Single market integration and competitiveness report

2016

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The report and related materials can be downloaded at: http://ec.europa.eu/DocsRoom/documents/20210

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1. Executive summary

1.1. Introduction

The recovery is consolidating in the EU amid increasing political and international uncertainties. Investment and employment are slowly approaching pre-crisis levels while trade flows of goods and services in the Single Market continue increasing. Structural reforms are contributing to improve the performance of Member States, especially in countries that needed those most.

However, these positive developments cannot enshroud important pending reforms and new emerging issues that still require policy attention and action. The generalised fall in productivity growth rates hinders the translation of the subdued growth rates into appreciable improvements in living standards. The pace of reform in some areas of economic activity and countries remains sluggish. New challenges (and opportunities) are appearing as a result of technical change.

Most importantly, all these changes are taking place against a backdrop of increasing economic and social disparities across countries and within Member States. There is evidence pointing out to inter-linkages between the causes behind the productivity problems that advanced economies face and the increasing inequalities in income, wealth and well-being.[1] Indeed, inequalities in areas such as education, training, health, and access to new technologies, have an impact on workers' skills and therefore their productivity, which in turn affects the evolution of aggregate productivity. On the other hand, productivity levels in Member States drive the level of wages and the number of jobs available, thus having an impact on inclusiveness and the income levels of citizens. In a way, these are two sides of the same coin. Therefore, the response to these challenges must also be a joint response in a process of upward economic convergence as outlined in the Five Presidents' Report.[2]

This report presents a panorama of the situation in the EU from the point of view of competitiveness and integration by the fall of 2016. It draws a map covering the main elements identified in the analyses of the economic evolution of the EU Member States in areas relevant for the European Semester. The report looks into topics and themes in a horizontal way but it does not look into the specific situation in Member States. Issues singled out in this report will be further analysed in the context of specific countries in the Semester.

1.2. The evolution of competitiveness

The evolution of productivity[3] is the main determinant of competitiveness in the long run. Despite a relative slowdown in productivity growth in the USA, the correction of macroeconomic imbalances and the introduction of reforms in some EU Member States, the productivity gap between the USA

[1] Cf. "The Productivity-Inclusiveness Nexus", OECD, 2016.
[2] Jean-Claude Juncker et al. "Completing Europe's Economic and Monetary Union", Five Presidents' Report, Brussels June 2015.
[3] Unless otherwise indicated, productivity throughout this report refers to apparent labour productivity measured as the ratio between value added and hours worked. If hours worked are not available, we use persons employed, Value added is in constant prices (gross in "chain-linked" volumes).

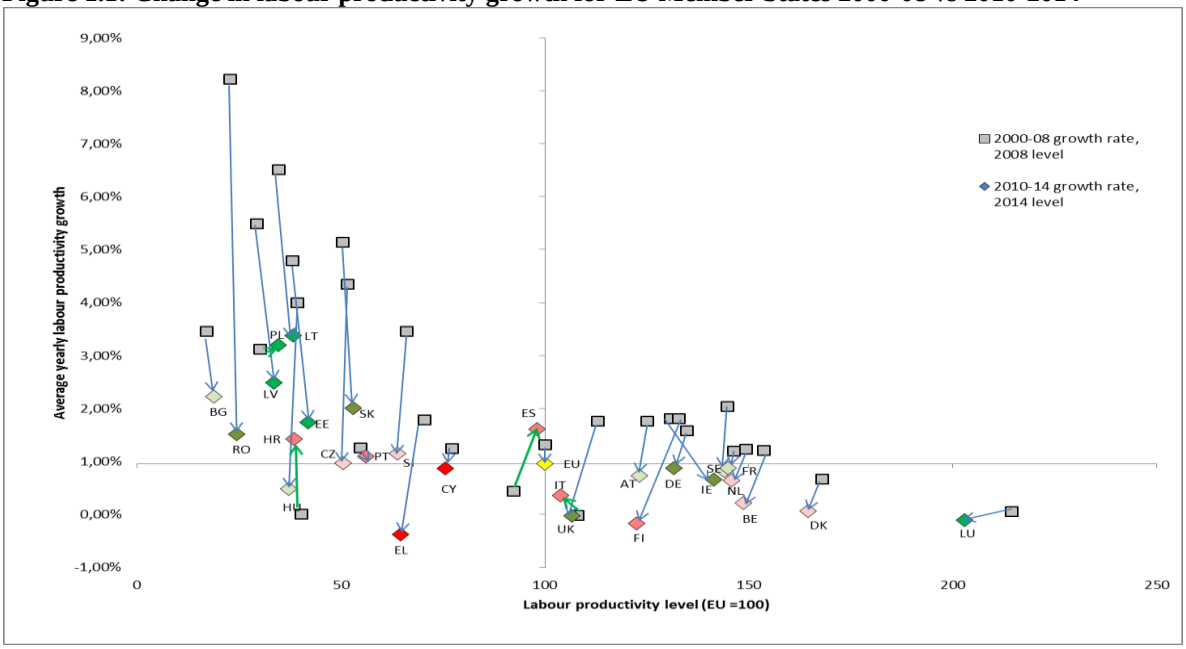
and the EU still persists. The recovery remains tepid and fragile and the subdued aggregate demand is not contributing to stimulate investment and innovation.

This report identifies progress in the introduction of reforms, but there is still considerable scope for improvement in many areas and countries.

In recent years, the significant fall in productivity rates in most countries around the world has been the most salient development on the productivity front. In the EU, this fall is evident if we compare the productivity growth rates of Member States before and after 2009, the worst year of the crisis. Figure 1.1 shows that regardless of their productivity levels, most Member States experienced a sharp cut in their productivity growth rates. The slowdown was more pronounced in countries with the highest productivity growth rates. Only Croatia, Poland, Spain and Italy (to a smaller degree) had higher productivity growth in 2010-14 than before the crisis. In the case of Spain, it seems clear that labour productivity improvement was mainly due to labour shedding.

The "catching-up" process started after enlargement has slowed down and higher productivity growth is needed in countries with relatively low productivity levels to speed up convergence -and therefore cohesion- in the EU. However, it is also important to raise productivity levels in the leading Member States to ensure an upward convergence that can sustain high living standards and the long term competitiveness of the EU.

Figure 1.1: Change in labour productivity growth for EU Member States 2000-08 vs 2010-2014



Source: Eurostat data
Note: Data on hours worked for HU, RO, PL for certain years have been recalculated due to breaks in available data series. Data points for the period 2010-14 have been coloured according to a ranking of Member States by their rate of real GDP growth. The five countries with the highest rates (LT, EE, LV, PL, LU) are coloured in dark green, while those with the lower (EL, CY) are coloured in dark red. The remaining countries are grouped in groups of five in mild green (IE, SK, RO, UK, DE), light green (SE, HU, BG, AT, FR), mild red (CZ, BE, DK, NL, SI) and light (FI, HR, IT, ES, PT) red following the same approach. Therefore, red colour signals a low position in the ranking but not necessarily a negative growth rate.

Capital investment has been the main driver of growth and productivity in the EU. Therefore, revitalising investment capital is vital for the recovery. In addition, it is important to ensure that capital is efficiently allocated.

However, structural reforms should also target fostering other sources of productivity and growth. A number of factors included under the economic label of "total factor productivity" or TFP such as successful innovation and a more efficient allocation of resources (i.e. all those factors other than labour and capital) have been the main driver of growth and productivity in the USA. In the past, total factor productivity contributed less to growth and productivity in the EU than in the US; this contribution has been even lower after the crisis. Structural issues affecting product, services, capital and labour markets are accounted responsible for this subdued performance of TFP in Europe.

The analysis of productivity levels in aggregate terms masks important information on the evolution of productivity. In many Member States, there is a trend of increasing dispersion of productivity across firms. In those countries, the most productive firms are becoming increasingly much more productive than the rest. This is important from the point of view of the evolution of social disparities as these differences are translated into wage differentials and, more broadly, income differentials within the economy.

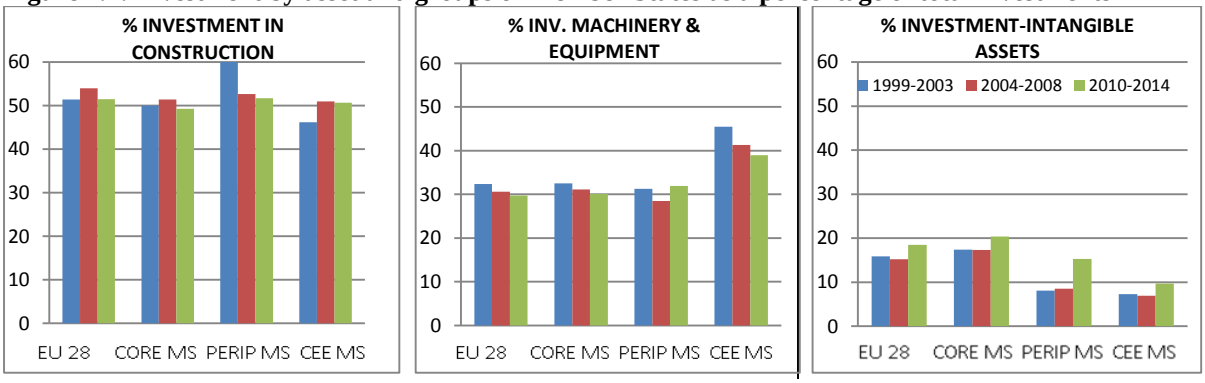
1.3. Investment in capital as a source of productivity growth

Increasing investment levels in Europe is an undisputed objective. Monitoring the past and present evolution of investment is necessary to ensure that market incentives and policies channel capital to high productivity occupations avoiding the resource misallocations observed before the crisis. The three panels in Figure 1.2 show differences in the composition of investment by assets in peripheral, core and central and eastern EU countries.[4]

This panorama of investment is perfectly consistent with the productivity patterns observed above. The significant fall in investment in equipment and machinery in the central and eastern Member States explains the drop in productivity after the crisis in those Member States. The share of investment in machinery and equipment over total investment was relatively more resilient in core and peripheral Member States, although it fell in absolute terms.

With over 50% of total investment across the EU construction – a sector with low productivity levels- remains the main investment asset. It attracted over 60% of capital invested between 1999-2003 in peripheral countries feeding real estate bubbles in Spain and Ireland.

Figure 1.2: Investment by asset and groups of Member States as a percentage of total investments



Source: Eurostat

[4] CORE Member States includes: AT, BE, DE, LU, NL. FR, UK, DK, SE, FI, MT.
PERIP Member States includes: EL, IE, CY, IT, PT, ES.
CEEMS are: PL, EE, LT, LV, CZ, SK, HR, HU, BG, RO.

The best news in this area is the relative increase in the share of investment in intangible assets in all country groups. This category of assets includes patents, knowledge-based-capital, trademarks and other vital components that boost total factor productivity growth. These graphs suggest that EU firms continue increasing their demand for these valuable assets but these stocks are still relatively low in many EU Member States and higher investment rates in intangible assets will be needed to push up TFP growth.

The role of the public sector in bolstering the investment recovery will be important, especially as regards investments in infrastructures, both physical and digital. EU facilities to encourage investment have never been so many and so diverse. Public administrations will have the responsibility to ensure the timely and the adequate allocation of these funds according to their needs.

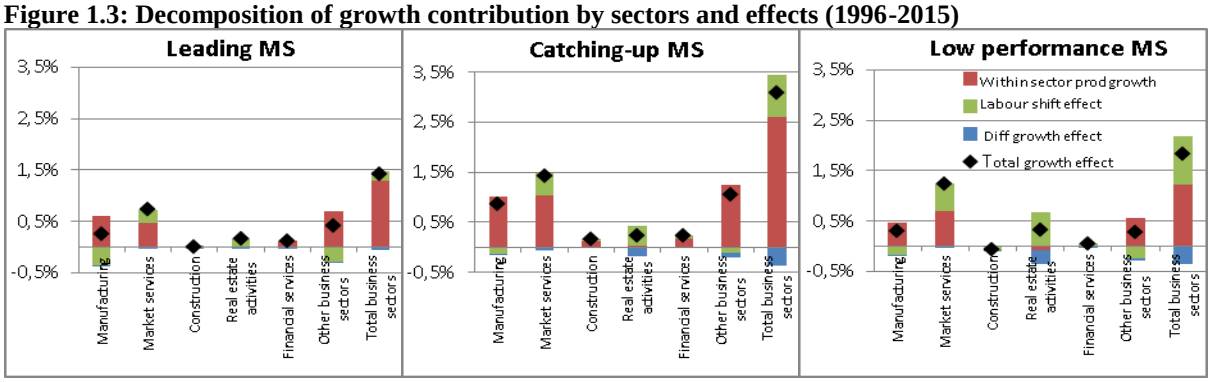
1.4. The faltering diffusion machine and the misallocation of resources: TFP performance

A major economic restructuring process driven by economic developments and technological changes is underway in Europe. It implies a significant reallocation of resources across firms, sectors and countries that will determine our competitive stance in the years to come.

The contribution to growth of each sector of economic activity depends on its individual productivity levels and the share of labour and other services employed in that sector. As restructuring takes places, resources -and labour in particular- are reallocated across sectors with different productivity levels thus modifying the aggregate economic performance of countries.

Figure 1.3 shows that in the leading Member States, productivity levels are higher in manufacturing than in services. However, the contribution of manufacturing to growth has been reduced by the reallocation of labour to other sectors with lower productivity levels. In Member States with lower performance, a considerable volume of labour was shifted to real estate activities with a poor productivity performance with an adverse impact on growth. The group of Member States catching-up on productivity with respect to the leading Member States fared much better in this process of reallocation of resources, although some negative differential effects attributable to specific temporary situations in some countries during the crisis can also be spotted.

Figure 1.3: Decomposition of growth contribution by sectors and effects (1996-2015)



Source: Eurostat data

This summarised view of a much more complex on-going structural change underlines the need of raising productivity growth, especially in services. This requires a better allocation of resources across firms within sector and more innovation.

A closer analysis is needed to draw more detailed conclusions. As already pointed out, productivity levels vary across firms within each Member State and most importantly, productivity growth varies considerably across firms. While productivity growth has fallen at global levels firms at or near the productivity frontier continue displaying high productivity growth rates. Productivity differences for firms operating in the same sector are increasing, especially in services, although there are considerable disparities across Member States.

These increasing differences in productivity growth are attributed to the lower capacity of firms below the productivity frontier to benefit from innovations. Several reasons could explain what some have called the "breakdown in the diffusion machine." The small average size of firms can be an obstacle to benefit from innovation. The extraction of rents in vertical value chains by firms with significant value chain power could be another possible factor deterring innovation.

The increasing disparities in productivity across firms have significant social implications both for cohesion and for the process of structural reforms. If productivity differences grew wider, the differences in wages and working conditions among workers of different sectors would grow greater too, with negative implications for income equality and social cohesion. As a result, the structural reforms process might face stronger social resistance.

Breaking up the link between productivity and wages is not a solution in the long term since it is not sustainable from an economic view point. Reducing the dispersion in productivity growth by fostering diffusion of innovation to firms below the "productivity frontier" seems a better option.

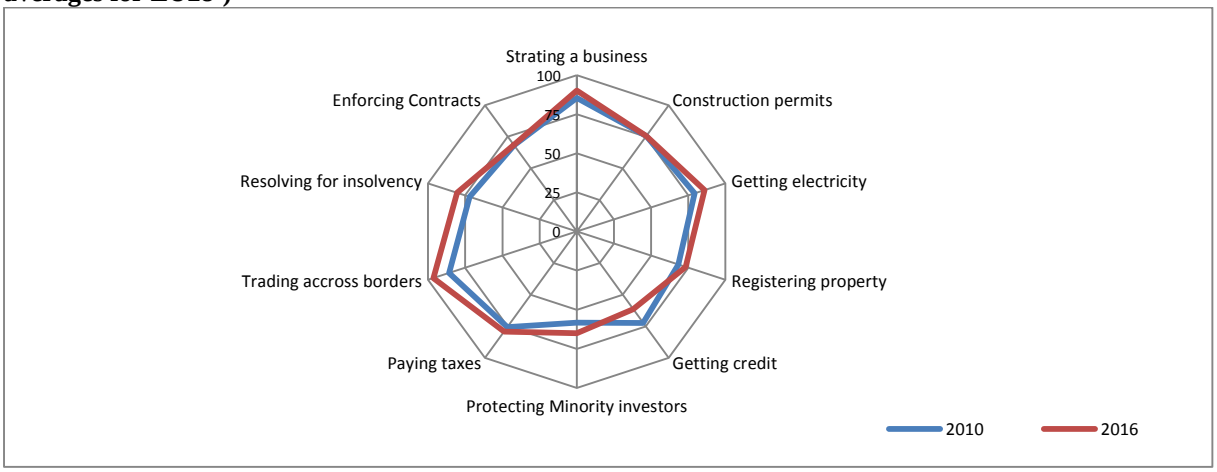
1.5.Scaling up and firm growth

Firms at the global and national productivity frontiers do not share the same characteristics, they are not uniform. For instance, they are relatively younger but not all of them are necessarily bigger than the rest. However, there is a positive correlation between productivity and size at firm level. In addition, aggregate productivity could be boosted if market incentives and policies were conducive to a reallocation of resources away from poorly performing firms towards more productive uses. In this sense, upward mobility in the productivity scale requires firm growth.

Compared to the USA, the size of EU firms remains relatively stable during their business life. Once established in the market, EU firms are unlikely to grow or shrink in size. This structural difference between the US and the EU seems to be a result of the relatively lower dynamism of EU markets. Chapter 5 looks at factors hindering firm growth by looking at external and internal factors influencing the evolution of firm size.

Public sector regulations define the business environment in which firms operate. The US is considered to have a more dynamic business environment than the EU. According to the World Bank rankings, the EU has improved its business environment and is closer to the global frontier in 2016 than it was in 2010 (by 3.5 percentage points). As shown in Figure 1.4, the EU can claim improvements in most of the dimensions defining the characteristics of the business environment, but not in all of them.

Figure 1.4: Doing Business scores for the 10 dimensions reported by the World Bank (2010-2016 weighted averages for EU28[5])



Source: World Bank

This progress must be welcome especially because reforms to the business environment have been more significant precisely in those Member States where they were needed the most. However, reforms have not been introduced in all Member States and progress has been slow on average. In particular, structural problems persist in access to credit and in areas related to the efficiency of public administrations (e.g. enforcement of contracts) there is considerable room for improvement.

In addition to the business environment, other factors internal to firms but nevertheless subject to the impact of public policies are also relevant for productivity and firm growth. The availability of micro-data allows us to identify some key features of EU fast-growing firms. For instance, these companies are human-capital intensive, with high labour costs. Their productivity is based on efficiency and knowledge-based capital is more important than labour or capital productivity. It is also important to note that fast-growing firms are twice more prevalent in services than in manufacturing. Once more, this emphasises the growing importance of efficient services markets in the EU.

1.6. Integration and competitiveness: the functioning of the Single Market

The performance of Member States depends on national policies and structural factors but it is also a reflection of the good functioning of the Single Market. The crisis has provided a good test for the Single Market. It interrupted several on-going structural trends that had been reconfiguring trade flows in the Single Market since enlargement. In addition, the functioning of the Single Market has not been able to dampen in full the asymmetric shock of the crisis. The labour, capital and product and services markets have all responded in different ways to the crisis making apparent some rigidity in the transmission mechanisms, especially in the Euro area.

Chapter 6 provides information supplementing the evidence presented in chapter 4. This evidence suggests that some obstacles hampered the allocation of capital inflows into Member States before the crisis, although these problems seem to have been mitigated after the crisis. The Capital Markets Union will contribute to correct the regulatory and governance problems already highlighted in the 2015 report, but this requires a proper implementation of the relevant rules by Member States.

[5] Excluding data for Malta which was not available for 2010.

Labour markets seem to have been working better than expected. Following enlargement, inter-regional flows of labour proved to be sensitive to regional differences in employment and wage levels. This applies to most labour market segments, across countries, educational levels and genders. This higher flexibility has contributed positively to convergence in labour markets in the Union.

Product and labour markets presented considerable adjustment costs in response to the shocks of the crisis. The transmission channels within the Euro area present some important differences with respect to the non-EU countries. First, adjustment costs in the Euro area labour markets are higher than elsewhere in the EU. Adjustment is particularly sticky in construction markets. Secondly, in the Euro area, labour markets are sensitive to changes in the demand for intermediate products in other EU countries but not to final demand. Finally, the sensitivity to shocks in other industries is much higher in manufacturing than in other areas of economic activity, especially in services.

This evidence underlines the importance of making progress in the deepening of the Single Market not just as an economic area providing a legal framework protecting the free circulation of goods, services, labour and capital but also as an integrated economic environment providing incentives for the efficient allocation of resources.

1.7. Public procurement, services markets and the construction value chain

The work ahead in the deepening of the Single Market takes special importance in three areas relevant for the efficient allocation of resources in the EU.

Accounting for over 14% of GDP, public procurement activities have a significant economic impact on national economies and their efficient operation can contribute to improving the quality of public expenditure and reducing budgetary imbalances while contributing to innovation and the modernisation of Member States' economies.

Activities in the construction value chain present low productivity levels with multiple regulatory restrictions and low cross border trade activity.

Productivity improvements are particularly needed in business services markets, where rigidities are still considerable at national and Single Market levels despite some progress in a number of Member States.

- ***Public procurement markets***

There has been progress in the introduction of reforms to improve public procurement performance by different Member States. 2013 and 2014 have been years of particularly active reforms although in most cases, the pace of reform has been relatively sluggish.

In several Member States, the publication rate remains low resulting in insufficient openness to cross-border business opportunities. The application of procurement procedures restricting competition, such as negotiated-procedure-without-publication, greatly varies in different Member States from close to 0% to more than 20% and the proportion of contracts for which there was only one bid remains high. This is particularly relevant in some sectors, such as IT where vendor lock-in is a frequently observed phenomenon. All this indicates that the Single Market for public procurement is not sufficiently integrated and further opening could boost economic efficiency and growth.

The usage of quality criteria for awarding of contracts widely varies between Member States, from below 10% in Croatia and Lithuania to above 90% in France and United Kingdom. In general the CEE countries apply the lowest price criterion very often, missing out on potential to encourage innovation or pursue social or green objectives.

The advantages from cooperative public procurement based on the aggregation of demand are being explored by Member States to increase the efficiency of their public spending, although there is still much room for improvement. The average proportion of the contracts award notices where the contracting authorities are purchasing on behalf of other contracting authorities is only about 8% and remained relatively stable in the recent years. Another challenge is the need for professionalisation meaning that public procurement is performed by personnel who have the necessary skills, technical knowledge, or procedural understanding.

Electronic procurement as a way of increasing transparency and efficiency of procurement procedures is being implemented progressively in the Member States. However, the quality of the introduced electronic procurement services still leaves room for improvement.

In summary, the situation remains fragmented with Member States spread across a broad range of the ranking distributions. A more consistent use of procurement practices could be very beneficial, especially to Member States with fiscal budgetary and debt imbalances. A more rational use of those rules could also provide incentives for innovation and firm growth, thereby fostering productivity, given the share of public procurement over in national economies.

- ***The construction value chain***

The construction value chain accounts for a sizeable part of the GDP of the Union (8.2%). It includes construction activities for residential, commercial and industrial purposes as well as public works. Most of the activities of this value chain present rigidities and problems that warrant particular attention on country by country basis.

The indications of market imperfections are multiple. Activities were hard hit by the crisis after 2008. However, product markets did not react accordingly in many countries. For instance, in Spain, one of the countries more severely affected by the crisis, the prices of construction materials continued increasing by 12.8% between 2007 and 2014, while in Germany, the increase was just 10% between 2008 and 2012. There is also evidence that imports of construction materials are not sensitive to levels and changes in the prices for those products.

National regulations are likely to be at the origin of these rigidities. Commercial practices but also national marking regulations have been identified as hampering trade in the Single Market for construction products based on the Construction Products Regulations. These practices affect in an uneven way trade for some products and countries (e.g. problems seem to be less severe in Slovakia and for metal structures than in Germany and for wooden doors).

Apparent labour productivity is low in construction services and in some construction products and market adjustments are slow and costly. Wages for construction services reacted quite sluggishly in Spain and Poland, although they proved to be much more flexible in Ireland.

Once more, national regulations hinder the functioning of the Single Market in construction services and the performance of the sector. Cross-border trade in construction services accounts for a very small share of the turnover of the sector. OECD indicators on trade barriers to construction and in particular, to the provision of services by civil engineers and architects, are above OECD averages for

many Member States. Planning regulations and building permits practices are still considerably lengthy and costly in a number of specific Member States.

Improving the functioning and efficiency in markets within the construction value chain can bring considerable dividends in countries where investments in infrastructures are needed. The impact would be enhanced by coordinated improvements in public procurement practices. In general, the supply-side response of the construction sector will play an important role in determining the speed and dimensions of the economic recovery.

- ***Service markets***

Intra-EU trade in services continues increasing vigorously from relatively low levels of around 6% of GDP. Growth of trade in services is hampered by obstacles to trade, integration and investment. OECD indicators of EU trade integration are lower in services than in areas such as logistics or air and maritime transports, while restrictions are higher in the EU for regulated professional services (architectures, engineering, legal services, accounting and audit). In these areas, cross-border trade in the EU remains below 5% of turnover.

These restrictions are being removed but at a very slow pace. Improvements can be found in countries that needed them most such as Italy or Greece, although not in all those countries. Slower progress can be reported in countries having relatively lower services trade restriction indexes. Some of these Member States seem to have taken steps increasing some restrictions to trade in services. The slow pace of reforms in business services is particularly worrying due to the considerable impact that these sectors have on the competitiveness of other services and manufacturing sectors.

Restrictions to establishment are particularly important for sub-sectors requiring cross-border establishment for service provision. This is the case of retailing in the traditional "brick and mortar" mode of distribution. In addition to planning and authorisation restrictions observed in the past, new forms of barriers in the form of operational restrictions targeting foreign companies are being developed, especially in the groceries and supermarket segments.

The development of new technologies is contributing to offset the impact of the barriers to market integration in services. With over 22% of annual growth, e-commerce is challenging traditional forms of retailing in different sectors, including the groceries subsector. New forms of collaborative economy are also opening new alternatives to formerly protected services. The correct use of competition and regulatory instruments should avoid the development of business practices that would restrict competition (e.g. geo-blocking), the abuse of dominant position in value chains (e. g. by electronic platforms) that would dissipate the social benefits resulting from the diffusion of these new technologies.

The report presents an analysis of the performance of the distributive trades. Wholesaling presents a very diverse panorama across countries and subsectors, with very different degrees of vertical integration, productivity and integration. The huge differences in productivity and profitability levels suggest the possible existence of market imperfections and barriers in some Member States. On the positive side, the diffusion of new technologies in wholesaling is greater than in retailing. The gradual diffusion of these technologies would be pushed by exposure to trade and competition from other Member States.

1.8. Conclusion

Structural reforms are contributing to increase competitiveness and integration in the EU, but the pace of reforms remains sluggish. The report outlines a number of new insights for the reform process which are worth summarising here.

- The reform process must take jointly into account competitiveness, equity and inclusiveness issues to ensure upward convergence in the Union.
- Investment in equipment and machinery should be encouraged taking into account two important elements:
    - First, structural reforms should steer investment towards occupations that can improve the EU's total factor productivity performance by increasing innovation, the adoption of digital technologies and higher human capital accumulation.
    - Secondly, the monitoring of the reform process should pay attention to the efficient allocation of resources at Member State and Single Market levels to avoid costly misallocations observed before the crisis. The monitoring process should consider not just aggregate data but micro-data as well.
- In different areas, progress can be observed in the removal of restrictions to integration, investment and productivity growth in countries that needed those most. This applies for instance to measures improving the business environment of firms and to the removal of certain restrictions to trade in services. However, leading EU economies with relatively better business environments and/or lower trade services restrictions are not improving their situation. In fact, in some cases some of these Member States are taking new measures with restrictive impacts.
- The Single Market reforms underway will improve the performance of the Single Market by making it more resilient to crises and more competitive. Product, services and labour markets remain relatively rigid to allow the Single Market absorb asymmetric shocks more effectively. Common perceptions on the relative functioning of capital and labour markets at EU level may have to be re-evaluated. The Single Market should provide the right incentives to an efficient allocation of resources that can allow upward convergence across and within Member States.
- Business services, public procurement and markets in the construction value chain warrant closer monitoring.

1.9. References

Jean-Claude Juncker et al. "Completing Europe's Economic and Monetary Union", Five Presidents' Report, Brussels June 2015.

"The Productivity-Inclusiveness Nexus", OECD, 2016.

2. Competitiveness and productivity

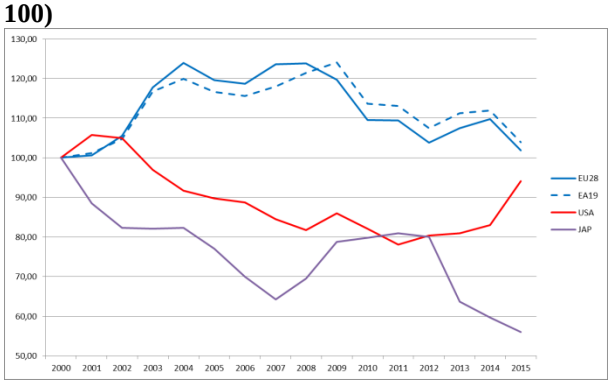
This chapter looks at the external competitiveness of the EU and shows that fostering productivity growth is crucial for improving the economic growth and living standards in Europe. The evolution of productivity is then analysed with a view to understand what are the factors driving its evolution. These drivers are then examined in more detailed in the following chapters with a view to identify the problems that are holding back productivity growth.

2.1.External competitiveness

The European Union is one of the world's largest economy and trading partner. Its future prosperity thus depends on its external competitiveness, that is its competitiveness vis-à-vis the rest of the world. International competitiveness can depend on a variety of factors. In this section we analyse the external competitiveness of the EU on the basis of the Real Effective Exchange Rates (REER), Unit Labour Costs (ULC) export market shares and current account balances.

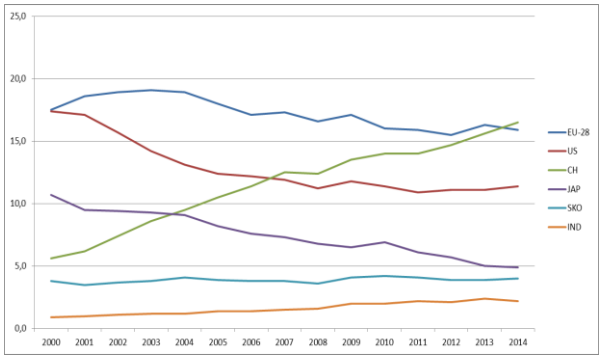
The EU has regained part of its price-competitiveness after the crisis. The EU's exchange rate (in real effective terms, or REER) has depreciated after the crisis, helping EU regain part of its price competitiveness (see Figure 2.1). Despite this positive development, the growing share in the global export market of emerging economies has not allowed for an increase in EU market share. Most advanced economies have recorded losses in world export market since the late 1990s as a result of the emergence of new competitors, most notably China. Yet, these losses have been more limited in the case of the EU than competitors such as the US and Japan (see Figure 2.2), showing the relative resilience of the EU exports. Nevertheless, the depreciation of the real effective exchange rate has not significantly improved EU's export performance. This shows that relative prices are far from being the main driver of gains in world export markets. Instead, more structural factors contributing to a more efficient functioning working of the economy, that is, to its productivity, would be the driving force.

Figure 2.1: Real Effective Exchange Rates (2000= 100)



Source: AMECO, European Commission
Note: 42 trading partners, based on HICP

Figure 2.2: Share in world exports (%)

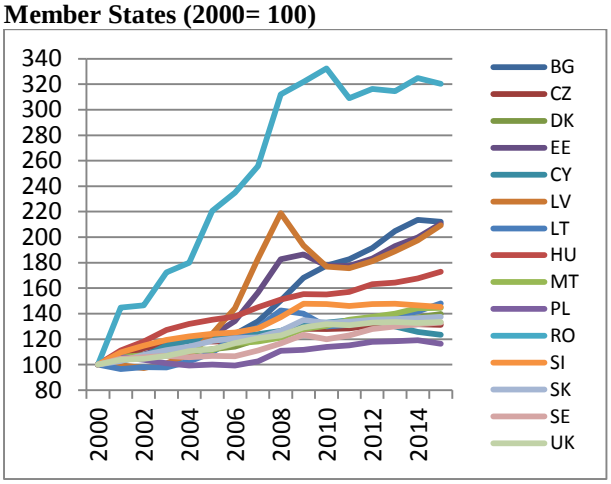


Source: Eurostat
Note: China excludes Hong Kong; EU-28 data for 2000 and 2001 excludes HR

A picture of increasing divergence among Member States emerged already before the crisis. The relative resilience of the EU export performance in the years preceding the crisis (see Figure 2.2) hid significant differences across Member States. Some countries accumulated losses in price competitiveness after a period of unsustainable aggregate demand growth fuelled by expanding private credit, housing bubbles and construction booms. Wages grew above productivity in some of them,

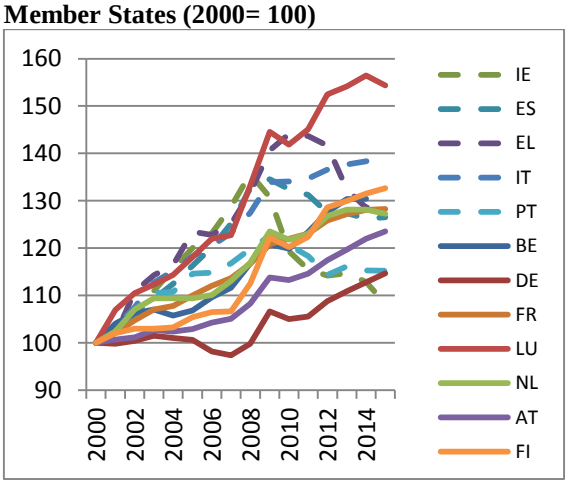
resulting in a clear divergence in the evolution of unit labour costs (ULC) within the EU, including amongst euro area Member States where peripheral economies saw their ULC surge (see Figure 2.3 and 2.4). Similarly, the developments in exchange rates (in real effective terms) showed increasing divergence across Member States. With over 60% of intra-EU trade in the exports of Member States, these divergences in their competitiveness performance lead to the build-up of macroeconomic imbalances.

Figure 2.3: Nominal Unit Labour Costs in non-EA-12 Member States (2000= 100)



Source: Eurostat
Note: Non-EA-12 refers to Member States that did not join the euro by 2001.

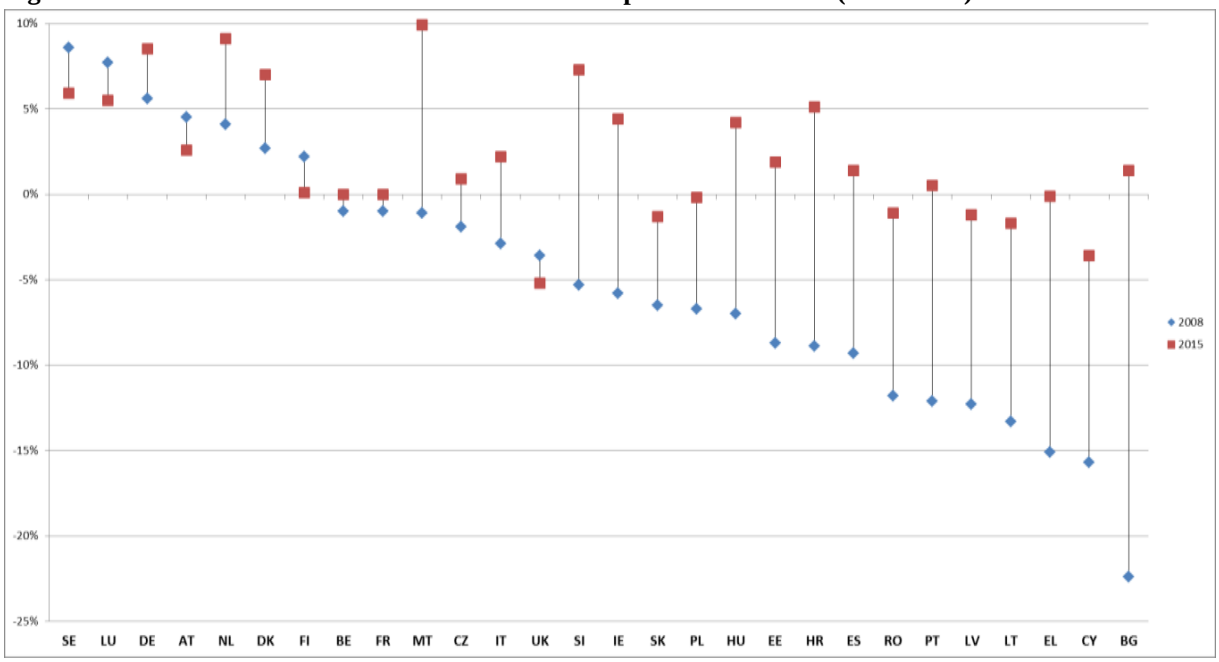
Figure 2.4: Nominal Unit Labour Costs in EA-12 Member States (2000= 100)



Source: Eurostat
Note: EA-12 refers to Member States that joined the euro by 2001.

The crisis prompted a correction of Member States external imbalances, halting the trend of increasing divergence. Member States with high current account deficits improved their trade performance and reduced labour costs to correct their imbalances. The correction of the current account by internal deflation was significant amongst deficit countries (see Figure 2.5). Unless structural reforms are introduced, the sustainability of current account improvements in the long run is in question.

Figure 2.5: Current account balance in 2008 and 2015 per Member State (% of GDP)



Source: Eurostat

2.2. Evolution of productivity

Productivity is the key driver of long-term growth. It is determined by the number of hours that people work (labour input), the capital they have to work with (capital input) and how efficiently these inputs are combined in production (the so-called Total Factor Productivity (TFP)). The latter therefore captures the impact of technological progress and innovation. Given the limitations of accumulating labour and capital, the long-term productivity growth is largely dependent on TFP growth. However, the evolution of productivity growth is also determined by the changes in the accumulation of labour and capital. Therefore, understanding the evolution of productivity and its main drivers is important to define policies aiming at improving productivity performance. This and the following chapters shed some light on this question. Using a simple growth accounting framework[6] we can identify the contribution of labour, capital and TFP to EU production. The following two chapters will analyse in more detail the evolution of these drivers of productivity (human capital, physical and immaterial capital, innovation).

Overall evolution of productivity

The EU still underperforms with respect to the US, but the catching-up process may be resuming as a result of a race to the bottom. Europe has been underperforming the US in terms of productivity in the last decades. Furthermore, the economic and financial crisis hit the EU economies to a greater extent than the US, and as a result convergence in productivity levels stopped (see Figure 1.1 in chapter one). The US better resisted the crisis since it was more reliant on TFP and had stronger job creation (see Figure 2.6). The highest TFP in the US may be explained by a higher rate of innovation and technological change, including the take-up of ICT (cf. chapter 4), that results from a higher level of investment in knowledge-based capital (cf. chapter 3). It could also be explained by a better allocation of resources to most productive firms as a result of more flexible labour, capital and product markets (cf. chapter 5). However, last year, the EU outperformed the US in terms of productivity growth and is expected to do so again in 2016.[7] This outperformance is however more due to the slowdown in US productivity growth than to a significant improvement of EU productivity.[8] In any case, it is still early to assess whether this marks a change of trend and the resume of the convergence process.

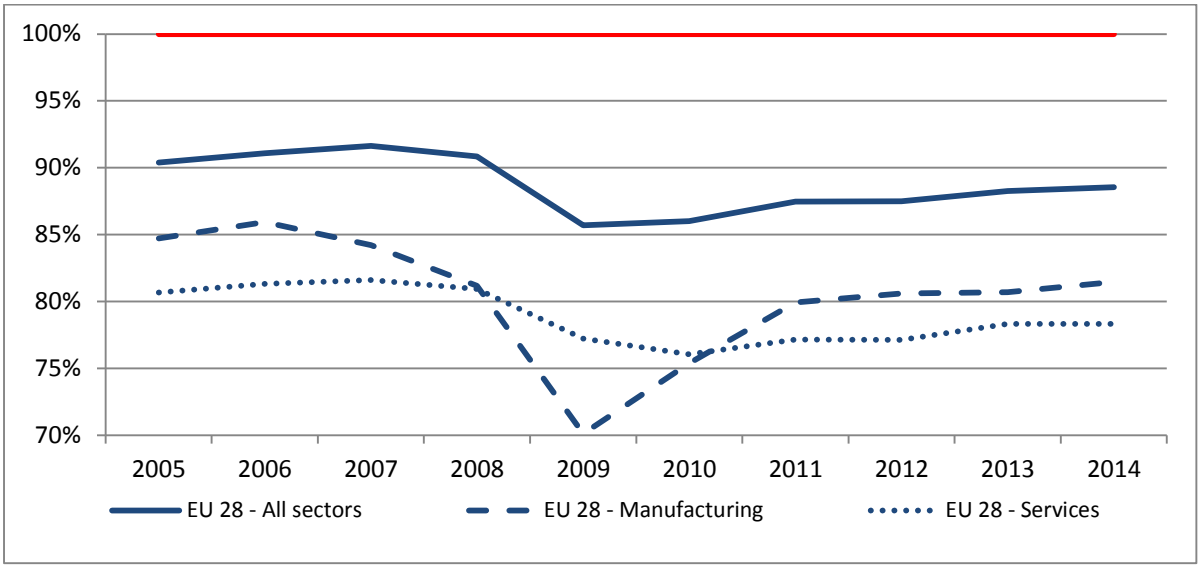
The low productivity of the service sector remains a major drag on EU economies. There has been a gradual shift of activity and resources from the manufacturing to the services sector. As a result, the service sector has become the largest contributor to the productivity of several Member States. Yet, it is precisely in this sector where the gap vis-à-vis the US is larger. As they become the largest sector in the economy, if the EU does not increase the productivity in the service sector it is unlikely that the productivity gap with respect to the US will be closed and, more generally, that the EU will achieve sound rates of aggregate productivity growth. The question arises of how to improve the productivity in the service sector (cf. chapter 9) and whether resources are being allocated not only to high productivity services sectors but also, within each services sector, to the most productive firms (cf. chapter 4 and 5).

[6] A growth accounting exercise breaks down output growth into the growth of production factors (capital, labour) and the growth of TFP, which measures the efficiency in the use of production factors. TFP growth is usually measured by the Solow residual. Cf. Solow, R. (1956) "A Contribution to the Theory of Economic Growth".

[7] Source: Total economy database, May 2016, The Conference Board.

[8] Indeed, productivity growth in the EU (0.8% in 2015, and projected 0.6% in 2016) and the US (0.3% in 2015 and -0.2% in 2016) will remain far below their average levels in 1999-2006 (1.9% in the EU, and 2.4% in the US). Source: Total economy database, May 2016, The Conference Board.

Figure 2.6: EU-28 labour productivity in the whole economy and per sectors (US = 100)



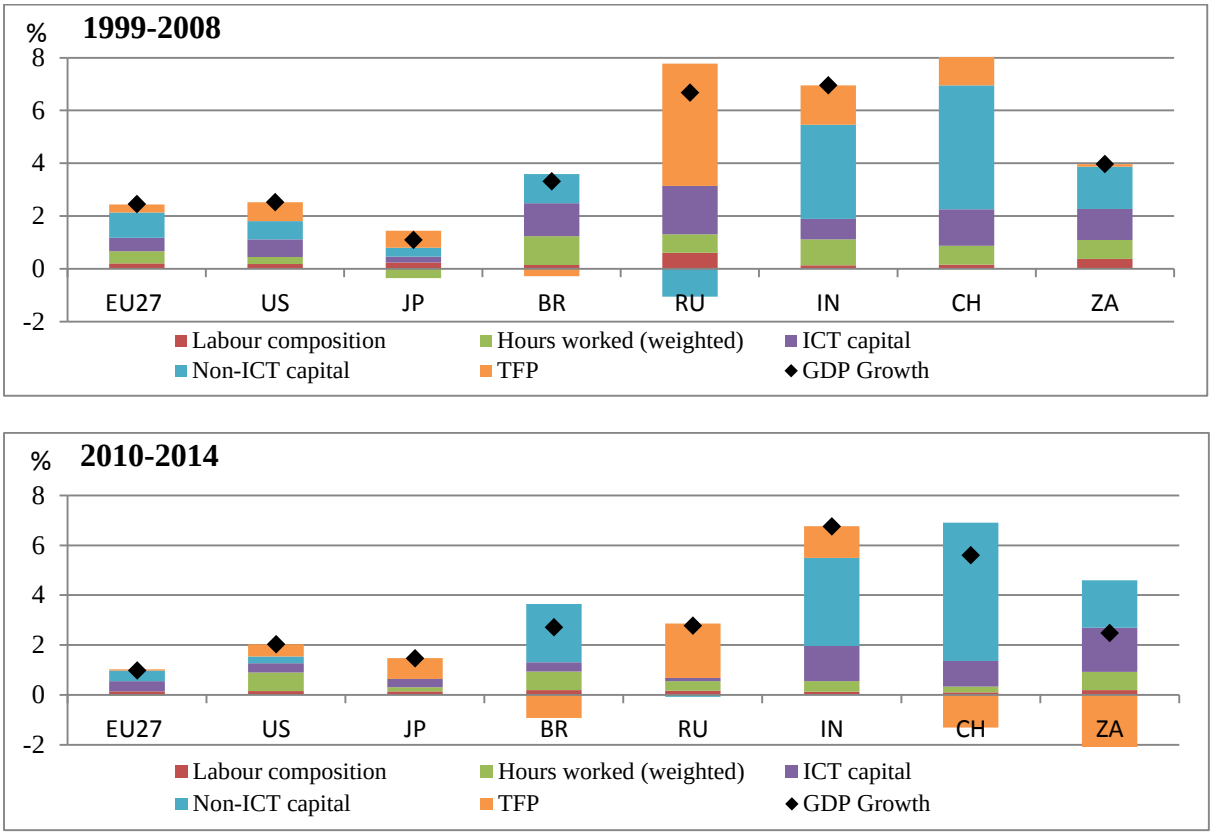
Source: OECD, Eurostat, own calculations
Note: For EU-28: Eurostat data on 'value added, gross' in constant prices (chain-linked volumes) and for labour input data in terms of persons (employees and self-employed). For US: OECD data on "Value Added and its components" and for labour based on data on employees.

The decline in TFP growth continues. There has been a secular decline in TFP growth in advanced economies in recent decades. The contribution to growth of TFP in the EU, Japan and the US was smaller than in some emerging economies such as India, Russia or China before the crisis, although the last group was more affected by the crisis (see Figure 2.7). This is particularly worrisome since, in the long term, TFP is the main determinant of productivity growth. This raises the question of what drives TFP growth, and may point to a lack of innovation and the misallocation of resources (cf. chapter 4). Furthermore, the low level of intangible capital may have especially weighed on Europe's TFP (cf. chapter 3). A question arises whether part of the productivity gap between the two continents can be explained by differences on investment in productive forms of capital including intangible capital. As growth is fuelled by TFP growth and its decline continues, it is capital that matters in the EU.

The insufficient recovery of investment has put EU's low productivity growth in a critical situation. TFP is more resilient to crisis (long term growth based on organisation, efficiency, etc.) while capital is more volatile as it requires investments. After the crisis, the collapse in investment decimated capital accumulation and therefore accentuated the productivity growth slowdown. The EU suffered more from this collapse as its productivity growth has been more reliant on capital accumulation than that of the US (see Figure 2.7). This led to a larger deceleration of productivity growth in the EU than in the US after the crisis. Indeed, all Member States have seen lower labour productivity growth rates after the crisis (see Figure 1.1 in chapter one), except for Spain, Croatia, and Italy, whose increase has been likely due to labour shedding. The decline has been particularly marked in those countries whose productivity was catching-up with the EU average.

The investment collapse has been a particular feature of the EU. The fall in capital accumulation in the EU contrasts with the situation in emerging economies, where it remains the main growth driver and has even increased in some instances (see Figure 2.7) although productivity growth has slowed down there too. There is abroad consensus on the need to revitalize investment in Europe to increase growth and productivity. This raises the questions of where should investment be directed and what type of investment is needed (cf. chapter 3).

