on governments to implement changes has declined, it is even more important for the Member States to continue to improve business conditions, enabling an efficient allocation of resources towards the more productive companies and sectors.

22 OECD (2017a), Economic Policy Reforms 2017: Going for Growth, OECD Publishing, Paris: http://dx.doi.org/10.1787/growth-2017-en

23 OECD (2012a), Economic Policy Reforms 2012: Going for Growth, OECD Publishing, Paris: http://dx.doi.org/10.1787/growth-2012-en

Figure A Responsiveness to *Going for Growth* priorities and fiscal consolidation effort, 2010-2011 and 2015-2016

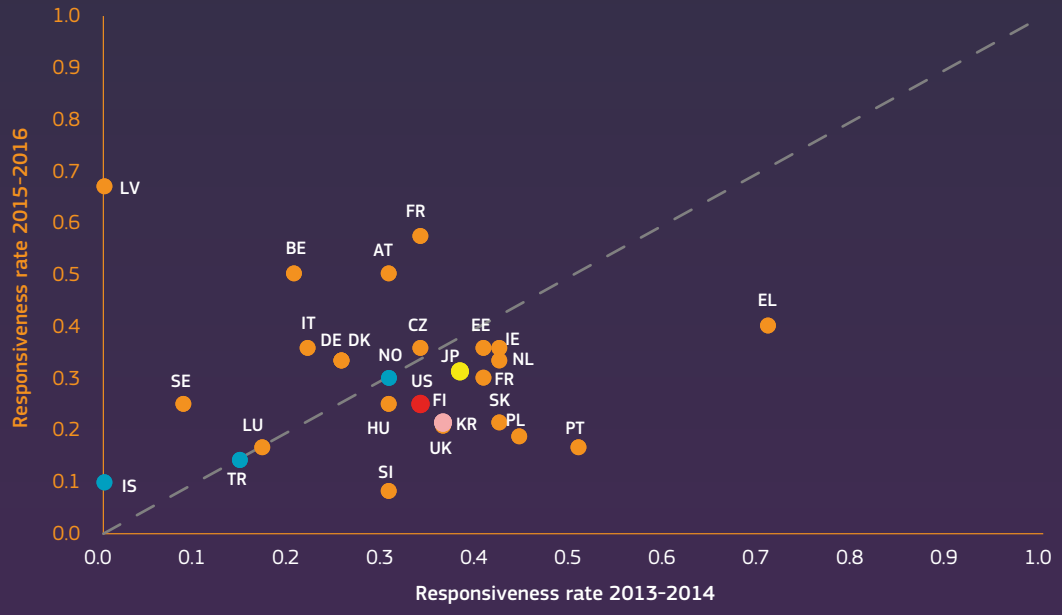
Science, Research and Innovation performance of the EU 2018

Source: DG Research and Innovation - Unit for the Analysis and Monitoring of National Research and Innovation Policy

Data: OECD

Stat. link: https://ec.europa.eu/info/sites/info/files/srip/parti/i_5_figures/figure-a.xlsx

Figure B Responsiveness to *Going for Growth* priorities and fiscal consolidation effort, 2013-2014 and 2015-2016



Science, Research and Innovation performance of the EU 2018

Source: OECD

Data: OECD

Stat. link: https://ec.europa.eu/info/sites/info/files/srip/parti/i_5_figures/figure-b.xlsx

Financial markets and access to capital

After the crisis, access to capital was singled out as a particularly important barrier for innovation and entrepreneurship in the EU. Even though significant efforts have been carried out by the European Central Bank (ECB) and other institutions since the crisis began, capital markets have still not entirely recovered, and imperfections seem to have increased.

While the liquidity of markets has increased significantly and recently SMEs are reporting that access to finance is no longer their most important concern, micro- and small and medium-sized enterprises in particular, amongst other start-ups and riskier business projects, remain at a disadvantage compared to large enterprises, and scale-up capital remains scarce[24,25,26]. Given that the core of the European economy comprises more than 90% of SMEs, it is paramount to get a deeper understanding of the European capital markets and access to financing[27].

Due to the efforts of the ECB and other European institutions, access to banking loans has significantly improved since the outbreak of the financial and sovereign crises.

As can be seen from the 'ease of access to loan index' provided by the World Economic Forum, in the height of the crisis in 2012-2013, many companies considered access to loans was severely restrained (black line in Figure I.5-B.5) and has yet to recover to pre-crisis levels in some EU Member States. While the United States, Japan and China report values that even exceed those from 2007, the EU as a whole has yet to recover completely. When looking at the trends in individual Member States, no clear geographical pattern emerges, with the biggest recoveries, exceeding even 2007 levels, reported in, e.g. the Czech Republic, Poland, Germany, Hungary and Austria, while countries such as, e.g. Greece, Ireland, Cyprus, Denmark, the Netherlands and Slovenia report values well below pre-crisis levels.