Figure 2.7: Decomposition of average annual GDP growth before (2000-08) and after (2010-14) the crisis



Source: The Conference Board, own calculations

Growth components at Member State level

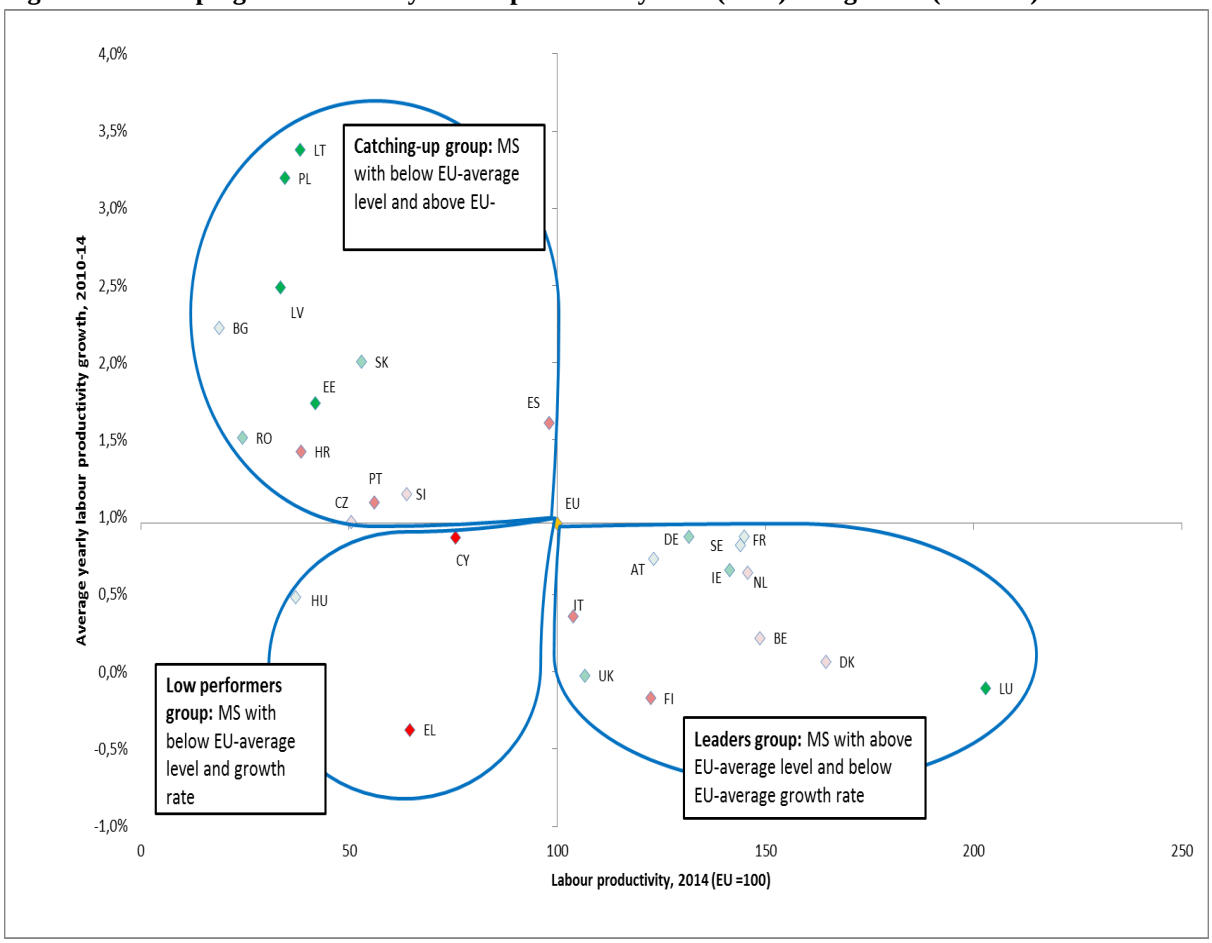
Member States with lowest productivity levels have been more affected by the investment fall, but the catching-up process continues. The countries with the largest decline in labour productivity after the crisis are those with below EU-average levels (see Figure 1.1 in chapter one). Yet, the catching up process is still going on as overall Member States with lower productivity levels are still growing at above-average rates, and vice versa. The persistence of the convergence process is partly due to the subdued performance of the leading economies, with productivity growth rates which are growing at rates below the EU average (in a few instances with negative rates). Indeed, in contrast with the pre-crisis period, there is no Member State displaying above-EU average productivity level and growth rate.

The relative contribution of Information and Telecommunication Technologies (ICT) capital[9] to growth has been resilient during the crisis and has increased afterwards. The investment collapse has significantly reduced the absolute contribution of capital to productivity growth. However, since the absolute contribution of the other factors (TFP and labour) has decreased even further, the relative importance of capital accumulation, in particular ICT capital, has increased. The higher resilience of ICT capital may be due to its expected higher return on output growth. Increasing ICT capital investment would therefore lead to higher productivity growth than investments in non-ICT capital. This raises the question whether Europe is investing in what are the most important assets for a productive recovery.

[9] Investment in ICT capital includes investments in ICT equipment and software. However, actual investments in ICT are higher since digital technology is also embedded in other investment goods.

The remainder of this section portrays the growth factors of each type of Member States. For this purpose, Member States have been classified in different groups based on their level of real labour productivity[10] and their productivity growth[11] (see Figure 2.8).[12]

Figure 2.8: Grouping of countries by labour productivity level (2014) and growth (2010-14)



Source: Eurostat, European Commission

Notes: Data on hours worked for HU, RO, PL, for certain years have been recalculated due to breaks in available data series. Each country data point has been coloured on the basis of their ranking in terms of real GDP growth rate between 2010 and 2014. A red colour signals a low position in the ranking but not necessarily a negative growth rate. Cf. note for graph 1.1.

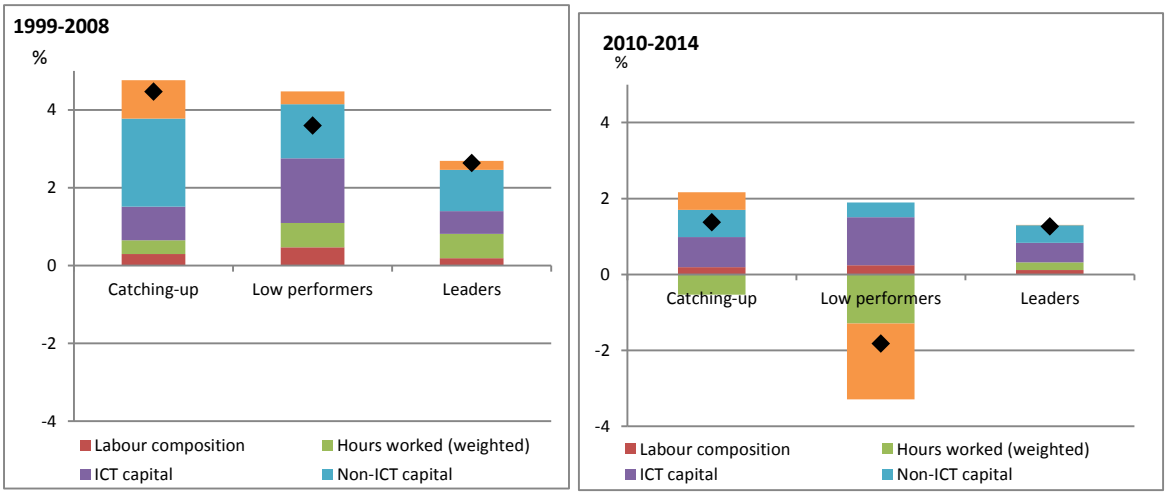
[10] Member States have been classified based on whether their level of real labour productivity is above or below EU average, and their productivity growth in 2010-14 was above or below EU average, namely:

- Member States with above EU-average level and growth rate: None.
- Member States with above EU-average level and below EU-average growth rate ("Leaders" group): LU, DK, BE, NL, FR, IE, SE, DE, AT, IT, UK, FI
- Member States with below EU-average level and above EU-average growth rate ("Catching-up" group): RO, LT, LV, PL, BG, SK, EE, HR, CZ, PT, SI, ES
- Member States with below EU-average level and growth rate ("Low performers" group): HU, CY, EL

[11] Labour productivity takes into account public work. The unavailability of the relevant data for some Member States does not allow us to exclude this concept in the calculations. If this would be possible, the position and classification of Member States could be different.

[12] Labour productivity figures and thus the classification of Member States into groups is sensible to the period chosen for the analysis given the sharp variations observed during the crisis. The period 2010-14 has been chosen in this chapter to avoid some extremes values observed in 2009. Yet, the grouping of countries would have slightly changed if another period would have been defined. For instance, if the period 2009-14 would be applied, Croatia and the Czech Republic would be growing below but close to the EU-average, while Ireland would be growing at above-EU average rates given the sharp rebound of its labour productivity in 2009. In any case, the main findings of this chapter would not be substantially affected by these slight changes.

Figure 2.9: Decomposition of average annual GDP growth per group

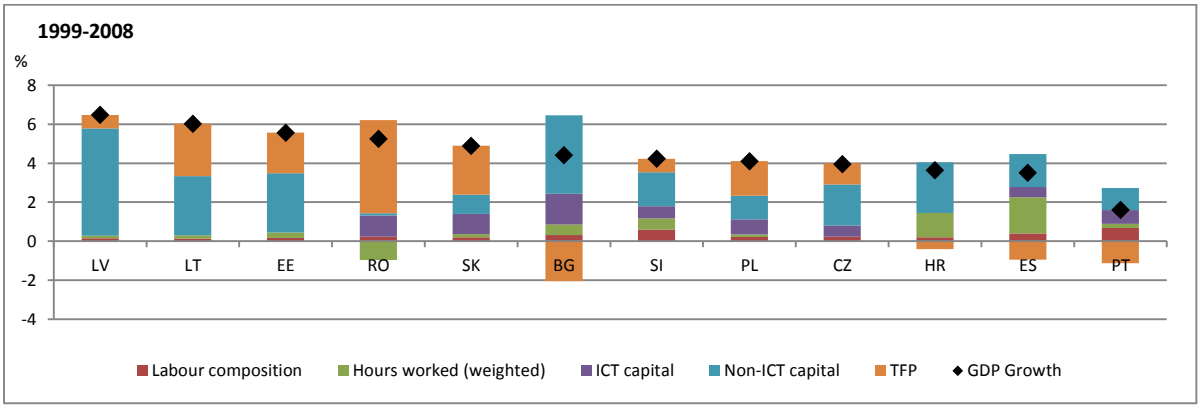


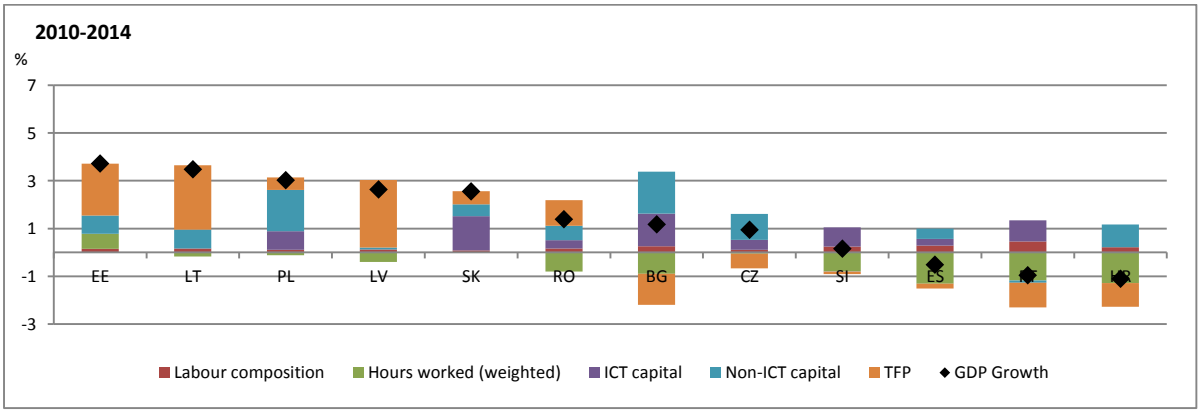
Source: The Conference Board, own calculations

Member States with low level and high growth rates (catching-up group)

The collapse of non-ICT investment is behind the reduced growth after the crisis. In line with the EU's overall behaviour, the decline in growth after the crisis is largely due to the collapse of non-ICT capital accumulation and job losses. This contrasts with the small decrease in ICT capital accumulation which has increased its relative contribution as a growth driver.

Figure 2.10: Decomposition of average annual GDP growth per country of members of the catching-up group





Source: The Conference Board, own calculations

The relative resilience of TFP has kept the catching-up process alive. TFP contribution to growth has been drastically reduced. However, it remains positive, in contrast with the negative contribution of the low performers and the almost negligible contribution of the leaders. This seems to indicate that the catching up process is supported by TFP.

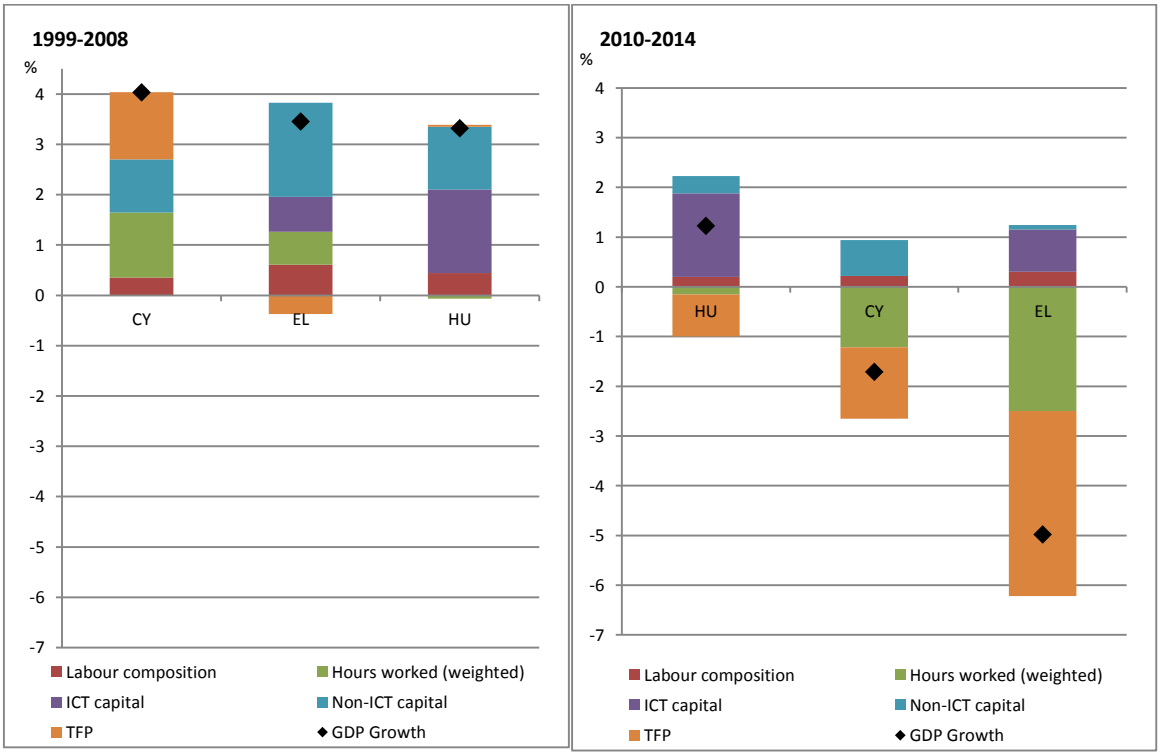
Labour quantity dragged down growth after the crisis but labour quality always had a positive even if minor contribution. The amount of labour (hours worked) dragged down growth in the second period (something expected given the sharp reduction in the workforce in many countries in the post crisis period). However, labour composition (quality) seems to have played a minor role is almost all countries. This raises questions of whether investments in human capital are too low or whether they do not have a significant impact on aggregate productivity (cf. chapter 3).

Member States with low level and low growth rates (low performers group)

All growth components have collapsed except the investment in ICT capital. Before and after the crisis, growth has been mainly supported by capital accumulation. However, while non-ICT capital collapsed with the crisis, ICT capital slightly increased, showing again its resilience as for the catching up group. The fall in investment levels is however evident in the collapse of non-ICT capital.

This group has seen the biggest collapse in TFP. The already low level of TFP decreased even more than in the first group. This may be behind the lack of catching up to the EU average in this group. TFP collapse could point to an increased misallocation of resources in the economy due to product and labour market rigidities (cf. chapter 5), as well as capital misallocation (cf. chapter 3).

Figure 2.11: Decomposition of average annual GDP growth per country of members of the low performers group



Source: The Conference Board, own calculations

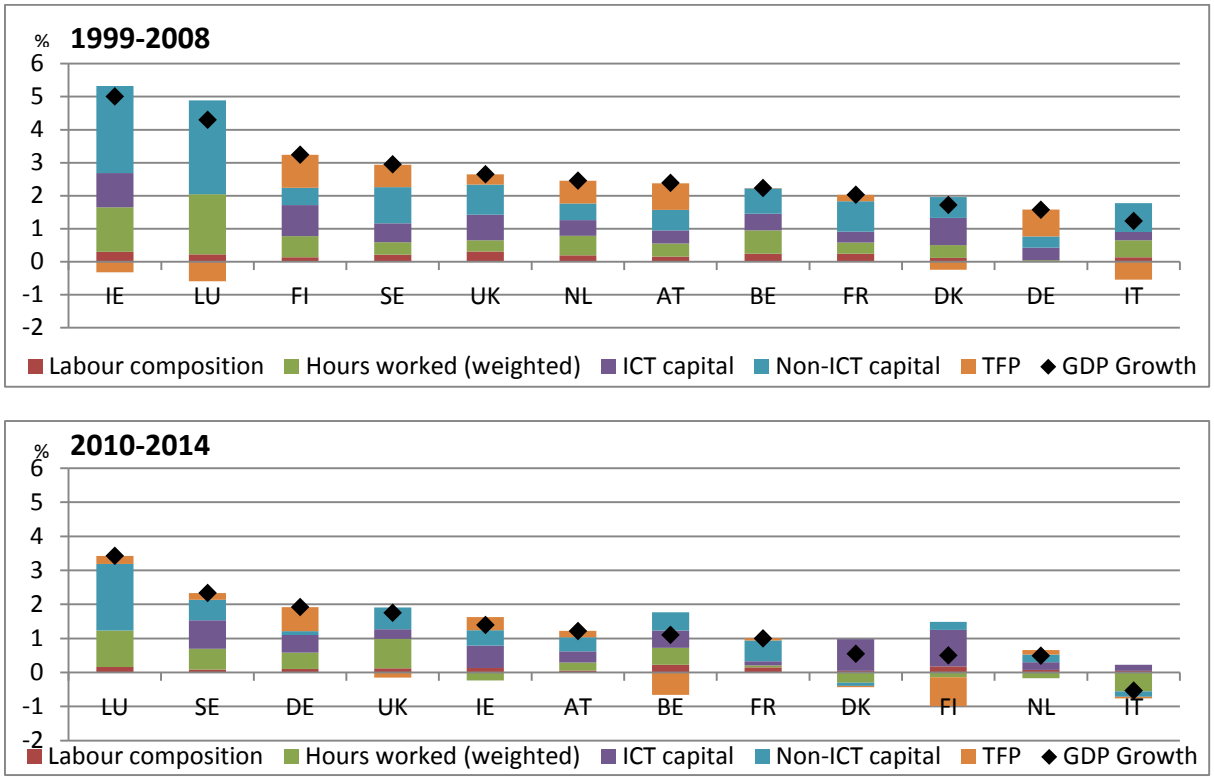
Member States with high level and low growth rates (leaders group)

The collapse in investment largely explains the reduced growth rates. The collapse in growth was largely due to reductions in non-ICT capital accumulation and job losses. Again, ICT capital has

shown a noteworthy resilience. Here again, the contribution of TFP has been structurally weak already before the crisis, but has further declined afterwards.

Job destruction has also played a role in growth slowdown. The collapse in growth is also explained by a lower contribution of labour quantity. Indeed, in the countries that show the highest growth rates in the post crisis period, GDP growth was supported by labour use as well, even if its contributions are significantly weaker compared to the pre-crisis period. This differing performance may be due to labour market rigidities causing asymmetric labour market shocks. Otherwise, the contribution of labour composition has continued to be positive, although its minor role may question the level and/or effectiveness of the investments in human capital (cf. chapter 3).

Figure 2.12: Decomposition of average annual GDP growth per country of members of the leaders group



Source: The Conference Board, own calculations

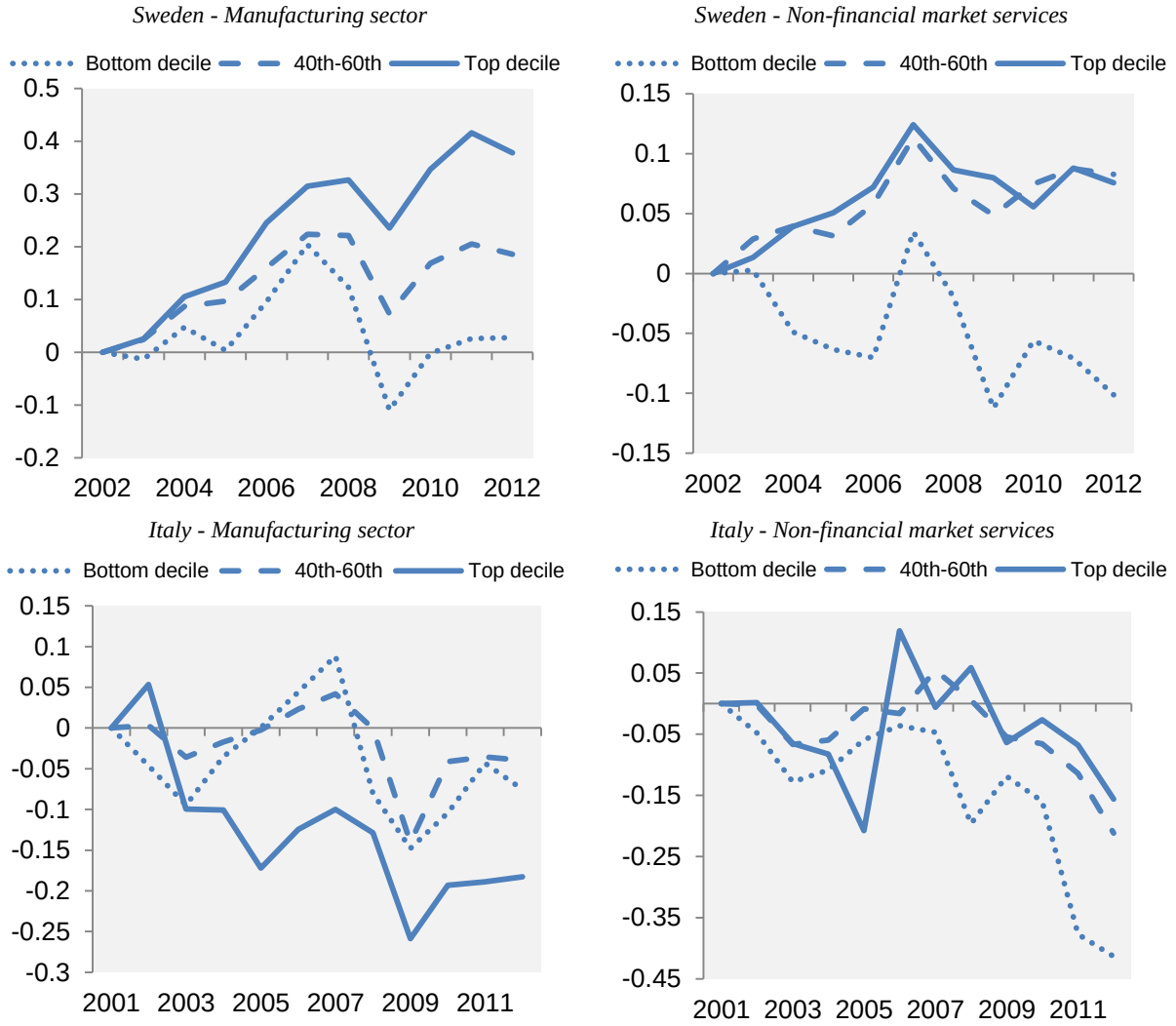
This overview has presented some good news, namely: the resilience of investments in ICT, and the fact that TFP growth working in the catching up group. However, there is less good news also, namely: the disarray in low performers and the subdued performance of leaders. It seems to point to ICT as the key variable but structural reforms can also lift the profile especially of TFP in the EU.

2.3.Firm-level productivity

While convergence in productivity across Member States is an important objective, the evolution of productivity within countries is also important for competitiveness but also for social reasons. If wages follow the evolution of labour productivity, the evolution of productivity differentials within the economy is a key factor driving social disparities in the economy prior to income redistribution interventions.

The productivity gap between the globally most productive firms and the rest of businesses is increasing in many Member States. The most productive firms, the so-called global frontier firms, have not been affected by the global slowdown in productivity growth. They continue to display robust productivity growth rates. This sharply contrasts with the productivity performance of the rest of firms which has been declining overall. Indeed, the labour productivity of global frontier firms is more than 10 times larger than that of less productive firms and the gap is increasing. Furthermore, this gap is wider in the services sector than in manufacturing.

Figure 2.13: Labour productivity by type of firm in Sweden (index 2002=0) and Italy (index 2001=0)



Source: OECD

Note: The graph reports the unweighted average of real labour productivity (defined as real value added per employee) expressed in 2005 US dollars. Top decile corresponds to the top 10% of firms with the highest productivity level; the bottom decile corresponds to the bottom 10% of firms with the lowest productivity level; the 40th-60th decile corresponds to the 20% firms which are closer to the median of labour productivity. The values are normalised at their initial values in 2001 for Italy, and 2002 for Sweden.

The productivity gap between the most productive and the worst performing firms within Member States has also increased. This is evident overall both in Member States of the leaders group and of the low performers group, although the detailed sources and patterns of productivity divergence may be different (see Figure 2.13). For instance, in Sweden, the patterns are different between the manufacturing and the service sector. In manufacturing, the most productive firms are leaving behind the rest of firms. However, in the services sector, the least productive firms seem to be

decoupling from the rest with falling productivity growth rates while productivity grows for the others. In Italy, there is some convergence in manufacturing as the most productive firms have larger negative rates, while the gap in services is increasing.

The widening gap in productivity growth between firms may explain the global labour productivity slowdown. This may explain the paradox between the fast technological change we are experiencing nowadays and the slowdown in labour productivity. Indeed, the latter may not be caused by a lack of innovation but rather by the lack of diffusion of new technologies and best practices across all firms, as well as the misallocation of resources towards less productive firms amongst those that are not at the frontier (cf. chapter 3). Evidence also suggests that immaterial capital could also be an important factor that differentiates firms at the global productivity frontier and those lagging behind (cf. chapter 2).

The reasons behind this increasing gap in productivity within Member States are not well known yet. They seem to be associated with the different ability that firms have to benefit from new technologies, but it is not clear why this is happening[13] (cf. chapter 4).

2.4. Conclusion

An increasing divergence in the competitiveness performance of Member States preceded the crisis. Prior to the crisis, the EU managed to withstand the increasing competition from emerging countries in export markets. However, the neglected evolution of productivity before the crisis led to macroeconomic imbalances. The crisis triggered a correction of these imbalances which has halted the trend of increasing divergence. However, ultimately, it is productivity that will be determining the long term competitiveness and prosperity of Member States, and here the picture is gloomier**.**

EU's low labour productivity growth has further collapsed after the crisis, especially in catching-up countries. The secular decline in TFP growth, also observed in other advanced economies, has been aggravated by the fall in investment. The collapse of non-ICT investment largely explains the further decline in productivity growth after the crisis. This drop has been particularly marked in those countries whose productivity was below the EU average, although the catching up process is still ongoing.

The investment fall has been a particular feature of the EU. The fall in capital accumulation has particularly affected the EU. Other advanced economies like the US have withstood it better as their productivity has been more reliant on TFP growth. Emerging economies have managed to keet or even increase their investment levels. The higher resilience of ICT capital may indicate that investments in this area lead to higher productivity growth, while the low level of intangible capital may have especially weighed on TFP. Furthermore, the contribution of human capital has been positive but unexpectedly low, casting some doubts about its effectiveness. This raises the question of where capital should be flowing to and which assets are the most productive. The following chapter tries to shed some light on these questions.

TFP remains structurally weak. The weak contribution of TFP has further declined after the crisis. The low TFP growth may point to a misallocation of resources and therefore raises the question of the level of allocative efficiency of labour and capital across sectors and Member States. Yet, the low TFP

[13] Cf. Commin and Mestieri (2013); and OECD (2016), Economic policy reforms 2016: going for growth.

growth may also point to a lack of innovation and technological progress. Then the question arises of the importance of innovation policies to foster adoption of technologies and best practices. Chapter four aims at throwing some light at these questions.

The increasing gap between most productive firms and the worst performing may explain the slowdown in productivity. The analysis of productivity at firm level is crucial to identify the drivers behind the disappointing productivity growth rates. The increasing gap between the most productive firms and the rest signals a lack of transmission technological progress across firms and may signal the existence of obstacles hampering the diffusion of innovation. These issues are analysed in further detail in chapter 3.

2.5. References

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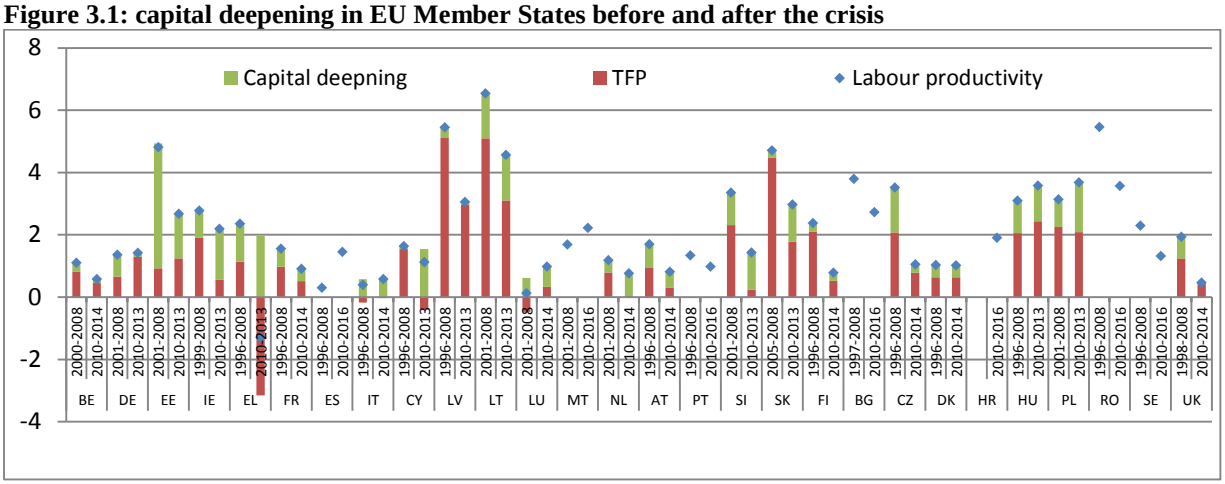
3. Investment and sources of productivity growth

The main factor driving productivity in the EU has been capital deepening, i.e. the ratio between capital and labour (chapter 2). This compares with the higher profile of total factor productivity, which has driven productivity growth in the USA. In the recovery, capital deepening remained the main driving force behind GDP growth for the majority of Member States, although its contribution has been uneven across countries. However, the contribution of capital to growth has been much lower after the crisis than before 2008. In addition, closer look suggests that capital deepening in many Member States was mainly due to labour shedding rather than higher investment and more use of capital in the production process. This was the case for stressed economies (IT, ES, PT, EL, IE, CY) where labour utilisation slumped between 2009 and 2012.

Figure 3.1: capital deepening in EU Member States before and after the crisis



Source: Eurostat

The European Commission 2015 Competitiveness and Integration Report underlined the importance of capital and the risks of the subdued investment levels accumulated since the outbreak of the crisis. In this chapter, we look at capital flows in the recent past. The ultimate question is to learn if capital is now flowing to where it is most needed. In order to answer this question, we look in this chapter at the *distribution of investment by assets particularly in investment in machinery and equipment and investment in construction[14] and the reasons for the subdued investment in Europe in the aftermath of the crisis. We also analyse the impact of human capital on labour productivity and the possible reasons behind its relatively low contribution.

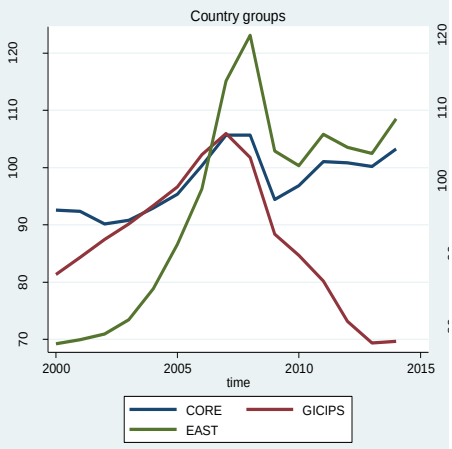
3.1.Developments in investment in Europe

Despite recent acceleration at the end of 2015, investment remains subdued and below historically sustainable levels impacting on potential output growth[15]. The aggregate level of investment in the EU28 is still around 10% below the average investment during 2004 and 2008. The evolution of investment presents considerable differences when we break down its evolution by

[14] Investment in intangibles is analysed in chapter 4.
[15] If investment activity in the Eurozone had been corresponding stronger, potential growth in the monetary union could have been 0,2 percentage points higher than observed since the crisis.

country and asset. A recent study on the transmission of shocks in the Single Market[16] has identified three different groups of Member States according to these transmission channels: CORE countries, GICIPS countries and EAST countries.[17] The EAST group experienced a sharp increase in investment before the crisis followed by a less sharp decline just after the crisis, but gross capital formation remained above the average value between 2004 and 2008. Country differences are important in the recovery for this group with EL, CY, SI, RO, experiencing big drops (-37%,-40%, -61% -62% respectively) while others like PL, increases from pre-crisis levels (+114%). The CORE group presents a more stable profile and despite the impact of the crisis, investment is recovering at a slow rate. The evolution of investment in the GICIPS group is more dramatic and investment levels in 2014 are around 70% of the average during the time period 2004 and 2008 and compared to the EAST group.

Figure 3.2: Investment dynamics in the EU 2000 to 2014: country groups



Source: Eurostat National Accounts, WIFO calculations.
Note: Volume Index, the average investment in 2004 to 2008 equals to 100.

Differences across groups are starker when looking at investment by assets. Both investment in machinery and equipment and investment in construction are below their pre-crisis levels (see Table 3.3). Investment in construction has fallen in all groups but this fall is particularly relevant for the GICIPS where it accounted for almost 16% of GDP in 2004-2008 and now it is less than 9%. The high investment levels displayed by the EAST group went to machinery and equipment (over 11% of GDP) before 2009. Despite the crisis, investment in equipment and machinery in these countries accounts for over 8% of GDP, well above the EU average even before the crisis (below 6%). However, all Member states present a commonality: investment in knowledge based and intangible capital has continued growing despite the crisis[18]. Under this common trend there are significant differences between CORE countries and the rest: both EAST and GICIPS Member States show considerable lower levels of investment in intangibles during the previous decade. This disaggregated review of investment trends suggests some interesting conclusions. The lack of capital investment is particularly important in the catching up countries included in the EAST and GICIPS groups. Furthermore, the crisis seems to have corrected excesses in the allocation of capital to construction in GICIPS countries. Finally, the

[16] Single Market Transmission Mechanisms Before, During and After the 2008/2009 Crisis: A Quantitative Assessment. Austrian Institute of Economic Research – WIFO (Study lead). Vienna, June 2016
[17] The CORE group includes AT, BE, DE, LU, NL, FR, UK, DK, SE, FI, MT the GICIPS country group consists of EL, IE, CY, IT, PT, ES, while the EAST country group consists mainly from countries of the catching up group that is PL, EE, LT, LV, CZ, SK, SI, HR, HU, BG, RO.
[18] This is also reflected in the composition of investment where it is evident that there is a shift towards intangible assets.

demand for highly productive capital in the form of intangibles seems to be latent but remains steady, although EAST and GICIPS countries have a lot of catching up to do.

Table 3.3: Composition of Investment across country groups

Countrygroup	Construction			Machinery and Equipment			Intangible Assets		
	1999 - 2003	2004 - 2008	2010 - 2014	1999 - 2003	2004 - 2008	2010 - 2014	1999 - 2003	2004 - 2008	2010 - 2014
					Investment in relation to GDP				
EU28	**10.9**	**11.9**	**10.2**	**6.9**	**6.7**	**5.9**	**3.4**	**3.4**	**3.7**
CORE	10.6	11.1	10.0	6.9	6.7	6.1	3.7	3.7	4.1
GICIPS	14.3	15.8	9.0	7.3	7.0	5.5	1.9	2.1	2.7
EAST	11.2	14.1	11.2	11.1	11.3	8.7	1.8	1.9	2.2
					Composition of Investment				
EU28	**51.4**	**54.0**	**51.5**	**32.4**	**30.6**	**29.7**	**15.9**	**15.2**	**18.5**
CORE	50.0	51.4	49.3	32.5	31.1	30.1	17.4	17.3	20.4
GICIPS	60.2	62.7	51.7	31.3	28.5	31.9	8.1	8.5	15.3
EAST	46.2	51.0	50.7	45.5	41.3	39.0	7.3	6.9	9.7

Source: Eurostat National Accounts, WIFO calculations.

3.2. Investment in machinery and equipment

Developments in investment in machinery and equipment explain large part of the poor performance of investment in Europe in the post crisis period. Even though the investment ratios in CORE and EAST countries show a slow but steady upward trend from immediately after the crisis to 2014[19] they are still lower in the post crisis period compared to the pre-crisis period[20]. In GICIPS countries the situation is even worse as investment remained weak during the whole period from 2008 to 2014. In 2014 the investment volume was at 78% of the pre-crisis average (see Figure 3.4). At country level only IE (+0.6bp) and LUX (+0.3bp) saw their investment levels in machinery and equipment increasing in the post crisis period relative to the pre-crisis period. Particularly hit countries include EL (-3.1 bp), PT (-2.2 bp), and most of the EAST countries (BG: -4.3bp, LV: -5bp, RO: -3.2bp, SI: -3.2bp). Not surprisingly those are also the countries which experience the biggest drops in growth levels.

These developments put into question the ability of some of the catching up economies to enhance their capital accumulation, to increase their labor productivity and ultimately to turn around subdued growth. In a number of EU countries the decline in capital accumulation resulted in a significant downward swift in potential growth. In Slovenia for instance where investment in machinery and equipment is estimated to lag behind its historical average by 1-2% of GDP each year, the Commission estimates potential growth at 0, 75% compared to 3-4% between 2000 and 2008[21]. In addition these evolutions put into question the ability of EU as a whole to close the productivity gap with the US taking into account that while the rate of gross investment in machinery and equipment in the EU is equal to its long-term average, that in the US is significantly higher than the long-term averages[22].

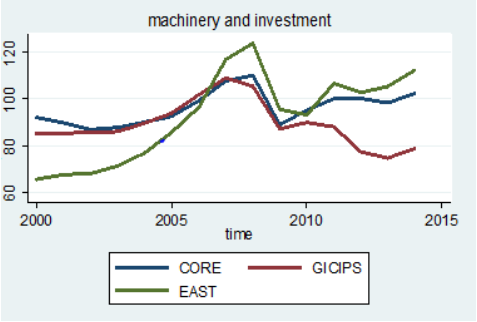
[19] Investment reached a volume of 102% and 106% of the pre-crisis average investment volume in CORE and EAST countries respectively

[20] Investment ratios fell in CORE and EAST countries from 6.7% to 6.1% and from 11.3% to 8.7% respectively.

[21] Country Report Slovenia 2016, SWD (2016) 92 final.

[22] Source: EIB (2015): Investment and Investment Finance in Europe

Figure 3.4: Developments in investment per asset class – machinery and equipment



Source: Eurostat National Accounts, WIFO calculations.
Note: Volume Index, the average investment in 2004 to 2008 equals to 100.

Europe's increasing productivity gap with the U.S. could be partly explained by differences in investment in ICT. Even though investment in ICT has shown a noteworthy resilience to the effects of the crisis[23], European companies in most Member States invest less in ICT than their US and Japanese counterparts. [24] There are great differences across EU Member states too: In 2013, EU investment in ICT was 2.2% of GDP, nearly 30% lower than in the US and 35% lower than in Japan. Furthermore there are pronounced differences between Member States, with the five best performers (CZ, SE, FR, AT, DK) investing on average more than double the share of their GDP compared to the five worst performers invest (SK, HU, CY, EL, IE)[25]. Overall in the EU, investment in ICT hardware and software has decreased during the crisis and has stagnated since then.[26]

Europe is leading in some areas of advanced manufacturing but still more investment is needed. Apart from ICT-enabled intelligent manufacturing, these advanced manufacturing technologies aim at sustainability (more efficient use of energy and materials; less emissions) and performance (more flexibility, precision; less defects) or consist of entirely new production methods (e.g. 3D printing). While Europe leads in terms of the share of patents in this field, as well as in the share of advanced manufacturing technologies in exports, only half of European manufacturing companies actually use or plan to use such technologies.[27]

3.3.Investment in construction and infrastructure

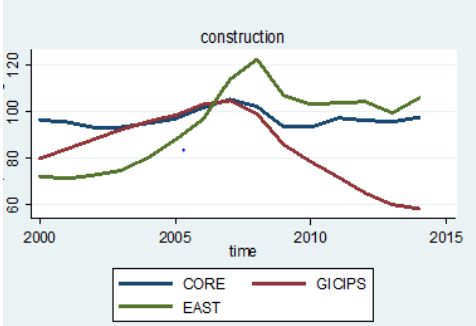
The crisis had a major impact on investment in the construction sector, but the situation varies considerably within the EU. Data shows clearly that no country group achieved values that were recorded for the year 2007 before the outbreak of the crisis and that investment remained comparably weak in all country groups. The cross group analysis shows that most of the decline is attributable to the crisis countries (GICIPS), where the real volume of investment fell steadily since 2007 from 104%

[23] For more information see also chapter 2
[24] National statistics underestimate the true ICT capital stock particularly in manufacturing. It is, for example, estimated that 98% of programmable digital devices are embedded in other products, including investment goods.
[25] OECD Science, technology and industry scoreboard 2015.
[26] As regards the three groups of Member States identified in chapter 2, a clear picture emerges: The leaders saw the smallest relative decrease during the crises and a slight increase since then. The catching-up economies invest significantly more in ICT than the leading countries. They experienced the steepest decrease in the crisis, which corresponds to the fact that many of them are the most distressed economies. Despite this steeper decline of their ICT investment, they continue to out-invest the leading economies. Finally, the low performers saw a continued decrease of their investment in ICT even after the crisis.
[27] European Commission (2015) Flash Eurobarometer 415.

of the pre-crisis average to 58% of the pre-crisis average in 2014. Investment fell sharply in the post crisis period in relation to GDP in EAST and GICIPS economies and this may have repercussions on their catching up efforts (see also Table 3.1).

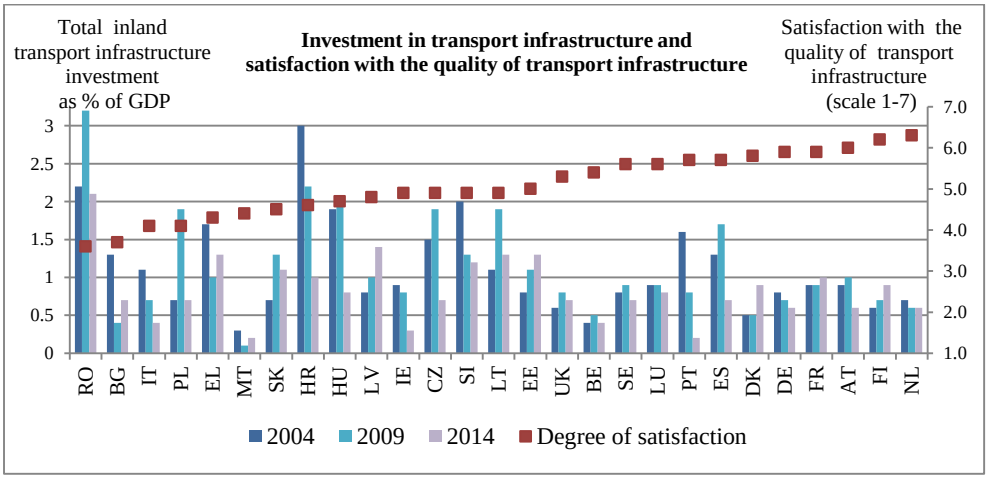
At country level, the evolution of investment is very heterogeneous. By 2014, the UK and Sweden had almost fully recovered to the 2008 level and Germany showed investment levels of +12.5 % above the pre-crisis level. Ireland is an exception, which reported levels of investment in 2008 almost double those of the other countries, but experienced a sharp collapse, dropping by 50% between 2008 and 2014. The situation in Southern Europe is generally bleaker compared to Northern Europe. Although investment in construction in ES, IT and FR was higher than in most Northern European countries in 2008, investment in these countries was more severely hit by the crisis, dropping by 13 % in FR, 33 % in IT and 46 % in ES, and investment is today still far from the pre-crisis level. In Central and Eastern Europe investment is more heterogeneous. For instance, in 2008, RO recorded the highest investment in the group, but it was the most affected by the crisis, falling by 39 % between 2008 and 2014. Similarly, HU reported a 20 % drop in construction investments over the same period. Investment in PL on the contrary experienced a sustained growth over the years, being 25 % above the pre-crisis level by 2014. This substantial increase has been fuelled by rising demand across all sub-sectors – largely driven by structural funds – but also by the foreign direct investment flows in the Polish construction market.

Figure 3.4: Developments in investment per asset class – construction



Source: Eurostat National Accounts, WIFO calculations.
Note: Volume Index, the average investment in 2004 to 2008 equals to 100.

Figure 3.5: Transport infrastructure: investment and quality



Source: OECD (2016) Infrastructure investment indicator and WEF Global Competitiveness Report 2015-2016

Infrastructure[28] is a key driver of growth and competitiveness[29] and continued underinvestment in infrastructure may constrain growth in the future. According to the European Investment Bank's estimates, the EU may need up to €2 trillion in investment in the period up to 2020. The construction of cross border infrastructures is partially important to articulate the sigle market. In transport, the cost of EU infrastructure development to match the demand for transport has been estimated at over €1.5 trillion for 2010-2030. The completion of the TEN-T Core Network Corridors requires about €700 billion until 2030.[30] In energy, the Commission estimates that around €200 billion are needed to develop cross border electricity interconnections.[31] However, there is a substantial funding challenge as traditional lenders are under pressure to deleverage and reduce their balance sheets. Governments can increase funding streams by raising user charges, capturing property value, or selling existing assets and recycling the proceeds for new infrastructure. Public-private partnerships have assumed an important role in infrastructure in the past but have slowed down after the financial crisis. Infrastructure ventures can attract more private financing and public-private partnerships will be an important source of financing in the future. [32] The satisfaction with the quality of transport infrastructure is particularly low in the eastern part of the EU. However, also in many other Member States the quality of infrastructure is negatively affected by insufficient investments in the upgrade and maintenance of the transport network.[33] Countries that are still particularly far from the EU average as regards the quality of infrastructure include RO, BG, IT, PL, and EL. In PL, BG and RO the quality and availability of transport infrastructure has notably improved over the last years, but considerable investment is still be needed in order to catch up with the EU average.

Investment in smart transport and energy infrastructure can enable new business models and increase productivity. Transport in the EU still suffers from non-interoperable legacy information systems, missing technical standards and a limited legal framework for sharing information. This leads to inefficiencies in the overall transport system and also hampers future opportunities for Europe to lead in rapidly developing technologies such as connected cars and automation. Smart grids and smart metering systems automatically monitor energy flows and adjust to changes in energy supply and demand and can thus also help to better integrate renewable energy. However, the first round of projects of common interests in energy infrastructure saw only two smart grid projects selected for funding, i.e. a UK-IE and a FR-IT cross border interconnection project.

3.4.Reasons behind weakness in investment

Weak demand

A prolongued period of subdued demand reduced investment ratios. In turn, continuous weakness in demand has led to deterioration in potential output via weaker growth in the capital stock[34]. A recent study from the OECD confirms these findings and shows that there is a strong

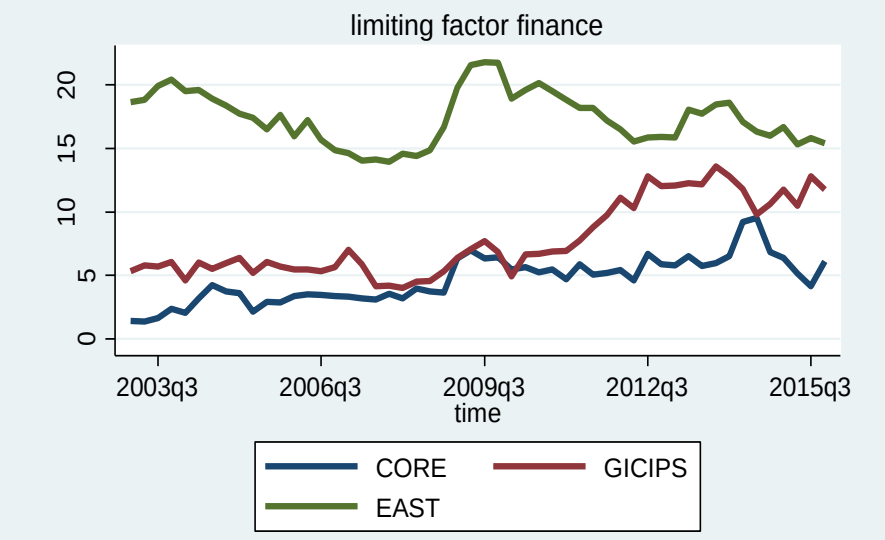
[28] In national accounts infrastructure investment is part of gross investment in other buildings and structures
[29] Infrastructure investments can be assumed to increase income and spending in the short-term and productivity of the economy in the longer-term. This is particularly the case for infrastructure investments aimed at improving connectivity, provided they do not create excess capacity
[30] COM(2011)144 final, "White Paper on Transport"
[31] COM(2014)330, European Energy Security Strategy
[32] McKinsey Global Institute, Bridging Global Infrastructure Gaps, June 2016
[33] European Commission, Key areas: comparing Member States' performance - Transport
[34] Barkbu et al (2015): Investment in the euro area: why has it been weak?; OECD working papers: Links between weak investment and the slowdown in productivity and potential output growth across OECD

correlation between output gap and the post crisis decline in capital stock growth[35]. More formal statistical analysis[36] confirms that a part of this weakness can be explained by output dynamics, particularly before the European sovereign debt crisis. The rest is explained by a high cost of capital, financial constraints, corporate leverage and uncertainty.