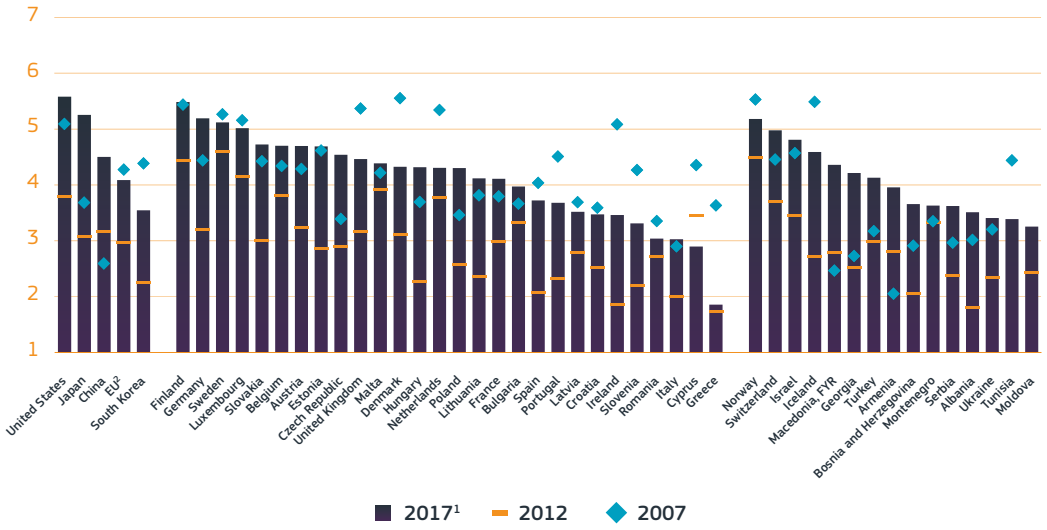
24 European Central Bank (2017). Survey on the Access to Finance of Enterprises in the euro area - October 2016 to March 2017.

25 OECD (2017b). Financing SMEs and Entrepreneurs 2017: An OECD Scoreboard. OECD Publishing.

26 Duruflé, G., Hellmann, T.F. and Wilson, K.E. (2017). From start-up to scale-up: examining public policies for the financing of high-growth ventures. Bruegel Working Papers.

27 European Investment Bank (2016). Investment and Investment Finance in Europe: Financing productivity growth. EIB Economics Department.

Figure I.5-B.5 Global Competitiveness Index - ease of access to loans, 2007, 2012 and 2017 values are on a scale of 1 to 7 (best)



Science, Research and Innovation performance of the EU 2018

Source: DG Research and Innovation - Unit for the Analysis and Monitoring of National Research and Innovation Policies

Data: World Economic Forum. The Global Competitiveness Index dataset 2017-2018

Note: [1]MT: 2016. [2]EU is the unweighted average of the values for the EU Member States.

Stat. link: https://ec.europa.eu/info/sites/info/files/srip/parti/i_5_figures/f_i_5-b_5.xlsx

Interest rates that are paid for loans have fallen, although large spreads across countries and types of companies persist.

While interest rates for new loans have continued to fall in most countries since 2007, reflecting the exceptionally low and even negative interest rates charged by the ECB, the additional charges for SMEs as compared to large firms have increased. This difference might be linked to a perceived higher risk and a lack of transparency associated with SMEs, since, for example, unlike large firms, they are not bound to publish their reports and accounts. However, the increase in the spread since the crisis suggests that there might be imperfections in the market[28,29]. The fall in interest rates coupled with a rise in the spread suggests that the liquidity that has been pumped into the markets might mainly benefit larger companies, pointing towards a concentration of capital in a minority of firms[30] (Figures I.5-B.6 and I.5-B.7).

28 PwC (2015). Capital Markets Union: Integration of Capital Markets in the European Union.

29 See European Investment Bank (2016).

30 OECD (2014). Financing SMEs and Entrepreneurs 2014: An OECD Scoreboard. OECD Publishing, and European Investment Bank (2016).

Figure I.5-B.6 Average interest rates charged to SMEs and large firms, 2014[1]

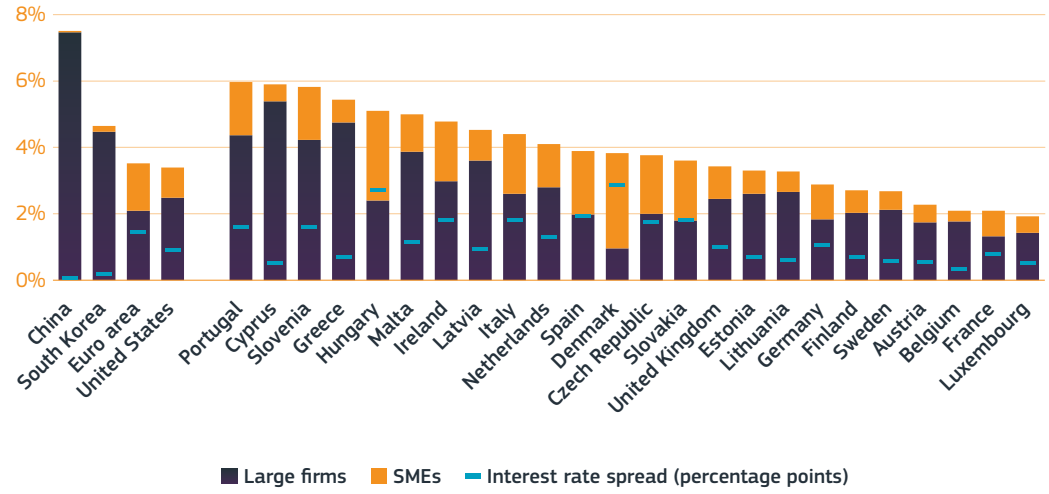
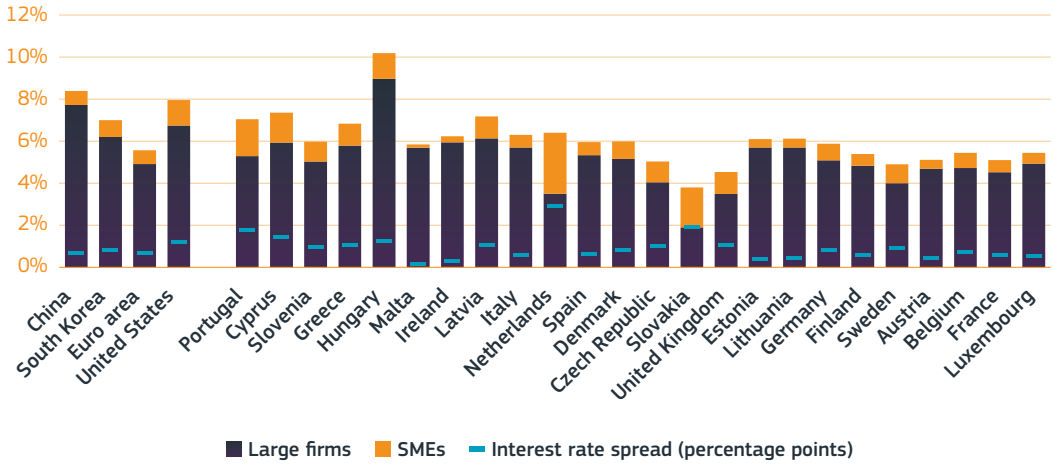


Figure I.5-B.7 Average interest rates charged to SMEs and large firms, 2007[2]



Science, Research and Innovation performance of the EU 2018

Source: DG Research and Innovation - Unit for the Analysis and Monitoring of National Research and Innovation Policies

Data: OECD, ECB

Notes: [1]SK: 2013, LU: 2015. [2]CY, UK: 2008; NL: 2011; SK: 2012; CN: 2013.

Stat. link: https://ec.europa.eu/info/sites/info/files/srip/parti/i_5_figures/f_i_5-b_6_and_f_i_5-b_7.xlsx

The European market is still highly banking driven, and has yet to take full advantage of the opportunities arising from the capital markets.

While this is opposite to the situation in the United States, being a more capital-market-driven economy, past surveys suggest that even in the United States bank loans are the main external financing source for SMEs[31].

The impact the imperfections perceived in the loans market might have on entrepreneurial activities in the EU is particularly important given the heavy reliance of European companies on bank funding[32]. While bank loans alone already make up more than 50% of European companies' external financing source, this becomes even clearer when adding other kinds of bank finance, totalling more than 65% of their external financing sources (Figure I.5-B.8). However, clear differences are evident across the EU. As expected, UK companies rely to a much greater extent on other sources of financing, such as leasing and hire purchase, with only slightly more than 35% of bank loans appearing in their financing structure. The importance of grants as a financing source in some Eastern European countries, e.g. Hungary, Estonia, Romania, Poland, Lithuania as well as Croatia, and to a lesser extent Greece, shows that these countries still rely more on public support, such as from EU funds, for instance. The underlying data reveals that, while SMEs rely more on bank loans, both large companies and SMEs use banks as a source of external finance for more than 60% of their investment needs[33]. While the heavy reliance on bank funding is not an issue per se, alternative sources of financing are needed in the EU to support entrepreneurship and improve access to finance for micro and high-growth companies. This has proved particularly relevant since the crisis, considering that access to credit was severely restrained and banks were particularly reluctant to finance SMEs[34].

The crisis unveiled weaknesses in the European banking and financial sector, mainly due to insufficient liquidity and capital reserves and a pro-cyclical effect of financial regulation. This called for the introduction of regulatory reforms to increase the sector's resilience and led to, amongst others, the higher capital requirements of Basel III, implemented in the EU via the CDR IV package[35,36].

However, while more restrictive capital requirements are needed to increase the resilience of the European banking sector, this may reduce the incentives for the regulated financial institutions to invest in SMEs[37]. Investing in SMEs, start-ups and innovation requires an appetite for risk and specific knowledge. Therefore, it is important to foster the common capital markets in the EU to provide more alternative funding choices for Europe's businesses and SMEs[38]. In this regard, venture capital companies play an important role in providing financing to start-ups and risky projects. However, the European venture capital market remains extremely less developed compared to that in the United States and, for example, Israel[39].

31 Board of Governors of the Federal Reserve System (2012). Report to the Congress on the Availability of Credit to Small Businesses. Federal Reserve Board.

32 See European Investment Bank (2016).

33 European Investment Bank (2017). EIBIS 2016/2017: Surveying Corporate Investment Activities, Needs and Financing in the EU. EIB Economics Department.