Tight credit conditions and high leverage

Long-lasting factors such as deleveraging in the private sector and tight credit conditions explain part of subdued investment but their importance varies across countries. Most studies show that interest rates played a modest role in explaining the weak investment dynamics since the crisis. Increases in the costs of capital were pronounced especially in Greece, Spain and Italy and credit standards concerning the size of loans supplied tightened in 2008-2009[37]. However only for Greece the cost of capital seems to have played an important role in reducing investment dynamics in the post crisis period[38]. High levels of indebtedness may be another reason for low investment activity as lenders are less willing to lend to indebted companies.

Figure 3.7: Impact of financial factors on production by country group. Percentage of businesses managers indicating financial factors as a limiting factor.



Source: European Business Survey, WIFO calculations

Inefficient allocation of capital

Unusually low interest rates for a long period before the crisis on 2009 shed light to another explanation for low capital formation in the post crisis period, that of misallocation of capital. Very low interest rates in some EU countries such as IT, ES, EL facilitated a construction boom in the pre-crisis period. In GICIPS countries this resulted investment in construction represented almost 16% of GDP. Moreover according to a recent study from OECD there is a strong correlation between the slowdown in capital growth and pre-crisis real interest rates. Countries which experienced the lowest short-term real interest rates over the pre-crisis period – most notably Estonia, Greece, Ireland, Portugal and Spain – were those which experienced the sharpest slowdown in capital stock growth in the post-crisis period**.** Another negative impact of the misallocation of capital was on productivity levels. In chapter one, we showed that total factor productivity slumped especially in stressed

[35] Links between weak investment and the slowdown in productivity and potential output growth across the OECD
[36] IMF (2015): Investment in the Euro Area: Why Has It Been Weak?
[37] ECB Bank Lending Survey
[38] Barkbu et al. 2015

economies: This may be explained by a decrease in the average efficiency of production linked inter alia to low interest rates which induced a shift of funding towards lower quality entrepreneurs. Information asymmetries may have played an important role in inducing bank lending to the less productive firms[39]. In chapter 4 we provide a more comprehensive analysis of allocative efficiency and its impact on (total and individual factor) productivity.

Uncompetitive market regulation

Regulatory reform and investment-friendly market regulation are key to re-launching investment, but the pace of structural reforms is slowing down. Structural reforms which promote competition in product markets tend to boost capital intensity[40]. A component of reform that plays a very important role is entry liberalisation, but privatisation also has a substantial effect on investment[41]. The 2015 Competitiveness and Integration Report underlined the importance of tackling regulatory constraints in order to boost investment. Insufficient regulations in some EU Member States may discourage investment decisions. High levels of restrictiveness in product and service markets can hamper cross-border expansion of firms in some Member States. Empirical analysis also highlights the importance of structural reforms in order to boost capital intensity[42]. A recent OECD study however, highlights the fact that while product market regulation has become more competition-friendly the rate of improvement has declined in the post-crisis period. Thus, at a time when the use of conventional macro policy instruments has become increasingly constrained, the slower pace of structural reform represents a missed opportunity, not least because of the beneficial effects it would likely have on investment and potential growth.

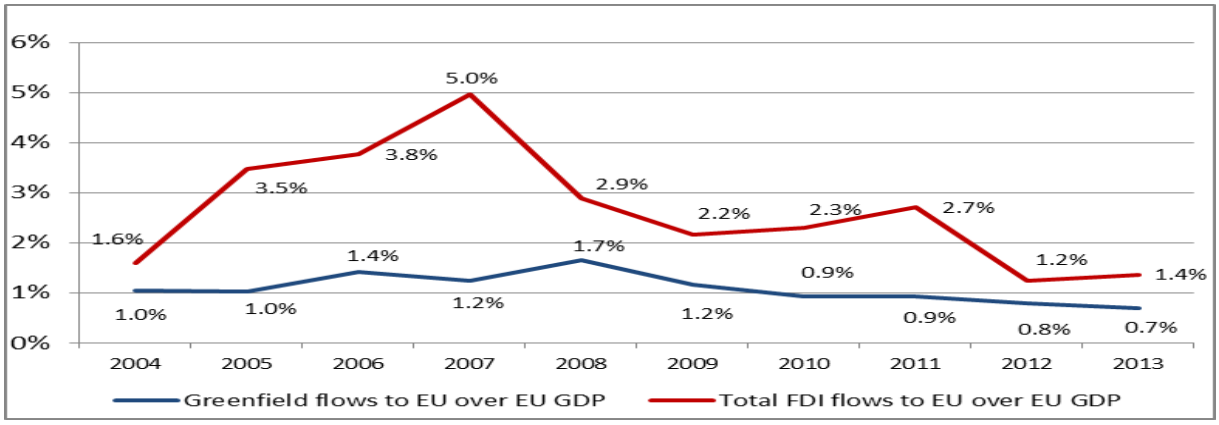
To support structural reforms in Member States as well as investment efficiency, conditionality requirements were introduced in the new 2014-2020 Cohesion Policy framework. A number of ex-ante conditionalities – either of horizontal nature (public procurement, institutional capacity etc.) or sector-related (smart specialisation, Small Business Act etc.) need to be met before the disbursement of funds. Moreover, macro-economic conditionalities aim to reinforce the links and coordination between the European Structural and Investment Funds and economic governance. The suspension of payments can take place in the absence of a national response to put the necessary reforms in place.

The role of Foreign Direct Investment

EU economies did not manage to attract sufficient FDI[43] to compensate for low domestic investment. The financial and economic crisis that hit the world economy in 2008 had a heavy toll on Foreign Direct Investment (FDI) inflows as those fell abruptly in most countries (see Figure 3.8). The economic slowdown in the aftermath of the financial and economic crisis further exacerbated the negative effects from the drop in FDI. As in the case of domestic investment, the depth of the crisis and the length of the recovery period of FDI have varied across countries. In particular, greenfield FDI flows into EU countries, which account for a non-negligible share of total EU FDI, saw a dramatic reduction in many EU countries (see Figure 3.9). Considereable drops in FDI flows can be reported in advanced economies (FR, DE) and in catching up Member States (i.e. RO or BG)

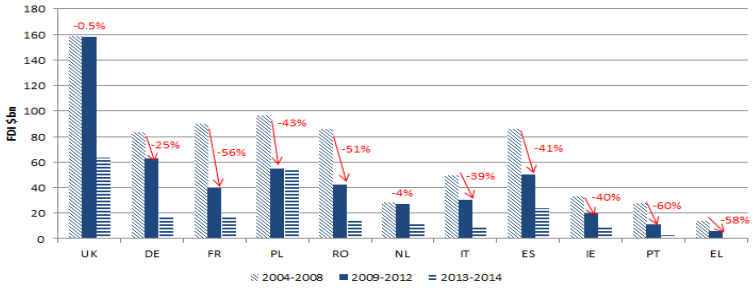
[39] Document du travail, number 586. Banque de France
[40] OECD 2015 b, Egert 2016 and Egert and Gal 2016
[41] Journal of the European Economic Association Volume 3, Issue 4, Version of Record online: 13.12.2010
[42] IMF (2015): Investment in the euro area: why has it been weak?
[43] Private investments support productivity enhancements, increase output and generate new jobs in the economy. In situations with low domestic investments, foreign direct investment (FDI) inflows can contribute to private investments and may bring new capital into the EU. FDI inflows may also have broader economic effects on the EU economy through knowledge and productivity spill over effects.

Figures 3.8: Development in Foreign Direct Investment



Source: Financial Times FDI markets. Investment and Structural Reforms in Europe: What Factors Determine Investments?

Figure 3.9: Evolution of Greenfield FDI inflows in the main EU recipients and countries with difficult economic conditions.



Source: Financial Times FDI markets. Investment and Structural Reforms in Europe: What Factors Determine Investments?

3.5.Human capital and productivity growth

After increasing in the last decade, public investment in human capital has declined after the crisis along with overall public expenditure. Public funding represents the bulk of the total investment on education.[44] In the immediate aftermath of the crisis, public expenditure on education as percentage of GDP held up relatively well in the EU as a whole, but then started declining in 2011. This overall trend hides significant differences across countries as a group of eleven Member States[45] accounted for most of the drop. However, the share of education in total public expenditure has remained stable around 10.3%. This means that education was not specifically targeted in the reduction of public expenditure after the crisis. It is worth noting that the drop in public spending on education may reflect attempts at improving the efficiency of the sector as well as changes in demographic conditions.

Private investment has also dropped after the crisis following a similar pattern. Private investment in education, measured as percentage of GDP, increased consistently in the previous

[44] Public funding accounts for 89% of expenditure on educational institutions on average in the EU, although this masks strong variation across countries. For instance, it represents 98% of expenditure in Finland, but "only" 77% in the United Kingdom. Cf. OECD (2016), Education at a Glance 2016: OECD Indicators, OECD Publishing, Paris.

[45] Namely: Denmark, Estonia, Ireland, Spain, Italy, the Netherlands, Poland, Portugal, Romania, Finland and the United Kingdom. Cf. Education and Training Monitor 2015, European Commission.

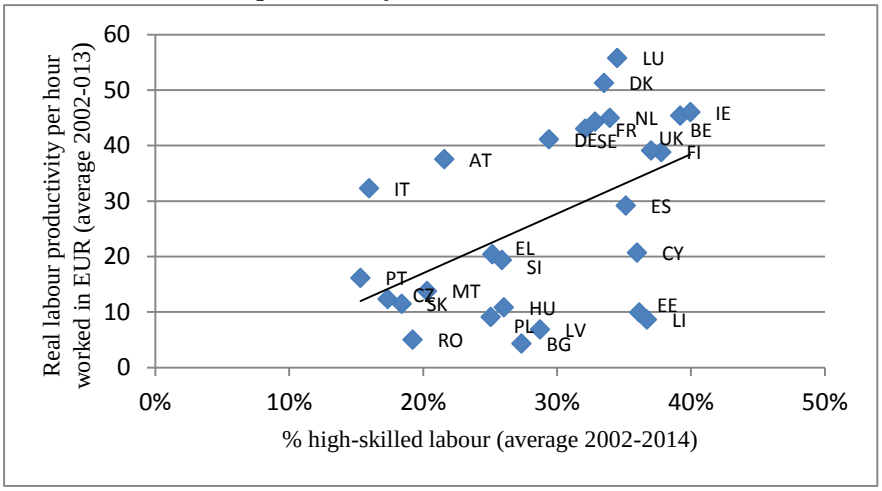
decade but then dropped significant in 2011.[46] Although there is no data available for subsequent years,[47] this pattern seems consistent with that observed in the public investment in human capital.

However, the investment in human capital has not been reflected in higher productivity growth. Human capital has overall been increasing since the early 1980s. The main drivers of this improvement have been the increase in educational attainment and on-the-job training.[48] However, the impact of these improvements on productivity growth has been minor. This seems to be the case for all Member States.

The most competitive countries have more skilled workers. International competitiveness rankings[49] show that the most competitive countries tend to have a more skilled workforce than less competitive ones. Indeed, labour quality is clearly correlated to the *level* of labour productivity (see Figure 3.12). However, countries with similar level of skills display different productivity growth rates. Factors hampering the adoption of new technologies would wipe out one of the main benefit of having a skilled workforce, that is: their capacity to more quickly adapt to technological change.

Translating human capital into higher productivity growth may require complementary investments e.g. higher quality management, organisational changes, adoption of technology or innovative processes. The positive impact of skills improvement on productivity growth could be increased by addressing the lack of specific, transferable skills, such as ICT skills, or tackling obstacles to the movement of workers to jobs better matching their skills in other firms, sectors, regions or countries.

Figure 3.12: Link between skills and productivity



Source: The Conference Board data, JRC data, own calculations

More targeted policies on skills may be needed. The low impact of skills improvements on productivity growth may point to factors hampering the adaptation to technological change. They would thus wipe out one of the main benefit of having a skilled workforce, that is: their capacity to more quickly adapt to technological change.

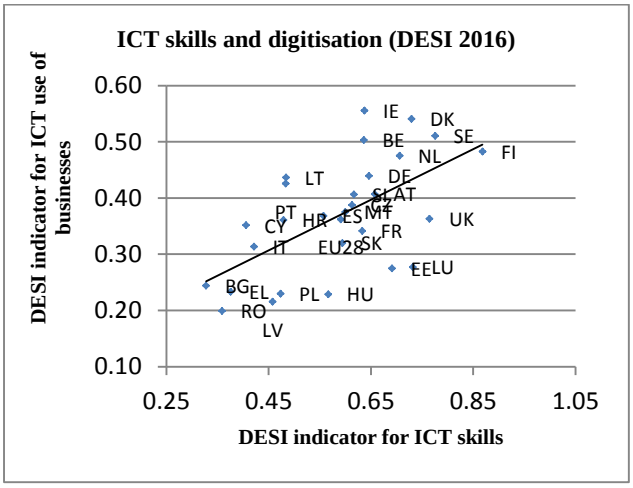
Demand for ICT specialists is increasing fast and could create a bottleneck if national education systems do not react. A higher ICT diffusion among all manufacturing and service sectors will

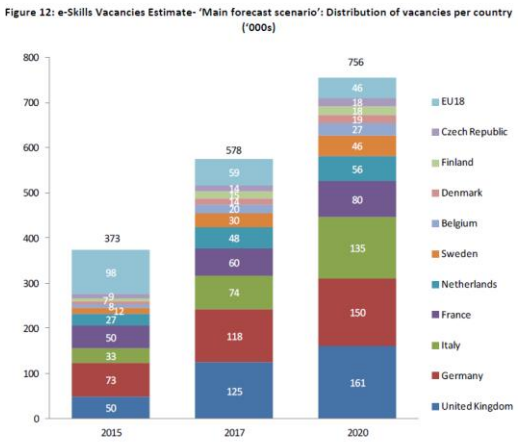
[46] From 0.8% of GDP in 2010 to 0.74% of GDP in 2011. Source: Eurostat.
[47] Data is only available up to year 2011 in Eurostat.
[48] Labour quality increased more in the early 1990s as the share of labour with tertiary education increased significantly, although this effect were attenuated in some countries as a result of an increased labour participation. Cf. Growth in euro area labour quality, ECB working paper series no. 575, January 2006.
[49] Cf. World Economic Forum, The Human Capital Report 2016..

significantly increase the demand for ICT specialists. ICT diffusion thus correlated to the availability of ICT specialists. While many ICT functions can be outsourced to specific service providers, which offer economies of scale and scope, enterprises (incl. SME) that heavily focus on building their business models and internal processes around ICT will always prefer to have important in-house ICT capabilities. The share of ICT specialists as part of the overall workforce varies significantly between Member States, ranging from 6% in Finland to less than 2% in Greece. By 2020 there could be up to 756,000 unfilled vacancies for ICT professionals[50]. The UK, Germany and Italy will account for 60% of unfilled vacancies in 2020 in the EU, with notably the UK and Italy expected to see a significant rise in the absolute numbers in such vacancies as well as when compared to the relative size of their respective workforces.

The adoption of ICT-driven business processes and models requires a high degree of ICT-literacy which needs to be integrated in all fields of education. The degree to which non-ICT specialists need to be capable to use ICT in the performance of their tasks will significantly increase. Most jobs will require at least some degree of ICT-literacy in the near future. This includes a good grasp by management and entrepreneurs of the potential of ICT-focused business models. ICT literacy of the general population, including familiarity and confidence in online transactions, can have a substantial impact on firm productivity in certain sectors such as commerce. Willingness of consumers to conduct transaction online has a significant potential to increase firm productivity (such as distribution outlets or service centres) in those industries where consumer interaction presents a significant cost item (distribution, banking).

Figure 3.13: Link between skills and productivity





Labour mobility in the EU has grown in significance in the last decade and may have been a more important adjustment mechanism in Europe than in the US during the recent crisis.. Undoubtedly, the size of labour mobility and its capacity in helping the economy and labour markets to adjust to asymmetric shocks have increased in the EU.[51] A recent study[52] indicates that migration may have been more important in adjusting asymmetric labour market shocks in Europe than in the US in the last decade. The study finds that migration responded more strongly to regional employment growth in Europe than in the US. These migratory flows have had a positive influence on population and labour force growth in countries with higher labour productivity. Immigrants seem to have lower cross-sector mobility costs since they are less attached than natives to a particular labour market

[50] Empirica Working Paper "e-skills in Europe" November 2015.
[51] Cf. European Commission (2015), Labour market and wage developments in Europe.
[52] "Single market transmission mechanism before, during and after the 2008/2009 crisis: a quantitative assessment", Austrian Institute of Economic Research (WIFO), for the European Commission, 2016.

segment.[53] This makes them more responsive to changes in economic conditions and therefore more effective in fostering structural change.

The impact of immigration from outside the EU and labour mobility on productivity growth may be ambiguous a priori. The effect on workers arriving from other Member States or from third countries on average labour productivity is dual. On the one hand, these workers increase labour productivity growth since they are better able to reallocate across sectors. On the other hand, they also slow productivity growth in high productivity sectors due to decreasing returns on labour.[54]

Movement of high skilled migration has had a particular positive impact. The positive contribution of migration to regional convergence is more pronounced among high skilled workers. High skilled have a higher propensity to move than low skilled and contributed more strongly to the adjustment of labour markets and the convergence of unemployment rates.[55] The fact that high-skilled migrants are expected to move to places where their skills are in demand (thus avoiding mismatching challenges) may explain their positive impact on structural change.

3.6. Conclusions

The dynamics of investments are heterogeneous across its different components and across country groups suggesting structural differences between them and different underlying causes for the subdued investment. Weakness in investment is mainly related to the weakness of expected demand but other factors like high deleveraging of public and private sectors and tight credit coupled with inefficient regulatory environment also have a heavy toll on investment decisions particularly for stressed economies.

Addressing the lack of capital investment, notably in machinery and equipment, is crucial for the convergence process of the catching up countries. The demand for highly productive capital in the form of intangibles seems to be latent but remains steady, although EAST and GICIPS countries have a lot of catching up to do. Infrastructure is a key driver of growth and competitiveness but continued underinvestment in particular in transport infrastructure may constrain growth in the future. Investment in intangible assets have held up rather well in the crisis as they are less prone to boom and bust cycles than 'traditional' capital formation and can therefore have an important role in the rebound of the EU investment. In order to fully benefit from the productivity potential of ICT investments, companies need to adapt their processes and business models and invest also in related intangible assets.

The most competitive countries also have more skilled workers and high skilled migration has had a positive impact. However, we found that improvements in the general level of skills do not necessarily lead to higher productivity growth. This may imply a need for more targeted polices on skills in order to have a stronger contribution to productivity growth, including policies to promote the acquisition of new, transferable skills and active measures that support efficient labour market transitions across firms and sectors.

[53] Cf. Borjas (2001) and Braun and Kavasnicka (2014).
[54] Cf. Braun and Kavasnicka (2014).
[55] "Single market transmission mechanism before, during and after the 2008/2009 crisis: a quantitative assessment", Austrian Institute of Economic Research (WIFO), for the European Commission, 2016.

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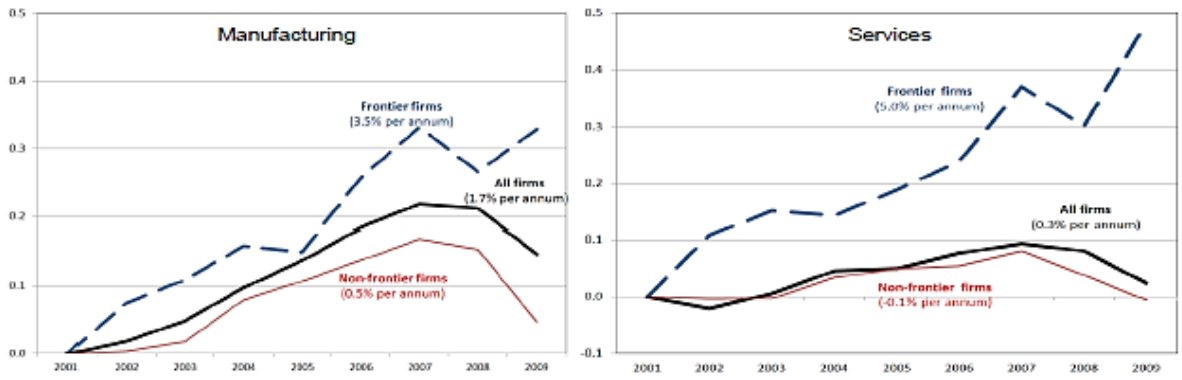
4. Knowledge-based capital, productivity and allocative efficiency

Building on the previous two chapters this chapter analyses developments in total factor productivity. A below-par performance in terms of total factor productivity has been found to be one of the main issues limiting growth and holding back the recovery. The focus here is on elements that determine the degree to which investment in physical assets or labour quality actually increases overall productivity.

4.1. Diffusion of innovation

Despite the global slowdown, firm-level labour productivity growth and total factor productivity (TFP) have remained robust at the productivity frontier. Firms at the global productivity frontier are on average 4 to 5 times more productive than the rest of firms in terms of TFP, while with respect to labour productivity there can be a tenfold gap between the most and the least productive firms.([56]) This gap is wider in services than manufacturing. The rising importance of tacit knowledge supports the idea that the competitive advantage of global frontier firms stems not only from investing in knowledge-based capital (KBC) but also depends on how they combine different types of intangibles – e.g. computerised information, innovative property and economic competencies – in the production process. OECD evidence suggests that immaterial capital could also be an important factor differentiating firms at the global productivity frontier from those lagging behind.([57]) This seems to indicate that the slowdown in productivity may be caused not so much by lack of innovation but rather by lack of diffusion of new technologies and best practices across all firms, as well as a misallocation of resources in the direction of less productive, non-frontier firms.

Figure 4.1: Labour productivity growth by type of firm (index, 2001 = 0) ([58])



Source: Andrews et al (2015)

In the last decade, global frontier firms that are technology leaders have increased their productivity growth differential with respect to other firms (Figure 4.1). This raises the question of how to improve the penetration rate of new technologies in follower firms. Firm-level TFP data can serve to illustrate the point.

Total factor productivity is a measure of the efficiency with which different production factors are combined to produce output and value added. It is a complex function of all firm-specific

[56] Andrews et al (2015).
[57] See Chapter 2.
[58] For the purpose of this figure, the frontier is defined as the top 10% of firm-level labour productivity.

elements, tangible as well as intangible, influencing the output of the firm. They include organisational aspects, efficiency gains, spillover effects, technological change, firm-specific research and innovation and other knowledge-based capital, as well as investment in business processes and models related to information and communication technologies (ICT).

In the EU as well as virtually all Member States, TFP grew year-on-year until reaching a peak in 2007. It then decreased across the board for several years during the crisis and recession but has since made a recovery in most, but not all Member States. In relation to the peak year 2007, it was higher in 2015 in Slovakia (+9%), Ireland (+8%), Latvia (+4%), Poland (+3%), Malta (+2%), Spain (+2%), Germany (+0.6%) and Portugal (+0.1%). In all other Member States, TFP was lower in 2015 than 2007, as it was also for the EU as a whole (–0.9%). The drop was particularly sharp in crisis-hit Member States such as Greece (–18%) and Cyprus (–11%) but TFP also fell sharply in Estonia, Croatia and several other Member States.

Figure 4.2: Total factor productivity growth by Member State, 2007–2015

Source: AMECO database

For a limited number of Member States, firm-level TFP data exist and can be used to calculate TFP distributions and frontiers by Member State. For manufacturing firms in the OECD's Multiprod dataset, preliminary results indicate that the national TFP frontier ([59]) was higher in 2012 in France than in the other five Member States included, while it was lowest in Sweden. As in the case of labour productivity, frontier firms are improving their TFP faster than non-frontier firms, leading to divergence among firms in Member States.

Figure 4.3: National TFP frontiers in (*a*) manufacturing, (*b*) non-financial market services, selected Member States, 2012

Source: OECD Multiprod data (*preliminary results subject to revision*)

In non-financial market services, preliminary results show that the frontier firms with the highest TFP are found in Austria and Italy, while Swedish frontier firms again have a lower TFP than frontier firms in other Member States. In Denmark, France, Finland and Sweden, the distribution of frontier manufacturing firms is slightly higher than for non-financial service providers, while in Austria the

[59] The top 10% of firm-level TFP in each Member State.

distribution is higher for frontier service providers than frontier manufacturers. For Italy there is virtually no difference between frontier manufacturers and frontier providers of non-financial services.

Firms at national TFP frontiers are often also at the global TFP frontier in their respective industries. Andrews et al (2015) report that out of 19 Member States: ([60])

- nine had global frontier firms in ICT-using and ICT-producing manufacturing as well as in business services: Belgium, Denmark, Germany, Spain, France, Italy, Netherlands, Sweden and the UK;
- Austria had firms at the global frontier in business services and ICT-using but not ICT-producing manufacturing;
- Poland had global frontier firms in business services but not in ICT-related manufacturing;
- Finland had firms at the global TFP frontier in ICT production but not in business services or ICT-using manufacturing;
- while the remaining seven did not have any firms at the global TFP frontier.

Together with labour, capital, energy and other production factors, TFP determines the overall productivity of a firm or economy and helps explain productivity and output differences between firms and between economies. Most of the time, TFP makes a positive contribution to EU productivity but during the crisis and recession, the negative TFP growth discussed above held back EU productivity. Growth accounting of EU labour productivity from 2008 to 2014 shows that positive contributions from capital deepening (non-ICT capital in particular) and improved composition of labour input were partly offset by the negative TFP development over the same period. This is in contrast with the United States, Japan and China, where during the same period TFP growth made a small positive contribution to labour productive growth (Foster-McGregor et al 2013).

4.2.Knowledge-based capital and the digitisation of businesses

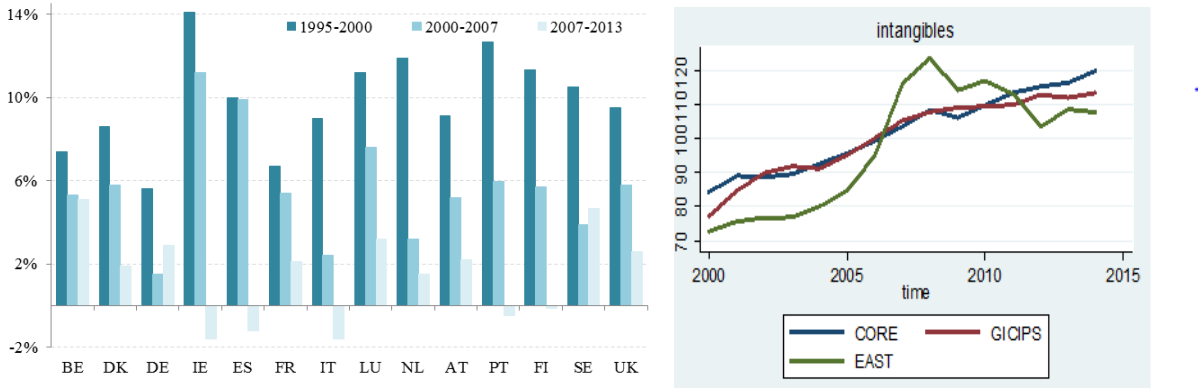
The productivity impact of investments in capital and labour quality depends on changes to business processes and models and the accumulation of KBC. This dependence is particularly strong in areas such as the digital economy where technology and skills are often 'general purpose' inputs and the productivity impact depends on how they are put to use. In fact, it has been argued by van Ark et al (2008) that a large share of the productivity gap between the EU and the United States can be explained by an earlier take-up of ICT in the United States coupled with complementary investment in knowledge capital and organisational change.([61]) The adoption of ICT-related business processes and business models is often referred to as digitisation. Various studies have shown a positive link between ICT-enabled business innovation and TFP growth. Bakshi et al (2014) looked at the use of online data and analytics in 500 UK companies. They found that businesses making more use of online customer data were more productive: greater use was associated with an 8% increase in TFP, and the top quartile in terms of online data use were 13% more productive than the least-using quartile.

In other words, investing in ICT capital is not in itself enough for productivity to go up. Firm-based evidence shows that the effective use of ICT capital often hinges on added complementary investment in knowledge-based capital, in particular firm-specific skills and know-how, as well as organisational

[60] EU28 except for BG, IE, HR, LV, LT, LU, CY, MT, RO.
[61] Havik et al (2008) refined the analysis of van Ark et al. by looking at ICT adoption in different industries.

change such as new business models and processes. Knowledge-based capital results from businesses investing in intangible assets such as firm-specific R&D, data, software, intellectual property such as patents, new business models or organisational processes, skills or designs. Such investment increased rapidly from 1995 to 2007 but has since stalled, or even decreased in Member States such as Ireland, Spain, Italy, Portugal and Finland.

Figure 4.4: Investment in knowledge-based capital: (*a*) average annual growth rates, selected Member States 1995–2013 and (*b*) per group of MS for 2000-2015



Source: (*a*) OECD (2016); (*b*) Oberhofer et al (2016)

As regards the adoption of ICT-related business processes, the EU continues to lag substantially behind the US. This can be seen for instance in the use by companies of ICT tools such as ERP software, RFID, e-invoicing, social media, cloud computing and e-commerce. The i-DESI indicator covering these issues shows that the top three Member States in this regard (FI, DK, SE) are close to US levels (i-DESI score of 0.53 compared to 0.62 for the US) and surpass Japan and Korea, while the EU28 level is significantly lower (0.38). The three laggards in the EU are LV, RO and BG (0.23).

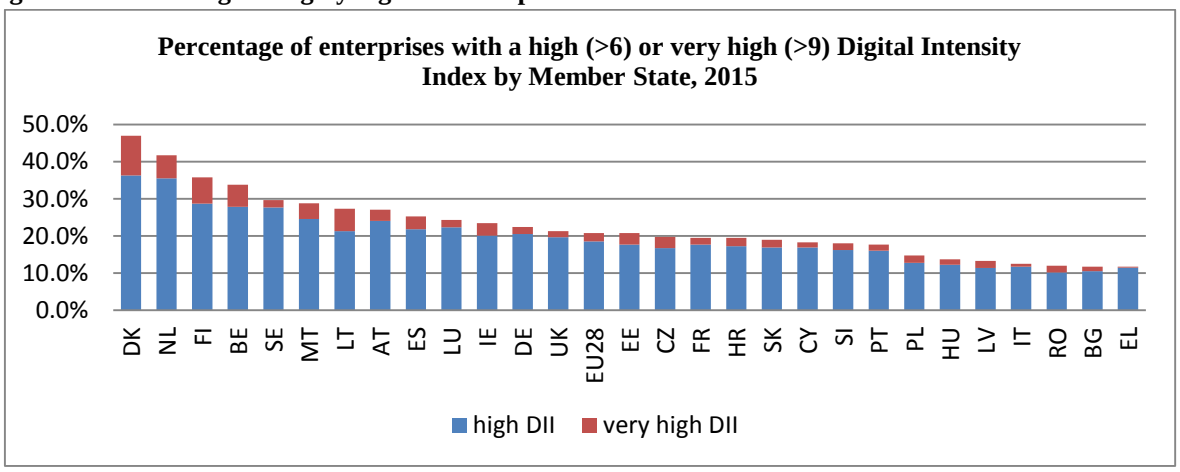
The slowdown in KBC investment is more widespread among small and medium-sized enterprises than larger companies. This is primarily due to inadequate demand and diminishing returns (in some cases also credit constraints). The consequences of the fall in KBC investment include a reduced capacity to benefit from ICT investment and a growing gap between the firms at the TFP frontier and non-frontier firms – in particular those with the lowest TFP which tend not to benefit from either ICT or KBC investment.

There are substantial differences between Member States with regard to the degree of digitisation of companies. When measured against the twelve key digital technologies covered by the Digital Intensity Index,([62]) more than 45% of companies in the best performing country (DK) are highly or very highly digitised, twice the European average of around 22%, while the score for the least performing country (EL) is around 10%. When looking at individual ICT-related business processes, the picture becomes much more nuanced. Some Member States with an overall high rate of digitisation lag behind in individual areas (e.g. Denmark leads overall but ranks only 10th for CRM adoption). The opposite can be the case as well, e.g. Bulgaria which has a low overall score but a high adoption rate of RFID technology. Finally, some Member States that are in the leading group of adopting one technology are in the least-performing group concerning others (e.g. Maltese enterprises

[62] The indicators are: internet access for at least 50% of employed persons; recourse to ICT specialists; fast broadband (30 Mbps or above); mobile internet devices for at least 20% of employed persons; website; a website with sophisticated functions; social media; ERP; CRM; electronic sharing of supply chain management information; e-commerce turnover accounting for over 1% of total turnover; business-to-consumer (B2C) web sales of over 10% of total web sales.

are among the best in terms of having websites with sophisticated functionality and in using social media but among the worst as regards the use of e-invoicing. This demonstrates that there is room for improvements in all Member States.

Figure 4.5: Percentage of highly digitised enterprises in EU Member States 2015



Source: Digital Agenda Scoreboard key indicators.

In most Member States, barriers exist which prevent firms from making full use of the benefits of ICT. A number of aspects have been identified in studies and surveys as particularly important barriers to ICT-related innovation and the digitisation of the economy. The important role of access to digital infrastructure was already pointed out in the previous chapter. ICT innovation in many domains relies on interoperability and standards. Lack of such interoperability diminishes the value of ICT investment and also leads to hesitations over 'vendor lock-in': not being able to change suppliers. This issue has notably been identified as a barrier to ICT adoption by SMEs. Connectivity/interface standards are essential for the 'Internet of Things' and for digitised value chains. Interconnectivity standards often rely on specific technologies that are developed mainly or exclusively in the context of standardisation. The standardisation framework needs to provide the necessary incentives for investments in such technologies.

Regulatory reform is needed to adapt existing regulation to accommodate new business models and to provide an adapted regulatory environment to policy challenges resulting from such business models. Digital business models are an illustrative example. They are expected to bring immense gains in productivity in their respective industries. They can however flourish only to the extent that regulators manage to adapt rules on safety, employment, liability, and consumer protection without throttling the very features that lead to their efficiency advantage. The most prominent examples concern online platforms as well as the collaborative economy. Furthermore, the amount of data collected ('big data'), notably from mobile consumer electronics as well as from embedded ICT technology such as smart meters, is exploding. This has been matched by advances in data analytics tools, evidenced by patenting numbers in the area of data processing. Big data technology and services are one of the fastest growing areas with annual growth of 40%. The use of big data by the top 100 EU manufacturers could lead to savings worth EUR 425 billion and big data analytics could boost EU economic growth by an additional 1.9%, a GDP increase of EUR 206 billion. Finally, public authorities could use some of the available data to better tailor their services to firms' and citizens' needs.

4.3. Allocative efficiency

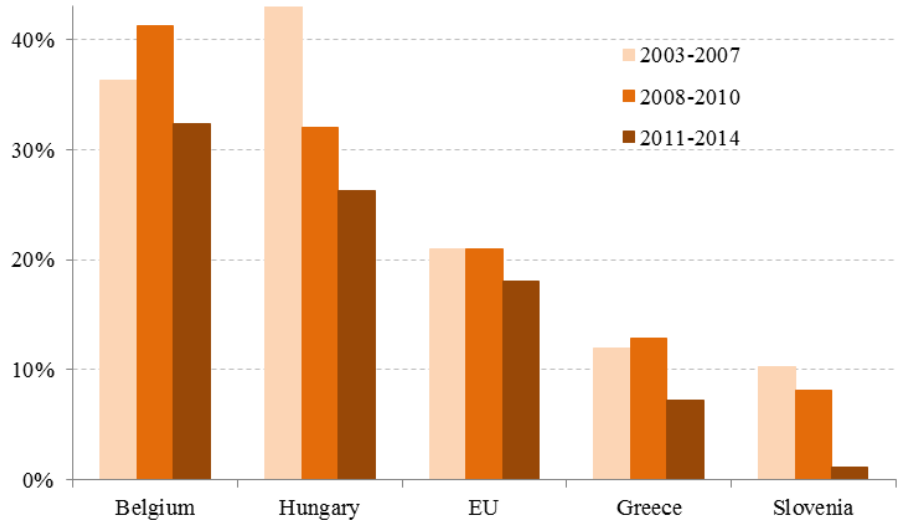
Economic literature distinguishes between three types of efficiency affecting productivity (European Commission 2013):

- *productive efficiency* – firms adopt better production methods to reduce slack and improve capacity utilisation
- *dynamic efficiency* – firms develop new products or processes through innovation
- *allocative efficiency* – the allocation, within or between firms, of productive factors to their most efficient uses

The focus here on allocative efficiency (AE) should not be understood to mean that it is a more important determinant of productivity than productive or dynamic efficiency. In fact, the relative importance of the three types of efficiency is likely to vary by product or service, by firm, sector and economy. For instance, AE explains more than half of productivity growth in the United States but only 4% in Slovenia (Bartelsman et al 2013).

It is also important to emphasise that the macroeconomic importance of high or low productive/dynamic/allocative efficiency depends on the importance of the sector to the rest of the economy: average efficiency in a vitally important sector will benefit the economy more than high efficiency in a sector of little economic importance, and vice versa for below-average efficiencies.

Figure 4.6: TFP allocative efficiency in the EU and selected Member States, 2003–2014



Note: EU average excludes IE, CY, LV, LT, LU and MT (also DK 2003–2007) due to data availability.
Source: Rincón-Aznar et al (2016) based on Amadeus data.

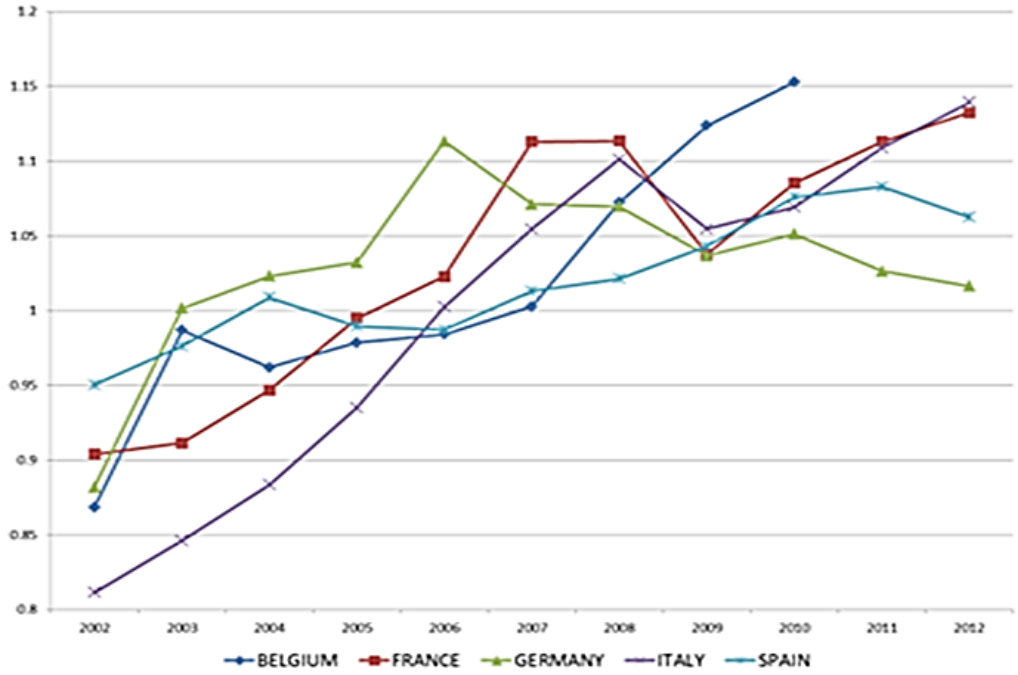
Decomposing TFP using the static technique developed by Olley and Pakes (1996) shows that for each Member State and each of the three time periods studied (2003–2007, 2008–2010, 2011–2014), the different tangible and intangible factors contributing to TFP are in fact up to 40% more efficiently allocated across firms than a random allocation of factors, reflecting an association of higher TFP with larger firms and lower TFP levels with smaller firms. However, as Figure 4.6 demonstrates for the EU as a whole as well as for two Member States with high allocative efficiency (Belgium and Hungary) and two with low allocative efficiency (Greece and Slovenia), the allocation of TFP factors was more efficient before the crisis (2003–2007) than during and immediately after the crisis (2008–2010), and has since deteriorated further. This negative trend is similar to the increasing misallocation of capital

in the next section and, in many Member States, the increasing misallocation of labour in construction and market services (cf. below).

- *Allocative efficiency of capital*

The allocation of production factors such as capital or labour can also be efficient or inefficient. Gamberoni et al (2016) have studied the firm-level allocation of capital in five Member States and found that over the period 2002–2012, the allocation of capital became less efficient in the case of Belgium, Spain, France and Italy, whereas in Germany it deteriorated until 2006 but improved from 2006 to 2012.

Figure 4.7: Dispersion of the marginal revenue of capital in selected Member States, 2002–2012



Source: Gamberoni et al (2016)

Possible explanations for the deteriorating allocative efficiency of capital include a high degree of product and labour market regulation; demand uncertainty following the recession; and credit constraints (Gamberoni et al 2016).

- *Allocative efficiency of labour*

Following European Commission (2013, 2015), in order to quantify the allocative efficiency of labour, the share of sector employment in size class *i* is used as a proxy for market share, while the baseline hypothesis is that market shares (in this case employment proportions) are distributed equally across size classes: 20% in each of the five size classes in manufacturing and construction, and 16.7% in each of the six classes for services.

Using logarithms of labour productivity in firm size class *i* of a sector and in the sector as a whole means that the results can be given a straightforward interpretation as the percentage gain or loss in relation to the baseline scenario. If the sum is positive, the observed allocation is better than the hypothetical uniform distribution across firm size classes. If the sum is negative, the observed allocation is less efficient than the hypothetical uniform distribution. The decomposition developed by Olley and Pakes (1996) is then used to calculate the efficiencies in Figure 4.8.

Figure 4.8: Allocative efficiency of labour in manufacturing, construction, market services in five representative Member States

Source: Own calculations based on Eurostat SBS (market services = NACE rev. 2 categories G to N, excl. K and L)

The five Member States in Figure 4.8 represent groups of countries with different allocative efficiencies, as detailed below.

Belgium: in ***manufacturing***, labour is around 20% more efficiently allocated than if evenly allocated across size classes, and is becoming more efficient over time; this is representative also for manufacturing in the Czech Republic, Denmark, Austria, Romania and Sweden.

In ***construction***, the allocation of labour is inefficient and deteriorating over time; this is similar to the situation in the Czech Republic, Estonia and Slovenia.

In ***market services***, the allocation of labour is slightly inefficient but very close to the baseline and, unlike in construction, not deteriorating over time. These results are similar to those obtained for Denmark and Austria.

Greece: even before the crisis, the allocation of labour in ***manufacturing*** was inefficient, and still remains around 4% less efficiently allocated than if evenly allocated across size classes. Cyprus is the only other Member State with a consistently inefficient allocation of labour in manufacturing.

In ***construction***, the misallocation of labour was severe already before 2013, when it dipped to 66% less efficient than an even allocation of labour. The misallocation in 2009 to 2012 is representative also of Italy and Poland.

In ***market services***, labour is around 20% less efficiently allocated than the baseline, and deteriorating over time. This is similar to Bulgaria, Italy, Hungary and Portugal.

Spain: labour in ***manufacturing*** is allocated efficiently by around 6%, and improving slightly over time. This is representative also of Portuguese and Slovenian manufacturing.

In ***construction***, the misallocation of labour is greater than in the group represented by Belgium but smaller than the group represented by Greece, and deteriorating over time. This is similar to construction in Hungary, Portugal and Slovakia.

In ***market services***, the allocation of labour is slightly inefficient and deteriorating over time. This is typical also for the Czech Republic, Croatia, Romania, Slovenia and Finland.

Lithuania has the most efficient allocation of labour of any Member State, even if the efficiency has been going down in recent years. The high allocative efficiency in ***manufacturing*** is representative also for Germany, Ireland and Hungary.

In ***construction***, labour was somewhat efficiently allocated until 2010 but has since been slightly less efficiently allocated than the baseline. This is similar to the case in Ireland, France, Austria and Romania.

Labour is highly efficiently allocated in ***market services***, as it is also in Germany, Ireland and Sweden.

United Kingdom: the labour allocation in ***manufacturing*** is efficient but deteriorating over time; similar to Bulgaria, Estonia, Latvia, Poland and Finland.

In ***construction***, the UK is almost alone in having an efficient allocation of labour with improving allocative efficiency over time; Bulgarian construction also has a positive and improving AE of labour but on a smaller scale than the UK.

In ***market services***, the allocation of labour is inefficient and deteriorating over time. Cyprus, Latvia and the Netherlands follow similar trajectories for market services.

The results in relation to allocative efficiency confirm that:

○ the allocation of labour is efficient where producers are exposed to international competition, such as in manufacturing. By contrast, in sectors such as construction or market services, competition is more local and producers are under less competitive pressure. In those sectors, the assessment of allocative efficiency often results in negative values, indicating that there is scope for a more efficient allocation of labour. It is however not possible to predict how important such a reallocation would be for firms, sectors or the economy as a whole;

○ the efficient allocation of capital across firms varies between Member States. From 2002 to 2006 it became gradually less efficient in all five Member States studied here, and in four of them the deterioration continued at least until 2012; demand uncertainty, credit constraints and highly regulated markets for products and labour are important drivers of the deteriorating allocative efficiency of capital;

○ the allocation of TFP-related factors is efficient in all Member States before, during and after the crisis and recession, but varies across Member States and is in most cases deteriorating over time;

○ reallocation of resources from less productive to more productive firms and sectors allows the latter to expand and gain market shares, removes inefficiencies and bottlenecks in the economy, thereby improving total factor productivity. This is further elaborated below.

- *Reallocation of labour and structural change: leaders, low performers, and catching-up countries*

The pattern and speed of structural change varies across Member States. In some Member States (denoted leaders and catching-up countries), the shift of labour has been larger the greater the impact of the crisis or of housing/financial bubbles, while all other Member States ('low performers' in what follows) underwent large shifts of labour. This seems to indicate that these movements were not driven by efficiency principles, and therefore raises the question whether adequate incentives exist for the allocation of labour to the most productive sectors and firms. The evolution of each of the group of Member States is analysed below.

The workers leaving manufacturing are not always joining the most productive services sectors. There has been a noticeable shift of labour resources across sectors in the last decades which intensified in the years preceding and during the crisis (2006–2010). However, the reallocation of labour across sectors has not been driven by efficiency gains as workers have not always joined more productive sectors. Furthermore, people have not moved to sectors with higher productivity growth either. Instead, other factors not related to efficiency have driven the movements of workers. Reducing the misallocation of labour across sectors would boost aggregate productivity growth and could take on increasing importance in the future as new technological developments and business models arise.

In some Member States, certain sectors have driven large shifts of workers. In the years prior to the crisis, those sectors attracted a large number of workers from elsewhere. The same workers then moved on to other sectors after the crisis. This has been the case in particular for the Member States most affected by the crisis, which in some cases had sector bubbles that imploded with the crisis, such as the construction sector in Spain and Italy, and the real estate sector in Greece and Cyprus.

The meagre contribution of the services sector may decline further in the near future, casting doubts on the future evolution of productivity. The shift of workers from manufacturing to services carries

important implications for future productivity growth. The contribution of the services sector to aggregate productivity growth is supported to a large extent by the attraction of workers from other sectors. Once this process fades away, this contribution will rely mainly on the evolution of the productivity of the services sector itself ("within effect"), which is very disappointing overall. The low productivity growth of services stems partly from the lack of competition in some industries, such as non-market, personal and business services. Liberalising the services sector to increase competition and boost productivity is thus becoming more urgent. Failure to reinvigorate productivity growth within the services sectors could therefore lead to a further slowdown in aggregate productivity growth.

- *Catching-up group*

Market services are becoming more dominant but productivity is set to decline. The manufacturing sector continues to be the main driver of productivity growth in countries such as Poland, the Czech Republic and Slovakia, but market services have already become the largest contributor in others, including the Baltic countries, Portugal and Slovenia. However, except in the case of the Baltic countries, the contribution of market services to aggregate productivity is largely dependent on workers joining this sector. This means that once this reallocation slows down, the contribution of market services, and therefore aggregate productivity growth, is set to decline.

There are different patterns and speeds of structural change within the catching-up group. Member States such as Spain and Portugal have experienced great shifts of labour moving from one sector to another, reflecting structural changes taking place in the economy. This was probably caused by the large variations in the labour allocated to the construction and real estate sectors, which increased before the crisis and decreased afterwards, impacting on the whole economy. The fact that there was a construction bubble in (some of) these Member States accentuated the effects of the reallocation of labour to and subsequently from the construction sector.

The crisis has not had a "cleansing effect". The reallocation of labour accelerated with the crisis but does not seem to be leading to a more efficient allocation of resources towards sectors with the highest productivity levels. Furthermore, people have not moved from sectors with low productivity growth to those with higher growth rates either.

- *Low performers*

The effects due to labour reallocation have dominated to such an extent that improvements of productivity within sectors have played a minor role only. The market services sector is driving overall productivity growth. The positive contribution of manufacturing is mainly due to the growth in the productivity of the sector. Furthermore, this contribution has been negatively affected by reallocation of labour to other sectors.

The crisis has not had a "cleansing effect". People have not moved from sectors with low productivity growth to those with higher growth rates. In fact, this effect has been negative and has intensified after the crisis to the point that it is now stronger than in the other two groups of Member States.

The process of structural change has been far from smooth. Member States in this group have seen big shifts in the reallocation of labour from one sector to another. The overall tendency has been to reallocate labour from manufacturing to real estate and services. As far as the construction sector is concerned, people moved in before the crisis, and out afterwards.

- *Leaders*

The contribution of market services is diminishing as the positive impact of workers moving in is fading. The contribution to productivity growth from labour shifts in market services decreased after the crisis and even turned negative in some instances, such as Denmark and the United Kingdom. This highlights the importance of enhancing the productivity of the market services sector in order to compensate for the inter-sector effect fading out. Tackling underlying distortions in market services such as lack of competition or labour market rigidities is therefore critical to boost aggregate productivity growth.