34 See European Investment Bank (2016).

35 European Banking Authority: http://www.eba.europa.eu/regulation-and-policy/implementing-basel-iii-europe

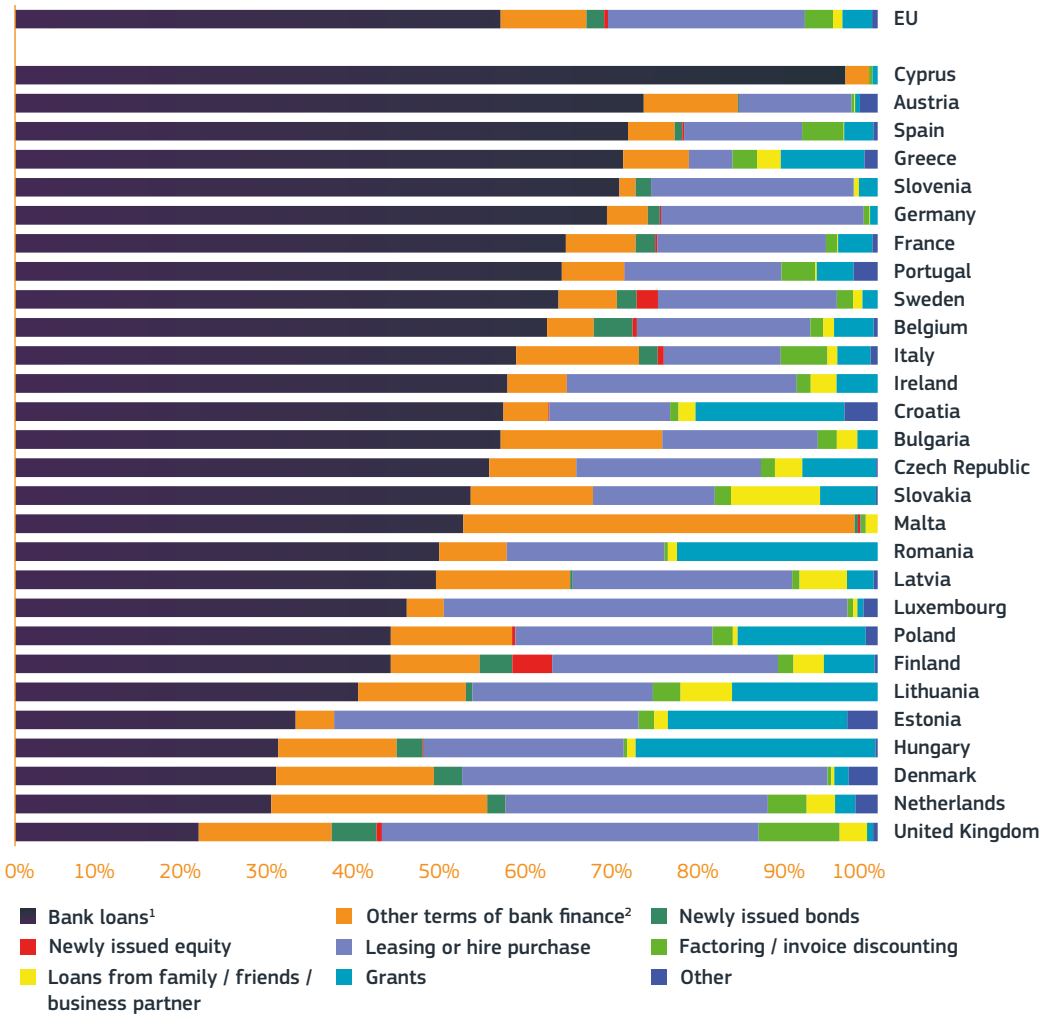
36 The Basel Committee on International Banking Supervision (2010): The Basel Committee's response to the financial crisis: report to the G20; ISBN 92-9197-851-5.

37 OECD (2012b), Financing SMEs and Entrepreneurs 2012: An OECD Scoreboard, OECD Publishing. http://dx.doi.org/10.1787/9789264166769-en

38 European Commission (2015b). Action Plan on Building a Capital Markets Union. COM(2015) 468 final.

39 OECD (2016b). Entrepreneurship at a Glance 2016. OECD Publishing, Paris: http://dx.doi.org/10.1787/entrepreneur_aag-2016-en

Figure I.5-B.8 Composition of external instment finance by source, 2015



Science, Research and Innovation performance of the EU 2018

Source: DG Research and Innovation - Unit for the Analysis and Monitoring of National Research and Innovation Policies
Data: EIB

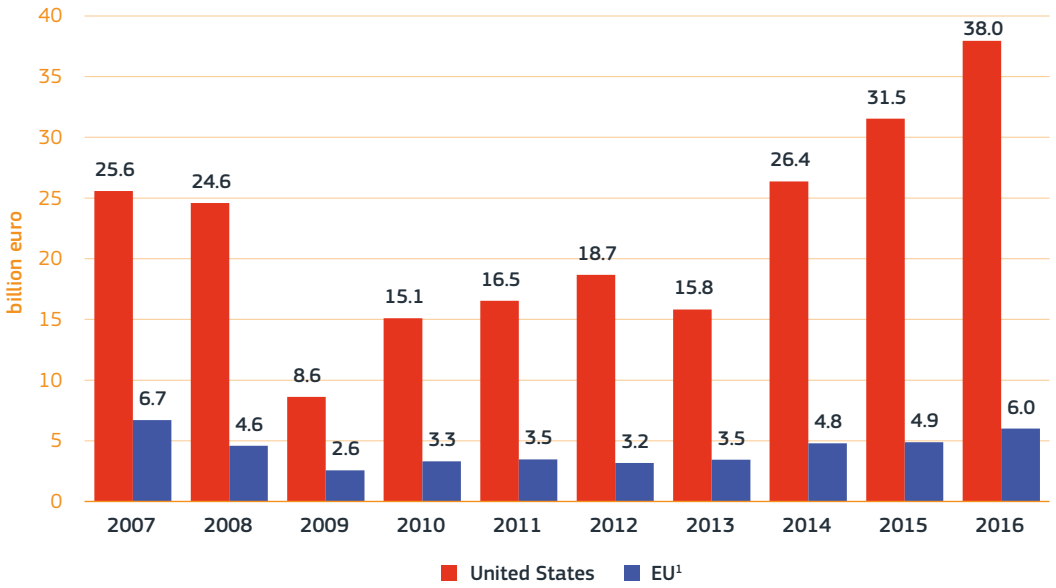
Notes: [1]Bank loans excluding subsidised bank loans, overdrafts and other credit lines. [2]Other terms of bank finance including overdrafts and other credit lines.

Stat. link: https://ec.europa.eu/info/sites/info/files/srip/parti/i_5_figures/f_i_5-b_8.xlsx

The European venture capital market, crucial for providing risk capital for innovation, remains less developed compared to the United States. While the market has almost recovered since the crisis, later-stage financing in particular remains restricted.

While the venture capital market has not only recovered in the United States, but even far exceeds its pre-crisis levels, the European venture capital market recovery is more modest, as can be seen in Figure I.5-B.9. Indeed, even though the recovery is clearly visible, the EU's venture capital market still lags far behind that in the United States. While, in 2007, EU venture capital companies attracted EUR 6.7 billion in funding from various investors, compared to EUR 25.57 billion in the United States, this amount dropped to its lowest level at EUR 2.57 billion in 2009, followed by an unstable rise, reaching EUR 6.01 billion in 2016, while the United States attracted EUR 38 billion in the same year (Figure I.5-B.9).