4.4. Conclusions

The reallocation of labour has accelerated with the crisis but does not seem to be leading to a more efficient allocation of resources. Labour has not moved from sectors with low productivity growth to sector with higher growth rates.

Member States and the EU need to design and implement policies that:

- *contribute to closing the growing gap between firms at the productivity frontier and non-frontier firms, notably by improving mechanisms for technology transfer and diffusion of innovation between firms*;
- *spur firms to invest not only in ICT but also in flanking knowledge-based capital in order to optimise the beneficial impact of digitisation*;
- *pay particular attention to SMEs and laggard firms*;
- *review and adapt existing regulation to accommodate new business models and meet challenges resulting from new business models*;
- *address the increasing misallocation of capital and, in sectors such as construction and some services, labour*.

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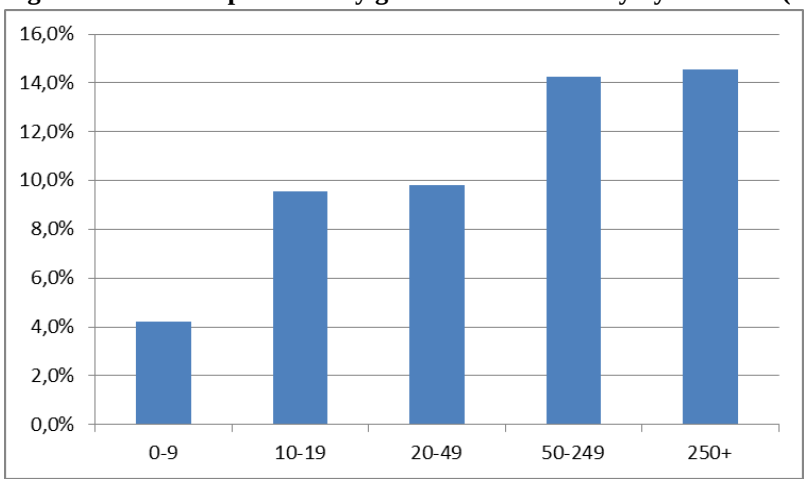
5. Factors having an impact on the productivity of firms: evolution of the business environment and other internal factors

Chapters 2 and 4 show that a low total factor productivity rate is one of the major reasons explaining the relatively unsatisfactory productivity performance of most EU Member States. In particular, the widening gap between high and low productivity firms warrants attention. But what is the profile of low productivity firms?

There is not such a thing as a "representative" low or high productivity firm. The segment of low productivity firms includes both large and small firms. However some of the reasons explaining low total factor productivity growth such as the difficulties to innovate or export are often correlated with the very small size of firms. Data from Eurostat show that large enterprises are generally more involved in innovation than small and medium-sized enterprises, especially in the fields of product and process innovation.[63] Thus, firm growth can be associated with productivity growth or rather, potential productivity growth. On this line, Figure 5.1 says that, over the period 2008-2014, the EU industry productivity had grown on average by 14% in medium-large companies, between 9-10% in firms with 10-49 employees and by only 4% in undertakings with 9 or less employees.

Figure 5.1: Labour productivity growth in EU industry by size class (N of persons employed) 2008-2014



Source: Eurostat, own calculations.

External and internal factors affect firm size and growth. A collection of elements defining the "business environment" where firms operate can be identified as the external factors having an impact on the average size of EU firms. Policy measures can modify the business environment to foster innovation, or improve the skills of the workforce. These policy measures are likely to increase productivity, improve the efficient allocation of resources, speed up the adoption of new technologies and strengthen sustainable long-term growth. For these reasons, the business environment has been under the focus of the structural reforms proposed in the European Semester.

Many Member States have introduced important regulatory reforms in recent years, to facilitate business creation, reduce administrative burdens on business and on productive investment. However, progress has been uneven and significant barriers and bottlenecks still remain such as the low degree

[63] See Eurostat (2016), Statistics Explained: Entrepreneurship – Statistical indicators, March at http://ec.europa.eu/eurostat/statistics-explained/index.php/Entrepreneurship_-_statistical_indicators#Small.2C_medium_and_large_enterprises

of efficiency of public administrations, the inefficient judicial systems and procedures, difficulties in access to finance or the burdensome regulatory and administrative frameworks.

This chapter also identifies internal factors relevant for growth paying special attention to start-ups and scale-ups because they are particularly important as drivers of wealth creation, employment, innovation and growth. Internal factors affecting firms' growth are harder to identify and have attracted relatively less attention so far and they are also sensitive to public policy interventions. This chapter reviews the evolution in the "business environment" in the next section and looks into internal factors using a new dataset produced by the CompNet led by the ECB[64].

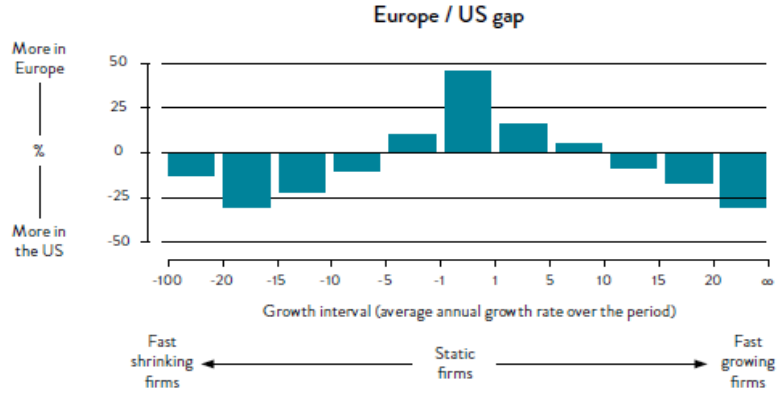
It is necessary to underline that firm growth is not relevant just for competitiveness purposes. Higher productivity in SMEs is needed to ensure sustainable higher wages for workers employed by SMEs. If firms are too small, they will have difficulties to offer training to employees who will have to face technological changes and update their skills to remain competitive. Non-monetary income is also available to the benefits of workers in larger firms. In summary, policies to reduce the productivity gap across firms could contribute reducing increasing social differences across employees.

Dynamics trends: what are the major differences between the USA and the EU in firm dynamics and demographics

The USA business environment is considered as highly dynamic compared to the EU although significant differences can be found across EU Member States.[65] What are the major differences between the EU and the USA in firm dynamics?

According to the OECD, there are no major differences in the US and EU rates of creation of new entrepreneur firms, although comparability of national sources presents some problems.[66] There are no major differences in the churn rate (i.e. the addition of firms' birth and death rates) between the EU and the USA either. [67] The main difference in the dynamism of EU and US firm seems to be in the growth potential of US firms. Figure 5.2 shows that the difference between the EU and the USA in the percentage of firms growing, shrinking or remain stable.

Figure 5.2: Difference in average annual company growth rate between Europe and US



Source: Alberto Bravo-Biosca, (2011)[68]

64 Paloma Lopez Garcia, from the European Central Bank, has been one of the main contributors to this chapter.

65 See Eurostat (2016).

66 USA new firms are normally bigger from the time of birth than newly created EU firms.

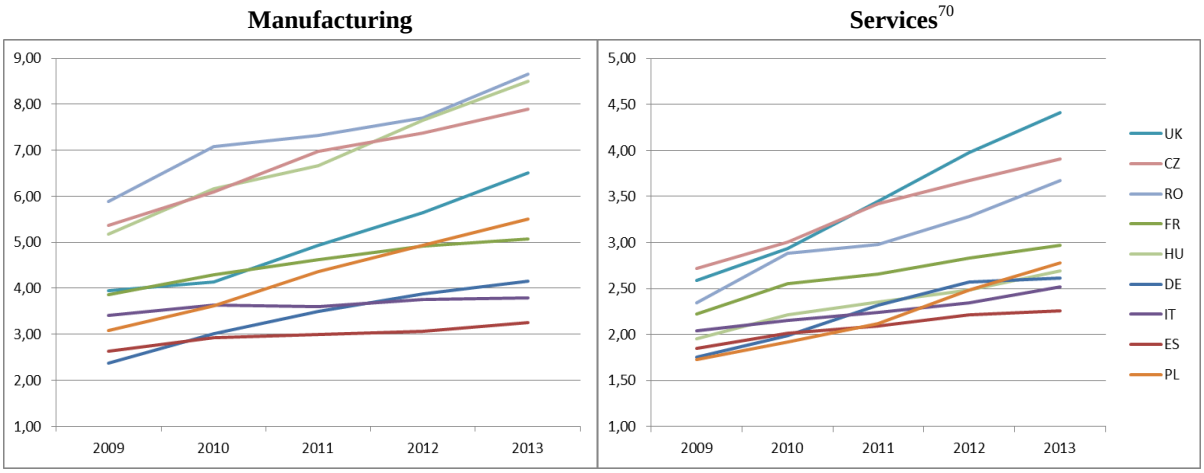
67 OECD, (2015) Entrepreneurship at a glance, Paris.

68 Data from the NESTA database on firm growth covering the period 2002-2005 for 11 OECD countries and 2005-2008 for fewer countries.

The difference is clear: once established, many more firms remain of the same size in Europe than in the USA. The percentage of firms that do not grow at all or just change their size by less than 5% is over 45% in Europe while it is 37% in the USA. On the other hand, many more firms grow or shrink in size in the USA than in Europe. In other words, "US firms are more likely to expand or contract, while European firms are more likely to stay the same size."[69]

EU enterprises grow bigger over time, but growth is slow and limited. Figure 5.3 below shows the evolution in the average size of firms created in 2008 until 2013. The graph only shows the evolution for some countries with the highest and lowest growth rates. Even for the EU countries with the highest growth rates, growth rates are relatively low compared to US firms, both for manufacturing firms and for services.

Figure 5.3: Average size of EU firms between 2008 and 2013 (Number of persons employed by enterprises born in 2008 in the period 2008-2013)



Source: Eurostat, *Business demography by size class (from 2004 onwards, NACE Rev. 2), Code: [bd_9bd_sz_cl_r2*]

5.1. External factors affecting the growth of EU firms: Barriers to growth and structural reforms

The World Bank Doing Business ranking of business environment in over 100 countries reflects the greater dynamism of business in the USA: USA is ranked 7th, while the EU is on the 31st place.[71]

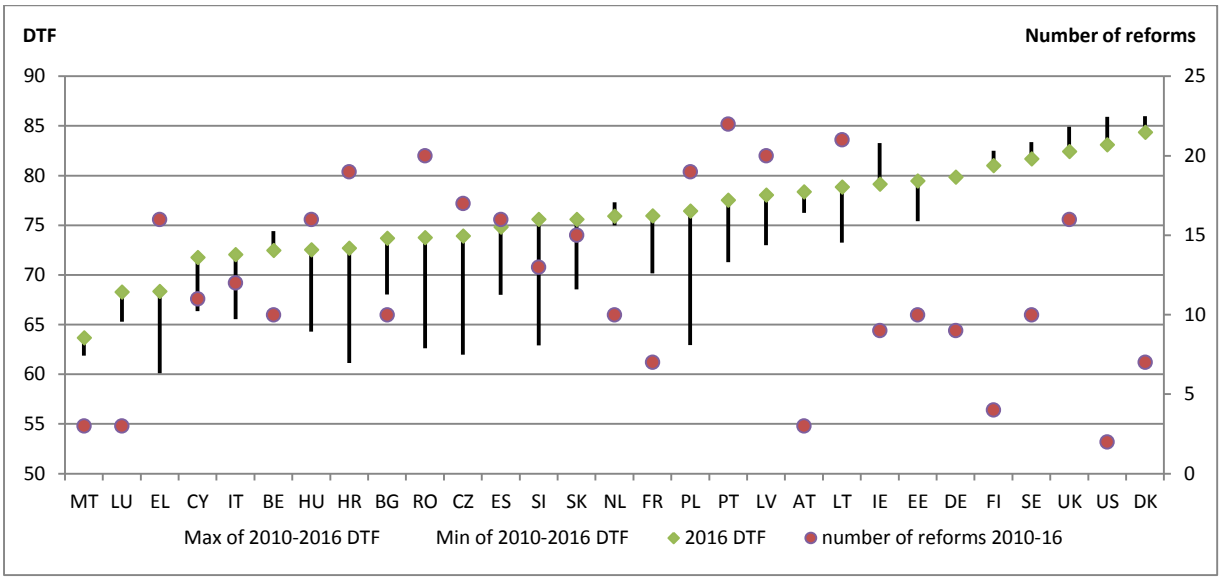
However, there has been uneven but clear progress in the EU overtime. This is reflected in Figure 5.4 which shows the general Doing Business composite indicator in 2016 and its evolution since 2010. The red dots in the same graph measured on the right hand side axis show the number of relevant reforms adopted for EU Member States and US in that period. For each country, a little square shows the distance of each Member State to the frontier[72].

[69] Alberto Bravo-Biosca, (2011), *A look at business growth and contraction in Europe*. Paper presented at the 3rd European Conference on Corporate R&D and Innovation CONCORD-2011, October 6th 2011, Seville (Spain), page 9.
[70] Services of the business economy except activities of holding companies
[71] Denmark, United Kingdom, Sweden and Finland are in the top 10 and Malta is the worst ranked EU country, in the 80th position.
[72] The aggregate of the distance to the frontier for each indicator (i.e. the best performing country for each indicator) is the overall ease of doing business here. For more information:

With the exception of Belgium, significant progress has been made in the ease of doing business in those countries that needed it most. Countries having a relatively unfavourable business environment have introduced important reforms. Croatia, Hungary, Greece, Poland, Romania, the Czech Republic and Slovenia have made a considerable effort to improve business conditions between 2010 and 2016.

Unfortunately, the best performing EU Member States do not show an equally positive improvement and in many cases, small negative developments are reported and the distance to the best world performers remains considerable.

Figure 5.4: Ease of doing business (DTF-distance to the frontier) and the number of reforms during for the period 2010-2016[73]



DTF-distance to the frontier: it measures the position respect to the frontier (which has a reference value of 100).
Source: World Bank, *Doing Business Database.* How to read the graph: The vertical segment indicates the variation in the indicator between 2010 and 2016 (or the mentioned period in the following graphs) with the upper and minimum levels reached during the period; the rhombus indicates the value for 2016 and the circle indicates the number of reforms that were adopted in the same period.

This composite indicator consists of 10 indicators capturing the most significant aspects of the business environment and the performance of each country varies across these 10 dimensions. Figure 5.5 compares the performance of the EU with the US in these 10 dimensions. Three indicators have been identified as particularly relevant: getting electricity, which is likely to be a proxy for bureaucratic barriers, paying taxes and resolving insolvency.[74]

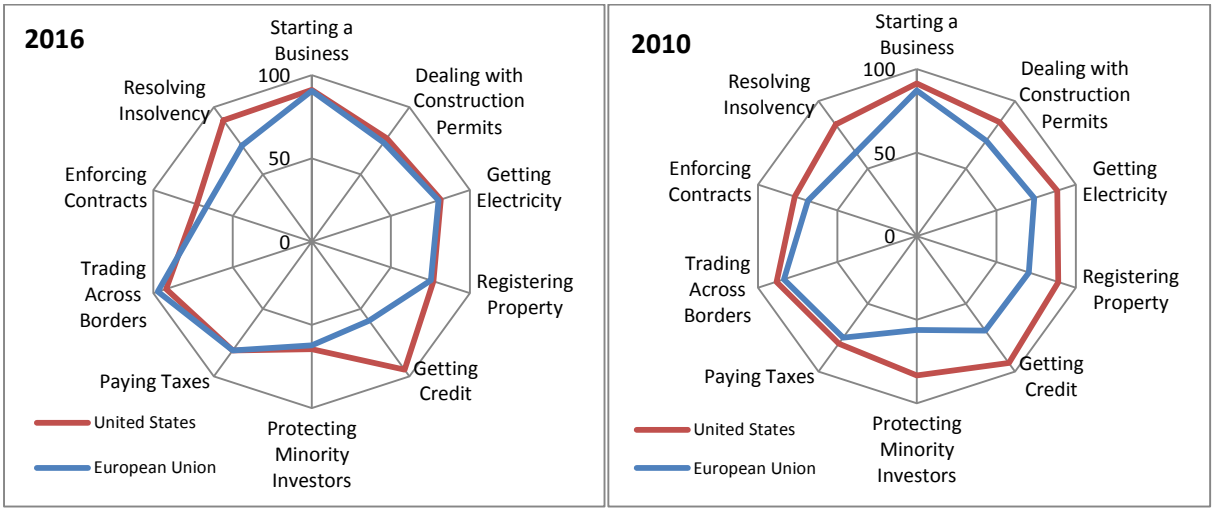
The following sub-sections review the situation for insolvency frameworks and the efficiency of public administrations that capture these three dimensions and also two others -enforcing contracts and getting credit- where the EU underperforms compared with the USA.

http://www.doingbusiness.org/~/media/GIAWB/Doing%20Business/Documents/Annual-Reports/English/DB16-Chapters/DB16-DTF-and-DBRanking.pdf

[73] The indicators getting credit, protecting minority investors, paying taxes, resolving insolvency, dealing with construction permits, registering property, trading across borders, enforcing contracts and getting electricity had methodology changes in 2014 and 2015.

[74] Antonio Fatás: The Agenda for Structural Reform in Europe, INSEAD, 2015

Figure 5.5: EU-USA Ease of doing business (DTF-distance to the frontier) 2016 and 2010



Source: World Bank, *Doing Business Report 2015-2016* & *Doing Business Database*

Insolvency

An efficient insolvency framework limits the economic and social consequences of bankruptcy for entrepreneurs, provided that business failure occurred in good faith. Efficient bankruptcy regimes (i.e. exit regulation) contribute to establishing a dynamic start-up environment and lower entry and exit barriers. Less adverse legal consequences of personal insolvency promote entrepreneurship by providing entrepreneurs with partial insurance against the consequences of failure[75]. Bankruptcy codes that excessively punish business failure could also affect allocative efficiency by hampering entrepreneurial start-up activity, thereby implying less competitive pressure on incumbents, and by raising the likelihood that resources are trapped in inefficient firms.

The attitude towards failure in the US is often mentioned as one of the main factors supporting business dynamism in the US. Figure 5.6 shows the doing business "resolving insolvency" indicator which includes the aspects of time and cost to recover debt, outcome, recovery rate for creditors and strength of insolvency framework. 18 EU Member States are currently at their best level of performance in this dimension for the last 12 years. Finland and Germany outperform the USA, but the worst performers are still too far from the frontier.

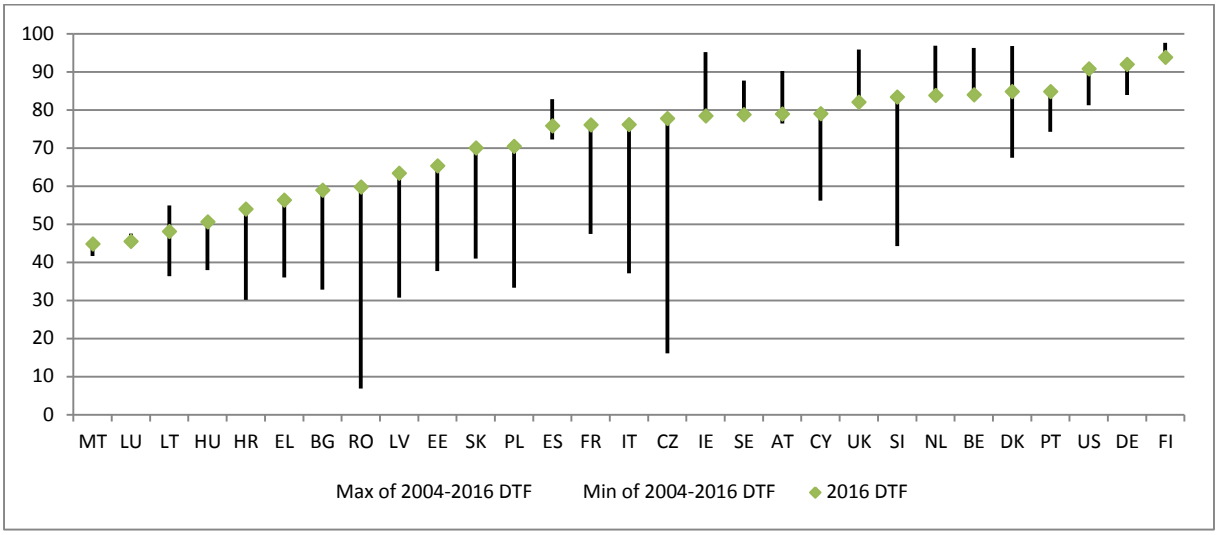
Most Member States have made huge improvements (e.g. Czech Republic, Romania, Poland, Italy, Sweden, Latvia, Slovakia and Estonia). However, the situation has deteriorated in several Member States having in 2016 their worst performance over the last 12 years.

In summary, there is a positive evolution in the improvement of insolvency frameworks but some punctual situations call for further attention[76].

[75] M. Carpus Carcea, D. Ciriaci, D. Lorenzani, P. Pontuch, C. Cuerpo (2005), " The Economic Impact of Rescue and Recovery Frameworks in the EU", European Commission, http://ec.europa.eu/economy_finance/publications/eedp/pdf/dp004_en.pdf

[76] Beyond the elements considered in this indicator, some Member States are also improving their complementary pre-insolvency framework. Such a framework entails out of courts settlements and hybrid preventive restructuring procedures between creditor(s) and debtor. This implies lower direct and indirect costs and limits the risk of pre-mature liquidation. This is important for SMEs which generally have less means to afford formal proceedings. See M. Carpus Carcea, D. Ciriaci, D. Lorenzani, P. Pontuch, C. Cuerpo (2005), ibidem.

Figure 5.6: Resolving Insolvency (DTF-distance to frontier) 2004-2016[77]



DTF-distance to the frontier: it measures the position respect to the frontier (which has a reference value of 100).
Source: World Bank, *Doing Business Database*

Enforcing contracts

The efficiency of the judiciary system[78] is positively associated with larger average firm size for several reasons. First, poor contract enforcement increases the risks faced by entrepreneurs thus discouraging investment decisions. Secondly, proper contract enforcement practices improve the predictability of business relationships and reduce ambiguity[79].

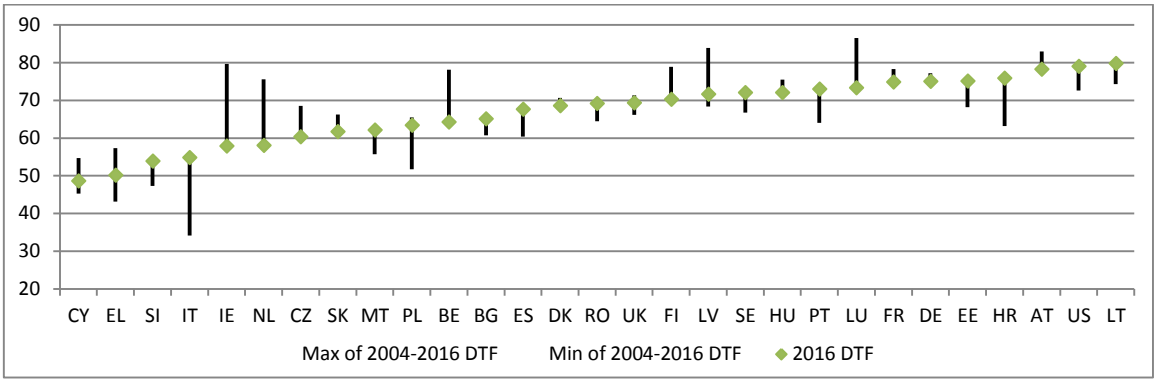
As illustrated in Figure 5.7, EU is rated worse than the US in terms of contract enforcement and most importantly, improvements are not as pervasive as in other dimension of the business environment: 11 Member States are in 2016 at their peak ranking and 11 at their worst over the last 12 years.

In addition, there is no clear pattern for the distribution of improvements, i.e. we cannot see here greater reforms introduced where they are needed most. Country specific factors seem to prevail. The absence of reforms in the recent period (2010-2016) may be at least partly responsible for the steep deterioration of Luxembourg, the Netherlands as well as Latvia and Ireland which have implemented in 2016 a reforms modifying the monetary jurisdictions of courts in Ireland and restructuring its courts and regulating domestic arbitration and voluntary mediation in Latvia. Despite the implementation of supporting reforms in 2014 and 2016 that improved the functioning of courts, Italy is still among the Member States with the biggest distance to frontier.

In summary, contract enforcement is an important dimension of the business environment with a significant impact on business growth where more systematic improvements are needed.

[77] The indicator resolving insolvency had methodology changes in 2014.
[78] See Rajan, Raghuram G. and Zingales, Luigi and Kumar, Krishna B., What Determines Firm Size? (March 2001); Beck, H. T. L., Demirgüç-Kunt, A., & Maksimovic, V. (2006). The influence of financial and legal institutions on firm size; Luc Laeven & Christopher Woodruff, 2007. "The Quality of the Legal System, Firm Ownership, and Firm Size," and Fabbri, D. (2010), Law Enforcement and Firm Financing: Theory and Evidence.
[79] Calvino, F., C. Criscuolo and C. Menon (2016), "No Country for Young Firms?: Start-up Dynamics and National Policies", *OECD Science, Technology and Industry Policy Papers*, No. 29, OECD Publishing, Paris. http://dx.doi.org/10.1787/5jm22p40c8mw-en

Figure 5.7: Enforcing Contracts (DTF-distance to frontier) 2004-2016[80]



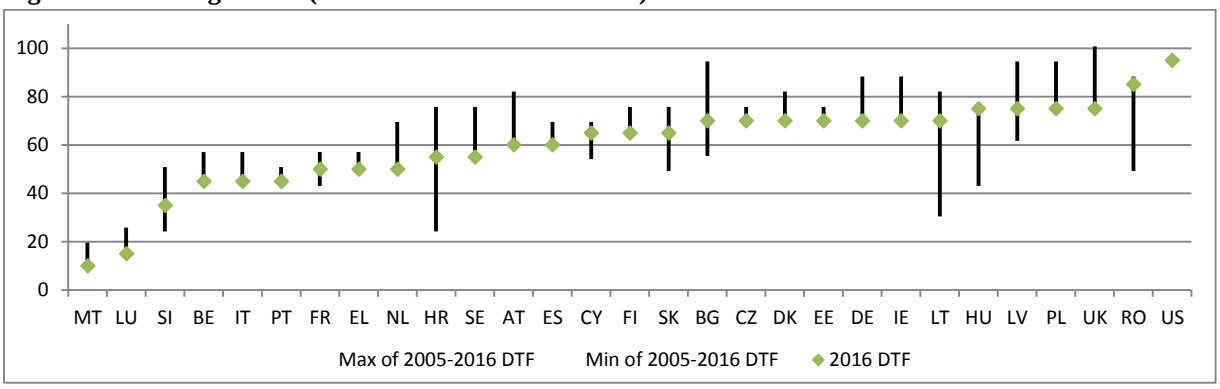
DTF-distance to the frontier: it measures the position respect to the frontier (which has a reference value of 100).
Source: World Bank, *Doing Business Database*

Getting credit

Difficulties in accessing finance are obstacles to firm growth because they deter investment in innovative projects, hamper productivity improvements and export activities.[81] The adverse consequences of credit constraints are particularly severe in activities involving intangibles, such as innovation and services, as young innovators often lack assets that can be used as collateral (e.g. buildings; machinery; real estate, etc.).[82]

Although results differ across countries and firms' size (with the smallest companies finding access to finance as a more troublesome issue), access to finance is improving for EU SMEs.[83] While 30% of Greek SMEs and 13% of Irish/Dutch SMEs mentioned access to finance as their most significant problem, only 7% of SMEs in Austria, Finland and Germany did so. Despite improvements, the Doing Business indicator for Getting Credit in the EU does not present a positive evolution. Many countries still are at their farthest distance to the frontier since 2005 as shown in Figure 5.8.

Figure 5.8: Getting Credit (DTF-distance to the frontier) 2005-2016[84]



DTF-distance to the frontier: it measures the position respect to the frontier (which has a reference value of 100).
Source: World Bank, *Doing Business Database*

Factors such as an expansionary monetary policy and improvements in the business cycle contribute to explaining this relative improvement in financing conditions, but some structural problems remain. At

[80] The indicator enforcing contracts had methodology changes in 2015.
[81] For instance, Bottazzi, Secchi and Tamagni (2014) recently argued that financial constraints prevent potentially fast-growing firms – especially young ones – from taking advantage of attractive growth opportunities.
[82] Policy Lesson from Financing Innovative Firms, Wilson K.E. (2015) OECD
[83] European Commission and ECB, SAFE Survey, November 2015
[84] The indicator getting credit had methodology changes in 2014.

a sector level, difficulties still persist to get finance from conventional sources especially for R&I-intensive SMEs and for SMEs in new/emerging sectors. Small SMEs also report higher percentages of credit rejections and more difficulties to get loans for the full amount requested.

According to the ECB Bank Lending Survey results, there is evidence of improved availability of bank loans on more attractive conditions. However, this may not translate into major credit expansions for EU scale-ups as they have recently expressed that they would rather complement or replace loans (still the most relevant source of financing) by alternative sources of financing such as equity or other instruments.[85] Interest rates and other conditions make bank credit less suitable for their needs than other alternative ways of funding. The availability of new financing instruments as an alternative to bank credit is still limited in the EU. From the firm growth perspective, the difficulties of start-ups to access the right sources of finance to export or upgrade their business model and operations to international and/or bigger markets are a particularly important problem. In fact, around 90% of EU venture capital investment is concentrated in only 8 EU Member States and public markets are also far from being fully developed. For instance, in 2013 the EU's stock markets were worth 64.5% of GDP, half of America's 138%.

According data from Invest Europe,[86] Venture Capital (VC) investment in Europe is still well below pre-crisis levels. While there has been a constant year-on-year growth since 2013, the level of VC investments in 2015 still represents a decrease of 41.9% when compared to 2008. VC investments account for less than 0.1% in the EU while it is 0.38% of GDP in the US in 2014.

The fragmentation of capital markets across national borders is another important structural problem. For instance, the average VC fund size in Europe is EUR 70 million, which is quite small compared to US. Of course, the smaller the fund's size, the more difficult is for big institutional investors (such as pension funds and insurance companies) to invest, since they often prefer to invest big tickets, where the big funds are. Thus, there is scope for improving financing so that entrepreneurs based in EU Member States can have an easier time raising capital and are able to better benefit from the diverse expertise and talent pools available within the EU Single Market. Attaining this goal is one of the Juncker Plan's priorities via the Capital Markets Union. Initiatives such as the creation of a Venture Capital FoFs or the review of the EuVECA regulation are only some of the measures to be adopted.

The Capital Market Union should contribute to restoring integration in capital markets in a more stable and resilient regulatory and governance framework.

Efficiency in public administration

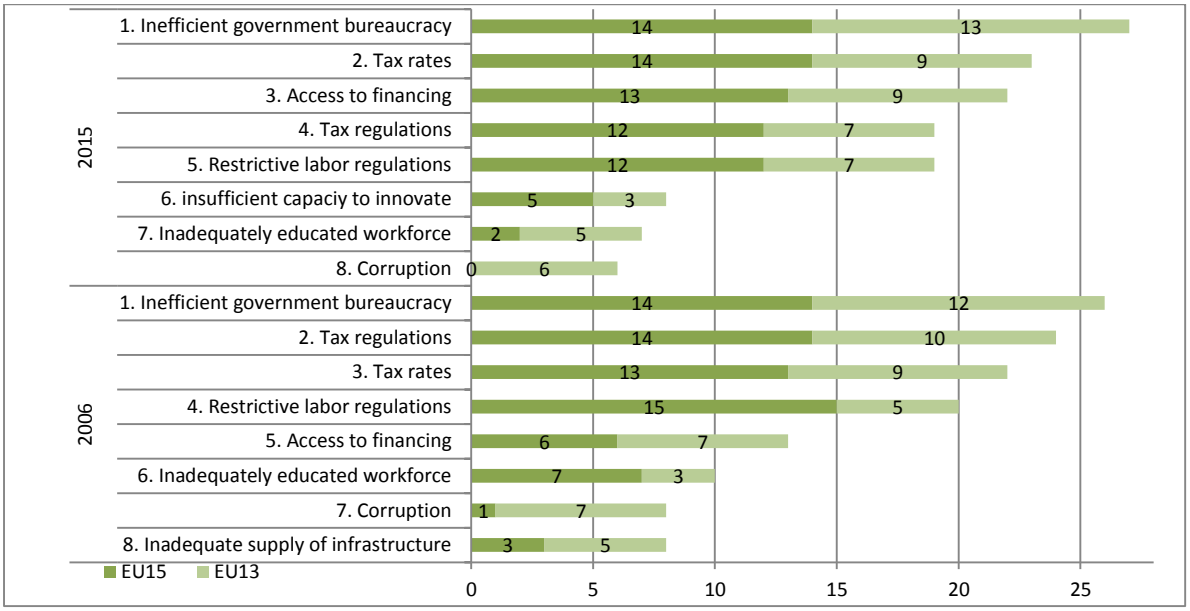
The World Economic Forum's Executive Opinion Survey reports that the most problematic element for doing business in EU identified by business executives in 2006 and 2015 is the inefficient government bureaucracy, considered as the most problematic factor in 26 and 27 out of the 28 Member States respectively (Figure 5.9). These survey results suggest that, in general, the problems affecting the ease of doing business have not changed within these 9 years, since tax rates, the complexity of tax regulation and the restrictive labour regulations complete the top 5 major issues identified in 19 or more EU countries. A sharper change comparing the two periods is recorded for

[85] While 64% of young firms and 63% of established firms would prefer bank loans, only 52% of firms between 2 and 10 years would resort to bank loans. Also, while 5% and 8% of young and established firms would prefer equity financing (respectively), more than 10% of older SMEs expressed special preference for this type of financing - Source: European Commission and ECB, SAFE Survey, November 2015.

[86]" With data on more than 1,200 European private equity firms, the 2015 statistics [alone] cover 91% of the €564bn in capital under management in Europe"- 2015 European Private Equity Activity Statistics on Fundraising, Investments & Divestments; Invest Europe

access to financing, which was considered in 2015 a more severely affecting issue with 22 Member States including it in their top 5 compared to 2006 when the number of Member States was 13.

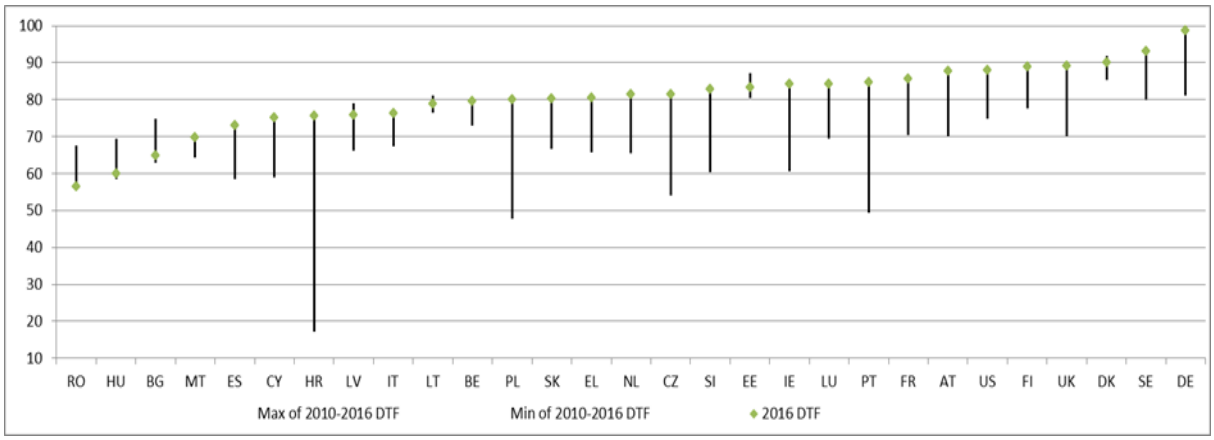
Figure 5.9: Number of MS where the issues was identified as one of the top 5 most problematic for doing business[87]



Source: World Economic Forum, *The Global Competitiveness Report 2015–2016 & 2006-2007 (2015 & 2006 Executive opinion survey)*

The Doing Business getting electricity indicator is likely to be a proxy for bureaucratic barriers. It refers to time, cost and number of procedures required for a small to medium-size company to legally connect a commercial warehouse to the electrical grid. According to Figure 5.10, several EU member states made progress in this area. However, for many of them, the distance to the frontier remains relevant as well as the gap with US.

Figure 5.10: Getting Electricity (DTF-distance to the frontier) 2010-2016[88]



DTF-distance to the frontier: it measures the position respect to the frontier (which has a reference value of 100).
Source: World Bank, *Doing Business Database*

[87] For the construction of the figure the top 5 problems for doing business as identified in each member state were listed for both years, the 8 issues that were in the top five lists of the most Member states for each year are presented in the graph.
[88] The indicator getting electricity had methodology changes in 2015.

5.2. Internal factors explaining firm growth: Scale-up firms[89]

All firms operating in a specific country face the same business environment. However, only a small percentage of them grow fast, while a significant percentage of firms stay stagnant and do not vary in size over long periods of time. These high growth firms (HGF) make a difference and are determinant of the main characteristics on national economies. According to the CompNet database, the share of HGFs before the crisis was the highest among new EU Member States -with a weighted average of 9.6%, compared to 4.1%, in other Member States (Table 5.1)[90]. However, the crisis had a significant impact on the share of HGFs in the new EU Member States, which has reduced the dispersion in prevalence rates across EU countries. The differential factors that make just a few firms grow faster cannot be found in the business environment of firms. They are firm specific, internal factors that differentiate them from the rest. Learning which these factors are is important for policy purposes.

Table 5.1: Share of HGFs

	Pre-crisis		Crisis
	CompNet	H&J (2006)	CompNet
AUSTRIA	2.6	0.2	2.2
BELGIUM	3.7	1.5	3.4
CROATIA			3.3
ESTONIA	8.4		3.9
FINLAND	5.6	1.9	5.2
FRANCE	3.3	1.4	2.7
GERMANY	4.6	0.5	3.5
HUNGARY	7.7		5.4
ITALY	4.6	2.7	3.4
LITHUANIA	11.6		3.2
POLAND	8		4
PORTUGAL			3.7
ROMANIA	12.8		6.9
SLOVAKIA	5.8		3.5
SLOVENIS	6.3		3.5
SPAIN	4.4	2.1	2.5
MANUFACTURING	3.3		2.4
CONSTRUCTION	5.3		3.3
SERVICES	6.7		4.7

Sources: CompNet percentage growth dataset, firms with 20 and more employees and Hoffman and Junge (2006). Notes: CompNet defines HGF as firms with more than 20 employees and annual average employment growth of at least 20% for 3 years. Hoffman and Junge (2006) define HGFs as firms with 15-200 employees increasing their employment by more than 60% over two years with a minimum annual grow of 20%. The average of the periods 1999-2001, 2000-2002 and 2001-2003 is shown. The pre-crisis period includes 3-years windows starting between 2001 and 2005. Crisis includes windows starting from 2006 to 2009 (last year available is 2012)

Data from CompNet database show that there are firms with an initial size of 1 or 2 employees that are able to grow up to, in average, till 40 employees in a period of 3 years. However, Table 5.2 shows that only about 1% of the population of very small firms are involved in this fast-growing process. Thus, only a very small share of firms is able to grow at an accelerated rate in a 3-year period. Figure 5.11 and 5.12 show the prevalence rate by country and macro-sector of each type of entrepreneur defined above. Belgium and Finland, with a prevalence rate of 1%, feature the lowest share of high-growth

[89] This section is based on a contribution by Dr Paloma Lopez Garcia from the ECB.

[90] Moreover, the coverage of the dataset used in Hoffman and Junge (2006) varies substantially across countries (and years) and it appears to be skewed towards larger companies. Hoffman and Junge (2006) consider three two-year periods: 1999-2001, 2000-2002 and 2001-2003. Using the same definition and time span as Hoffman and Junge (2006) but administrative balance sheet data for Spain, Lopez-Garcia and Puente (2012) calculate the share of HGFs in Spain to be also larger than the one of Hoffman and Junge (2006), although still lower than the one in CompNet (3.2% in average over the period 1999-2003).

entrepreneurs whereas in Estonia 3% of very small firms make the transition to the top of the size distribution.

Table 5.2: Only 1% of firms move from the lower 2 quintiles of the size distribution to the upper one

quintile at t/ quintile at t+3	Q1: 0-20%	Q2:20-40%	Q3: 40-60%	Q4: 60-80%	Q5: 80-100%
Q1: 0-20%	63%	24%	9%	3%	1%
Q2_20-40%	20%	45%	27%	7%	1%
Q3: 40-60%	6%	16%	50%	26%	3%
Q4: 60-80%	2%	3%	14%	62%	19%
Q5: 80-100%	1%	1%	1%	8%	89%

Source: CompNet, full sample. Note: Share of firms moving from a given quintile –shown in the first column- to another –shown in the first row- in a 3-year period. Average of the pre-crisis period); the pre-crisis period is the average of 3-year windows starting between 2000 and 2005

The rest of countries are in the middle, with a prevalence rate of high-growth entrepreneurs of 2%. Most of very small firms, between 70% and 80% of all firms initially in the first and second quintile, are stagnant entrepreneurs. Manufacturing and trade record the lowest incidence of high-growth entrepreneurs –with a prevalence rate of 1%- and construction and real state the largest, with a share of 3%. Although there are some exceptions (most notably in Finland), high-growth entrepreneurs share the same set of characteristics in all countries examined.

High-growth entrepreneurs are characterised by higher labour cost per employee, higher TFP, higher capital intensity, higher investment rates and lower leverage than the rest of small firms. The higher TFP and labour cost per employee in HGF compared to firms with moderate growth or stagnant, suggests that HGF have a workforce of much higher quality. Capital productivity and investment are also in general higher than in the rest of small firms. High-growth entrepreneurs are more capital intensive than the rest of small firms, and hold less cash. Box 1 shows very preliminary regression analysis which confirms the descriptive results above.

Figure 5.11: Most very small firms are stagnant in all countries…

(Share of firms initially in the first or second quintile moving to the top quintile, to the third or fourth quintile or stagnating in a 3-year period by country)

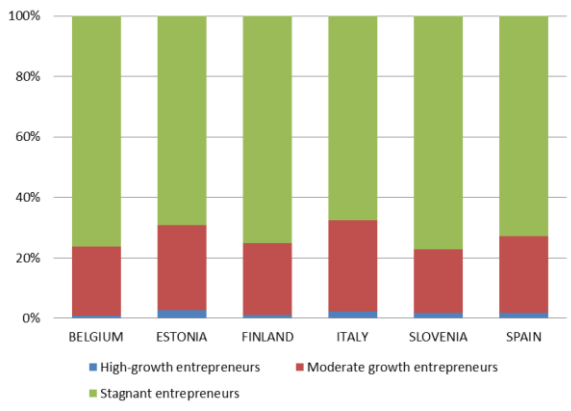
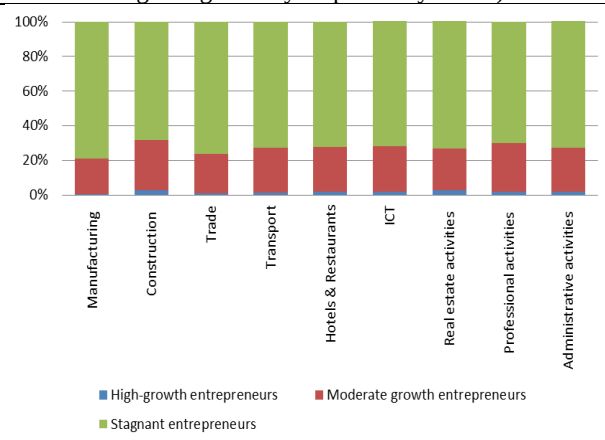


Figure 5.12: …and also in all sectors

(Share of firms initially in the first or second quintile moving to the top quintile, to the third or fourth quintile or stagnating in a 3-year period by sector)



Source: CompNet, full sample dataset. Note: average over 2000-2012

Polices aimed at favouring the availability of these factors would contribute to increase the shares of fast growing firms. For instance, fostering entrepreneurship of highly qualified professionals and expanding their potential markets by eliminating obstacles to the cross border supply of goods and services would increase the growth potential of EU firms.

BOX 1 - Preliminary regression analysis

Column 1 of Table 5.3 shows the point estimates of an ordered probit where the highest ranking is given to high-growth entrepreneurs and the lowest to stagnant entrepreneurs. The most significant variables to explain firm growth are labour cost per employee, TFP, investment and collateral. Columns 2, 3 and 4 show the elasticities of each of the covariates, that is, the increase in percentage points in the probability of being high-growth, moderate or stagnant entrepreneur when each covariate increases by 1%, holding the rest of them constant at the sample mean. The largest impact comes from the labour cost per employee, a possible proxy for human capital, followed by TFP. According to the estimated marginal effect, 1% increase in labour cost per employee would increase the probability of being a high-growth entrepreneur by 3.6pp, of being a moderate entrepreneur by 0.9pp and would decrease the probability of being a stagnant entrepreneur by 1.8pp. Note that the investment ratio makes a difference for high-growth and stagnant entrepreneurs, but it does not make a difference for the probability of being a moderate entrepreneur. Lastly, given the low level of cash holdings of high-growth entrepreneurs, the importance of collateral could be explained because it facilitates the access to credit and, therefore, the expansion of the firm.

Table 5.3: Ordered probit estimates and marginal effects

Ordered Probit	(1)	(2)	(3)	(4)
		Marginal effects (elasticities)		
	point estimates	High-growth entrepreneurs	Moderate growth entrepreneurs	Failed entrepreneurs
Firm size	-0.055	-0.2160	-0.048	0.113
	-0.036	(0.140)	(0.0320)	(0.073)
Labour productivity	0	-0.0475	-0.011	0.022
	-0.003	(0.279)	(0.069)	(0.131)
Labour cost per employee	0.088***	3.663***	0.856***	-1.826***
	-0.016	(0.688)	(0.169)	(0.352)
TFP	0.382***	1.583***	0.328***	-0.880***
	(0.102)	(0.397)	(0.061)	(0.278)
Investment ratio	1.545***	0.604***	0.036	-0.495***
	(0.381)	(0.137)	(0.028)	(0.159)
Capital productivity	0	-0.001	0	0
	-0.018	(0.125)	(0.032)	(0.057)
Capital intensity	0	0.014	0.003	-0.006
	0	(0.061)	(0.015)	(0.027)
Cash holdings	-1.032	-0.256	-0.074	0.1
	(0.989)	(0.245)	(0.072)	(0.095)
Collateral	0.895**	0.566**	0.151**	-0.245**
	(0.439)	(0.276)	"(0.071)	(0.124)
Ratio eruity-debt	-0.038	-0.063	-0.017	0.027
	(0.104)	(0.171)	(0.047)	(0.072)
Leverage	0.915	0.337	0.069	-0.186
	(0.729)	(0.269)	(0.051)	(0.154)
Constant cut1	3.914***			
	(0.590)			
Constant cut2	5.889***			
	(0.636)			
Observations	2,833			

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: Ordered probit where the dependent variable takes the value 1 if the firm is classified as high-growth entrepreneur, 0 if it is moderate and -1 if it is a stagnant entrepreneur. Data are available for 6 countries, 9 macro sector and 13 years (2000-2012). The value of the covariates is taken at the beginning of each 3-year period. Fixed effects for country, macro-sector and year are included. Errors are clustered at the country and macro-sector level.

5.3. Conclusions

This chapter shows that differences in the growth potential of firms are a major factor explaining the gap in dynamism between EU and US firms. Then it looks into the external and internal factors having an impact of firms' growth. There have been considerable improvements in the business environment that favour entrepreneurship and firm growth. These improvements have taken place in those countries that needed them most. However, the evolution of the business environment in leading EU economies has been tepid and some of them report relative setbacks in the distance to world leading economies in business environment terms. The situation can be summarised as follows:

- Member States best positioned in 2010 are the ones that have registered the smallest improvements since then. A group of countries, which includes Malta, Luxembourg and The Netherlands, has also registered small improvements even if the situation in 2010 was not among the EU highest performers. Belgium worsened its score even if the starting point was not among the best ones;
- Member States in the caching-up phase and the ones most hardly hit by the economic crisis have recorded the largest improvements since 2010. The exception is Ireland.

Despite these improvements, further reforms are needed to eliminate structural deficiencies in the access to finance by diversifying alternatives and suitable forms of financing. Other structural reforms are needed to improve the efficiency of public administrations and to provide a more favourable legal environment for insolvency and contract enforcement. There is no single recipe of reforms suitable for all countries. Reforms in these areas should be adapted to national circumstance.

The good news is that reforms are being introduced, although the speed of reforms might not be fast enough and their positive effects are not as strong as desired[91]. Estimates of the potential benefits of reforms are considerable. Quantitative model-based assessment of the potential impact of structural reforms show for example that Euro Area Gross Domestic Product (GDP) could be up to 6% higher after ten years if Member States adopt measures to halve the gap vis-à-vis the average of the three best-performing Member States in each of the reform areas assessed (labour and product markets) in the model simulation.[92] Policies to foster firm growth should not be limited to the improvement of the external factors affecting the growth of firms by improving the business environment. A better understanding of the internal factors common to HGF can help develop policies to improve those specific factors that can actually increase the share of fast growing firms.

Finally, it is important to underline the social impact of increasing the average size of EU firms. Firm growth tend to increase the productivity of labour and this is the best path to sustainable wage increases. In addition, larger fims can offer advantages to workers in terms of training, non-monetary income (eg. complementary health insurance or pensions), job stability and labour market and social mobility that smaller firms cannot afford to offer to their employees. These are important advantages from the point of view of inclusiveness and fairness giving an important social dimension to enterprise policy.

[91] Antonio Fatás (2015), ibidem.

[92] The growth impact of structural reforms, Quarterly report on the euro area, Vol. 12, Issue 4. December 2013, available at: http://ec.europa.eu/economy_finance/publications/qr_euro_area/2013/pdf/qrea4_section_2_en.pdf. Similarly, estimation of impact of reforms could be found at: B. Barkbu et al. (2012), "Fostering growth in Europe now", IMF Staff Discussion Note, IMF; Janos Varga and Jan in 't Veld. "The growth impact of structural reforms". Vol 12, No 4. P. 17-27; World economic and financial surveys (2004), "World Economic Outlook. Advancing Structural Reforms", Chapter III: Fostering Structural Reforms in Industrial Countries, IMF; EC-ECFIN, The Economic Impact of Selected Structural Reform Measures in Italy, France, Spain and Portugal, April 2016.

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6. Integration in the Single Market

6.1. Integration and competitiveness

Previous sections of this report have shown the importance of market efficiency in the allocation of resources for competitiveness and how it depends, to a considerably degree, on labour and product market regulations.

The characteristics and quality of the common regulatory framework provided by the Single Market also have a considerable impact on the individual and collective competitiveness of EU Member States. This became apparent during the past financial crisis when the regulatory framework applicable to financial markets proved to be insufficient to cope with the requirements of highly complex and integrated EU financial markets under stress.

The importance of economic interdependence in EU economic integration is particularly important within the Euro area. The smooth functioning of a currency area depends on issues such as the free movement of labour and capital, the openness of the economies, especially in markets of tradable goods and the degree of similarity of the economic structures on the economies integrating the currency area.([93])

With a common currency, the mobility of labour and capital and the resilience provided by flexible product, services and labour markets are essential for macroeconomic stability, but also for the good allocation of resources, and therefore for productivity and competitiveness.

In this sense the Five Presidents' Report goes beyond the objectives of introducing structural reforms to improve the performance of EU economies. The Report sets the objective of economic upward convergence among the Euro area economies because "Member States have a responsibility and self-interest to maintain sound policies and to embark on reforms that make their economies more flexible and competitive" ([94]) and resilient to economic shocks.

The crisis has shaken the EU economy. The 2015 Single Market Report on Integration and Competitiveness already presented some evidence of the impact of the crisis on the Single Market suggesting that the crisis could have introduced some structural breaks in the patterns of economic integration. This year's report digs deeper into the impact and lessons from the recent crisis for the Single Market.

In this part of the 2016 report, we present the main results of two studies providing further evidence in this sense. The first detected some relevant changes in the specialisation, concentration and clustering of trade within the Single Market. The second study looked at the transmission of economic shocks in recent years, pointing out barriers to investment and the misallocation of resources. Then we look into the performance and integration of three groups of markets of special relevance for competitiveness: services markets, public procurement markets and the construction sector.

[93] Mundell, Kenen and McKinnon
[94] Five Presidents' Report

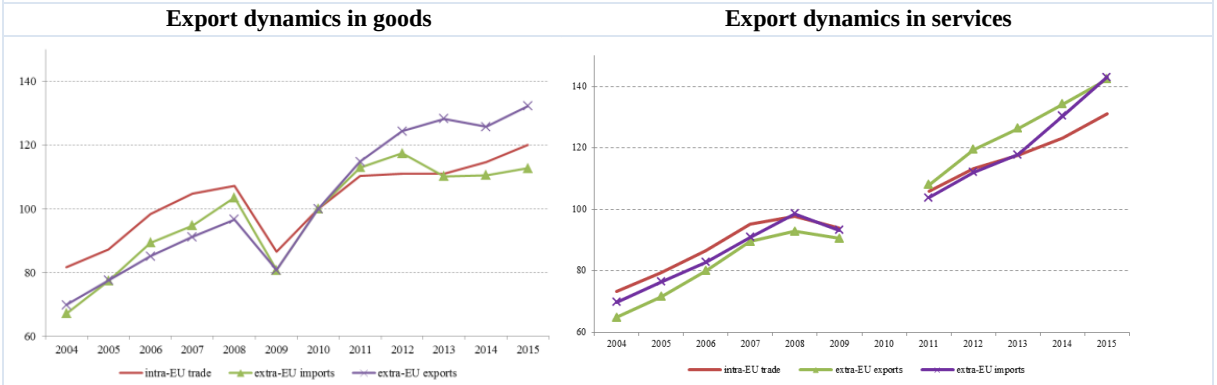
6.2.Evolution of intra-EU trade in goods and services

Following the enlargement of the single market, intra-EU trade developed vigorously until the financial and economic crises severely hit all EU Member States and sectors, leading to a sharp decline in trade in 2009. EU trade in goods suffered a bigger dip in comparison to EU trade in services, but quickly recovered by 2011. From 2011 onwards, weak demand and slow economic growth led to low dynamics in intra-EU trade in goods. Positive signs of accelerated growth in goods trade have been observed in 2014 and 2015.

Prior to the crisis, intra-EU trade developed more strongly than world trade, suggesting an increasingly stronger integration among European countries in this period. This trend, however, changed in 2009 when intra-EU trade slowed down and came to a practical standstill (Figure 6.1). Sluggish internal demand in Europe seems to be the main reason for this break in the trend of intra-EU trade. This is confirmed by the even greater fall in imports to the EU from the rest of the world

Trade flows of goods outside the EU have recovered faster than intra-EU trade after 2009, although they seem to have slowed down after 2011. EU-28 exports to the world basically followed this trend though at a slower pace.([95])

Figure 6.1: Trade dynamics in goods and services (Index 2010=100)



Source: Eurostat; own calculations

Note: BoP used for services data (bop until 2009 and bop6 from 2010 onwards). Data for 2015 are provisional.

Extra and intra-EU trade in services faced a less severe trade slump as a result of the crisis and showed a more stable increase afterwards. The recovery after the crisis has been particularly steady in intra-EU trade but extra-EU exports and imports of services to and from the rest of the work have accelerated faster than intra-EU trade in services.

6.3.Exports dynamics across Europe

Trade in the Single Market does not grow evenly across markets and countries. Policies and external shocks shape the evolution of intra-EU trade. The enlargement of the Union and the recent crisis had a considerable impact on EU Member States. To what extent have these developments modified trade

[95] These trends are also observed at the level of the individual EU Member States. The share of exports in goods to other EU-28 countries in the countries' total exports declined in almost all countries. However, there is still a large variation across countries with respect to their shares of intra-EU exports.

patterns in the EU? This section presents evidence of the impact of enlargement and especially the financial and economic crisis on different aspects of intra EU trade. It is based on a study on "The evolving composition of intra-EU trade over time" by WIIW which looked into the impact of the crisis on the EU dynamics of concentration (in the sense of production or trade being concentrated to a few locations, regions or Member States), clustering and specialisation in the 2004-2014 period.([96]) It also looked into the evolution of the quality of goods exchanged in intra-EU trade.

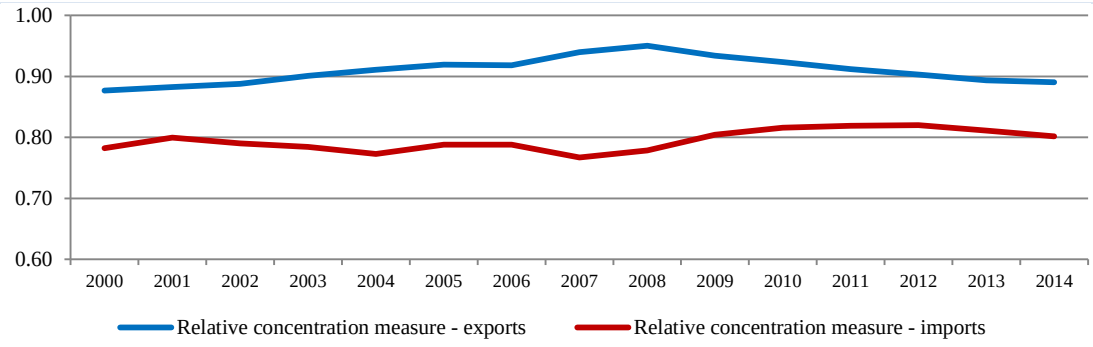
- *Concentration, relative concentration and specialisation*

Enlargement contributed to diversify the geographic origin of intra EU exports. The Single Market has become "flatter" in the sense that exports and imports of goods are less concentrated across countries.([97]) This trend has not been modified between 2000 and 2014.

In services, export activities have become slightly less concentrated until 2009 and the concentration has remained stable since then. Some countries have strongly specialised in services export activities. Concentration strongly increased in insurance services, financial services and computer and information services until about 2006; after the crisis these patterns reversed. The overall tendency towards lower concentration is driven by the trends in the large categories (transport, travel and other business services) which are characterised by a decline in concentration. However, concentration in business services increased again after the crisis.

In contrast with these developments, the ratio between the concentration of goods exports and the concentration of GDP has been affected by the crisis. The latter declined between 2000 and the start of the crisis (as mostly the smaller EU-CEE countries tended to grow faster), resulting in an increasing ratio as depicted in Figure 6.2, but it started to increase again around 2011 as some smaller countries experienced a less favourable development. This suggests that higher-growth countries experienced a better export growth performance. The opposite change in trend is observed for imports as shown in Figure 6.2. This structural break in relative concentration cannot be detected in services trade.

Figure 6.2: Relative concentration of intra-EU export and import activities in goods



Source: BACI; wiiw calculations

Note: This indicator compares concentration of exports (imports) with the concentration of GDP. A value below 1 indicates that exports (imports) are less concentrated than GDP.

The crisis seems to have introduced another structural change in the process of integration. Until 2008, Member States increased steadily their specialisation in the exports of some goods and services. EU integration triggered a specialisation dynamics across Europe manifesting in an agglomeration of

[96] WIIW, 2016, *The evolving composition of Intra-EU trade over time*, a study conducted for the European Commission, DG GROW

[97] The Herfindahl index of exports has fallen consistently since 2000 till 2014 from 0.110 to 0.102. Imports are less concentrated with Herfindahl indexes falling from 0.095 to 0.090).

industrial activities in a subset of countries which therefore also gained shares in intra-EU trade. In other words, a growing share of certain goods and services was coming from some individual Member States. This trend changed after the crisis.

This is similarly the case for services, with agglomeration tendencies in another area of Europe. These specialisation dynamics slowed down after the crisis. However, some countries have strongly specialised in some services export activities.

- *Clustering and bilateral gross trade intensity (BGTI)*

The evolution of the integration process and the crisis seem to have had a more considerable impact on the geographic distribution of economic activities.

The clustering measure indicates whether export activities are being carried out in an increasingly closer geographic area. Table 6.1 shows that until 2008, exporting activities were increasingly taking place in countries with lower distance from each other. After the crisis, this trend has slowed down. The share of the 'Central European manufacturing core' (CZ, DE, HU, AT, PL, SK) amounts to more than a third of the EU manufacturing value added exports. It reached 42.6% in 2011, an impressive increase of 8 percentage points since 1995 (see Stehrer and Stöllinger, 2015).([98])

In addition, Eurostat data shows that in most Member States, over 50% of their intra-EU exports are directed to only 2 or 3 partners, very often within close geographical distance.

Clustering of exporting activities increased for most industries from 2000-2008, but from then on remained stable or even declined. Notable exceptions to this are the computer, electronic and optical products industry and other transport equipment where clustering declined only from 2011 onwards. In 2014, the clustering of economic activities was particularly high in Printing and reproduction of recorded media, Coke and refined petroleum products, Chemicals and chemical products, Computer, electronic and optical products and Pharmaceutical products.

Table 6.1: Clustering measure for goods

	Intra-EU exports			Intra-EU imports		
	Exports	GDP	Clustering	Imports	GDP	Clustering
2000	0.218	0.193	1.133	0.198	0.193	1.028
2001	0.218	0.191	1.140	0.199	0.191	1.042
2002	0.216	0.190	1.137	0.199	0.190	1.047
2003	0.214	0.188	1.143	0.196	0.188	1.043
2004	0.216	0.186	1.159	0.194	0.186	1.038
2005	0.218	0.184	1.183	0.194	0.184	1.055
2006	0.217	0.183	1.184	0.193	0.183	1.057
2007	0.217	0.181	1.199	0.189	0.181	1.043
2008	0.217	0.178	1.218	0.191	0.178	1.070
2009	0.217	0.179	1.209	0.196	0.179	1.094
2010	0.216	0.180	1.203	0.196	0.180	1.092
2011	0.218	0.180	1.206	0.200	0.180	1.106
2012	0.218	0.182	1.197	0.203	0.182	1.117
2013	0.218	0.182	1.196	0.204	0.182	1.119
2014	0.216	0.184	1.176	0.201	0.184	1.091

Source: BACI; wiiw calculations.

[98] Robert Stehrer and Roman Stöllinger (2015) *The Central European Manufacturing Core: What is Driving Regional Production Sharing?*

A clustering of trade activities over time is also observable in services (Table 6.2). Furthermore, before the crisis, Europe experienced a strong increase in bilateral trade intensities which, however, stopped after the crisis, thus marking a structural break in these trends.

Table 6.2: Clustering measure for services

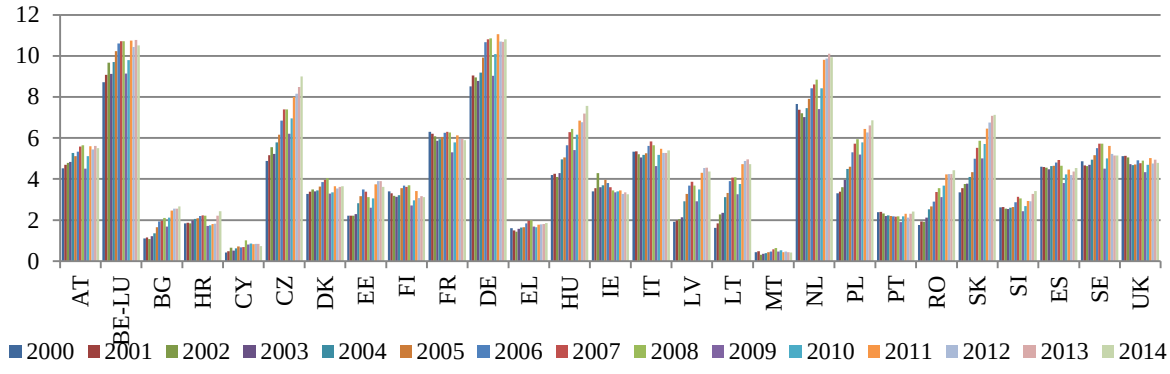
	Intra-EU exports			Intra-EU imports		
	Exports	GDP	Clustering	Imports	GDP	Clustering
2000	0.19	0.19	1.01	0.23	0.19	1.19
2001	0.19	0.19	1.00	0.22	0.19	1.17
2002	0.20	0.19	1.04	0.22	0.19	1.15
2003	0.19	0.19	1.02	0.21	0.19	1.13
2004	0.19	0.19	1.03	0.21	0.19	1.12
2005	0.19	0.18	1.04	0.20	0.18	1.11
2006	0.19	0.18	1.06	0.20	0.18	1.10
2007	0.19	0.18	1.06	0.20	0.18	1.09
2008	0.19	0.18	1.07	0.20	0.18	1.10
2009	0.20	0.18	1.10	0.20	0.18	1.12
2010	0.20	0.18	1.11	0.20	0.18	1.13
2011	0.20	0.18	1.10	0.20	0.18	1.13
2012	0.20	0.18	1.10	0.21	0.18	1.13
2013	0.20	0.18	1.10	0.21	0.18	1.15

Source: UN data; wiiw calculations.

EU integration has further led to a strong increase in overall bilateral trade in goods intensities, measured by bilateral trade flows relative to GDP. Bilateral gross trade intensities generally improved over the whole period 2000 – 2014 with a proportionally higher increase for country pairs which started with relatively lower intensities. The trade slump marked a short-lived dip, though in 2011 most countries had already returned to the pre-crisis levels. Since 2011, a more diverse picture emerges.

Bilateral trade relations in goods intensified significantly only for a subset of countries, amongst which most CEE economies (BG, CZ, EE, HU, LV, LT, PL, RO, SK), Austria, Germany, Belgium/Luxembourg and the Netherlands. For the remaining EU countries, bilateral trade intensities have either increased less significantly or even remained more or less constant over the whole period. This suggests that intra-European trade integration has been driven by a specific group of countries.

Figure 6.3: Bilateral gross trade intensity (means)



Source: BACI and WDI; wiiw calculations

In summary, EU enlargement and the economic crisis have had a considerable impact on the geographical patterns of intra EU trade. Enlargement triggered a process of specialisation, clustering of economic activities economic and a strong increase in bilateral trade intensities in goods. These changes were not generalised and affected to a larger extent to a limited number of countries. However, after the crisis no further increase in this respect is noticed, marking a structural break in the trend. Similar patterns can be observed with regard to bilateral trade intensities for services, but in contrast to goods trade, these intensities remained stable in the crisis years and increased at a lower level after the crisis.

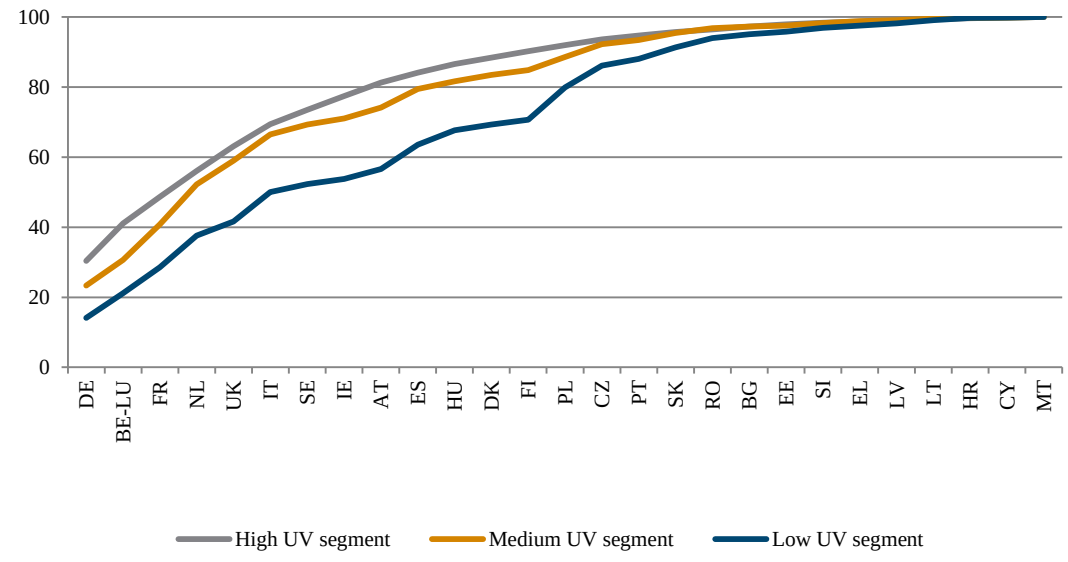
- *Patterns of exports by product and quality dimension*

To complete the description of structural changes in intra-EU trade, this section looks into the evolution of the quality of exports in intra-EU trade.([99]) This analysis is based on a classification of the quality of exports according to their specific unit-value (UV) differentiating three groups: high UV, medium UV and low UV segments.

Figure 6.4 presents the cumulated shares of the three segments ranked according to the high-quality segment. It shows that trade in the high-quality segment is most concentrated; trade in the medium-quality segment is slightly less concentrated, while trade in the low-quality segment is the least concentrated. This suggests a certain 'division of labour' across Member States in the provision of high-unit value goods across Europe.

The countries which gained overall market shares have done so by gaining market shares mainly in the medium and low-quality segments. Significant changes in high-quality market shares are only observed for Belgium-Luxembourg and Germany. Accordingly, countries with overall losses in market shares did so predominantly in the medium unit-value segment as well.

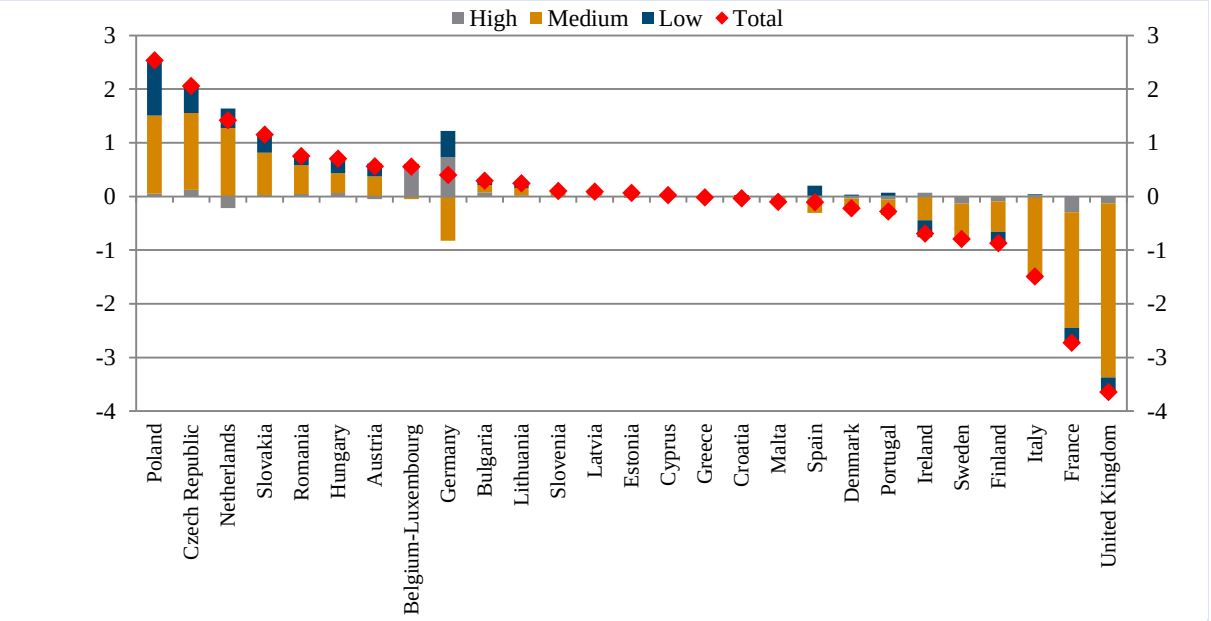
Figure 6.4: Cumulated shares in intra-EU trade by quality segments



Source: BACI; wiiw calculations

[99] The HS 6-digit products are classified into three types using the information about unit values of exports to each destination market served by the EU countries: products belonging to the high unit-value range, those that belong to the medium unit-value range and those that are classified in the low unit-value range.

Figure 6.5: Changes in contributions to intra-EU exports in %, 2000-2014



Source: BACI; wiiw calculations

Splitting trade into quality segments using detailed trade data, one can observe that the overall shift in the geographical patterns of intra-EU trade has happened almost exclusively in the medium-quality segment of traded products and to a (much) smaller degree in the low-quality segments. The performance of Poland and the Czech Republic has been particularly impressive in that sense.

In contrast, the shares in the high-quality segments are almost unchanged. This is indicative of a 'climbing up' phenomenon of less advanced countries which have gained in medium quality segments at the expense of (some of) the advanced countries.

In summary, enlargement has implied a partial restructuring in the distribution of exports of goods by country according to their quality. The Member States that joined the Union after 2004 have been steadily increasing the quality of the exports but only up till the quality mid-range. This has had an uneven impact on the export performance of Member States, having a particularly minimal impact on Member States having a comparative advantage in high-quality exports.

6.4. Single Market transmission mechanisms

The benefits of the single Market are not limited to offering lower prices and a more diverse range of goods and services to consumers. In principle, the Single Market should make EU economies more resilient to asymmetric shocks. It is supposed to provide mechanisms to absorb and mitigate the impact of asymmetric shocks, notably through reallocation of resources and changing trade flows. That way, the impact should be absorbed by all Member States to some degree, rather than concentrated to those initially most affected by an asymmetric shock.([100]) In addition, the elimination of barriers to the free movement of goods, services, people and capital should also facilitate the efficient allocation of resources, thus contributing to productivity growth.

[100] Asymmetric due either to the nature of the shock or to different economic structures or trade and FDI flows in different Member States, making them more or less vulnerable.

There are three main channels through which the Single Market can be expected to absorb and spread out the impact of asymmetric shocks:

- *Labour markets*: local labour market dynamics and flows of labour from surplus regions to regions where labour is in demand.
- *Capital markets*: flows of capital from regions of low to regions of higher return.
- *Goods and services*: a shift in intra-EU trade patterns in favour of the worst off economies, as a consequence of improving terms of trade.

A potential fourth channel could be exchange rate and interest rate adjustments, but with 19 Member States already having adopted the single currency and most of the remaining nine having pegged their exchange rates against it, the scope for Single Market shock absorption through monetary mechanisms is limited. In relation to third countries though, exchange rate adjustments remain a powerful channel for shock mitigation.

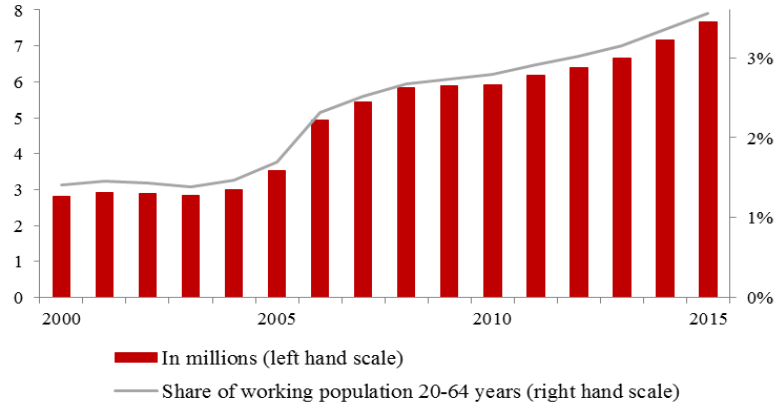
Thus, the effectiveness of the Single Market in absorbing shocks and facilitating an efficient allocation of resources hinges on the elimination of barriers to the free circulation of goods services, people and capital in the labour, capital and goods and services markets.

The recent financial crisis has put to the test the capacity of the Single Market to perform these functions in a smooth and effective way. This section reviews and summarises the evidence revealed by a recent study ([101]) on the transmission and absorption of asymmetric shocks in the Single Market.

- *Labour market transmission*

Unlike the United States, which is known for its dynamic and highly mobile labour force, cross-border labour mobility in the EU has a reputation for being low. Out of a working age population of almost a quarter of a billion, just over 3% are working in a Member State other than their country of origin.([102]) This is a lower proportion not just than the United States (and other major economies) but also lower than regional mobility within Member States. In other words, the labour market channel is a better absorber of asymmetric shocks *within* Member States than between them.

Figure 6.6: EU citizens working in another Member State, 2000–2015



Source: Eurostat LFS

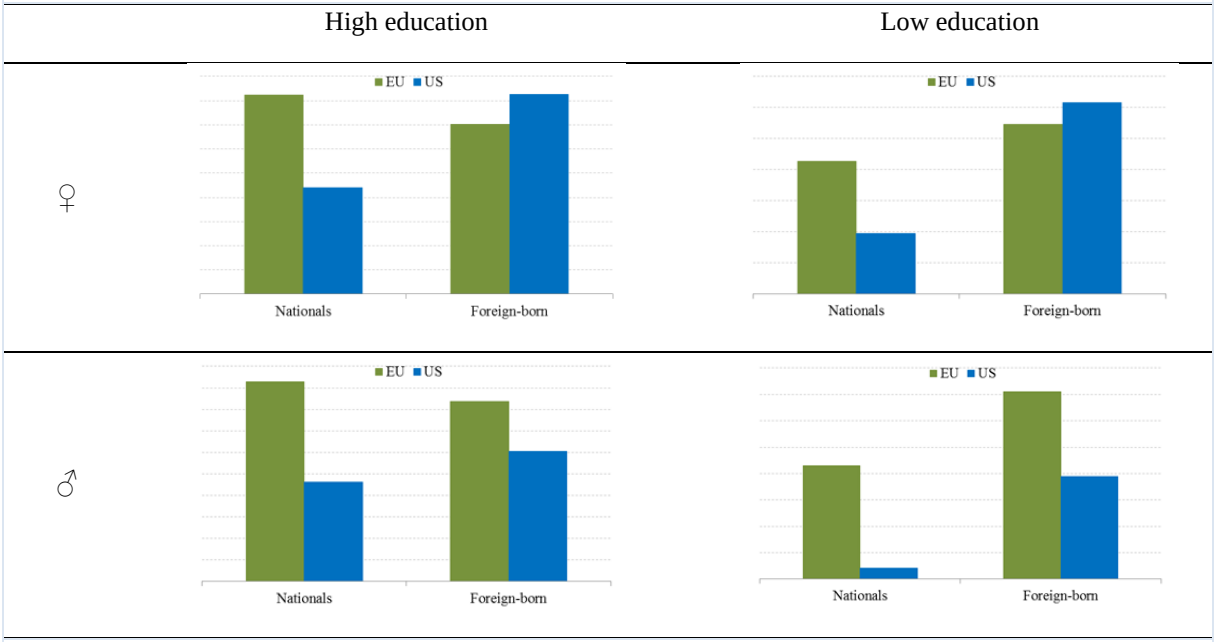
Language barriers aside, there are several features of the Single Market that help explain the low cross-border mobility: lack of information about the possibilities and practicalities of worker mobility

[101] Oberhofer et al. (2016)

[102] It is worth noting that the proportion more than doubled after the 2004 enlargement, notwithstanding the relatively limited addition to the EU labour force represented by the ten Member States joining in 2004.

in the EU; red tape; transferability of social security contributions and rights; heavily regulated professions with different regulations in different Member States; lack of recognition of professional qualifications.

Figure 6.7. Responsiveness to employment changes, EU and United States



Source: Oberhofer et al (2016)

However, Oberhofer et al. (2016) use regional data to show that this transmission channel gained in importance during and after the economic and financial crisis, as workers in the worst hit Member States (Greece, Ireland, Spain, Portugal, Italy and others) decided to move to less affected Member States where they could find employment. These results are consistent with Arpaia et al. (2014). Their results also indicate that in the EU, most groups are in fact *more* responsive to labour market shocks than their US counterparts: only foreign-born women are less responsive to labour market shocks than in the United States.

These results are important as they suggest that migration was rather responsive to regional economic conditions in the time period considered. Furthermore, migration from abroad (both from other EU countries as well as from third countries) has also contributed to the reduction of regional labour market disparities in the EU, as well as to facilitating convergence and the reallocation of labour to more productive sectors in the time period considered.

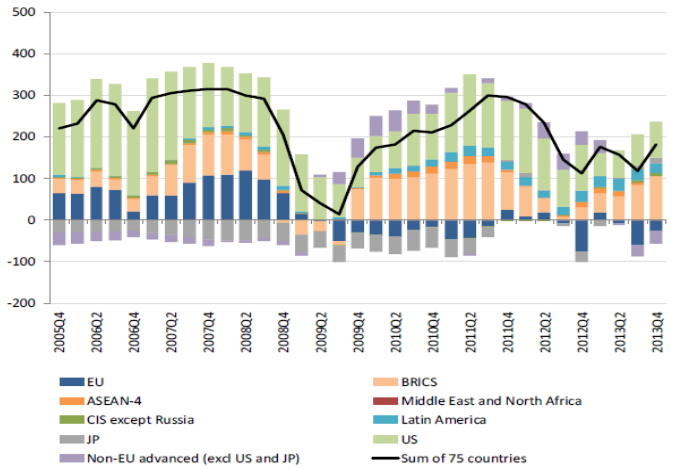
The conclusions of this study reflect positively on the labour market flexibility in the European Union in the last decade and also underline the positive contribution of immigration from abroad to the equalisation of living conditions across regions and to the capability of regions to reallocate labour inputs to high-productivity sectors.

- *Capital market transmission*

Before the economic and financial crisis of 2008/09, EU financial markets were generally regarded as fully integrated and efficient. According to economic theory, an integrated financial market triggers the flow of capital from economies abundant in capital to capital-poor economies offering higher returns on capital, thereby contributing to convergence and shock absorption. In fact, the current account imbalances prevailing in the euro area have been interpreted as a positive sign of economic convergence precisely for that reason (Blanchard and Giavazzi 2002).

However, once the financial crisis started in the United States, it quickly spread to the global economy and had a particularly profound impact across the EU, on account of its openness and free capital movements (whereas some non-EU economies imposed restrictions on capital movements in the wake of the crisis). And contrary to expectations and economic theory, rather than absorbing the shock the Single Market for capital aggravated it, reversed the integration trend into disintegration, and led to serious contagion risks for EU banking, not least in the context of the ensuing sovereign debt crisis.

Figure 6.8: Net financial flows 2005–2013 (USD bn)

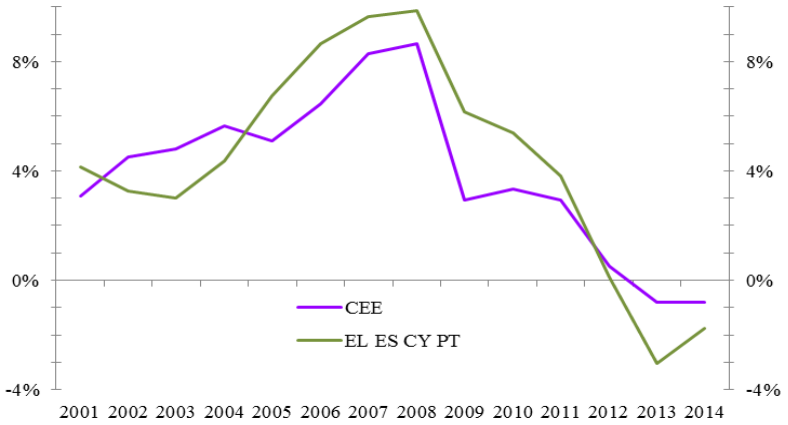


Source: Darvas et al (2015). (Positive bars signify net inflows, negative signify net outflows)

As an immediate consequence of the outbreak of the financial crisis, the net flow of capital changed direction, from a net influx into the EU in the run-up to the crisis to a net outflow from the start of 2009. This is in contrast to the United States (in particular) and several other economies (except Japan and certain BRICS economies) where the net financial flow stayed positive throughout the crisis, and in some cases even grew more positive.

The shift from positive to negative was to a large extent driven by shifting net flows in peripheral euro area countries such as Greece, Spain, Cyprus and Portugal, as well as in Central and Eastern Member States. The four peripheral euro area members had enjoyed a strong net influx of capital before the crisis, but it quickly deteriorated and turned negative from 2012. The eleven CEE Member States experienced a similar change in net direction.

Figure 6.9: Net financial flows (% of GDP) of euro periphery and CEE countries



Note: CEE = BG, CZ, EE, HR, LV, LT, HU, PL, RO, SI, SK
Source: IMF (Positive values signify net inflows, negative signify net outflows)

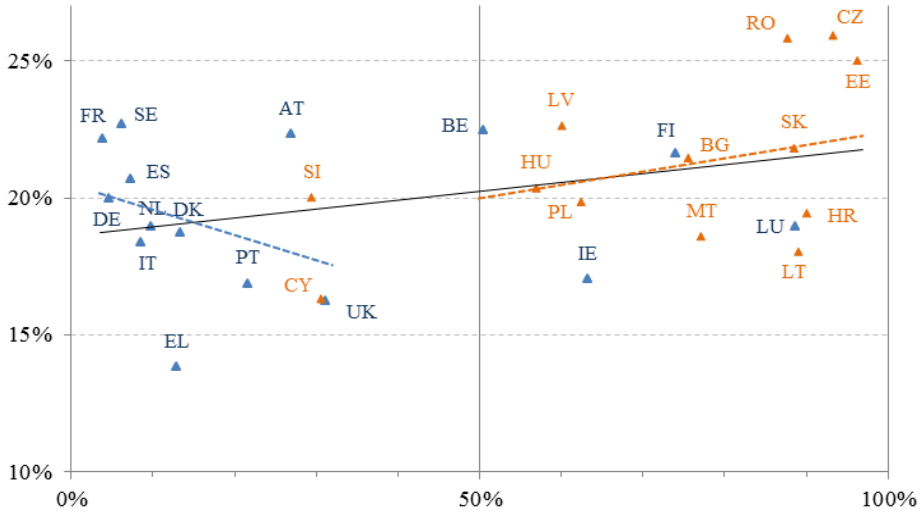
These quantitative changes also led to qualitative changes in the relationship between investment and capital flows. Before the financial crisis, larger net capital inflows were not associated with an improved allocation of resources toward more financially dependent sectors for total investment. After the crisis we observe a better allocation of resources to financially dependent sectors for total investments, but not for investment in buildings and structures. This finding points in the same direction as the evidence presented in Chapter 4 on inefficiencies in the allocation of capital, but in the context of cross-border investment flows in the Single Market. However, for cross-border banking there is not much evidence for the claim that it impacted on the allocation of financial resources before or after the crisis. Domestic lending remains crucial for investment finance in most bank-based economies in Europe.

The financial disintegration in the EU – the euro area in particular – which was triggered by the financial crisis imported from the United States, was and still is fuelled by the negative feedback loop between banking and sovereigns that has become a defining feature of the euro area crisis (Darvas et al. 2015). Commercial banks remain exposed to sovereign debt in most Member States.

Oberhofer et al. (2016) examine the consequences of financial disintegration for the provision of risk capital, in particular for SMEs, barriers to investment in different sectors and Member States, and the role of foreign ownership of banks.

Foreign-owned assets in the banking system range from 4% in France to more than 96% of total assets in Estonia. Most EU15 Member States, along with Cyprus and Slovenia, have foreign assets proportions up to a third of total assets in the banking system, while Member States from the 2004 accession and later tend to have foreign assets representing 55% or more of the total assets of their banking systems. Ireland, Luxembourg and Finland also have a high proportion of foreign-owned assets in their banking systems.

Figure 6.10: Gross fixed capital formation (% of GDP) as a function of foreign bank assets/total banking system assets (%), average 2010–2014



Source: Oberhofer et al (2016)

Across all Member States, foreign ownership of banking assets and the investment ratio are positively related, even though the linear correlation is not particularly strong (r = 0.38). A similar positive link can be found for the 15 Member States with more than half the assets of their banking systems in foreign ownership (r = 0.26). However, for the 13 Member States with foreign ownership of ⅓ or less, the relation between investment and foreign ownership of bank assets is negative and of the same

order of magnitude ($r = –0.36$). The positive impact on gross fixed capital formation from foreign ownership in the banking system therefore seems to be limited to cases where most of these assets of the banking system are foreign-owned.

In summary, an integrated European banking market is one important element to support the efficient allocation of financial resources. The findings presented here suggest that better governance and regulation of the financial sector and cross-border integration of banking activities can help to reduce financing constraints in Europe as it provides insurance to deleveraging shocks in the domestic banking system, as pointed out in the 2015 edition of this report.

- *Trade in goods and services*

Unlike the labour and financial channels, the trade channel has the potential to reduce the likelihood of asymmetric effects already *before* a shock has materialised. Empirical evidence shows a strong link between trade and converging economic structures: the more trade there is between two countries, the more similar their economies will become. Therefore a shock to the EU economy is more likely to be symmetric for Member States with close trade links (and similar economic structures as a consequence) than for Member States with weaker trade links.

Secondly, once a shock has materialised, the trade channel has the potential to absorb it and spread the impact across economies linked by trade. The trade channel can operate in two ways, directly and indirectly. Direct effects come if countries which are asymmetrically affected by the shock change their trade patterns in favour of the more severely hit country, for instance reflecting improved terms of trade. The indirect effect is linked to changes in global value chain participation.

Oberhofer et al. (2016) use input-output tables to analyse how asymmetric shocks are transmitted and absorbed in the EU through trade in value added in global value chains. They compare the sensitivity of an impact variable, employment, to changes in the demand of final goods but also along the whole value change, both domestic and foreign. In other words, they can differentiate between the impact on employment of changes in domestic demand for final products, domestic demand for intermediate products, foreign demand for final goods and foreign demand for intermediate products. They estimate and compare the sensitivity of labour demand functions in 40 World Input-Output Database (WIOD) economies and in the EU (except Croatia).

The results reveal that employment is not very sensitive to changes in foreign and domestic demand for goods. For all 40 economies as well as for the EU and the euro area, parameter estimates between 0.8 and 0.9 suggest a sluggish reaction function of employment in the face of demand variations. The only exception is for electricity services and construction, where employment in the non-EU economies appears to react more flexibly to demand fluctuations than in other aggregated sectors. In the EU, on the other hand, the reaction function of employment in electricity services and construction to changing demand is very similar to the EU reaction function in other sectors. It is also worth pointing out that except for in electricity services and construction, employment appears to react more flexibly in the EU than in the other 13 economies.

On the other hand, looking at the subset of Member States that formed the euro area at the start of 2009 ([103]) suggests less flexible employment in the euro area than in the rest of the world: in all aggregated sectors except electricity services and construction, parameter estimates are higher for the

[103] Belgium, Germany, Greece, Ireland, Spain, France, Italy, Cyprus, Luxembourg, Malta, Netherlands, Austria, Portugal, Slovenia, Slovakia, Finland.

Member States that had adopted the euro by January 2009 than for other countries (eleven Member States and thirteen non-EU economies).

These results underline the crucial importance of adjustment costs for shaping persistence in the employment dynamics within the euro area. These adjustment costs are likely driven by labour market institutions which reduce the flexibility in the employment adjustment over time with likely (additional) negative employment effects in times of economic downturns. Insofar as the analysis incorporates impacts on employment along the value chain, rigidities in product and services markets may also be playing an indirect part in the sluggish adjustment of labour demand.

Domestic demand for final and intermediate goods is the main driver of change in employment for all countries and goods considered. However, (lagged) demand for intermediate goods also plays a considerable role in the demand for labour. This is particularly important for countries in the euro area but not so much for other EU Member States.

These results suggest that rigidities in product and services markets but especially in labour markets are limiting the capacity of the Single Market to adapt to asymmetric shocks. The main channel for the transmission of effects seems to be through the demand for intermediate goods, but this applies mainly to euro area countries, not to non-euro countries.

6.5. Conclusions

The crisis has had a considerable impact on the Single Market. This is not limited to the quantitative dimension of trade flows. Some structural breaks in the process of integration seem to have occurred. The process of progressive specialisation and relative concentration of countries and activities seems to have come to a halt and even reversed. This seems apparent for products trade but less so for services, where some specialisation processes continue.

Geographic patterns of the distribution of economic activity seem to have been interrupted too. The increasing clustering of economic activities in some "core" countries seems to have come to a halt. This is not so clear for the increasing trend of bilateral trade relationships that remain significantly strong for a number of country couples. Whether these are a temporal or permanent impacts remains to be seen.

The crisis has also tested the capacity of the Single Market to provide effective mechanisms of absorption of asymmetric shocks. As indicated above, the labour channel of absorption of shocks seems to have performed above expectations. For most population groups, migration contributed to bridge gaps in labour market demand and supply. Highly skilled workers have been particularly effective in this sense. This higher sensitivity of labour to employment conditions can contribute to economic convergence across regions, resilience and to a better allocation of resources.

The capital markets channel seems to have performed below expectations. Even before the crisis, evidence suggests that it did not contribute to a better allocation of resources. In a context of high level of market integration, capital markets regulations and governance were not capable to cope with developments and the credit channel broke down.

Product and services market channels are not performing at their full capacity to respond swiftly and effectively to shocks. Despite high levels of integration in goods markets, rigidities in products,

services and labour markets limit the capacity of markets to dampen the impact of asymmetric shocks. The mechanisms for and effective absorption seem to be present, at least in the euro area, with a significant impact of intermediate demand for goods on labour demand. However, markets remain relatively sluggish to respond to shocks.

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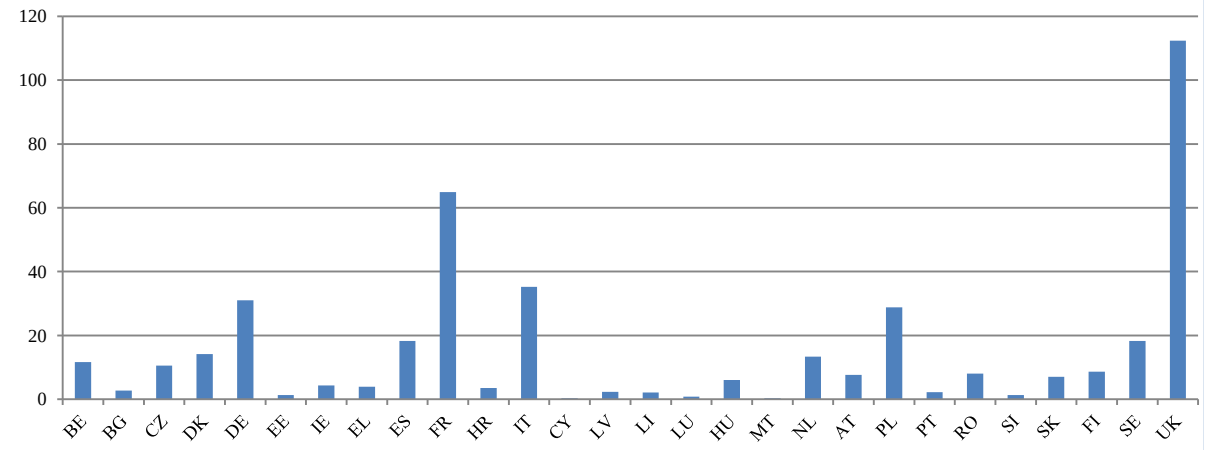
7. Public procurement as a key to economic growth

7.1. Introduction

Every year public authorities in the EU spend around 14% of GDP in public procurement, which amounts to more than €1.9 trillion spend annually in the EU.([104]) Public procurement is important, especially in sectors such as energy, transport, defence, IT or the provision of health services, where the public sector is a key source of demand.

Public contracts above the EU thresholds have to be published EU-wide, on the Tenders Electronic Daily (TED) platform. This obligation comes out of the objective to integrate the procurement markets in the Single market, increasing competition and obtaining better value for public money spent. In total, call for tenders published EU-wide represented € 421 billion in 2014. Figure 7.1 shows the distribution per Member State, in absolute terms.

Figure 7.1: Value of calls for tender published in € billion by Member State, 2014



Source: European Commission based on OJ/TED data (Croatia 2013-2014)

But efficient public procurement is also crucial for solving many of the key policy challenges that the EU is facing. This includes growth and jobs, fiscal discipline, the modernisation of public administration, fight against corruption and collusion, market access for SMEs, the trust of citizens in public authorities and democracy, as well as innovation and environmentally and socially sustainable growth.

Especially in times of constrained government budgets, efficient spending and investment of public money is a key lever to restoring economic growth. For Member States, public procurement is an essential vehicle for the delivery of governmental policies and for the achievement of national strategic objectives. Well-functioning public procurement markets boost national competitiveness through better public finances, better investments and provision of higher quality services such as infrastructure or e-government.

[104] This is the latest estimate not including spending by utility companies. Former estimates including utility procurement are around 19% of EU GDP, i.e. roughly €2.3 trillion.

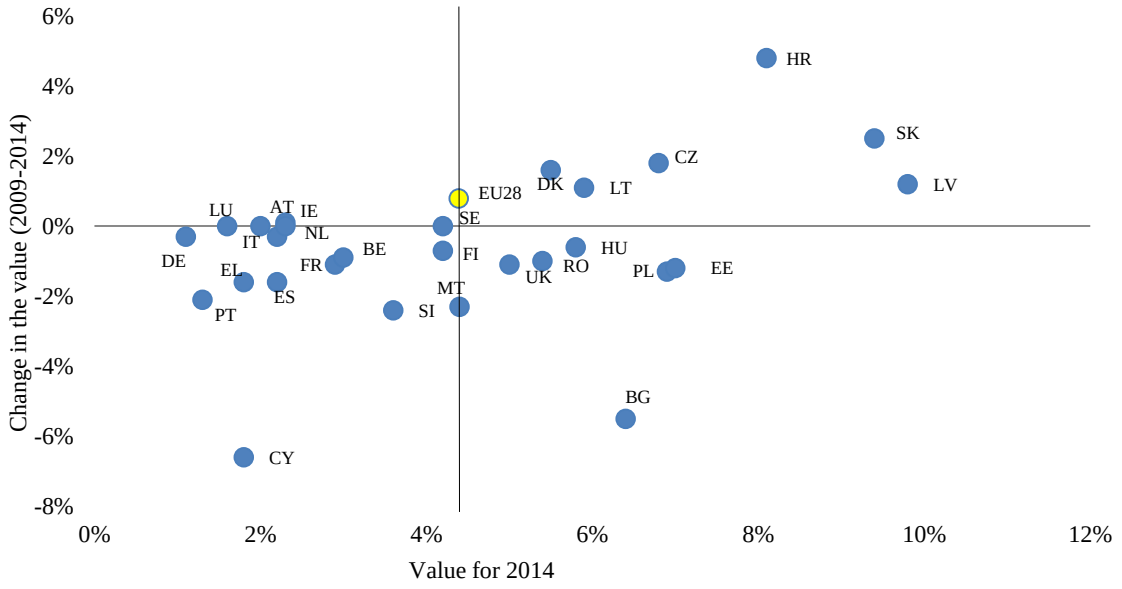
7.2.Key challenges

Efficient public procurement relies on the performance of the national public procurement system. This system consists of many parts, each of which must be well governed. Foremost, public procurers must be professionals who understand the economic implications of their work and whose integrity is without doubt. Furthermore, institutions must be available to coordinate procurement between bodies to attain economies of scale, manage complaints by companies, and audit public contracts. Finally, the public sector must be able to respond to threats of collusion by suppliers. In many Member States the management of the individual parts of the public procurement system could be greatly improved. Several challenges can be identified which hold back the achievement in this context.