Figure I.5-B.9 Venture capital funds raised (billion euro) in the EU and in the United States, 2007-2016



Science, Research and Innovation performance of the EU 2018

Source: DG Research and Innovation - Unit for the Analysis and Monitoring of National Research and Innovation Policies

Data: Invest Europe, NVCA / Pitchbook

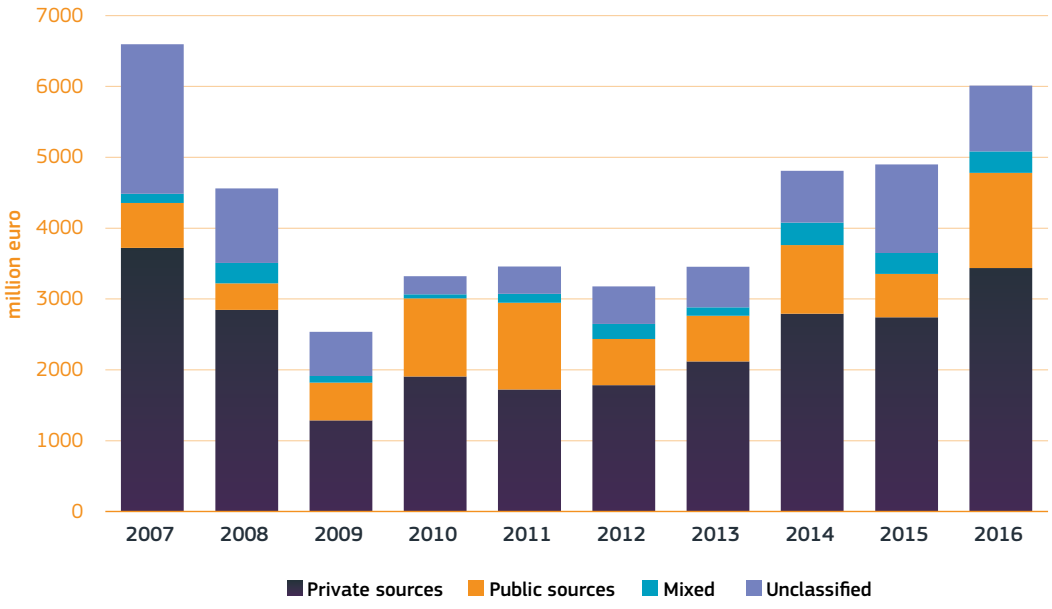
Note: [1]EU does not include HR, CY, MT, SI, SK.

Stat. link: https://ec.europa.eu/info/sites/info/files/srip/parti/i_5_figures/f_i_5-b_9.xlsx

The public sector has been a resilient source of venture capital in the EU, supplementing the volatility of private sources, and even slightly increasing its share during the years following the crisis.

From Figure I.5-B.10 it is clear that public funding sources play an important role for venture capital in the EU. Indeed, funding provided by public sources to venture capital proved resilient and relatively stable and increased its volume compared to the early years of the crisis. This is in contrast to the share of private funding which has been more volatile and has declined in value compared to 2007. The large fluctuations after the crisis are also linked to both the small size and concentration of the market, which is characterised by a relatively small amount of large venture capital funds (over EUR 100 million) providing a large share of the overall funding (80 % of the total amount)[40], and therefore not sufficiently diversified and more prone to volatility.

Figure I.5-B.10 Venture capital in the EU[1] - new funds raised by source (million euro), 2007-2016



Science, Research and Innovation performance of the EU 2018

Source: DG Research and Innovation - Unit for the Analysis and Monitoring of National Research and Innovation Policies

Data: Invest Europe

Note: [1]EU does not include HR, CY, MT, SI, SK.

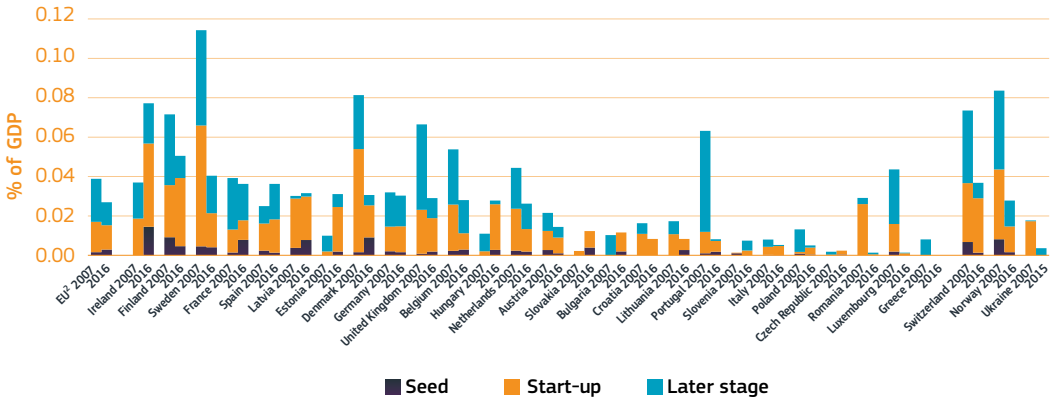
Stat. link: https://ec.europa.eu/info/sites/info/files/srip/parti/i_5_figures/f_i_5-b_10.xlsx

40 Invest Europe (2016). 2016 European Private Equity Activity: Statistics on Fundraising, Investments and Divestments: https://www.investeurope.eu/media/651727/invest-europe-2016-european-private-equity-activity-final.pdf.

Since the crisis, funding for the scaling up[41] of companies has become scarcer, with later-stage financing accounting almost entirely for the overall fall in venture capital funding, as opposed to the visible recovery of the seed and start-up funding.