Low level of publication of public tenders at EU level([105])

A key indicator is the level of publication of public tenders at EU level. The rate of publication reached a maximum in 2014 despite the low rates in some larger countries but the situation varies greatly across Member States. There are some Members States where the value of procurement published in relation to GDP is far below the EU average of 4.39% in the period 2009–2014 (Figure 7.2).([106])

Figure 7.2: Value of calls for tender published as a percentage of GDP by Member State 2009-2014



Source: European Commission based on OJ/TED data (Croatia 2013-2014)

Member States with low publication rates, will not be able to benefit from increased publicity (such as reduced search costs about upcoming auctions i.e., entry costs or enlarging the pool of potential participants). In addition, the low publication rates hamper the access to their market from other Member States thereby reducing the gains from the Single Market to the EU as a whole.([107])

[105] Including utilities and defence.

[106] In general, it is considered that increased publicity reduces the search costs about upcoming auctions (i.e., entry costs) and enlarging the pool of potential participants.

[107] It should be emphasised that a low value in relation to GDP does not imply that rules are not respected, simply that other Member States publish tenders representing a higher proportion of their economy.

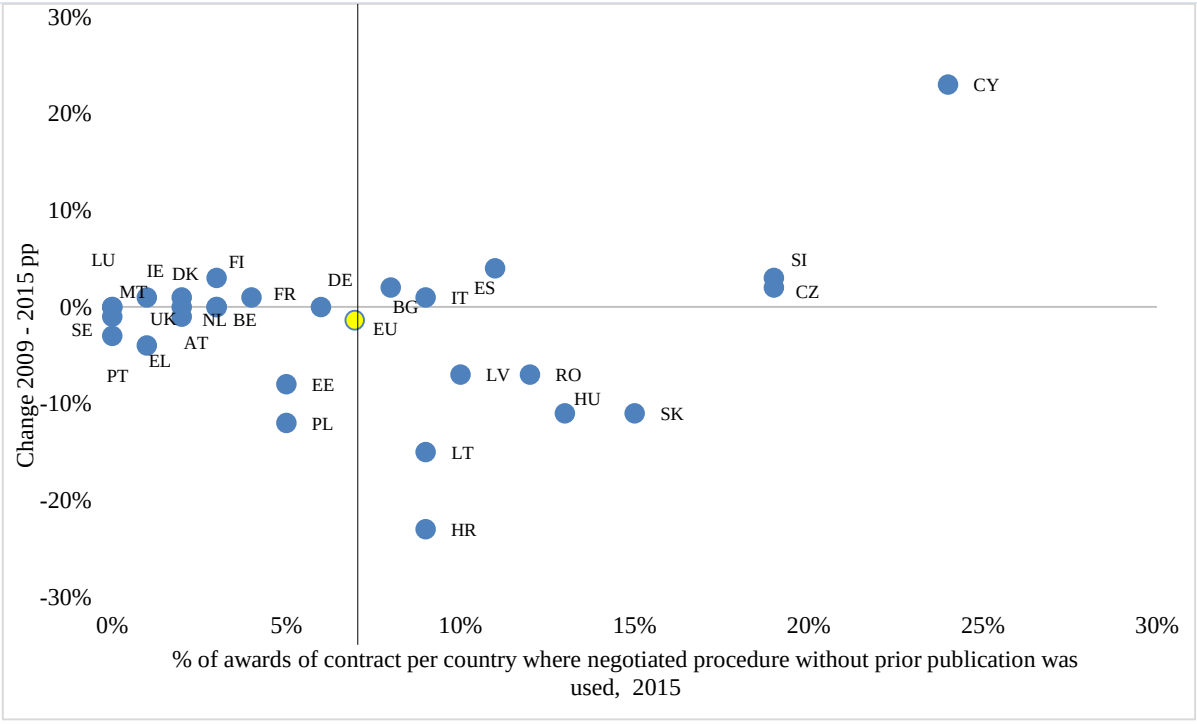
Not always open procedures used in public procurement

Transparent public procurement markets have a high level of openness and a potential for high competition which means that the companies that win the bids are those with the best product, at the best price targeted at achieving the best outcome.

A key element that indicates the transparency level is the type of procedures used. When open procedures are used, high transparency and competition are more likely. On the contrary, when a negotiated-procedure-without-publication (NOC) is used, these are likely to be much lower.

The EU28 proportion of contract award notices where the latter procedure was used is 7% in 2015 and fairly stable over the years. This indicates that the observable part of public procurement is fairly transparent. The overall trend since 2009 is of relative stability with a decreasing usage of non-transparent procedures in many of the Eastern Member States (see Figure 7.4). Some sectors stand out with a very high use of NOC procedures. This is the case for example for procurement of IT solutions, where supplier lock-in is a frequent phenomenon.

Figure 7.4: Proportion of contract award notices where the NOC procedure was used 2009-2015



Source: European Commission based on OJ/TED data (Croatia 2013-2015)

Lack of competition in public procurement

Contract award notices published in TED record the number of bids submitted, which is another indication of the level of competition. Competition among bidders for public contracts is one of the main elements to achieve the final aim of public procurement policy - best value for money.

At EU28 level there were 23% notices with just one bidder in 2015. The highest figures were for Italy and most of the new/Eastern European Member States but overall there is an increasing proportion for most EU countries which shows a high potential for improvement in this respect (Figure 7.5).

Figure 7.5: Proportion of contracts for which there was a single bid (excl. frameworks) 2009-2015

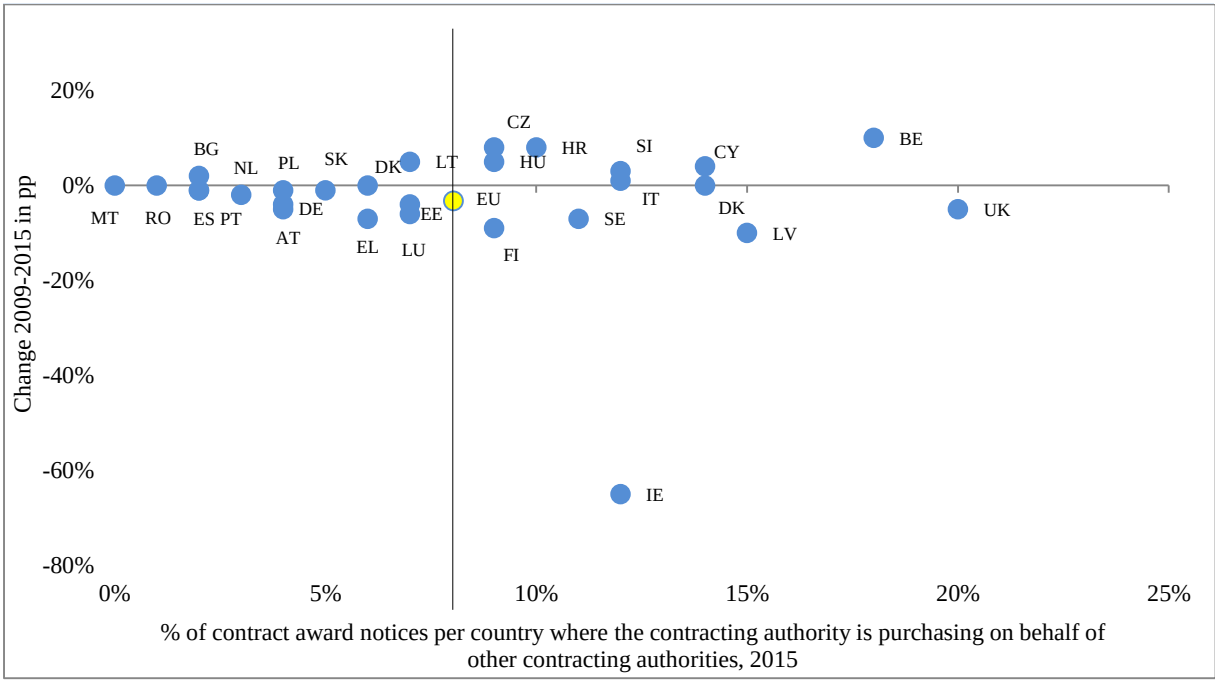
Source: European Commission based on OJ/TED data (Croatia 2013-2015)

Aggregation of demand

Financial constraints and stronger public demands for more responsibility push public authorities to centralizing and standardizing procurement. At the same time, demand aggregation in public procurement has the potential to help public authorities achieve key objectives such as better value for money through the large scale economy benefits, professionalization of buyers, effective planning and monitoring of the public procurement cycle. For example, energy has become one of the most successful instances of collaborative procurement in the U.K. In 2010 all central government departments were mandated to source energy through the Government Procurement Service (GPS), saving £51million. Two options of demand aggregation are buying through an established central purchasing body (CPB) or through joint procurement with other entities. Commodities such as electricity, gas, waste disposal, or office furniture and equipment are good examples.

At EU28 level in 2015, the average proportion of contract award notices where the contracting authority is purchasing on behalf of other contracting authorities was 8%. There is a wide range for the usage of joint purchasing or central purchasing versus EU28 average but with relative stable evolution in time, evidence that the EU MS despite the budgetary constraints that so not take advantage, where suitable, from aggregation of demand. (Figure 7.6).

Figure 7.6: Proportion of contracts award notices where the contracting authority is purchasing on behalf of other contracting authorities (either joint purchasing or central purchasing bodies) 2009–2015

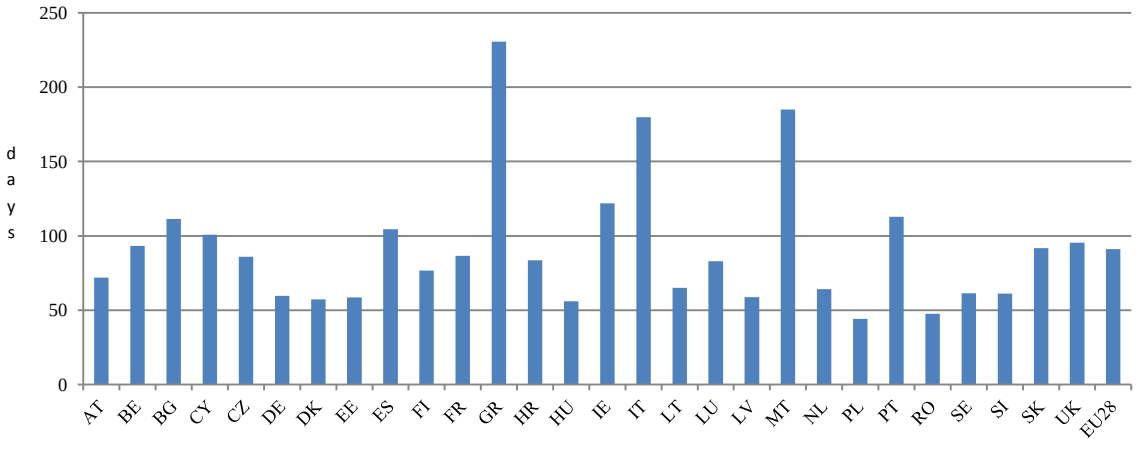


Source: European Commission base on OJ/TED data (HR 2013-2015)

Varying degrees of procedure efficiency

Another aspect is the degree of efficiency of the procurement management. If the completion of the entire process takes too much time, there is insufficient clarity of the requirements on what is to be provided and the qualification requirements are excessive (e.g. technical, professional, financial), these can all discourage companies to take part in procurement tenders. As a consequence, public authorities may miss out on the best offers that the market could provide, leading to a waste of resources.

Figure 7.7: The time between the deadline for receipt of offers (or requests to participate) and the awarding of the contract, 2009–2015



Source: European Commission base on OJ/TED data (HR 2013-2015)

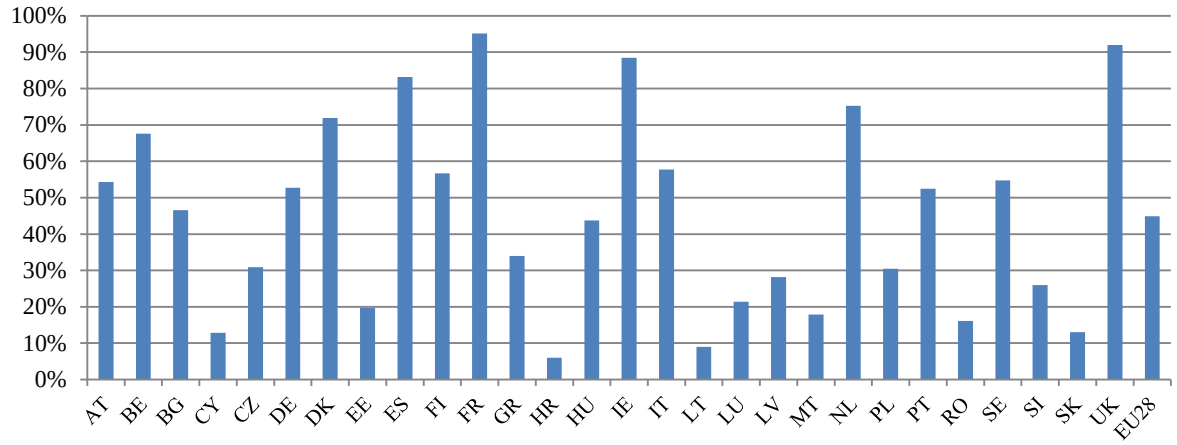
Varying use of quality criteria

Public procurement is often perceived as a mere bureaucratic function, without considering its strategic dimension. Only a limited number of Member States have been active in defining policies for

environmentally/socially responsible public procurement or innovation, resulting in excessive use of the lowest price as an award criterion which does not always lead to best value for money.

Instead, the Commission promotes the integration of quality criteria in the so-called Most Economically Advantageous Tender (MEAT) principle. As the demonstrated by the following graph, the use of MEAT by different Member States varies to a large degree.

Figure 7.8: Use of MEAT criteria for evaluating tenders, 2009–2015



Source: European Commission base on OJ/TED data (Croatia 2013-2015)

Lack of reporting data

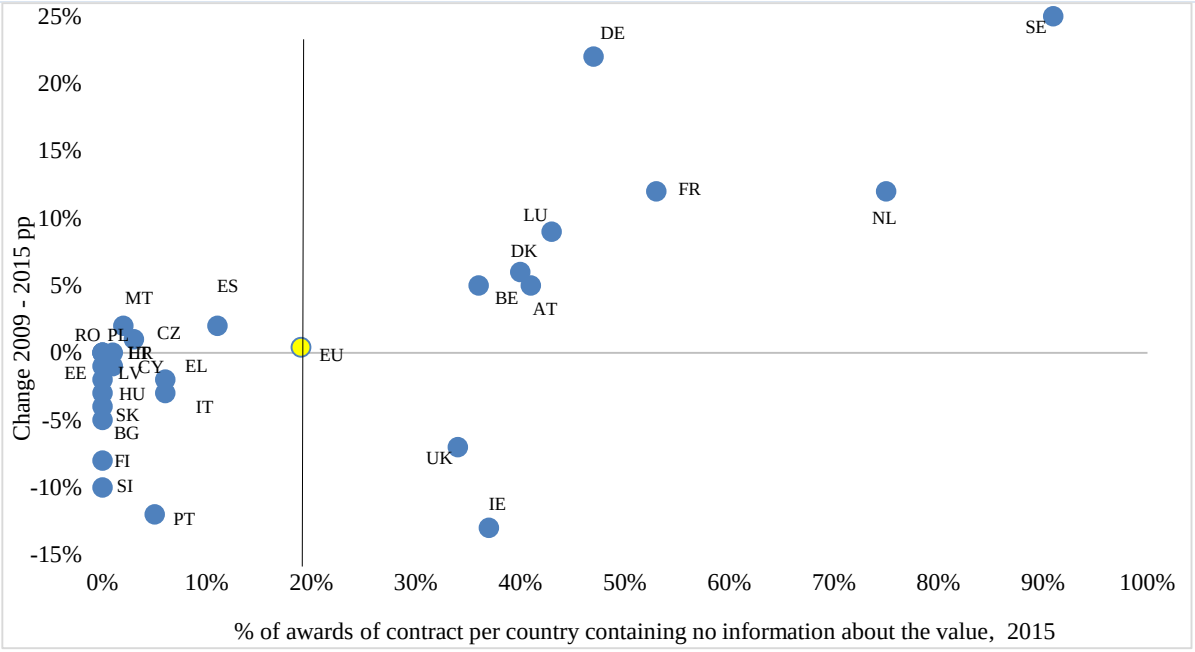
Not all public procurement problems will be solved by data and thus we cannot equate the size of the problem with the benefit of the solution. However, since what is not measured cannot be managed, having good quality data on public procurement is a necessary precondition for any improvement in public procurement efficiency.

The importance of data is widely agreed upon. The OECD for example stated that "although member countries increasingly collect basic data on procurement, few of them make a systematic analysis of this information to measure the performance of the procurement system". Furthermore, the Commission's studies have recommended improving the quality of procurement data, and remedy data. Some Member States have conducted dedicated studies for instance by the British, German, and Swedish governments and the non-governmental sectors in Croatia, Czech Republic and Hungary.

The cost of the proposed solutions is generally not large – both in absolute terms and, especially, in comparison with procurement expenditures. For example, the costs of the contract register in Slovakia have been below €25,000; audit data is already available, and thus the main changes need to be done to work processes; and sophisticated data analysis has been done in some Member States within modest NGO budgets.

One indicators used to illustrate data quality is the rate of notices in TED with no information about the contract value. At EU level, many Member States are improving since 2009. However, a number of countries with high proportion of missing values do not improve over time, the most extreme cases being those of Sweden and Netherlands.

Figure 7.9: No information recorded on contract value, 2009–2015



Source: European Commission base on OJ/TED data (HR 2013-2015)

7.3. Selected priority issues

This section looks at some of the priorities in public procurement policy, such as professionalization and aggregation, simplification and health procurement.

Professionalization and aggregation of procurement

A common source of difficulties is the lack of professionalization (one of the consequences is for example lower levels of aggregation of demand in public procurement) meaning that public procurement is performed by personnel who lack the necessary business skills, technical knowledge, or procedural understanding. Professionalization remains a systemic problem in many EU countries (14% of contract award notices at EU level established a framework agreement in 2009–2015, but it varies with type of product/service);

On many levels, public procurement is not working efficiently. This is widely acknowledged, with for example the 417 Flash Eurobarometer from April 2015 showing that out of the nine potential obstacles to participation in public procurement, all nine were identified as obstacles by more than two thirds of the companies. However, the monetary value of such inefficiencies is notoriously hard to estimate, especially in areas such as professionalization. Available studies can provide some insight, with the general point being quite simple: public procurement has a huge impact on national economies, and thus every slight improvement to its efficiency leads to huge gains.

Concerning professional conduct of procurement, according to Bandiera, Pratt, and Valetti (2008), this is even more important than corruption. Their estimates indicate that corruption is responsible only for 17% of waste in spending, as compared to 83% which can be attributed to low professionalization. This means that the potential gains just from improving the professionalization aspect of public procurement could be estimated at roughly €400 billion.

Public procurement is increasingly seen as an instrument to realise a wide range of political and economic priorities. The growing demands on the tens of thousands of contracting authorities in the EU create a need to specialise and professionalise them. Cooperative procurement is seen as a potential way to address those demands.[108] Some of the most prominent examples of cooperative procurement can be found in central purchasing bodies (CPBs) across Europe.

Cooperative procurement happens at many levels:

- **Cooperative procurement at central state level:**

  CPBs typically work under a strict mandate which frames their everyday business making around goals such as savings, professionalization and simplification of public procurement procedures. Nevertheless, there are different business models to achieve those mandates. In some MS, CPBs manage an ever increasing share of PP value because of the benefit they bring, e.g. significant efficiencies and simplification of the PP system. Nevertheless, the increasing role of CPBs also carries a number of potential risks, e.g. potentially reduced access for SMEs due to larger contracts, reduced decentralisation, etc.

- **Cooperative procurement at local level:**

  The incentive to aggregate often comes from the local level – for instance, a number of local authorities own a CPB in the UK – the YPO.[109] The YPO has consistently offered highly professional services since the 1970s. It operates a for-profit business model with most of the profit going back to its shareholders and the rest being invested in business improvement. Similar cases operate in Sweden[110] and Finland.[111]

- **E-procurement & data drive decision making and market knowledge:**

  The most advanced CPBs also boast the most sophisticated e-tools e.g. G-cloud[112] - a digital market place that has dispersed suppliers of IT services in the UK and which hid the legal compliance complexity from its users. An eBay style market place in Consip similarly caters for SMEs' needs in Italy. Traceability and measurability that come from extensive use of e-tools allow CPBs to make more data-intensive decisions and also to be more accountable to citizens.

Simplification through eProcurement and SME-friendly procedures

The transition to full e-procurement in the European Union has been an ongoing process most recently encapsulated in the revamped public procurement directives from 2014. According to them, e-notification and e-access will be fully available in the whole EU by April 2016. Obligatory e-submission will be phased out in two stages – for central purchasing bodies in April 2017 and for all contracting authorities in October 2018. So far the progress in implementation of e-procurements in

[108] Directive 2014/24/EU provides different modalities for implementing cooperative procurement, via central purchasing bodies (CPBs) and occasional joint procurement. See in particular Article 37 (centralised purchasing activities and central purchasing bodies), Article 38 (occasional joint procurement) and Article 39 (procurement involving contracting authorities from different Member States). Recitals 69-70 clarify the objectives and modalities of CPBs; recital 71 those of occasional joint procurement; recital 73 those regarding joint cross-border procurement.

[109] http://www.ypo.co.uk/

[110] http://skl.se/tjanster/englishpages.411.html & https://www.sklkommentus.se/

[111] http://www.kuntahankinnat.fi/en

[112] https://www.gov.uk/digital-marketplace

many Member States has been slow and the quality of the introduced electronic procurement services (e.g. availability, user-friendliness) insufficient.

One of the biggest promises in this reform is the increased use of data. E-procurement allows better traceability and transparency of the process. Not only does e-procurement allow the automatisation of businesses processes in procurement, but it also helps contracting authorities to collect data about their procurements. This in turn leads to more informed decisions and evidence-based policy making.

The transition to e-procurement is an opportunity to modernise the public procurement system. Good practices in this process are for instance:

- Setting up a single portal at national level including all notifications;
- Having a competitive market for e-procurement services;
- Having a contract register with full disclosure of information on contract awards;
- Light requirement for signatures. E-signature use is decreasing;
- Having a comprehensive reporting system;
- Implementing the once-only principle.

Equally important is that companies (or citizens) must provide information only once to all public administrations. The once only principle (OOP) is a practice in interaction between the state and companies (or citizens). It refers to a principle that information which can be recovered from within a public administration using various references (like the tax number) should never be asked from companies (or citizens).

This can be achieved either through national registers directly (like in Estonia) or through an aggregation system (like pre-qualifications) where companies provide the information to administrations only once. The EU supports this concept in public procurement by focusing at selection criteria through services such as e-Certis (a validation documents comparison tool) or the ESPD.

European Single Procurement Document (ESPD) is a self-declaration document that will reduce the administrative burden of both economic operators i.e. companies, and contracting authorities alike. The ESPD's philosophy is that the economic operator needs to provide the various proofs of selection criteria, e.g. proof of having paid all social dues, only in case it is selected in the public procurement procedure. The ESPD allows companies to just declare their fulfilment of the appropriate criteria and then they can provide it at a later stage if necessary.

ESPD can go even further. It will be implemented in an electronic form so that the document itself is in a structured format. This means that a company's ESPD can be used in various procurement procedures by selecting those fields that respond to the concrete selection criteria designed by a contracting authority. Because the ESPD exists as a structured data file, it can also be compatible with national self-declaration standards and solutions. Eventually, the ESPD will act as a "business passport" for companies bidding for tenders in the EU.

SMEs are underrepresented in public procurement (at least in procedures above the EU-thresholds) compared to their overall weight in the economy. Besides easing their access to public procurement through user-friendly tools, SMEs are encouraged to participate through provisions such as division of public contracts into lots and easier rules for turnover criteria.

Box 7.1 **Sector-specific focus: Procurement in the health sector**

Healthcare represents a significant part of our economy, an average of 7.8 % of GDP. With an ageing population and increasing costs of treatments, health budgets are increasingly under pressure. Public procurement could provide useful instruments to obtain better value for money, while promoting innovation and further improving the health care services.

Figure 7.10: Public Procurement in Health Sector (averages 2012 – 2015)

Member State	Estimate of total general government expenditures on works, goods, and services (excluding utilities) in billion euros	Estimated value of tenders published in TED in billion euros	Publication rate	Most economically advantageous tender (MEAT
Belgium	58.0	1.8	3.1%	80%
Bulgaria	5.3	0.4	6.8%	36%
Czech Republic	22.3	0.5	2.4%	18%
Denmark	38.0	3.5	9.1%	62%
Germany	434.5	3.3	0.8%	42%
Estonia	2.7	0.1	5.5%	21%
Ireland	17.5	0.8	4.5%	95%
Greece	19.2	0.4	1.9%	37%
Spain	108.8	3.3	3.0%	79%
France	316.6	8.1	2.6%	94%
Croatia	5.9	0.2	3.8%	0%
Italy	170.7	9.9	5.8%	67%
Cyprus	1.1	0.1	10.0%	2%
Latvia	2.8	0.5	17.2%	8%
Lithuania	3.7	0.3	6.8%	3%
Luxembourg	5.9	0.0	0.4%	41%
Hungary	15.2	0.6	4.2%	55%

Malta	0.8	0.1	8.5%	0%
Netherlands	134.8	0.7	0.5%	91%
Austria	43.1	0.8	1.8%	46%
Poland	49.9	3.7	7.5%	39%
Portugal	17.1	0.2	1.3%	32%
Romania	16.7	1.3	8.1%	4%
Slovenia	5.0	0.4	7.1%	7%
Slovakia	11.1	0.5	4.4%	7%
Finland	37.2	1.0	2.7%	61%
Sweden	71.0	3.6	5.0%	61%
United Kingdom	309.5	19.1	6.2%	93%
EU	1924.1	65.2	3.4%	42%

Source: Eurostat and TED

The table above shows the disparities across countries in the use of public procurement in this important area of public spending. The publication rate widely varies from below 1 % in Luxemburg, the Netherlands and Germany to 17.2 % in Latvia.

Large differences can also be observed in the use of MEAT award criteria, which allow taking quality and innovation into account when tendering health procurement contracts. The United Kingdom and Ireland are applying them in more than 90% of the public tenders. In contrast Malta and Croatia seem reluctant to use the MEAT criteria, applied in less than 1% of public procurement.

The Commission is currently looking into this sector to clarify what is the scope of the public procurement rules for health organisations in Member States and to disseminate best practices for innovation and quality procurement in the health sector.

7.4. Conclusions

Improvements in the public procurement framework have been implemented in recent years, both at EU and Member States level, but challenges still persist. Member States spend a considerable part of their public expenses through procurement. Yet, in several Member States, the publication rate remains low resulting in insufficient openness to cross-border business opportunities. The application of procurement procedures restricting competition, such as negotiated-procedure-without-publication, greatly varies in different Member States from close to 0% to more than 20% and the proportion of contracts for which there was only one bid remains high. This is particularly relevant in some sectors, such as IT where vendor lock-in is a frequently observed phenomenon. All this indicates that the

Single Market for public procurement is not sufficiently integrated and further opening could boost economic efficiency and growth.

The usage of quality criteria for awarding of contracts widely varies between Member States, from below 10% in Croatia and Lithuania to above 90% in France and United Kingdom. In general the CEE countries apply the lowest price criterion very often, missing out on potential to encourage innovation or pursue social or green objectives.

The advantages from cooperative public procurement based on the aggregation of demand are being explored by Member States to increase the efficiency of their public spending, although there is still much room for improvement. The average proportion of the contracts award notices where the contracting authorities are purchasing on behalf of other contracting authorities is only about 8% and remained relatively stable in the recent years. Another challenge is the need for professionalization meaning that public procurement is performed by personnel who have the necessary skills, technical knowledge, or procedural understanding.

Electronic procurement as a way of increasing transparency and efficiency of procurement procedures is being implemented progressively in the Member States. However, the quality of the introduced electronic procurement services still leaves room for improvement.

8. Construction Value Chain

The Construction Value Chain (CVC) sustained 23 million jobs in 6.2 million companies, 8.2% of EU's GDP and value added of €1.14 trillion in 2014. The CVC is more than a sum of its parts, having multiple knock-on effects to the rest of the economy with both forward and backward linkages; the output multiplier is estimated at 2.31 in 2011.

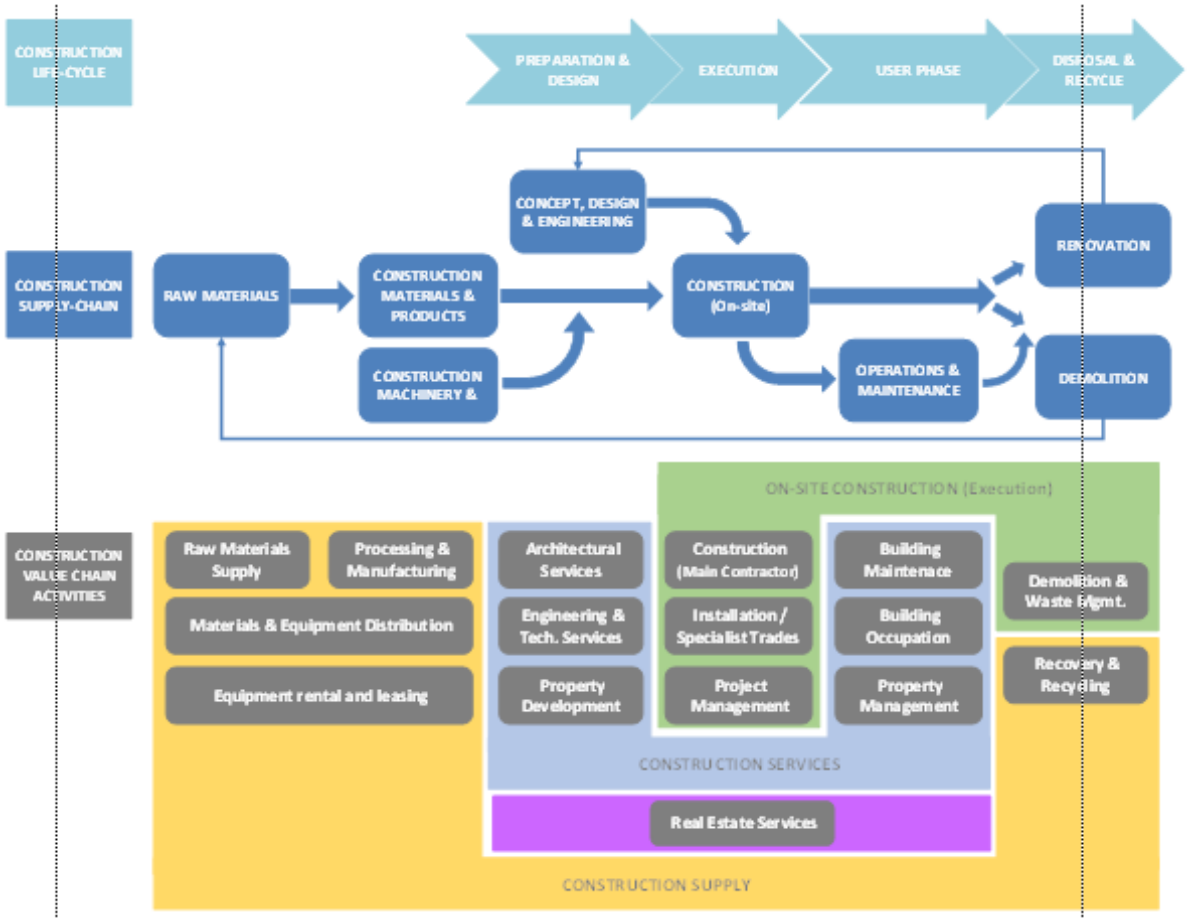
Within the life-cycle of this value chain, **three core sets of activities (which are subdivided according to NACE classification) [113] may be distinguished**:

1 On-site construction activities which extends to demolition and possible site remediation (NACE F).

2 Construction supply includes construction materials, construction products (NACE B and several NACE C divisions), the wholesale and retail supplying products (part of NACE G, H, and N)

3 Construction services which can be sub-divided into professional construction services and building operational services (NACE M71 and L68).

Figure 8.1: The Construction Value Chain (CVC)



Source: Ecorys

[113] NACE: European Classification of Economic Activities

Inputs to the Construction Value Chain

- Over 70% of inputs to the construction sector (NACE F) are either materials or manufactured goods or are linked to their supply.

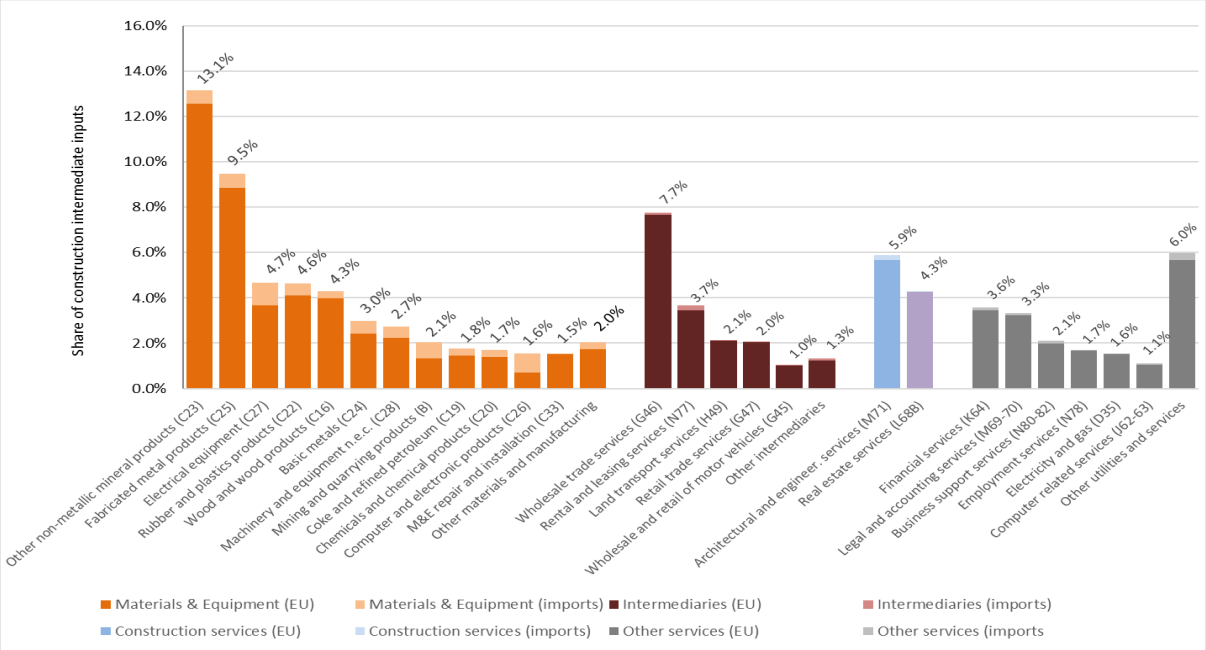
- Around 30% of construction sector's intermediate inputs come from "own supply" of a construction company supplying another (such as sub-contracting).

- The main upstream sectors are: Construction products, Mining and quarrying, Construction machinery, Intermediaries and Professional construction services.

- The main downstream sector, i.e. the 'client' of the construction sector is real estate

The graph below indicates the inputs to the CVC. Manufactured products account for 51% of inputs to the CVC, the most important of which is 'other non-metallic mineral products' at 13.1%. Services provide almost 20% of total inputs to the CVC, the most important being wholesale trade at 7.3%, architectural and engineering services at 5.9% and real estate services at 4.3%.

Figure 8.2: Composition of intermediate inputs used by the construction sector (2011)[114]



Source: Eurostat (Input-Output Tables), Ecorys calculations

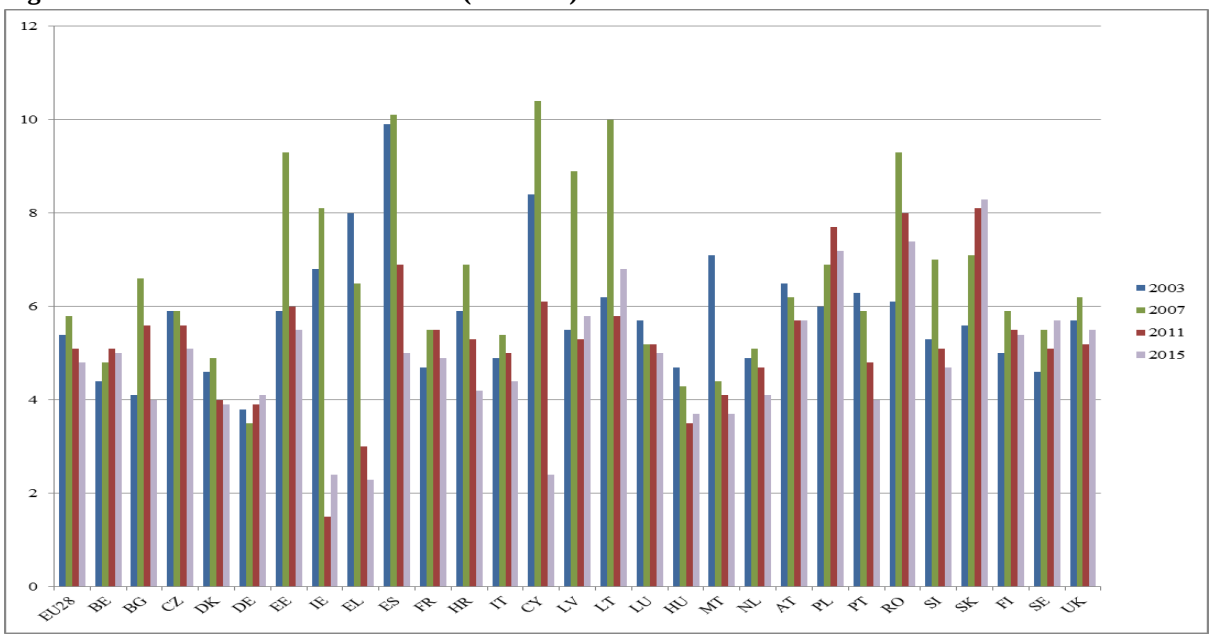
The following sections examine the evolution of the performance including costs and productivity, investment, followed by firm structure and employment. The subsequent sections examine single market integration of product markets and service markets; the latter includes trade restrictions in services.

[114] Shares calculated on the basis of total intermediate inputs less "own supply" of construction.

8.1.Evolution of the performance of the CVC

The main activity of the value chain is on-site construction which includes general construction, specialised construction activities and civil engineering works. These economic activities (classified as NACE F) experienced a severe contraction during the economic and financial crisis from which it has not yet fully recovered. Having peaked at around 4.8% of EU GDP in terms of value added at factor cost in 2008 the share of EU core construction sector's share % of GDP remains around 3.5% in 2015; this does not include the whole value chain nor multiplier effects. As can be seen from Figure 8.3, the peaks representing construction booms in different Member States are quite varied, Cyprus reached a peak of 10% in 2007, Latvia, Lithuania and Ireland follow close behind, Croatia and Romania also experienced such a boom. The troughs are also varied, the contraction of construction has been very severe in some Member States, such as Ireland, Estonia, Greece, Spain and Malta, while Czech Republic, Denmark, and Finland experience much less of a bust. Germany, France and Belgium remained relatively stable during this period.

Figure 8.3: Value added in construction (NACE F) as % of GDP



Source : Eurostat

In contrast to construction activities above, other sectors of the value chain experienced a more positive development since 2008. Real estate increased its share in total value added of GDP from 1.7 % of GDP in 2008 to 1.9% in 2014, architectural and engineering services kept a stable level of 1.2%.

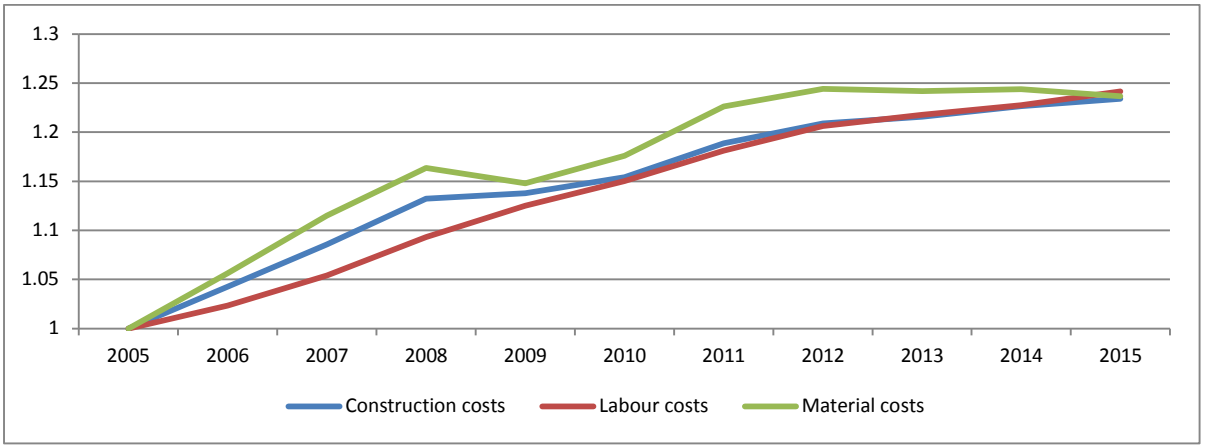
In a working paper published 2013, the International Monetary Fund (IMF) provides insights on the driving forces behind the changes in construction shares (value added of NACE F as a share of GDP).[115] The IMF suggests that actual country shares revolve around a norm which is determined by country-specific fundamentals which include geography, demographics and economic conditions such as income level, credit conditions and stock market performance. The IMF suggests that during the boom many countries overshot the norm, which should reverse after the crisis. However, the IMF suggests that when economic conditions normalise over the medium term, Greece, Ireland, Latvia, Lithuania and most other Member States should see a recovery in construction shares, however, there could be a further decline in Spain, Romania and the UK.

[115] The Driving Force behind the Boom and Bust in Construction in Europe, IMF Working Paper WP/13/181

Costs

Despite the crisis, the cost of residential construction has not declined but has been steadily increasing overall in the EU, as shown in the graph below. This graph illustrates an aggregate index of costs for materials, labour, plant and equipment, transport and energy. According to the European Construction Sector Observatory we can see that within the member states, the cost of construction for residential buildings increased in Spain by 12.8% from 2007 to 2014. Costs increased in the UK since 2008, in France, Czech Republic, Slovenia and Portugal since 2009 and in Finland since 2010. They also increased in Bulgaria, Denmark and Slovakia and increased in Germany by 10% between 2008 and 2012. In contrast, the same costs declined in Greece since 2011 and in Romania since 2012.

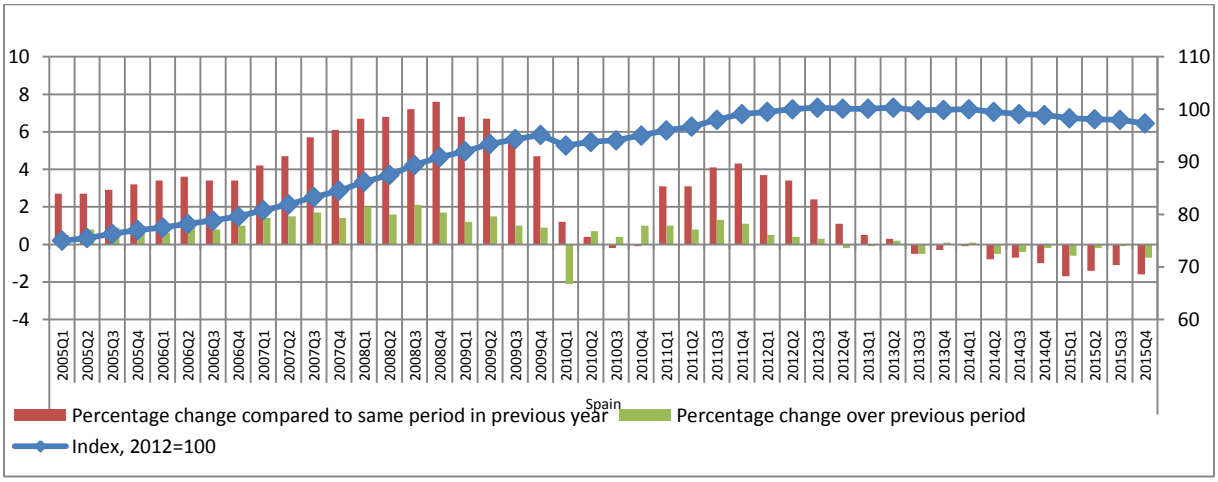
Figure 8.4: Construction cost index of residential construction for EU28



Source: Eurostat

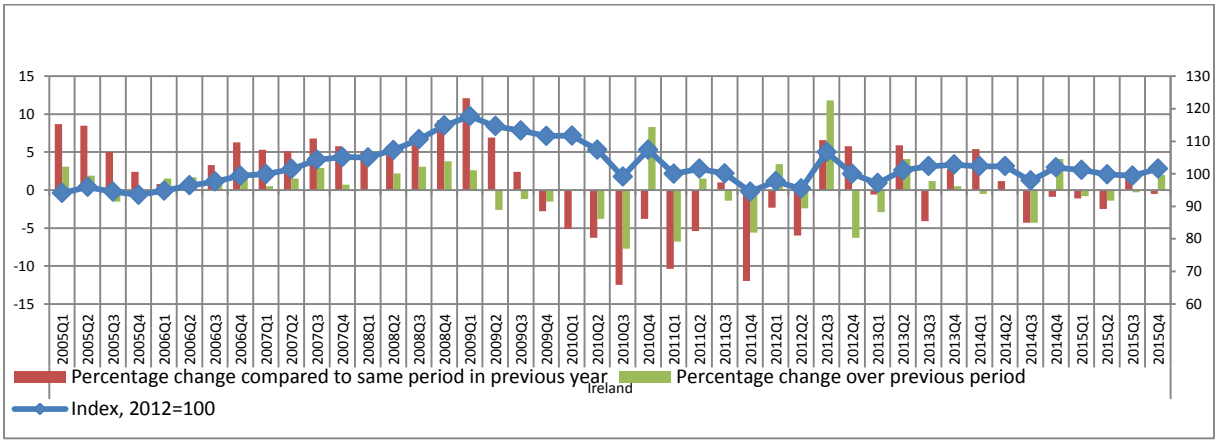
In certain Member States, labour market rigidities have prevented a rebalancing of the sector. The graphs below illustrate remuneration by employee in Spain, Ireland and Poland in the construction sector from 2005 to 2015. With the exception of one quarter, compensation per employee kept rising in Spain until mid-2013, even though many jobs were lost. On the contrary, the remuneration of employees in Ireland sharply contracted from 2009 to 2015 which could allow the sector to recover more quickly in the long run. Labour costs in Poland have been on an increasing trend since accession in 2004, except for dips in 2006, 2010 and 2012.