As shown in Figure I.5-B.11, a shift can also be observed when looking at the stages of companies in which venture capital funds are investing[42]. a drop in venture capital funding from 0.039 % to 0.027 % can be seen following the crisis. When taking a closer look at the evolution of financing by company stages, it becomes clear that later-stage financing has suffered the most, with seed financing exceeding pre-crisis levels and start-up funding showing some recovery (0.012 % in 2016 as compared to 0.015 % in 2007) whilst later-stage financing remains considerably lower. The opposite is true in the United States, where not only the overall amount of venture capital financing, but also the share of later-stage financing in overall venture capital funding has increased.

Figure I.5-B.11 Venture capital (market statistics) by stage as % of GDP, 2007 and 2016[1]



Science, Research and Innovation performance of the EU 2018

Source: DG Research and Innovation - Unit for the Analysis and Monitoring of National Research and Innovation Policies

Data: Invest Europe, Eurostat

Notes: [1]UA: 2015. [2]EU does not include CY, MT.

Stat. link: https://ec.europa.eu/info/sites/info/files/srip/parti/i_5_figures/f_i_5-b_11.xlsx

41 Please note that for scale-ups, normally both later-stage venture capital funding and growth or expansion equity capital are used; however, as the section focuses in particular on venture capital markets and in order to ensure consistency and the comparability of data across countries, we focus on later-stage financing in this analysis.

42 Duruflé, G., Hellmann, T. and Wilson, K. (2017). From start-up to scale-up: examining public policies for the financing of high-growth ventures. Bruegel Working Papers.

Fulfilling the European single market

The EU single market has shaped business, consumption and everyday life activities for all EU citizens for the last 25 years. It concerns the removal of barriers and regulatory obstacles to the free movement of goods, services and people.

Such a process stimulates competition and trade, an efficient allocation of resources and investment flows across Europe and increases the opportunity spectrum for business and consumers alike. Overall, a functioning single market contributes strongly to enhancing the framework conditions for investment in innovative activities, as described in this section, with a positive effect on convergence, productivity and economic growth in the EU.

The road towards a complete functioning single market includes initiatives such as the Single Market Act I (2011) and II (2012) and the most recent Single Market Strategy (2015), in order to create more opportunities for business and consumers and to foster modernisation and innovation in Europe. The latter strategy aims to reduce uncertainty for business, especially SMEs and innovative start-ups, identifying regulatory requirements and countering the lack of access to finance. Most importantly, the Better Regulation framework provides the tool needed to assess the possible impacts on innovation of new policy proposals and to identify existing barriers and possible ways to remove them[43,44].

Progress towards a fully integrated single market since 1995 is shown in Figure I.5-B.12. The graph plots an average index resulting from the aggregation of 14 indicators representing the rate of integration, convergence and exchange across Member States. These include import and export of goods and services, foreign direct investment flows, the adoption of EU Directives, convergence in labour costs, interest rates, taxes, purchasing power and per-capita GDP between Member States. The larger the index value, the more integrated the EU market[45].

A steady rising trend can be observed, with an acceleration in 2003 for the EU-25. The EU was around 30% more integrated in 2015 than in 1995, with the trend also holding after the last crisis.

Progress towards a fully functioning single market with no barriers to innovative investment depends on the rate of correct transposition of EU Directives by Member States. Figure I.5-B.13 shows the deficit in transposition, i.e. the rate of EU Directives yet to be adopted, and the compliance deficit, i.e. the share of incorrectly adopted Directives, in the EU. Only eight countries have respected the 1% target set for the transposition deficit. Such a deficit has doubled in the last year, with 20 Member States now above the threshold. Malta is the only Member State respecting the threshold, which was originally proposed in the Single Market Act in 2011 (0.5%). Significant progress has been made by Italy, having been in last position for 18 months. a similar scenario holds for incorrectly transposed Directives, with only nine countries below the 0.5% threshold, although five are very close to it. Malta and Estonia notably have achieved a perfect score (0%), the former for the fourth time[46].

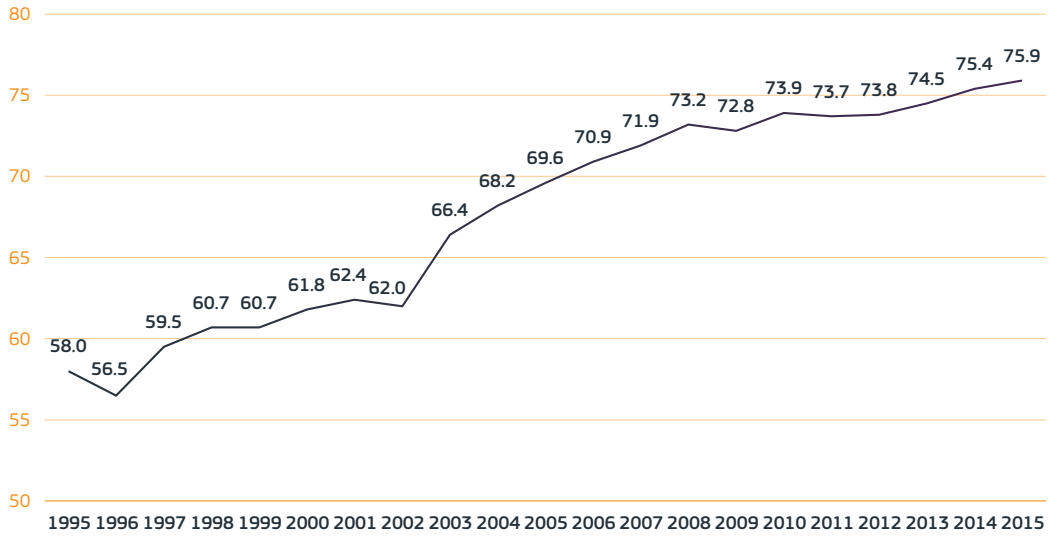
43 See European Commission (2015c). Upgrading the Single Market: more opportunities for people and business. http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2015%3A550%3AFIN, p.6.

44 The assessment and monitoring of framework conditions for growth and investment is also done for all Member States by the European Commission in the European Semester process. See: https://ec.europa.eu/info/strategy/european-semester_en.

45 The index takes a value of 0 in case of no integration, while no upper limit is set. For more details about its composition, see: LE Europe (2017). The EU Single Market: Impact on Member States.

46 See the Single Market Scoreboard for further details: http://ec.europa.eu/internal_market/scoreboard/performance_by_governance_tool/transposition/index_en.htm.

Figure I.5-B.12 Summary Index of Single Market integration[1] in the EU, 1995-2015



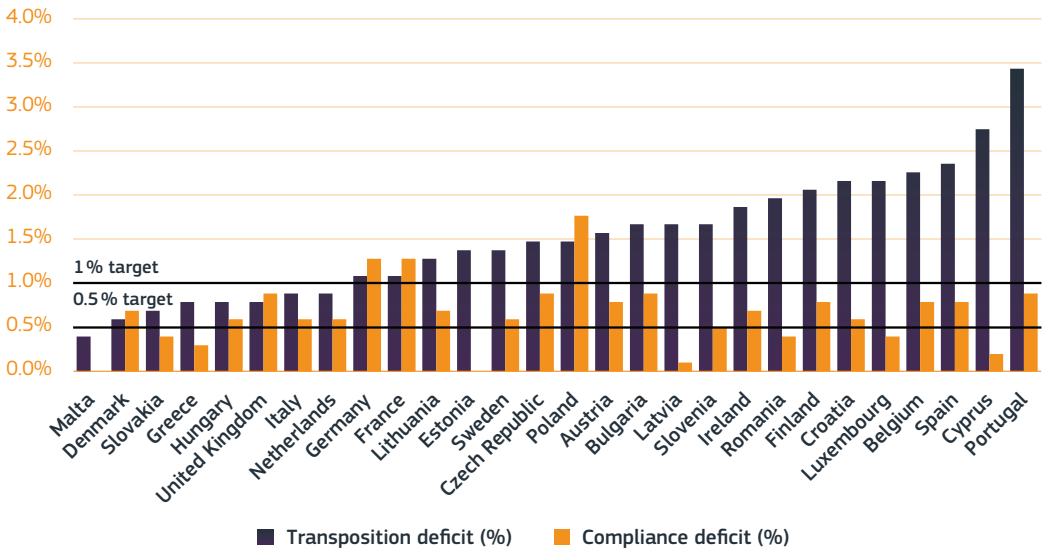
Science, Research and Innovation performance of the EU 2018

Source: London Economics, 2017

Note: [1]The indicator combines information on different aspects of the Single Market freedoms, the adoption of EU legislation by Member States and the extent to which the economic performance of individual Member States matches the EU economy overall. Although the minimum value of the index is zero (representing no integration at all), the index has no upper limit because the indicators of FDI and trade in goods and services included in the summary index have no upper limits.

Stat. link: https://ec.europa.eu/info/sites/info/files/srip/parti/i_5_figures/f_i_5-b_12.xlsx

Figure I.5-B.13 Transposition deficit[1] and compliance deficit[2] in EU Member States, 2017



Science, Research and Innovation performance of the EU 2018

Source: DG Research and Innovation - Unit for the Analysis and Monitoring of National Research and Innovation Policies
Data: DG Internal market, Industry, Entrepreneurship and SMEs (Single Market Scoreboard, July 2017)
Notes: [1]The transposition deficit is the gap between the number of Single Market directives adopted by the EU and those transposed in Member States (the % refers to the % of all directives not transposed). [2]The compliance deficit is the number of incorrectly transposed directives (the % is the % of all directives transposed incorrectly).
Stat. link: https://ec.europa.eu/info/sites/info/files/srip/parti/i_5_figures/f_i_5-b_13.xlsx

CHAPTER I.5-C: FRAMEWORK CONDITIONS AND ZOMBIE FIRMS

As a result of persisting rigidities that affect the well-functioning of the markets, 'zombie' firms[47] continue to 'capture' capital and labour resources that could otherwise be redirected towards innovative, more productive activities, thereby hindering Europe's innovation performance.

The misallocation of resources, including credit, barriers to entry and inefficient product and labour markets ease the survival of less-productive firms which would otherwise have exited the market. Consequently, the economy is characterised by a wider distribution of productivity among firms, with a larger gap between the laggards and the most-productive companies.

The reduction of exit rates of non-sustainable firms has both a direct and an indirect effect on labour productivity. As long as these companies survive by draining resources from the economy, the reallocation of resources towards more innovative and productive activities will be hampered. Capital, labour force and credit will be locked-in around non-productive activities and unable to be reallocated towards more-productive companies. In addition, this will directly slow down productivity growth by making a zero or negative contribution to the overall economic performance.

Recent evidence by the OECD[48] has estimated that the survival of zombie firms triggers the indirect effect of *congesting* the market and draining resources from the most-productive firms. Zombie companies are firms that survive on the market without being profitable in the long run, being artificially kept alive via a misallocation of external support and being too weak to stay on the market on their own. Their survival is due to the inefficiencies presented in this chapter, most notably those in the product market which reduce the entry rates of competitors, the erosion of exit margins, and the misallocation of credit towards non-productive activities.

Since the start of the crisis, the number of such companies and the share of employment and capital stock locked in them have been increasing across countries, with the exception of France and the UK.

Since the last economic crisis, estimates by the Bank of International Settlements indicate that the median share of zombie firms increased by around 10.5% in 2015, more than double the pre-crisis level[49]. The increase is most significant in Italy and Spain, especially in terms of capital stock. Figure I.5-C.1 is drawn from OECD (2017) and shows the increase in the number of zombie firms and their share of capital and employment in the overall economy. The capital stock share in 2013 is reported in Figure I.5-C.2.