Figure 8.5a: Spain - Remuneration by employee in construction



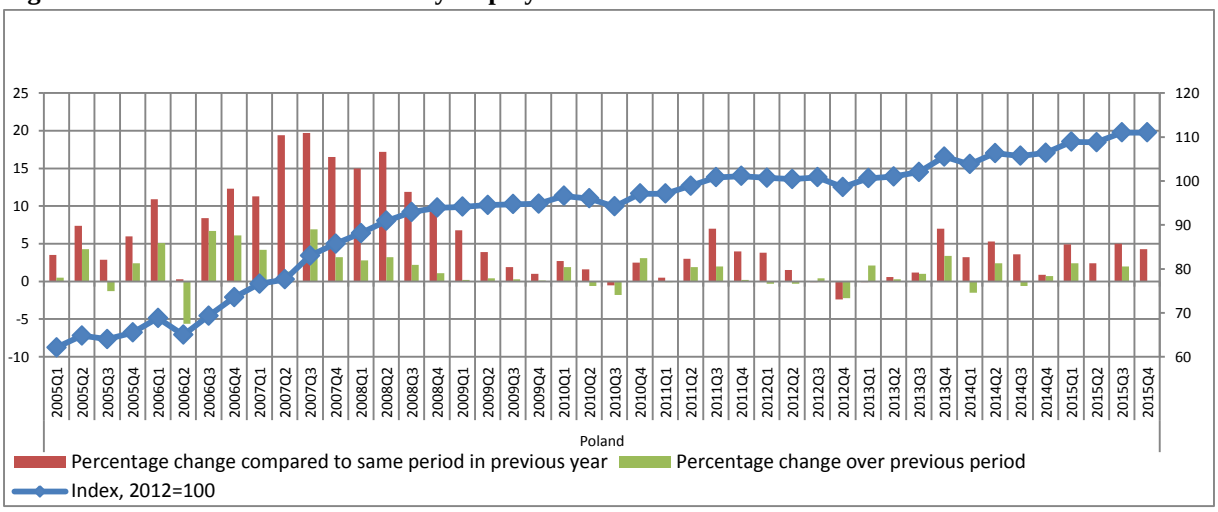
Source: Eurostat, Labour Cost Statistics

Figure 8.5b: Ireland - Remuneration by employee in construction



Source: Eurostat, Labour Cost Statistics

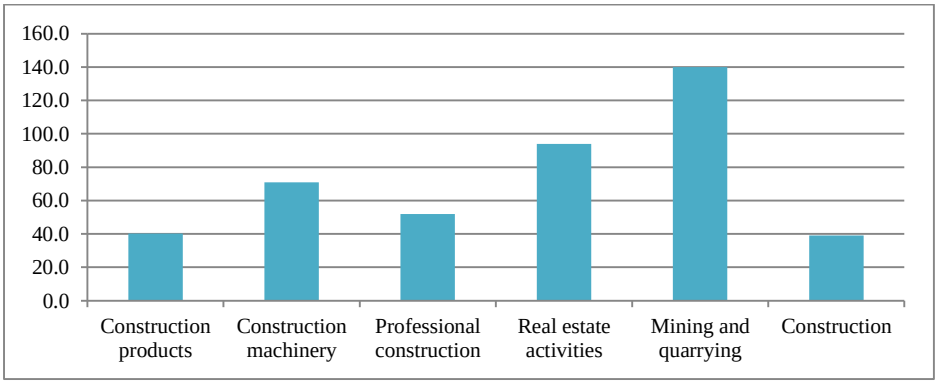
Figure 8.5c: Poland - Remuneration by employee in construction



Source: Eurostat, Labour Cost Statistics

Productivity

Figure 8.6: Apparent labour productivity in sectors of the CVC, 2012 (in 1000 euros)



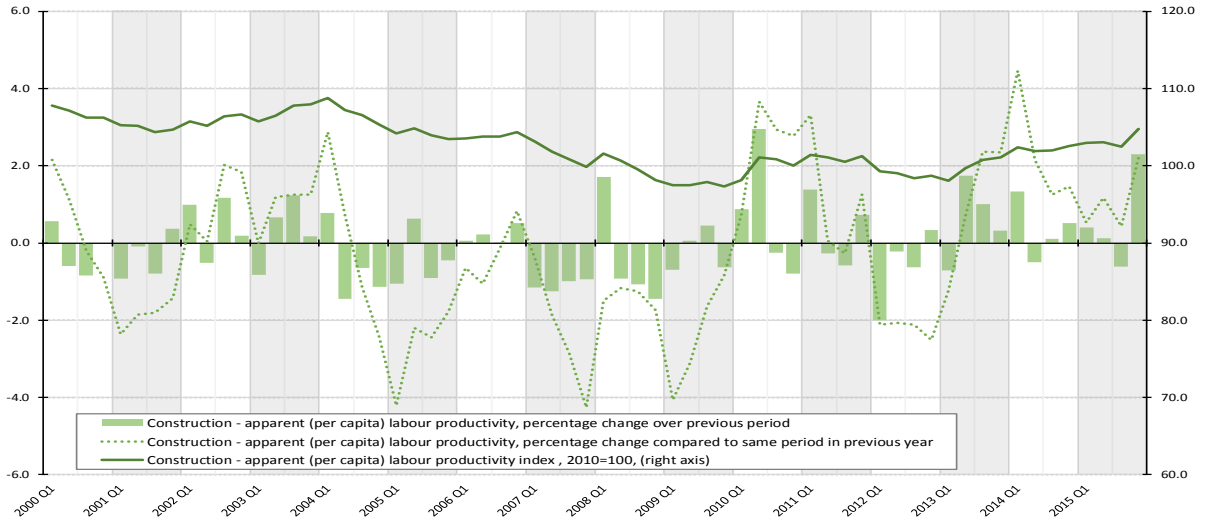
Source: Eurostat

For the core construction sector, although the EU average of apparent labour productivity (value added at factor costs divided by the number of persons employed, expressed in thousands of euros per person employed) is slowly recovering, it is still below pre-crisis levels. Although the onset of the financial and economic crisis appears to have contributed to negative growth, apparent labour productivity in the construction sector had been on a downward path since 2004. Overall, from 2004-Q1 to 2009-Q4,

apparent labour productivity fell by 8%. Following a relative stabilisation during 2010 to 2012, apparent labour productivity has seen some modest, albeit erratic, improvement from 2012 through to 2015. Nonetheless, apparent labour productivity is still below pre-crisis levels.

The picture varies from one Member State to another and also varies among the subsectors along the value chain. As reported in the European Construction Observatory, the productivity in Portugal declined in all the subsectors. Spain and Greece exhibit variable productivity growth across the subsectors, while in Finland, productivity is recovering, except in construction products. However, Germany and France maintained stable productivity among all the subsectors from 2008-2013. Furthermore in many sectors productivity has increased after the crisis.

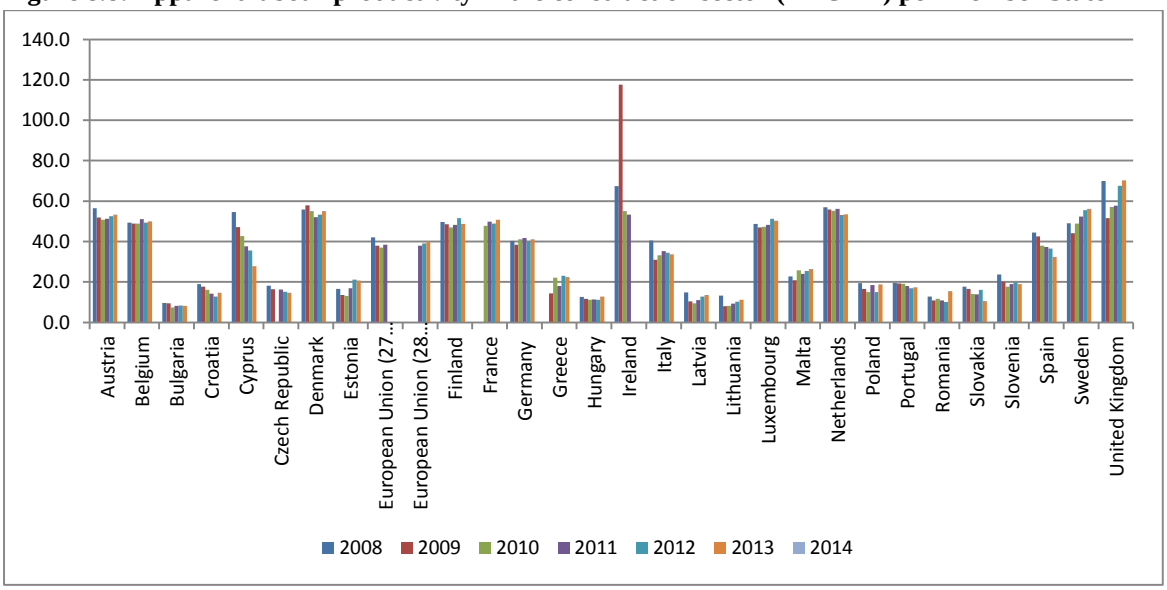
Figure 8.7: EU28 Construction Sector (F): apparent labour productivity level and growth; quarterly data, seasonally and calendar adjusted



Source: Ecorys

Ireland experienced a sharp and extreme decline from 2008 and the slide continues. Other countries such as Croatia, Cyprus, Portugal and Spain also declined. In Denmark, Sweden and France, productivity is recovering from the crisis.

Figure 8.8: Apparent labour productivity in the construction sector (NACE F) per Member State



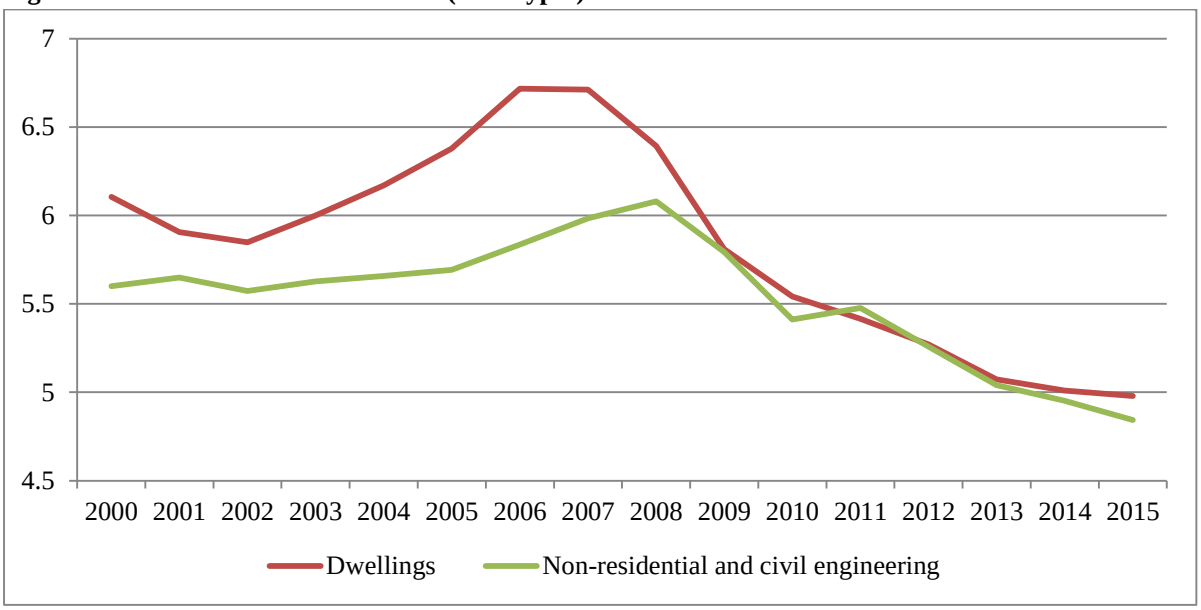
Source: Eurostat

There are a number of possible explanations for prevalent low labour productivity in the construction sector. One explanation is that companies are hiring skilled workers to do unskilled jobs thereby underutilising human capital. Another explanation is that companies are not investing in technology but instead have substituted less expensive labour. A third explanatory factor is the fragmentation of the value chain, in cases where architectural/engineering companies do not work in close co-operation with the contractors during the design phase which results in time and resource inefficiencies. However, in some cases, e.g. Greece, job shedding has led to an increase in productivity.

8.2. Investment in Construction

As mentioned in chapter 3 of this report, the combined impact of the sovereign debt crisis and the need for readjustment squeezed both public and private investment in the construction sectors across Europe. From the Figure 8.9 below you can see that investment in residential construction (in dwellings and other buildings/structures as asset types) reached a high point in 2006/07 with 6.7 % of GDP and in 2015 still remaining 5.0 %. In addition, non-residential construction and civil engineering reached a high of 6.1 % in 2008 and in 2015was only 4.8 % of GDP.

Figure 8.9: Investment in construction (asset types) as % of GDP in the Euro-area



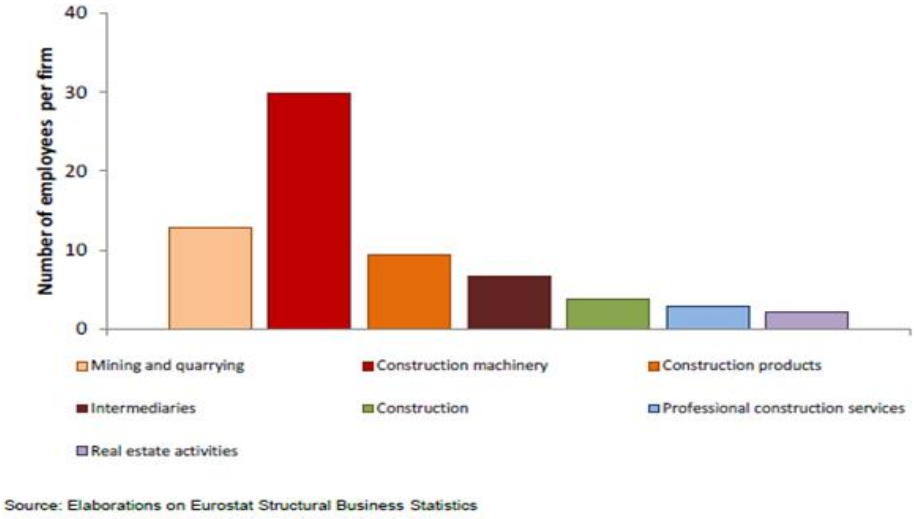
Source: AMECO

With the recovery and as public balance sheets are improving, some public authorities are focussing on investment in transport infrastructure to provide an impetus to the construction sector; this is the case in Italy, Bulgaria, Denmark, Hungary, Czech Republic, Ireland and Sweden. Other countries are turning to investment in energy efficiency opportunities to provide a boost to the construction sector; this is the case in Spain, Portugal, Germany, France, Denmark and Finland. However, it will be important that labour force planning and reform goes hand in hand with project planning in order to ensure that skilled labour is available for these investments.

8.3. Firm Structure and Employment

The largest firm size in the CVC can be found in the mining and quarrying and construction machinery divisions which require high levels of investment and economies of scale. At the other extreme, the professional services such as architecture, engineering and real estate are dominated by small or micro firms.

Figure 8.10: Average size of firm in the CVC

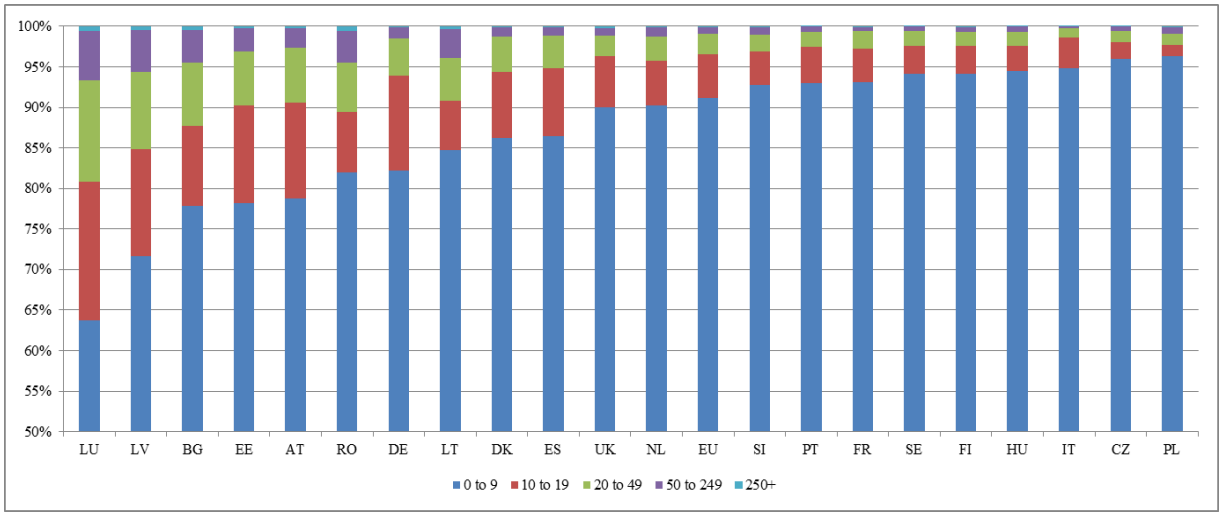


Source: Ecorys, based on Eurostat Structural Business Statistics

Firm size

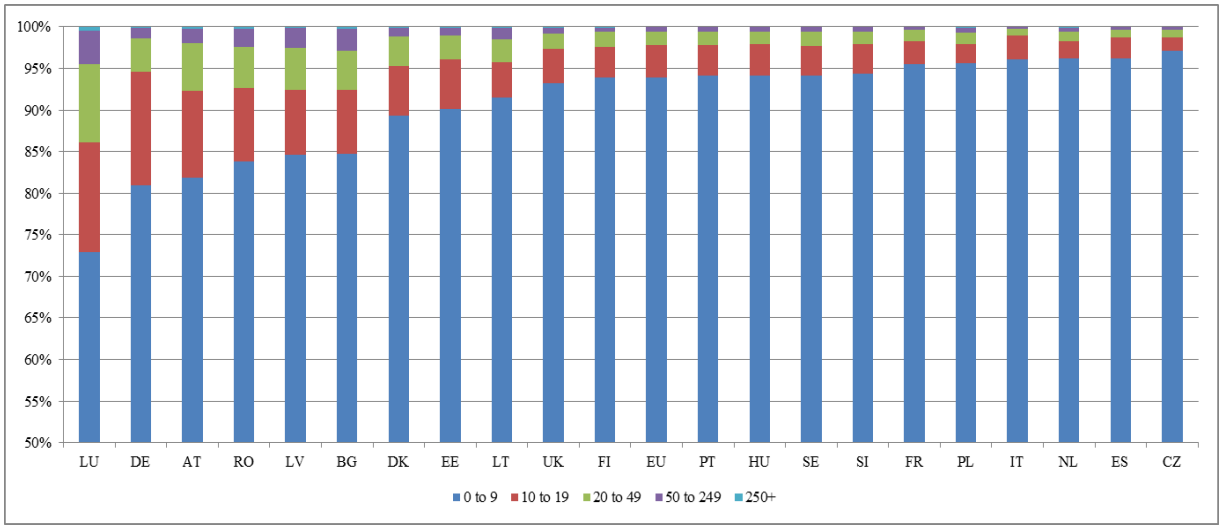
The structure of the firms engaged in construction activities (NACE F) has changed as a result of the crisis. The two graphs below illustrate the share of firms of total number of firms per size class for 2005 and 2013. The percentage of firms with more than 250 persons employed has declined in most Member states. The number of companies with 50-249 and 20-49 persons employed has also reduced in most member states during the crisis. However, in contrast, the percentage of firms with less than 20 persons employed has significantly increased, with the most obvious change being an increase in the number of micro-firms of less than 10 persons employed, for example the percentage of firms with less than 10 persons employed increased from 83% to 96% in Spain. This overall decrease in persons employed by firm size could have a long term negative impact on productivity, as is demonstrated in previous chapters, larger firms tend to be more productive than smaller ones. Therefore, structural reforms may be necessary to address the scale up challenge, as mentioned in chapter 5 of this report, for the small construction companies which survived during the contraction in construction. It is also possible that the loss of firms in the construction sector, creates opportunities for those remaining and may allow capital to go to the more productive companies, thereby increasing allocative efficiency.

Figure 8.11: Percentage of firms per size class (persons employed) in construction (NACE F) 2005



Source: Eurostat, own calculations

Figure 8.12: Percentage of firms per size class (persons employed) in construction (NACE F) 2013



Source: Eurostat, own calculations

Figure 8.13 shows the percentage change of employment in construction activities (NACE F) compared to the same period in the previous year. The statistics reveal negative growth in employment in the core construction from third quarter 2008 to the fourth quarter in 2014. This translates into the loss of over three and a half million jobs. The human cost was most keenly felt in Spain with a loss of approximately two million jobs, Italy which lost over half a million jobs and Portugal which lost 200.000 jobs. However, some Member States maintained their employment levels such as Austria, Finland and Sweden and France to a certain extent. In contrast, Germany and Belgium saw increased employment in construction during this time. These changes to employment levels brought about a change in the structure of the workforce; the number of self-employed workers has increased significantly and has mentioned above, there has been an increase in the number of micro firms, thereby possibly affecting the long term labour productivity of the sector.

Figure 8.13: Employment in Construction (NACE F – General construction and specialised construction activities)

Source: Eurostat, Short-term Business Statistics

Skills

The European Construction Sector Observatory reports that many Member States are experiencing either shortage of skilled labour or skill mismatches, which is likely to impact the competitiveness of the construction industry in the long run. Also a large proportion of existing skilled workers is reaching retirement age and the industry has difficulty in attracting young people, as the sector is handicapped by a poor image in terms of working conditions, opportunities for skills and career development, and vulnerability to economic cycles. Namely, in Germany two-thirds of companies are having difficulties finding employees with the right skills.

The challenge is to equip workers with the right qualifications and skills needed to transform the sector. This is to be set against the background of fewer construction apprenticeships, increasing self-employment, and the underlying domination of small businesses (<10) within the industry. Further, the fragmentation of education and training programmes and multiple qualification and certification schemes can cause problems for the recognition of skills which, in turn, impacts on mobility.

Many construction workers, however, have migrated to other EU Member States thus creating skills gaps in the countries they have left and potentially slowing down the recovery of the construction sector there. For example, there are now skill shortages and lack of trainers in Bulgaria, the Czech Republic is facing a critical shortage of qualified workers and craftsmen and is a threat to the growth of the industry. In Romania, it is estimated that 27% of construction workers are lacking sufficient skills. In Hungary, a survey indicated that three-quarters of building contractors report not having sufficient skilled workers such as masons, carpenters, plumbers, electricians and central heating technicians.

Given that energy efficiency and sustainable construction are seen as one of future drivers to revive the construction sector, it is rather imperative that such initiatives are supported by actions on

development of appropriate skills; it is estimated that between 3 and 4 million workers will need training by 2020[116].

8.4. Product market integration in construction

The Single Market for construction products is facilitated by common technical language (mainly harmonised standards) in accordance with the Construction Products Regulation (CPR). As identified in the report on the analysis of the implementation of the CPR, there is room for improvement in areas of the implementation of the CPR such as:

- General rules on marketing construction products, there are difficulties applying the framework; national marks still compete with EU regulation, there are substantial overlaps between the contents of Declaration of Performance and CE marking
- SME policies; lack of evidence of any successful application of the rules intended to simplify the system for SMEs, especially micro-enterprises
- Harmonised European standards (hEN) covering 70-80 % of all construction products, but not yet comprehensively adapted to the CPR
- European Organisation of Technical Assessment (EOTA) procedures; paradigm change from "approvals" to "assessments" and towards the exclusive use of CPR-based instruments still underway
- Market surveillance; lack of evidence of the application of the main procedural rules involved.

This report underlines satisfactory progress considering the significant changes brought by the Regulation to the functioning of the Internal Market for construction products. The report also recalls that the CPR has only been fully applied since July 2013 and that some areas therefore still show room for improvement, especially in the fields of harmonised standards and market surveillance. Steps also need to be taken to better meet the expectations of SMEs, especially micro-enterprises. The Commission intends to reinforce the efforts already undertaken, in particular through the organisation of technical platforms open to the main relevant stakeholders and focusing on the key challenges identified.

In 2015, the Commission launched a fitness check of EU legislation in the fields of Internal Market, Energy Efficiency, Environment and Occupational Safety and Health, which aims at identifying overlaps or inconsistencies between the various relevant legal acts and analyse burdens and benefits for enterprises of the construction sector, including products manufacturers. The results will be presented in 2017.

Barriers to Integration

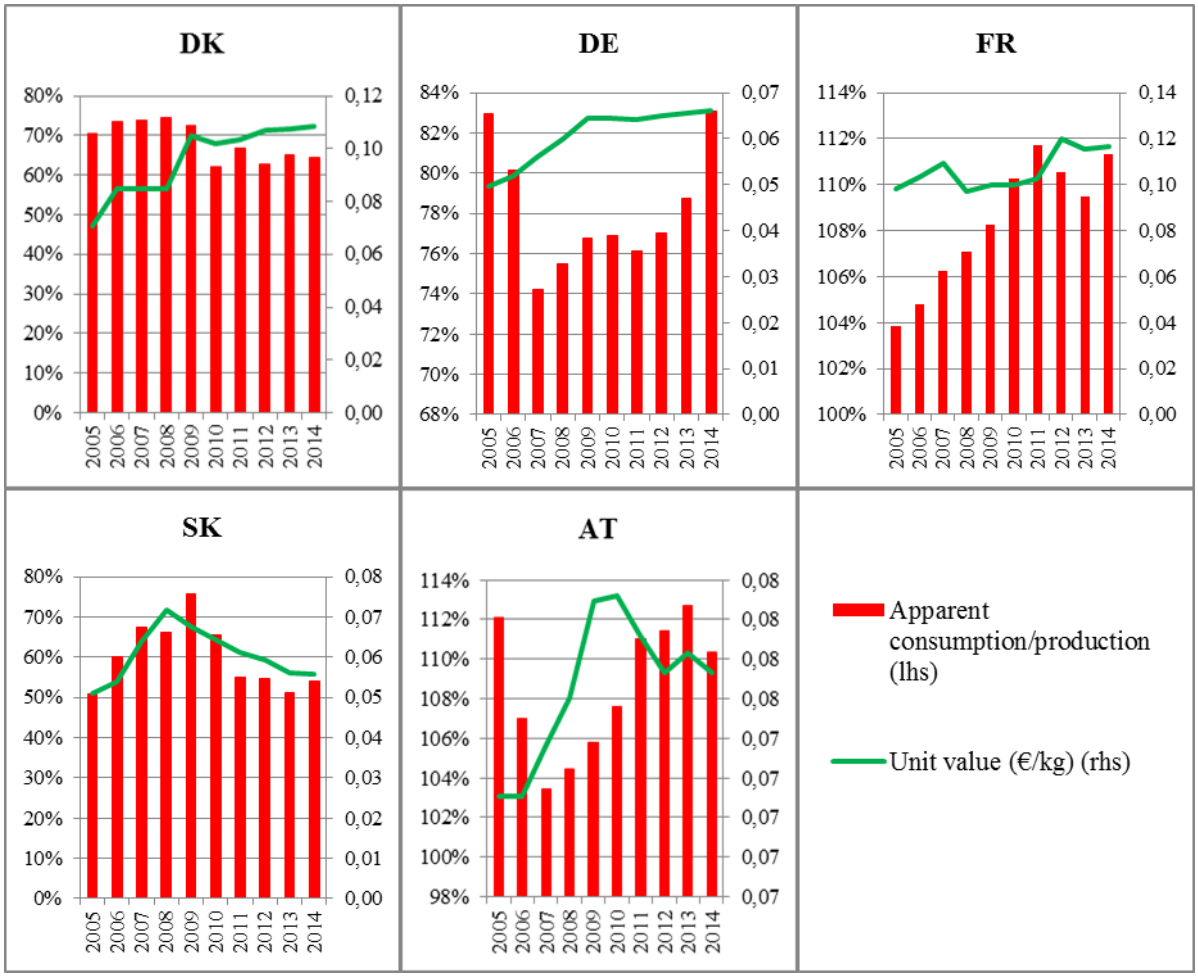
Barriers to free circulation of construction products remain in some Member States. In Germany there still exists a national technical approval system requiring construction products to be further tested in order to obtain a national conformity mark, even though they have already been CE marked. The national mark is still in practice necessary for construction products to be marketed in Germany,

[116] Evaluation of the BUILD UP Skills initiative under the Intelligent Energy Europe Programme, based on information from the National Status Quo Analyses of 30 countries (EU28 + Former Yugoslav Republic of Macedonia and Norway) of the BUILD UP Skills initiative funded under the Intelligent Energy Europe Programme 2011-2014.

although the European Court of Justice has declared this to be a breach of the free movement of goods in 2014.

Such barriers seem to have been effective in protecting national markets from foreign competition. The example of Portland cement provides some *prima facie* evidence of this. This is a fairly homogenous and important intermediate product and is a useful test for barriers in construction products markets. Figure 8.14 below shows apparent consumption[117] over production and production value in Portland cement in selected Member States. In a well-functioning market such as Slovakia, rising prices stimulate increased import penetration, thereby causing prices to begin to fall again. However, in some countries such as Germany, the internal market for Portland cement may not function well as rising prices are not softened by cheaper imports. In France, the price of Portland cement is high relative to other countries, and continues to increase despite the increased contribution from imports.

Figure 8.14: Apparent consumption and unit value of Portland cement in selected countries



Source: Eurostat own calculations

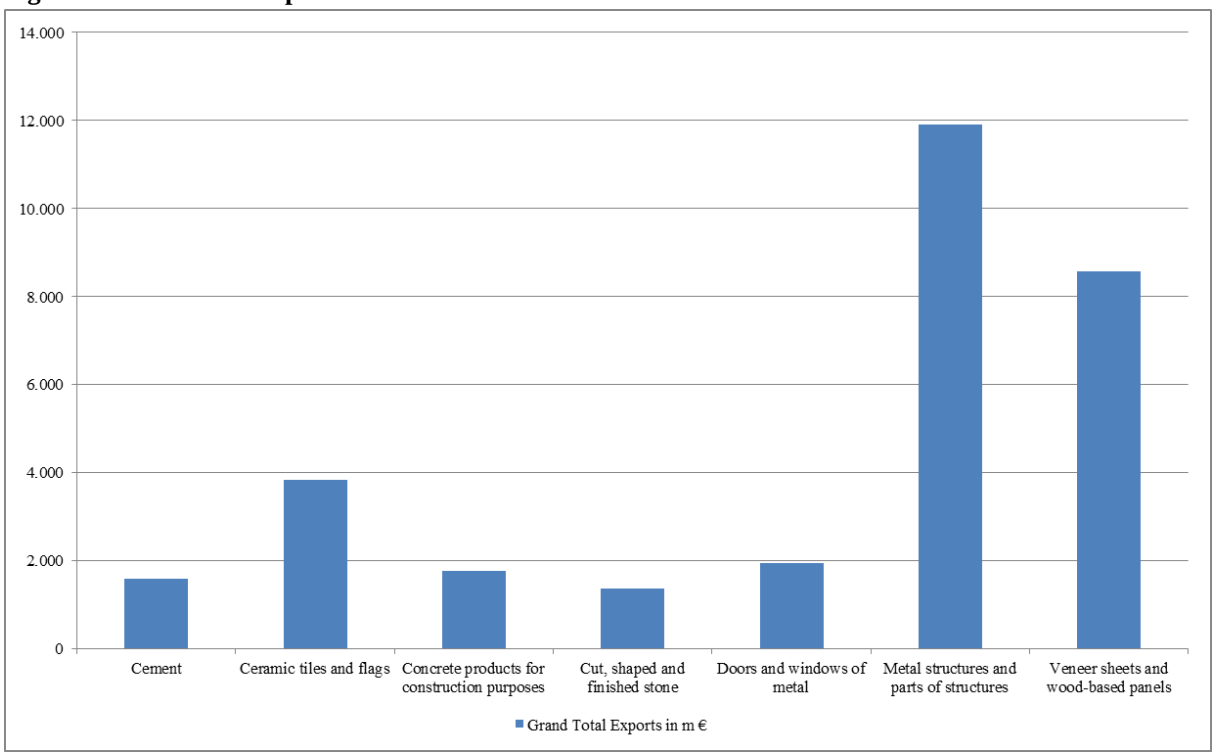
Trade in Products

In addition, the wide dispersion in the volumes of trade in construction products suggests some potential deficiencies in the functioning of the Single Market for construction products. Approximately two-thirds of trade in the CVC is in products and materials. Intra-EU trade in intermediate products has increased steadily over time, from 23 billion euros in 2004 to 39 billion

[117] The mathematical sum of production plus imports minus exports.

euros in 2014. The graph below intra-EU exports for six intermediate products in the CVC in 2015, the most important of which is the metal structures (NACE 25.1) and veneer sheets (NACE 16.21), which together account for almost 20bn of exports. The disparity between the divisions raises interesting questions about why some construction products, e.g. metal structures are much more traded than other products, e.g. ceramics.

Figure 8.15: Intra-EU exports 2015



Source: Eurostat own calculations

Extra-EU trade in products

Virtually all of the CVC products are used domestically within the EU, with only 6% being supplied by extra-EU imports. However, extra-EU exports have more than doubled in value, increasing the extra-EU trade surplus from 6.5 billion to 16.5 billion from 2004 to 2014. This is a first indication that intermediate products are competitive in the world market, and that imports from outside the EU do not tend to crowd out domestic production. In particular, construction machinery is competitive on the world stage and the main markets are United States, Russia, China and Australia. Intermediate products are also competitive outside the EU; the most important being exports of metal structures, ceramics, veneers and cut-stone products.

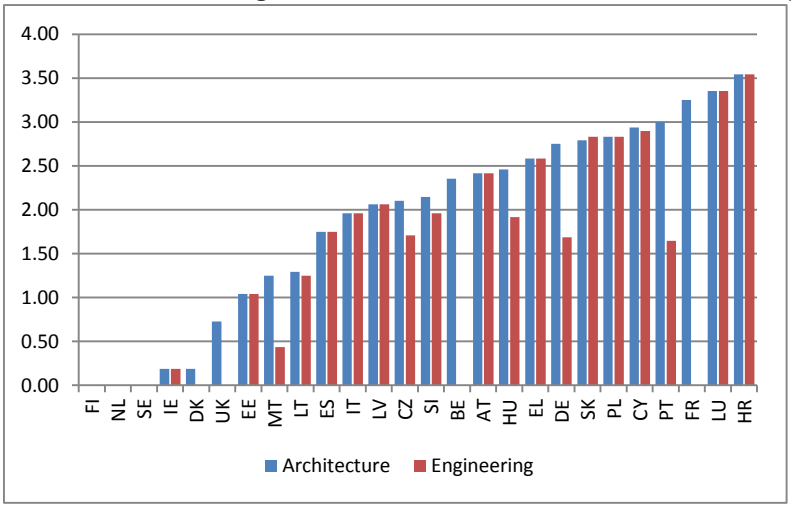
8.5.Services market integration in Construction

Services account for just under a fifth of inputs in the CVC. These can be sub-divided into professional construction services, architectural, engineering, building control, surveying, project management, real estate and building operational services which include building maintenance and property facility management. In order to enhance the recovery some Member States must improve the access for EU service providers which limit competition on the Market. For example Bulgaria has a highly restrictive regulatory framework for EU service providers.

Architecture and engineering

Architecture and engineering services provide 5.9% of inputs to the CVC and an effective market for this service enhances the CVC. The Product Market Regulation (PMR) index is constructed by the OECD to measure the intensity of regulation in a particular Member State; on a scale from 0 to 6, a lower value of the PMR indicates a more competition-friendly position. The PMR index for engineering indicates that some countries, such as Croatia, have a restrictive regulatory regime. Architecture tends to be more regulated than engineering. For example architecture is highly regulated in France, while engineering is not regulated. In addition, Member States investing in transport infrastructure should ensure that the regulated professions such as civil engineers and architects can move freely between projects in different regions within a Member State and to avoid differences in regulation at regional level. In addition, some Member States are in need of transport infrastructure investment such as Malta, Italy, Latvia, Poland, Sweden and Slovakia.

Figure 8.16: OECD Product Market Rregulation indicators 2013 in architecture and engineering



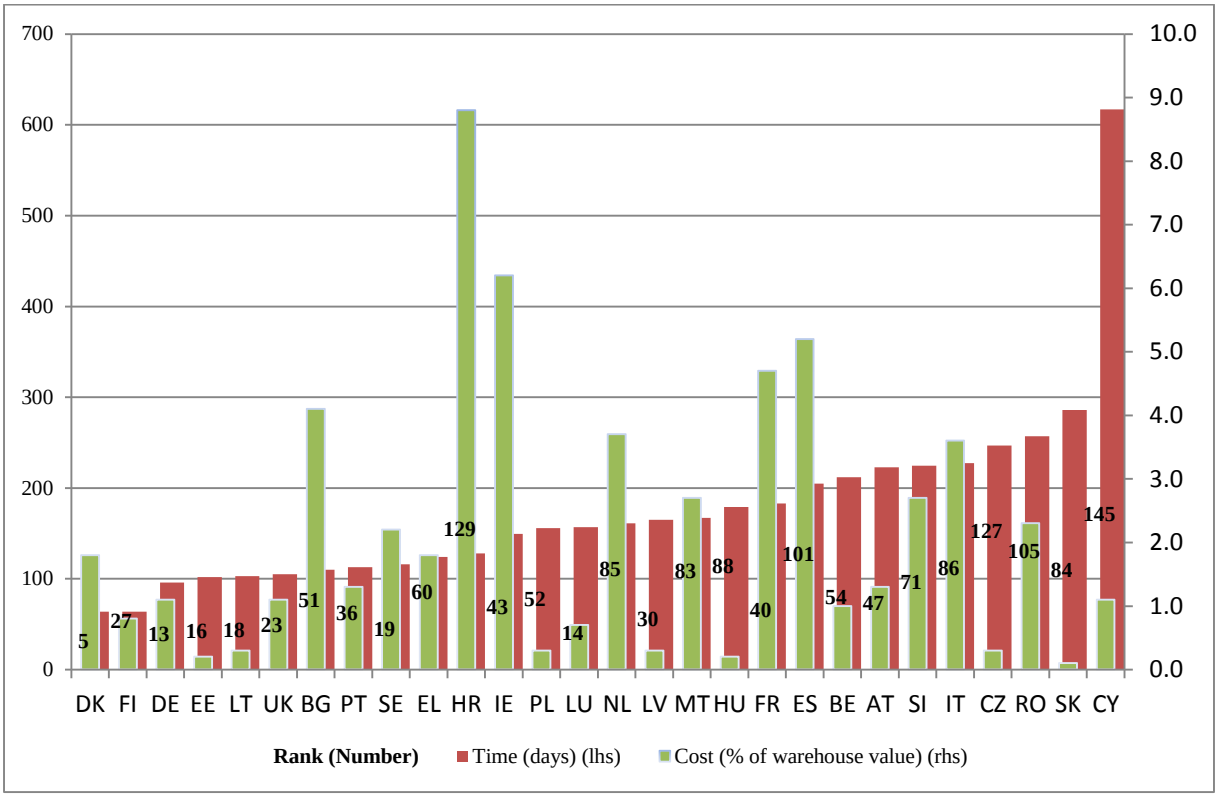
Source: OECD

Construction Permits

Additional indications of regulatory barriers are provided by the World Banks' Doing Business that monitors among other things the procedures, time and cost to comply with the formalities to build a warehouse including permits, notifications, inspections and utility connections. The numbers on the graphs below show the world ranking; Cyprus is ranked 145, influenced by the fact that it takes 617 days to get a construction permit, the ranking of Croatia is 129 influenced by costs reflecting 8.8% of the warehouse value, Spain is ranked 101, Ireland is ranked 43 even though it takes 150 days to get a warehouse building permit. Czech Republic ranked 127 given that there are 21 procedures to undergo to build a warehouse and it takes 247 days on average to get a permit.

The indicator of the World Bank could be useful to show how the effects of the contraction could be reversed. Effort could be made in the Member States to facilitate the recovery. For example, planning and zoning procedures in Finland are lengthy, over-regulated and restrictive making it hard to obtain suitable lots for housing and non-residential developments; Sweden has similar problems which makes it difficult for SME's to compete as they may find it difficult to find the resources to deal with the administrative burdens. Slovenia has complex and lengthy spatial planning and construction permit procedures, on which structural reforms are on-going.

Figure 8.17: Dealing with construction permits for a warehouse (World Bank) 2015



Source: World Bank "Doing Business" database

Trade in construction services

Intra-EU trade in construction services has stagnated at around 13 billion euro since 2006. The performance is uneven among the Member States. Spain has an export surplus of construction services, in particular infrastructural services and expertise, ranging from airports, railways and highways to construction of solar power plants. Extra-EU trade is more important than intra-EU trade having increased from 9.5 billion in 2004 to 18 billion in 2014.

Intra-EU trade in Architecture and engineering services increased from 12 billion to 17.5 billion in the same period. Countries that export engineering services include France, Germany, Italy, Belgium and the UK also have a positive balance for architecture/surveying services. However, again extra-EU trade is more important than intra-EU trade. Extra-EU exports doubled in value between 2004 and 2012 from 13.5 billion to 26 billion.

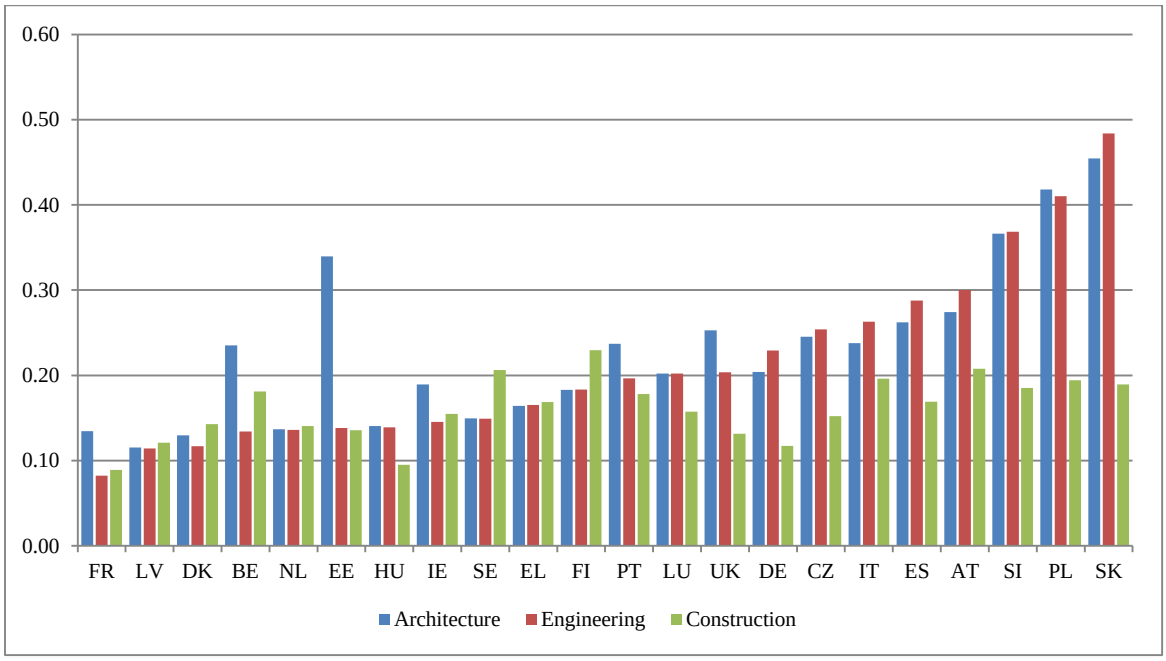
Trade restrictions in services

The OECD has analysed the mode of entry of trade in construction, engineering and architecture services. For large architecture and engineering companies, establishing a commercial presence abroad (mode 3) allows companies to have greater access to projects and after-sales support. However, professionals often have to move to inspect sites and therefore the temporary movement of persons (mode 4) is often used by architects and engineers but cross-border service provision (mode 1) is facilitated by developments in ICT. However, construction services are mainly supplied by Mode 3 and Mode 4, as the product has to be supplied in situ.

Barriers for cross-border activities of service providers are partly reflected in the OECD Services Trade Restrictiveness Index (STRI). Of the five measures included in the STRI, restrictions to movement of people and restrictions to foreign entry contribute most to the results. Higher levels of

restriction can partly be attributed to general measures that have an impact on all sectors of the economy, such as limitations on board members and managers of construction firms, investment screening, quotas and labour market tests, as well as impediments on acquiring land and real estate. The graph below illustrates the STRI for construction, architecture and engineering services. The most restrictive countries for architecture and engineering are Slovenia, Poland and Slovakia, whereas service providers in France, Latvia and Denmark face the least barriers. Finland is the most restrictive for construction services.

Figure 8.18: OECD Services Trade Restrictiveness Index 2015 in architecture, engineering and construction



Source: OECD, STRI

8.6. Conclusions

The construction value chain is a complex interaction between capital, labour markets, goods and services, encompassing a broad range of activities with many linkages and interactions between the different elements of the value chain.

The core of the value chain is the construction sector (NACE F). During the economic and financial crisis Member States had very different experiences of boom and bust as a result of country specific circumstances; framework conditions; market effectiveness or rigidities and reactions.

Despite the contraction of value added and production in some Member States, costs have continued to rise, which points towards rigidities and market failures in both labour and product markets which supply inputs to the value chain. It can be seen that rigidities can slow down the recovery when wages have not reacted to the prevailing conditions.

Firm size varies along the value chain according to the subsector of the CVC, however as firm size declines, this can possibly have a long term negative impact on productivity. It is imperative that in those countries where firm size has decreased the most; the challenge to scale up surviving firms is addressed.

Productivity varies along the value chain depending on the subsectors. Productivity also varies among the Member States in the different subsectors. However, despite the exceptions of France and Germany, the general trend is for productivity for products and manufacturing subsectors to continue to decline while there is an upswing in productivity in services and real estate. The productivity level for the core construction sector is still below pre-crisis levels but is recovering in some of the Member States.

During the crisis, both public and private sector investment declined in all Member States. In a bid to restore the construction sector public authorities are focussing ly on investment in transport and energy efficiency. It is imperative that structural reforms regarding contracting and authorisation schemes, planning permissions and permitting, the regulated professions and skills and are made in parallel with the increased investment; otherwise the investment will not achieve the multiplier effect envisioned. In addition public procurement procedures in construction require attention in order ensure that taxpayers achieve the best result for investments made by public authorities. Finally, the drop-off in investment has left a legacy of shortages in residential housing in some Member States which also requires a framework approach and structural reforms to solve.

Over three and a half million jobs were lost during the downturn in the construction sector. These effects were not proportional in the Member States with countries such as Spain, Ireland, Portugal and Italy suffering extreme declines. However the labour markets reacted according to the conditions prevalent in that country; and quite differently in countries such as Spain and Ireland.

The free movement of goods is enhanced by the CPR but barriers remain to the internal market for construction products. Intra-EU trade is increasing but could be improved further. Extra-EU imports are very low; extra-EU exports are increasing indicating that some Member States are developing new markets to compensate for reduced domestic demand in the EU; this is particularly true for construction machinery.

Some services which are part of the value chain are highly restrictive in their regulation which may reduce their competitiveness. The effectiveness of construction services in some Member States is particularly impacted by inefficient requirements for construction permits and planning permissions.

Construction and other services have different modes of trade integration which depends on the type of service. In some Member States the restrictiveness index for services is very high which impedes intra and extra EU trade. There is an opportunity to develop more intra and extra EU markets for high value products such as construction machinery, intermediate products and services; easing the barriers to products goods and services markets would enhance the overall value chain.

8.7.References

International Monetary Fund (2013), *The Driving Force behind the Boom and Bust in Construction in Europe*, IMF Working Paper WP/13/181

ECORYS Nederland BV (Ecorys) in cooperation with The Vienna Institute for International Economic Studies (wiiw) and the Austrian Institute of Economic Research (WIFO), "The European construction value chain: performance, challenges, role in the GVC", for the European Commission, 2016.

9. Integration and performance of services in the EU

This chapter reviews briefly the evolution of performance, integration and restrictions in the Single Market for services. In the absence of updated indicators on the restrictions in service, the chapter focuses on the performance and integration in the wholesale and retail distribution sectors.

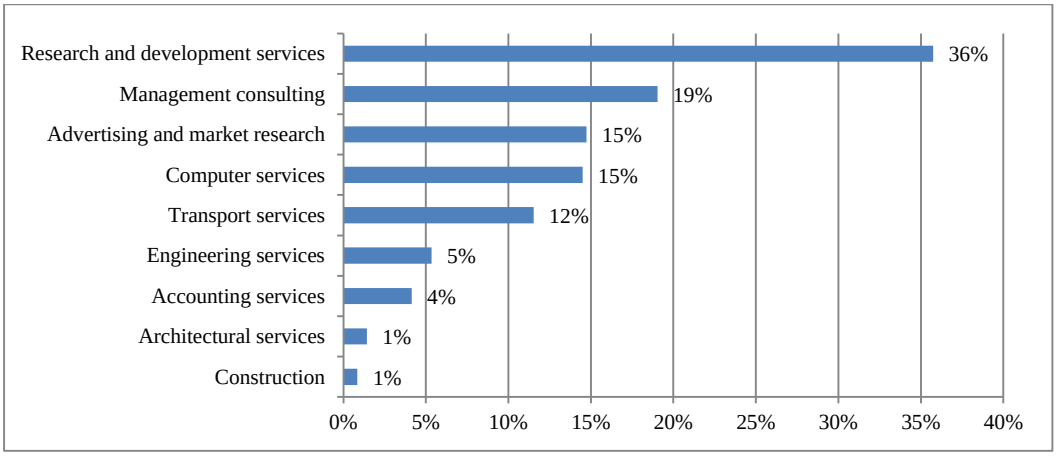
9.1. Integration of services in the EU

Integration of services through cross-border trade and secondary establishment

Integration of services in the EU can happen either through cross-border trade of services ("trade integration") or through the establishment or the expansion of an enterprise controlled in another Member State ("integration through secondary establishment").

Trade integration across the EU is considerably smaller for services than for goods (6% vs 22%)[118],[119]. At the same time, there are discrepancies across sub-sectors of services: trade integration is particularly low for construction and a number of professional services[120] (Figure 9.1).

Figure 9.1: Cross-border trade intensity[121] in 2014



Source: Eurostat (Data from 2014), Commission services' assessment.

Similarly, integration through secondary establishment is lower in services than in goods. Indeed, as shown by Figure 9.2, the share of value added generated by enterprises controlled by another EU Member State is lower in services than in goods (11% vs. 17%)[122], especially for business services and construction services. This is a serious obstacle to integration since cross-border provision of services often requires establishment in the country of destination.

[118] Source: Eurostat (2012 data). Trade integration is defined as the average of intra-EU imports and exports divided by GDP. Nace Rev. 2 service sectors included are D-J, L-N and S95

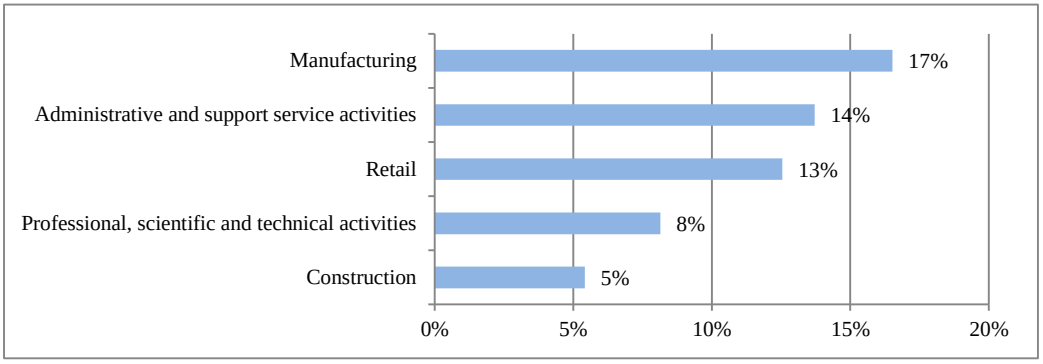
[119] Certain caution is needed when comparing services to other sector due to the inherent lower tradability of services, but the data can still serve as an indication of the impact of existing barriers.

[120] Professional services include also services provided by liberal professions.

[121] Cross-border trade intensity is measured as the average of intra-EU imports and exports compared to the total size of the sector.

[122] Source: Eurostat (2012 data). Nace Rev. 2 service sectors included are D-J, L-N and S95.