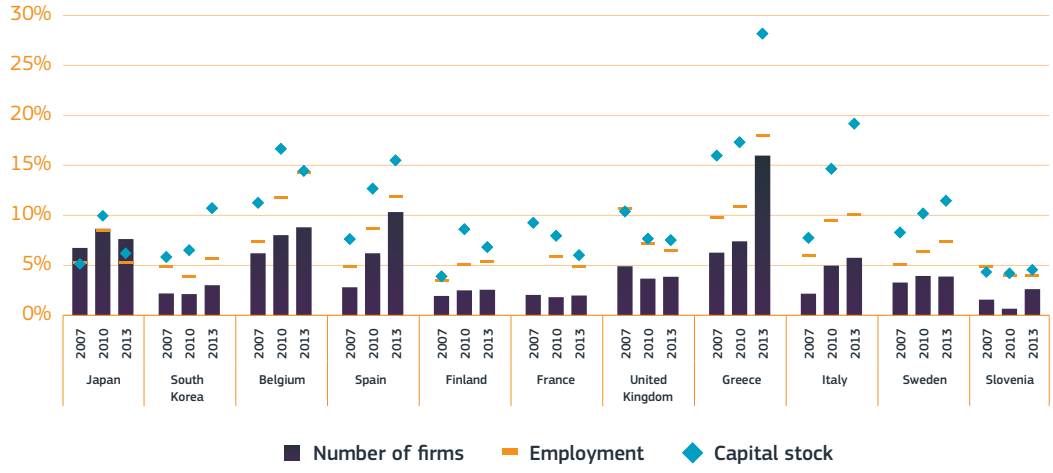
Improving framework conditions and stimulating a proper allocation of credit to the most innovative and productive activities is crucial to revert the trend and boost productivity growth in the EU and other advanced economies.

47 Here, zombie firms are defined as those companies with a ratio of operating income to interest expenses of less than one-third for three consecutive years, following McGowan, M.A., Andrews, D. and Millot, V. (2017). The walking dead? Zombie firms and productivity performance in OECD countries (No. 1372). OECD Publishing.

48 See McGowan et al. (2017).

49 See Bank for International Settlements (2017). 87th Annual Report, which applies a slightly different definition of zombie firms and a different sample of countries. The report considers zombie firms as listed firms with a ratio of earnings before interest and taxes to interest expenses below one, in a firm aged 10 years or more. The reported finding shows the median for the following countries: Austria, Belgium, Canada, Switzerland, Germany, Denmark, Spain, France, the UK, Italy, Japan, the Netherlands, Sweden and the United States.

Figure I.5-C.1 Zombie firms[1] -% share in total firms, capital and employment 2007, 2010 and 2013



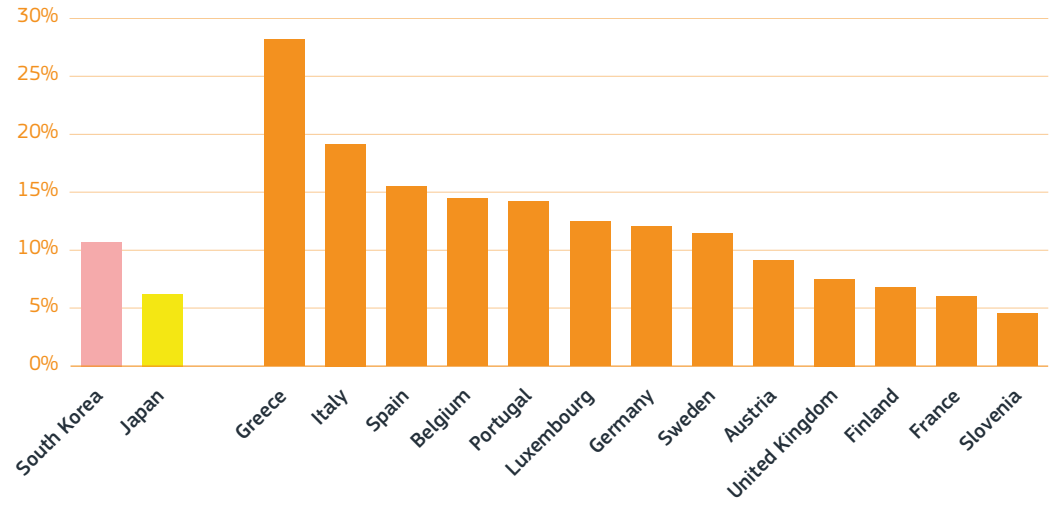
Science, Research and Innovation performance of the EU 2018

Source: OECD (Adalet McGowan, Andrews and Millot, 2017)

Note: [1]Zombie firms are firms aged ≥10 years and with an interest coverage ratio<1 over three consecutive years. Capital stock and employment refer to the share of capital and labour sunk in zombie firms. The sample excludes firms that are larger than 100 times the 99th percentile of the size distribution in terms of capital stock or number of employees.

Stat. link: https://ec.europa.eu/info/sites/info/files/srip/parti/i_5_figures/f_i_5-c_1.xlsx

Figure I.5-C.2 % share of capital sunk in zombie firms[1], 2013



Science, Research and Innovation performance of the EU 2018

Source: DG Research and Innovation - Unit for the Analysis and Monitoring of National Research and Innovation Policies

Data: OECD (Adalet McGowan, Andrews and Millot, 2017)

Note: [1]Zombie firms are firms aged ≥10 years and with an interest coverage ratio<1 over three consecutive years. The sample excludes firms that are larger than 100 times the 99th percentile of the size distribution in terms of capital stock or number of employees.

Stat. link: https://ec.europa.eu/info/sites/info/files/srip/parti/i_5_figures/f_i_5-c_2.xlsx

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