Figure 9.2: Share of the EU value added generated by foreign affiliates in 2013



Source: Eurostat (data from 2013); Commission services' assessment.

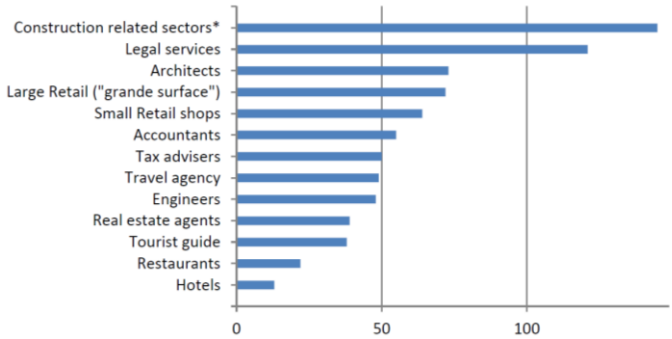
Focus on the integration of business services

Business services involve one firm providing services to another one in support of their services[123]. They cover many varied sectors[124]: they range from technical services such as engineering, architecture and IT, to other professional services such as legal services, employment services and facility management. As one of the largest service sectors, they contribute to around 12% of both EU GDP and employment.

Since the average service content of manufactured goods produced in the EU reaches close to 40% of the total value of final manufacturing goods -and in particular the average business services content of manufactured goods reaches 16%-, services and in particular business services have a direct impact on the competitiveness of the manufacturing industry[125].

Regarding trade between Member States, a 2015 staff working document of the European Commission[126] indicates that in addition to the construction sector, some key business services, such as legal services, architects, accountants, tax advisers, engineers, are still among the sectors with the largest number of barriers in the EU.

Figure 9.3: Number of maintained restrictions in sectors covered by the Services Directive in EU in 2014



*This includes: construction/building companies; certification services in the area of construction; crafts businesses in construction sector.

Source: Staff Working Document, *A Single Market Strategy for Europe – Analysis and Evidence*, SWD (2015) 202 final. European Commission, 2015

[123] See Final report of the High-level group on business services. Published by the European Commission. April 2014

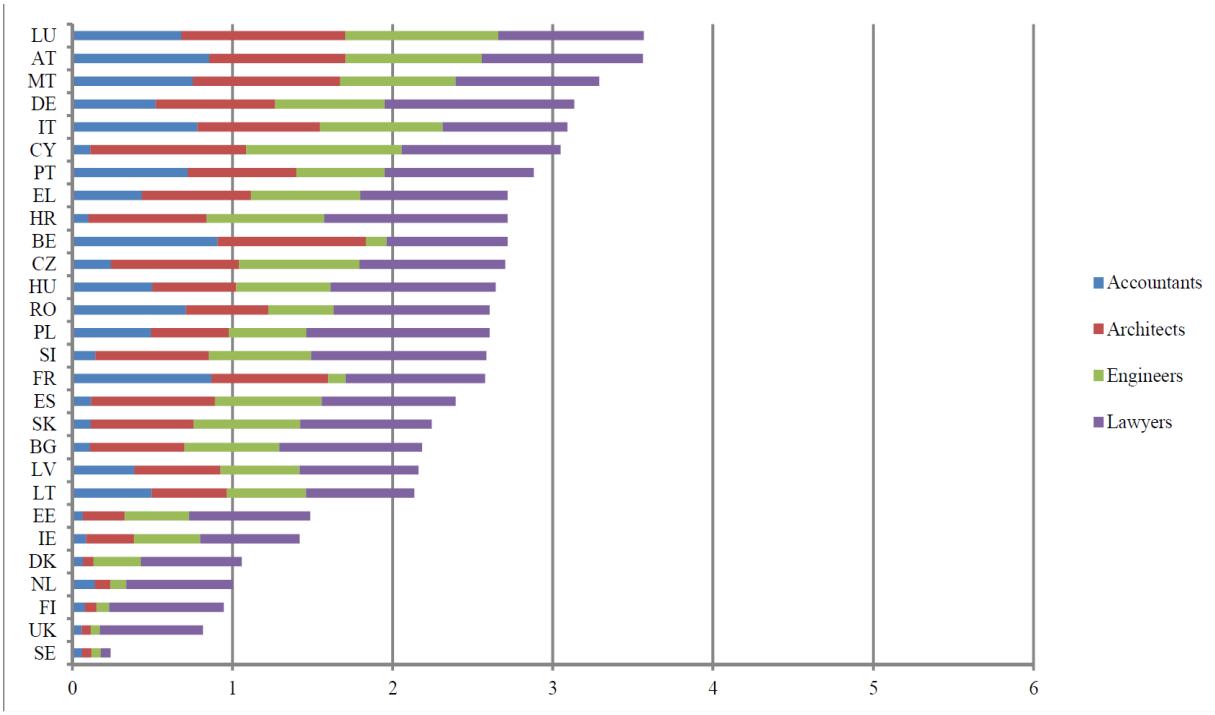
[124] Since 2008, the definition of "business services" used by Eurostat is based on NACE Rev2. It includes NACE Rev 2 codes: J62, N78, J582, J631, M731, M691, M692, M702, M712, M732, M7111, M7112.

[125] When taking into account both direct and indirect linkages. See Study on the relation between industry and services in terms of productivity and value creation. ECSIP consortium. October 2014.

[126] European Commission, Staff Working Document, *A Single Market Strategy for Europe – Analysis and Evidence*, SWD (2015) 202 final

Figure 9.4 shows the restrictiveness per Member State for the provision of legal, accounting, engineering and architect services.

Figure 9.4: Restrictiveness for the provision of legal, accounting, engineering and architect services per Member State in 2014



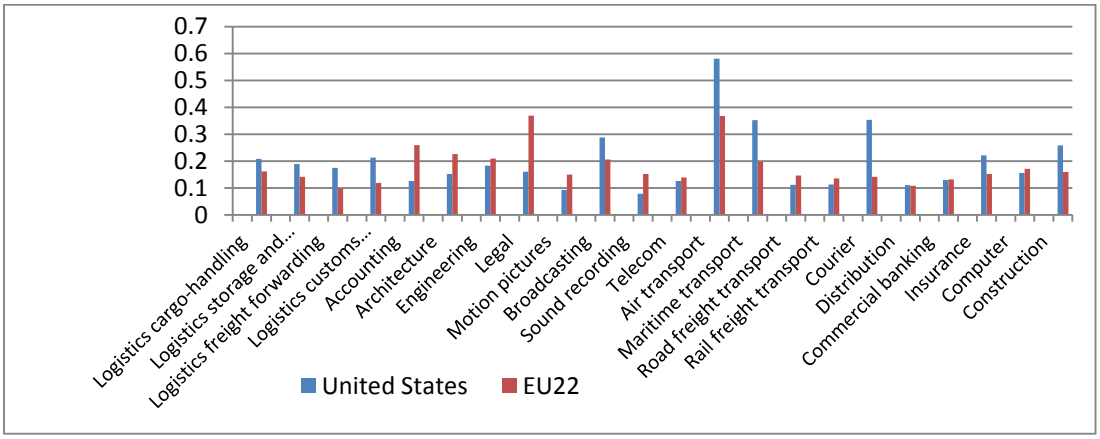
Source: "Business services – Assessment of barriers and their economic impact", European Commission[127]. This assessment covers the following regulatory barriers: reserved activities, tariffs, restrictions on advertising, compulsory chamber membership, restrictions on corporate form, insurance obligations and authorisation requirements. In addition, it also captures the performance of the Points of Single Contact in the different Member States. Higher scores indicate higher restrictiveness. Maximum possible score is 6.

Regarding external trade (as opposed to trade between Member States), the latest indicators for the 22 EU Member States that are also members of the OECD show that the EU is more restrictive to trade than the USA in the regulated professions covered by the Services Trade Restrictiveness Index ("STRI") database of the OECD, as well as in computer services, land transport and motion pictures. The USA is more restrictive in logistics, air and maritime transport, courier, broadcasting, insurance and construction. Taking into consideration the economic value of those sectors[128], the EU does not clearly appear to be more restrictive than the US.

[127] The document is available on http://ec.europa.eu/DocsRoom/documents/13328/attachments/1/translations/en/renditions/native

[128] Value added at factor cost / GDP of the main sectors (designed by the NACE code) where the EU22 is more restrictive than the US: M69 Legal and accounting: 1.33 %; M71 Architecture and Engineering: 1.19 %; H492 Rail freight transport: 0.04 %; H494 Road freight transport: 0.73 %; J59 Motion pictures, incl. sound recording: 0.19 %; J61 Telecommunications: 1.17 %
Value added at factor cost / GDP of the main sectors (designed by the NACE code) where the US is more restrictive than the EU 22: H50 Water transport: 0.17 %; H51 Air transport: 0.21 %; H52 Warehousing and support activities for transportation: 1.31 %; H53 Postal and courier: 0.43 %; J60 Broadcasting: 0.20 %; F Construction: 3.63 %
Source of the data: Eurostat. No data for distribution, commercial banking, insurance and computer. In these sectors, the STRI is very similar for EU22 and US.

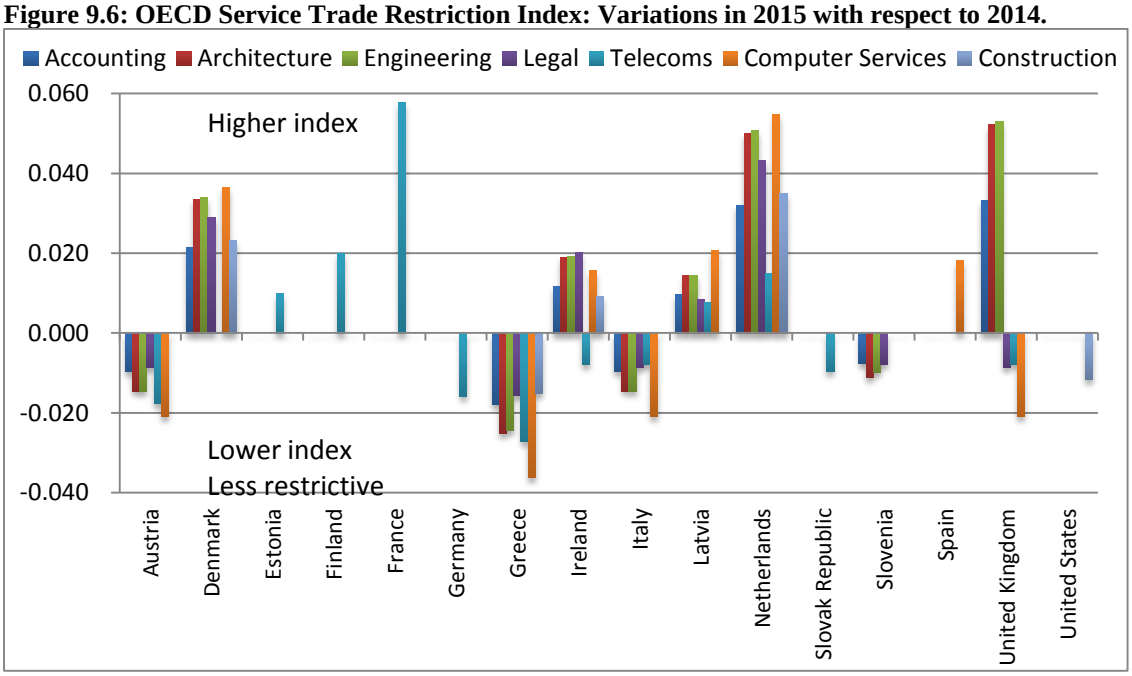
Figure 9.5: OECD Services trade Restrictiveness index 2014 – USA and EU 22



Source: OECD data. Note the STRI is a composite indicator giving value 1 to the most restrictive countries and 0 to the least restrictive ones.

In 2015, Services trade restrictiveness indexes were updated by the OECD for seven sectors. The evolution for EU countries is mixed. Austria, Italy, Slovenia and Greece have eliminated former restrictions in most sectors for which new data are available. The situation has worsened in Denmark, Ireland, the Netherlands and Latvia. In telecom services, restrictions have increased France[129], and to a lesser extent in the Netherlands, Finland, Estonia and Latvia, while Germany, Ireland, Slovakia and the UK have lifted some restrictions. Once more we can see improvements in countries where reforms were needed most and a relative deterioration in countries that initially had relatively less restriction. In particular the Netherlands, Denmark, the UK for a number of professions, Ireland and Latvia have increased restrictions, including introduction of labour market tests and shortening of the duration of stay for temporary services suppliers.

Figure 9.6: OECD Service Trade Restriction Index: Variations in 2015 with respect to 2014.



Source: OECD Data. The vertical axis indicates the variation of the STRI index between 2014 and 2015. When positive, restrictions have increased.

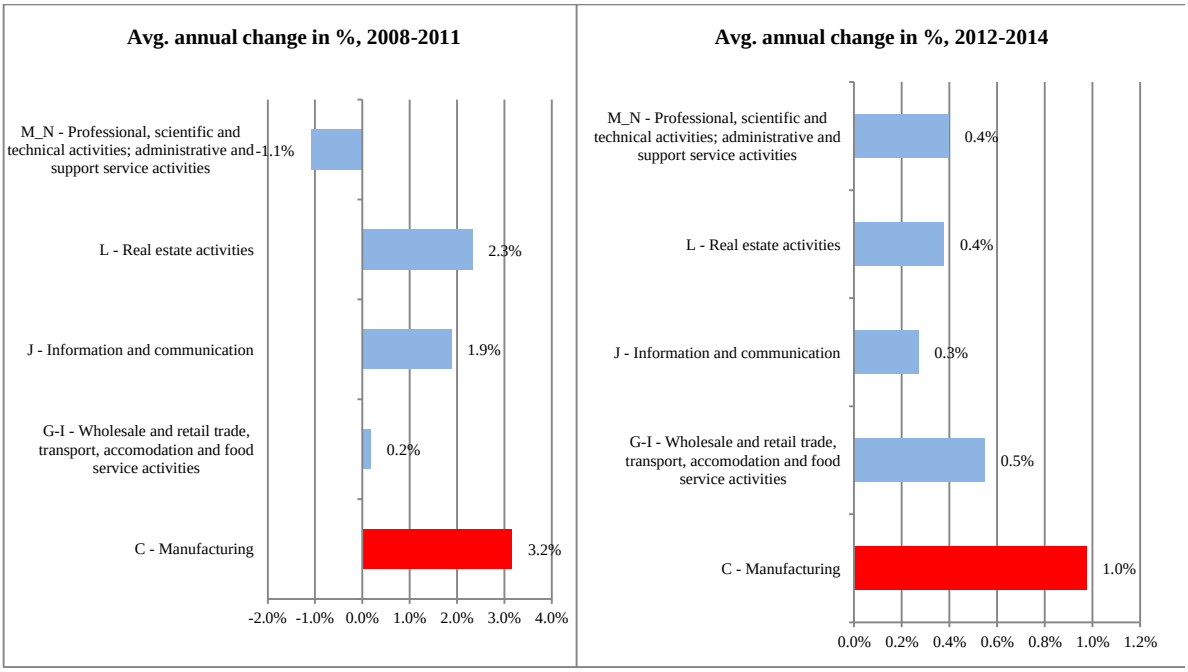
[129] France has almost doubled its STRI score in the telecommunication sector due to the introduction of an authorisation process where the conditions for authorisation of foreign suppliers are related to the economic interest of the host country.

9.2. Performance of the services sector

Labour productivity

Labour productivity growth in the EU services sector saw some improvement during the period 2008 to 2013, in particular in those Member States that join the Union in 2004. However, when comparing labour productivity growth with other economic sectors, including manufacturing[130], the service sector was outperformed. Indeed the labour productivity in the manufacturing sector has grown at higher rates in comparison with key services sector (Figure 9.7). In particular, during the first years of the crisis (2008-2011), business services displayed a negative labour productivity rate.

Figure 9.7: Sectoral labour productivity growth during and after the crisis



Source: Commission services' calculations based on Eurostat

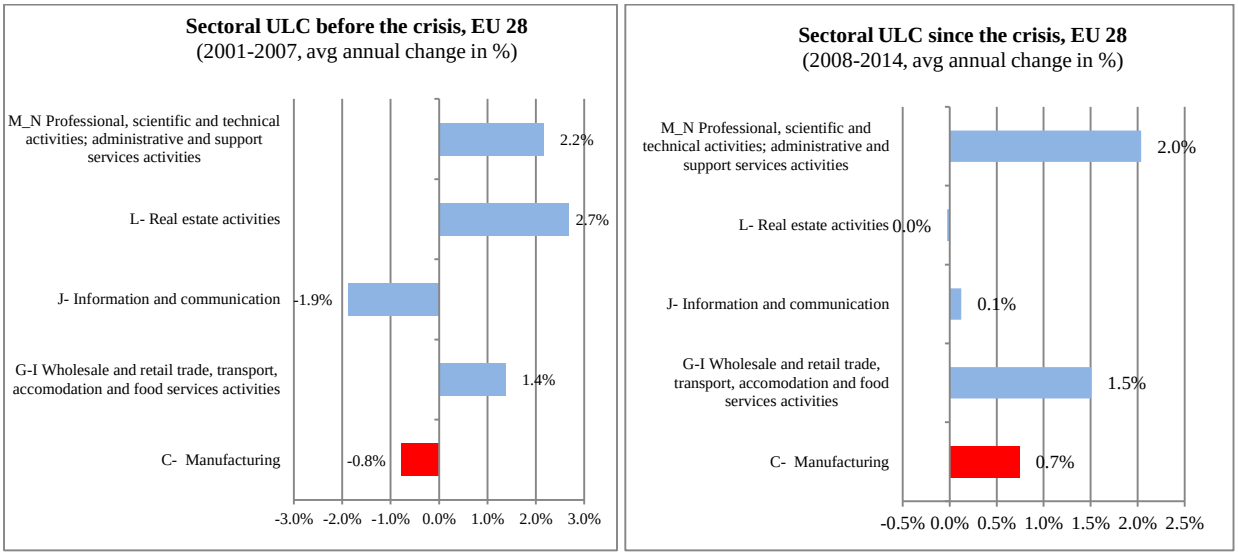
Unit Labour Costs

Both before and after the crisis, unit labour costs (ULC) have increased in business services, distributive trade (wholesale, retail), transport, accommodation and food services (see Figure 9.8), resulting in loss of competitiveness. Only in programme countries under strong market pressure subject to major competitiveness adjustments, such as Portugal, Spain, Cyprus and Greece[131], labour costs in services increased less than labour productivity.

[130] Staff Working Document SWD(2015) 203 final, accompanying the Communication "Upgrading the Single Market: more opportunities for people and business", COM(2015) 550

[131] However the major wage adjustment in Greece has not been accompanied by improvements in labour productivity in services.

Figure 9.8: Sectoral ULC before and during the crisis

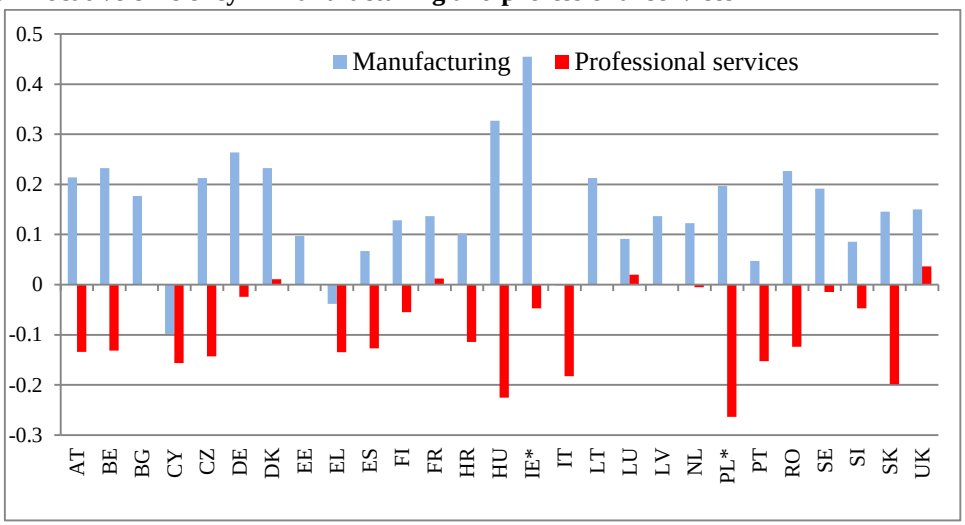


Source: Commission services' calculations based on Eurostat

Allocative efficiency

Estimates of the effectiveness of the EU services sector – as illustrated by the allocative efficient index[132] – show that resources are not flowing to the most competitive firms. In particular most Member States show a negative allocative efficiency in professional services, implying that firms with relatively low productivity have above-average market shares. This is not the case in the manufacturing sector (Figure 9.9). Negative allocative efficiency is also prevalent in several other services sectors, including retail (see below) and construction (see chapter 8).

Figure 9.9: Allocative efficiency in manufacturing and professional services



Source: Commission services' calculations based on Eurostat (2013). Data for MT not available. Data missing for BG, EE, LT and LV for professional services. * Data for IE and PL (2012).

[132] This index illustrates the extent to which more productive firms have higher market shares by approximating market shares with the employment of the firms in a size class; European Commission (2013): "Product Market Review 2013 – Financing the real economy"; European economy 8/2013

9.3. Integration and performance of wholesale trade services[133]

Wholesale trade is the resale of new and used goods to other wholesalers, retailers, industrial, commercial, institutional or professional users. Wholesalers may also provide a range of services from basic storage and bulk-breaking, to sorting, grading and logistics.

Wholesale employs more than 10 million people in 1.8 million enterprises, which is 4.4% of total employment in the EU28. Wholesaling contributed a value added of around 550 billion EUR; 4.5% to GDP in EU28 in 2014, ranging from around 7.8% in Poland to less than 3% in the United Kingdom.

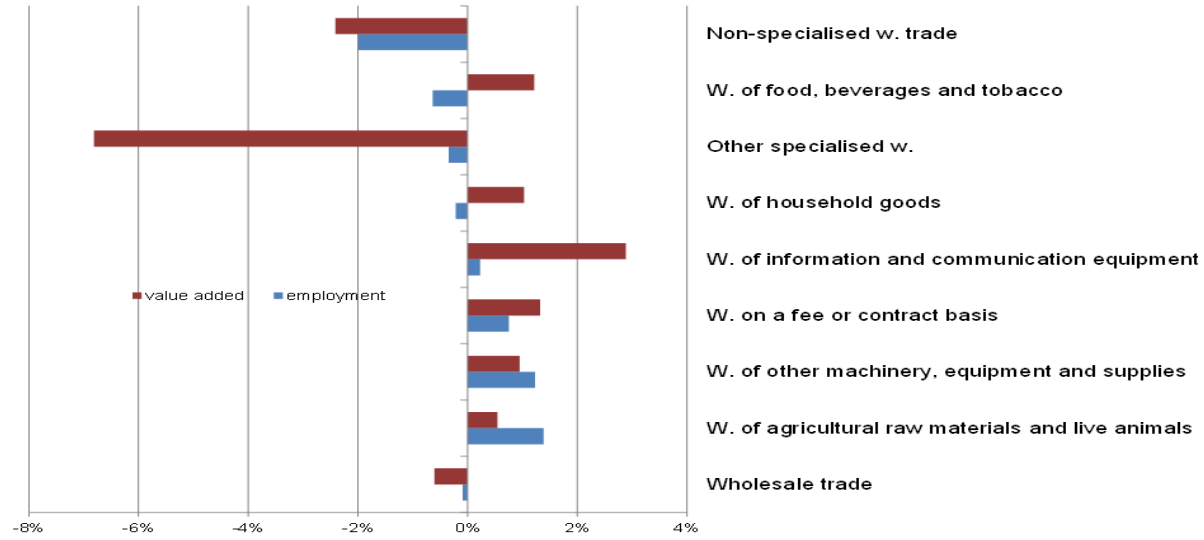
Wholesale costs have an impact on the competitiveness of the industry sector. The costs for wholesale services as a percentage of total costs in manufacturing and construction vary widely between countries: from 12% in Belgium to slightly above 2% in Bulgaria, Hungary and Romania.

Performance of the wholesale sector

Wholesaling is divided into eight subsectors which deal with different products. Wholesalers operate differently among the subsectors; in most subsectors, wholesalers take the ownership of the goods before selling them on; however in one subsector (NACE 46.1), the wholesaler acts as an agent or broker, without taking title to the goods. In terms of employment, the largest subsectors are wholesale of household goods (46.4), other specialized wholesale (46.7), and the wholesale of food and beverages (46.3). In terms of value added, the wholesale of household goods is by far the largest sub-sector. The subsector wholesale on a fee or contract basis (46.1) has the largest numbers of enterprises but relatively low value added and small firm size.

The wholesaling sector depends on the health of other sectors of the economy and is therefore heterogeneous. This may be seen at subsector level for 2008 to 2013. For example the sub-sector 'other specialised equipment' (46.7), which includes intermediate products, experienced a sharp decline in value-added reflecting, in particular, the contraction of the construction sector.

Figure 9.10: Compound annual growth rate of value-added and employment in wholesale subsectors 2008-2013

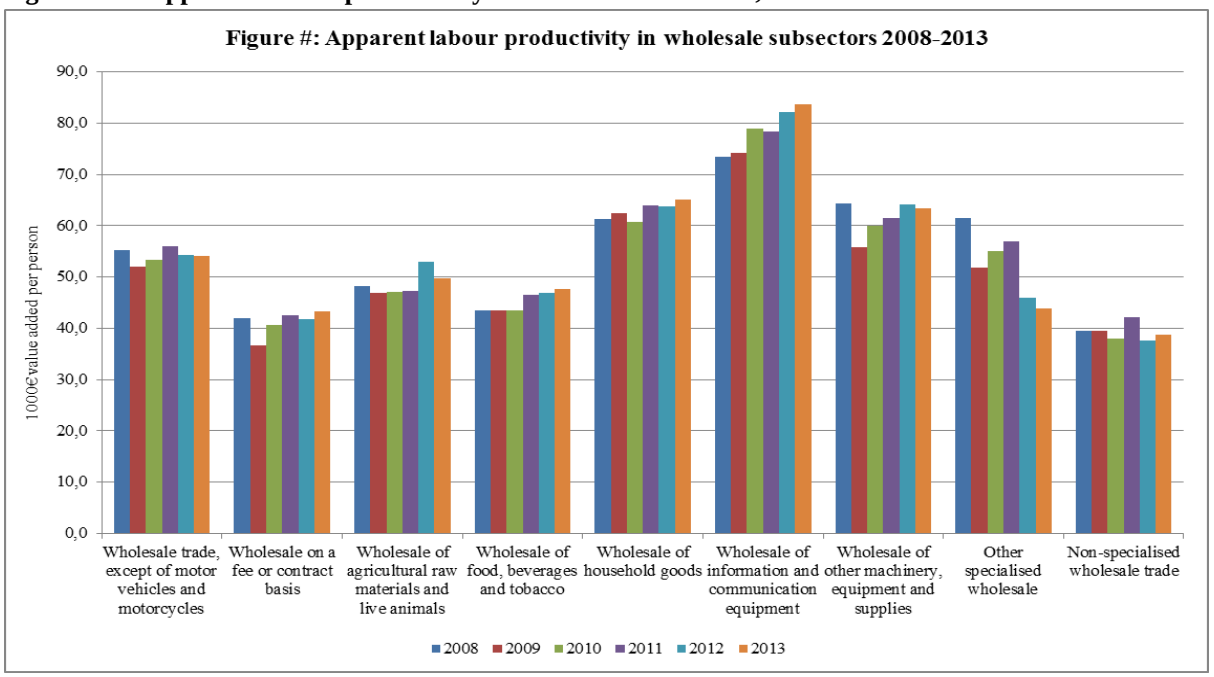


Source: Eurostat, Structural Business Statistics

[133] This section is based on the findings of a study on "*EU wholesale trade: analysis of the sector and value chains*", June 2016. The study was commissioned by the European Commission. It was carried out by the Austrian Institute of Technology, IDEA Consult and the Vienna Institute for International Economic Studies (wiiw).

In the sub-sector of information and communication equipment, the value added increased much more than employment from 2008 to 2013. The productivity in this sub sector therefore increased and was the highest among the subsectors (84,000 EUR per employee in 2013). On the other side of the scale, in the sub-sector "other specialised wholesale", the productivity decreased, being one of the lowest, together with "wholesale on a fee" (dominated by micro-firms) and "non specialised wholesale trade".

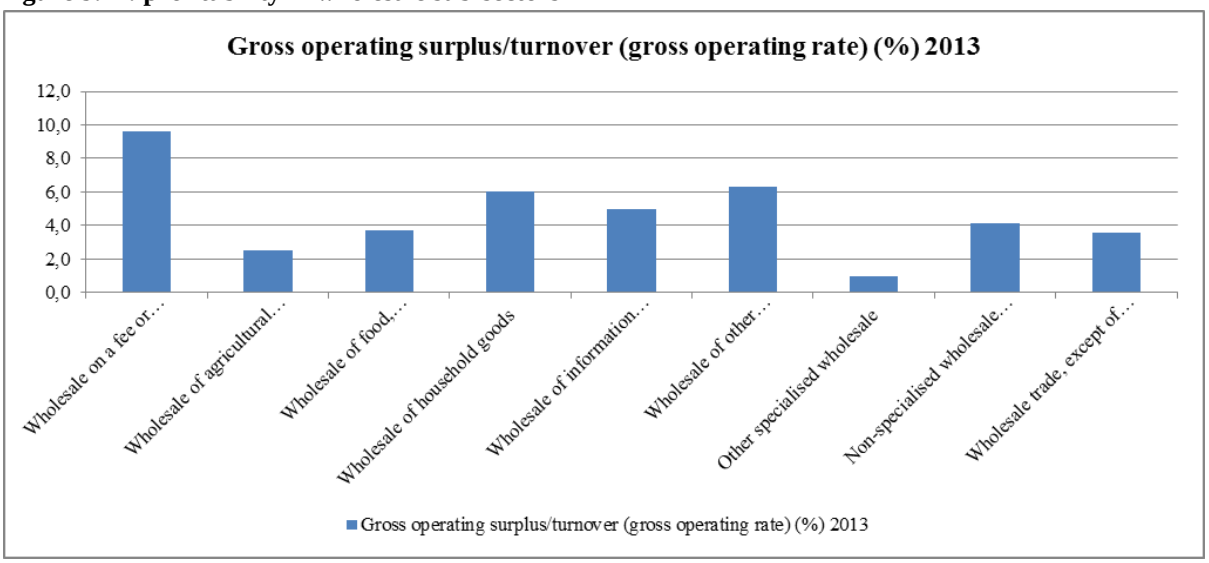
Figure 9.11: Apparent labour productivity in wholesale subsectors, 2008-2013



Source: Eurostat

Wholesale on a fee or contract basis had the highest profitability and the lowest productivity in 2013. This could reflect the fact that this sub-sector is less likely to take title to the goods and hence has less need to invest in stocks. In contrast, the profitability of 'other specialised wholesale' which is linked to intermediate products dropped to 1% in 2013 and, in addition, declined from 2.7% to 1% between 2011 and 2013. Profitability of the other subsectors varied mildly from 2011-2013, except information and communication equipment which increased from 4.6% to 5%.

Figure 9.12: profitability in wholesale sub-sectors



Source: Eurostat, Structural Business Statistics

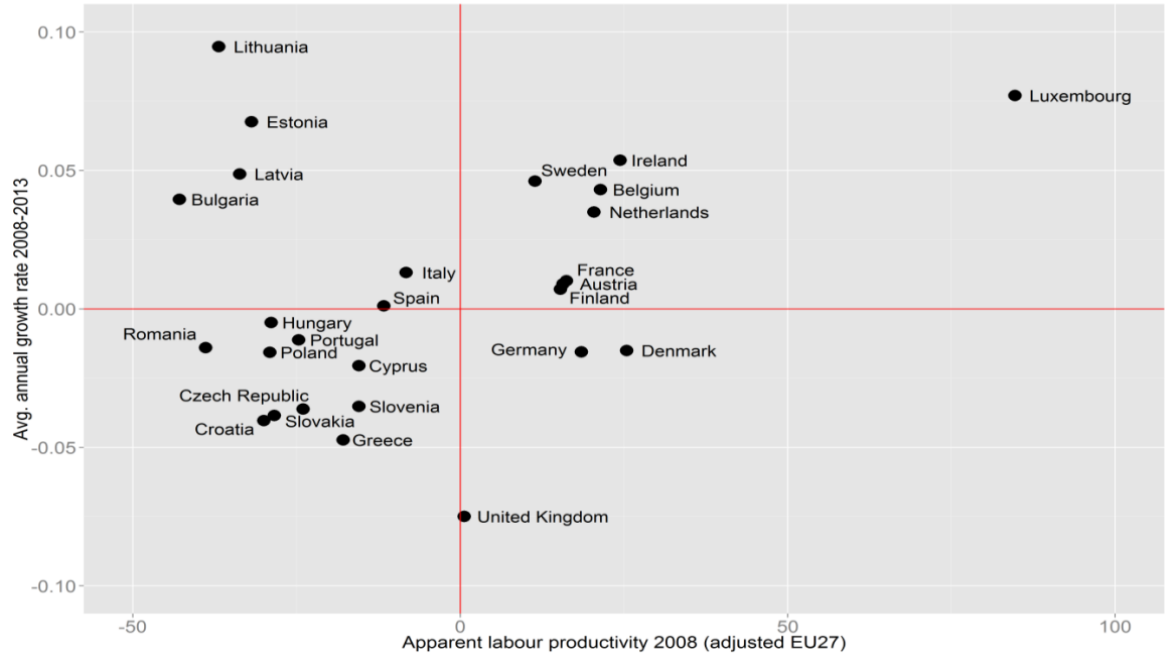
The previous indicators present the state of play of the wholesale sector from a static point of view. From a dynamic perspective, three aspects can be examined to complete this review of the performance of the whole sector. They can also be considered as indirect indicators of the level of integration in this sector.

Integration of the wholesale sector

- *No convergence in labour productivity*

To determine whether wholesale labour productivity has been converging across Member States, the Figure 9.13 contrasts the countries' growth rates of labour productivity in wholesale from 2008-2013 with their initial values from the beginning of the respective period. This results in four quadrants, two of them - the upper left and the lower right quadrant - indicating convergence. Countries in the upper left quadrant are below EU average, but are catching up. Countries in the lower right quadrant are above EU value and falling behind. The Figure indicates that nine countries are in the two convergence quadrants, while 16 countries are in the divergence quadrants. The findings therefore suggest divergence of labour productivities in the wholesaling between Member States.

Figure 9.13: Avg. annual growth and initial apparent labour productivity (adjusted by EU27 value) for NACE 46



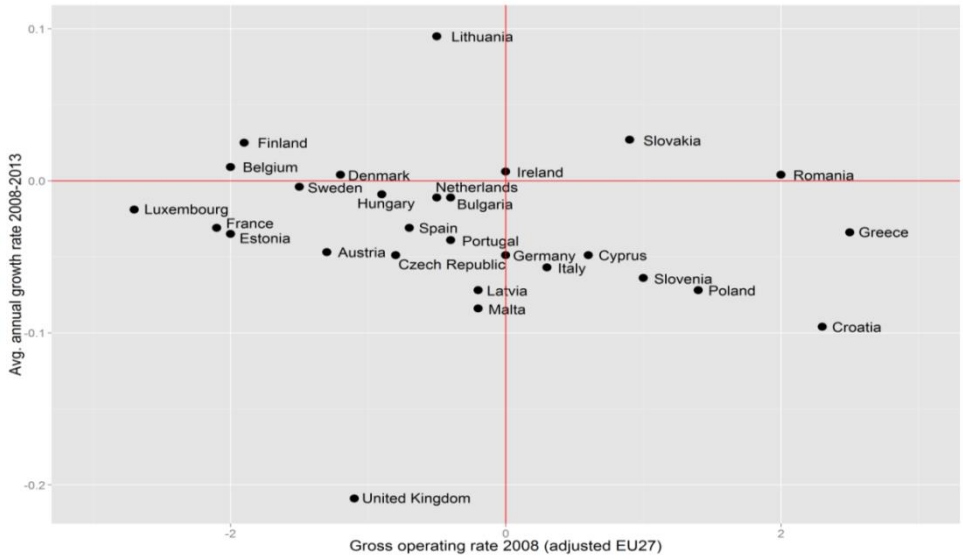
Note: Malta excluded due to lack of data

Source: Eurostat, Structural Business Statistics, own calculations. The average annual growth rate is in %; the apparent labour productivity is in thousands of € per person employed.

- *Slight convergence in profitability*

The plot of the average annual growth rate of profitability over the years 2008-2013 and profitability levels for the year 2008 suggests the existence of a negative correlation between profitability growth and the level of profitability, which may be a sign for convergence. This convergence may however be due to the fact that the majority of countries are falling behind. Indeed most of the countries faced overall decreasing profits in the period 2008 to 2013.

Figure 9.14: Avg. annual growth and initial level of profitability (gross operating rate), adjusted by EU-27 value for NACE 46



Note: The gross operating rate of 2008 was adjusted by the value of 2007, since EU-27/28 values for the years 2008-2010 are missing.

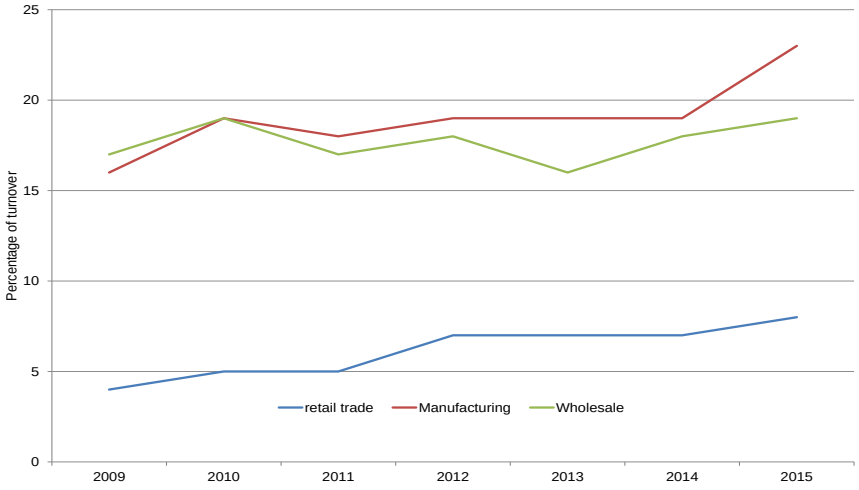
Source: Eurostat, Structural Business Statistics (sbs_na_dt_r2), own calculations. The average annual growth rate and the gross operating rate are in %.

Innovation and e-commerce in wholesale

Wholesale is a highly innovative sector of the European economy. Compared to manufacturing, there is no lack of innovative firms in wholesale. However, wholesale firms are less engaged in R&D and more often employ external technologies in their innovation projects. The economic returns to innovation in wholesale are below those of manufacturing firms.

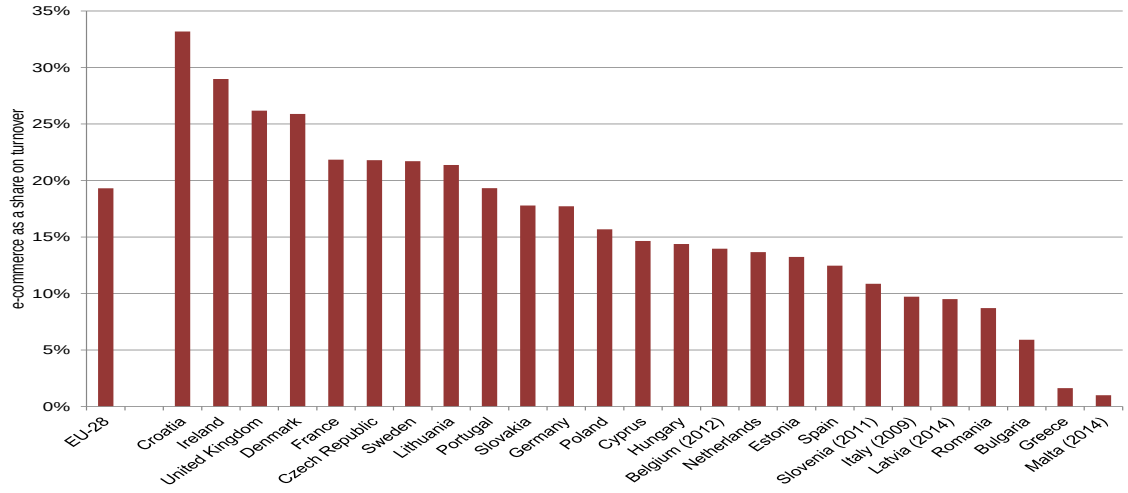
An important part of innovation in wholesale comes from new information technologies. As shown by Figure 9.15, wholesalers are very active in e-commerce. This may explain why the wholesale sector has remained an important sector of the economy (as shown by the employment figures), whereas it could have shrunk due to disintermediation between manufacturing on one side and retailers/final consumers on the other side.

Figure 9.15: Total turnover from e-commerce by enterprises in different sectors, EU-28, 2009 - 2015



Source: Eurostat, e-commerce statistics

Figure 9.16: total turnover from e-commerce in wholesale firms at country level, E-28, 2015



Source: Eurostat, e-commerce statistics

Expenditure on tangible investment such as buildings, machines or transport equipment dropped considerably in wholesale after the crisis and has not recovered since. On average, the wholesale sector spends less per employee on tangible investments than manufacturing, but considerably more than retail trade.

Conclusion on wholesale

The wholesale trade sector is very heterogeneous across EU Member States. In some Member States and sectors, large parts of the wholesale sector are very much integrated along the value chain with upstream manufacturers. The very large differences between EU Member States in wholesale productivity suggest the possible existence of market imperfections and may also point to barriers for the Single Market in this sector. In addition, Member States' labour productivities in the wholesale sector have been rather diverging since 2008.

This divergence can partly be explained by differences in the sectorial composition of wholesale in various European countries. However, the levels of divergence also indicate that barriers for market integration still exist. The existence of barriers, for examples measures by producers to limit parallel imports have been confirmed by previous studies on wholesale sub-sectors[134]. EU and Member States' policies should examine whether those barriers are justified and if not, remove them.

Differences in profitability are smaller but still notable. The comparison of annual growth rates and initial profitability suggests that Member States' profitability in the wholesale sector have been converging.

9.4. Integration and performance of retail trade services

Retail is the biggest sector in the EU non-financial business economy in terms of number of enterprises and persons employed. It employs nearly 19 million people and accounts for 4.5% of total EU value added. It accounts for more than 6 million companies, i.e. 29 % of all EU undertakings are active in this sector. The sector is particularly important for youth employment with 13.7 % of

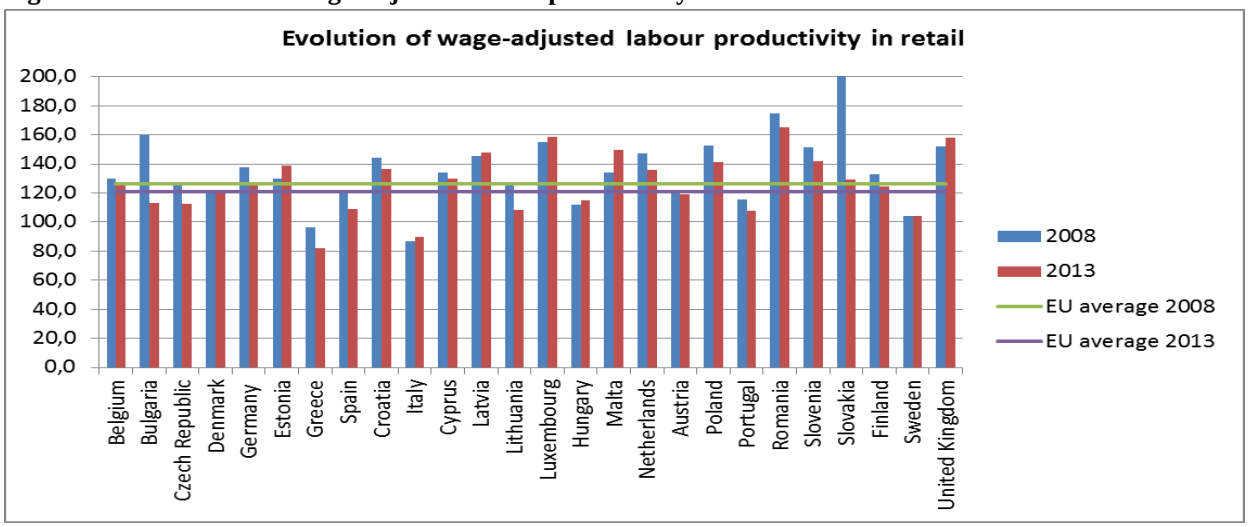
[134] IDEA Consult et al. 2011

employees in the 15-24 age range. It also represents a large part of the SME sector - almost 1 out of 3 European SMEs are active in retail.

Performance in the retail sector

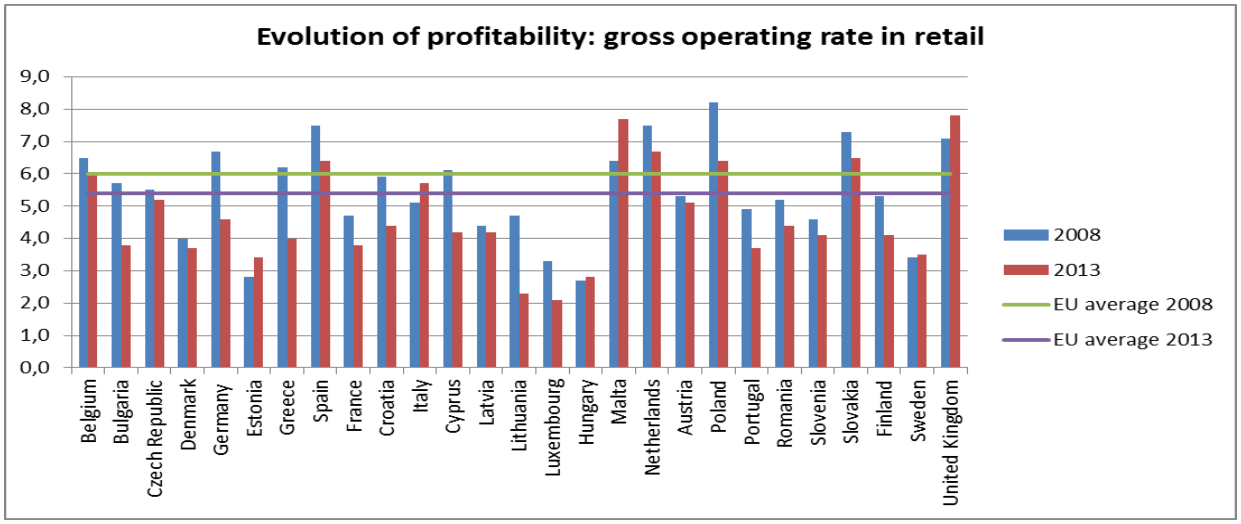
Overall productivity and profitability in the sector have been declining slightly between 2008 and 2013. This might be due to the effects of the economic crisis. Indeed, the economic crisis may reduce the sales (or the growth of the sales), while employment and costs cannot easily be reduced in the short term (which results in reduction of labour productivity and profitability).

Figure 9.17: Evolution of wage-adjusted labour productivity in retail



Source: Eurostat. The wage-adjusted labour productivity is in thousands of € per person employed. The use of the wage-adjusted labour productivity allows to cancel the impact of part-time working.

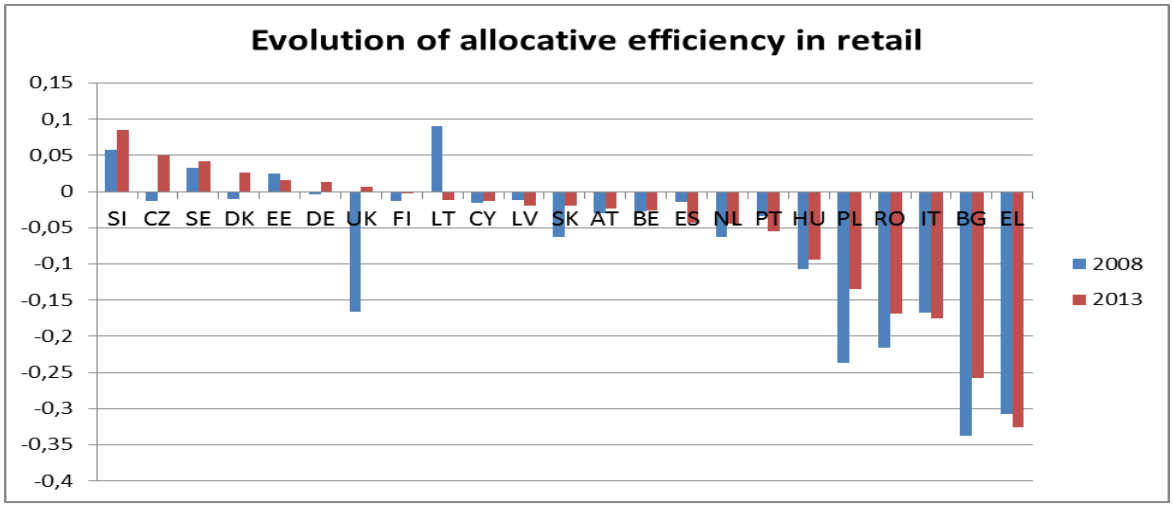
Figure 9.18: Evolution of profitability in retail



Source: Eurostat. The gross operating rate is the gross operating surplus/ turnover (in %).

However, there has been a positive trend in allocative efficiency, which increased between 2008 and 2013 for many Member States. This shows that resources have been flowing to the more productive firms allowing them to achieve their optimal size.

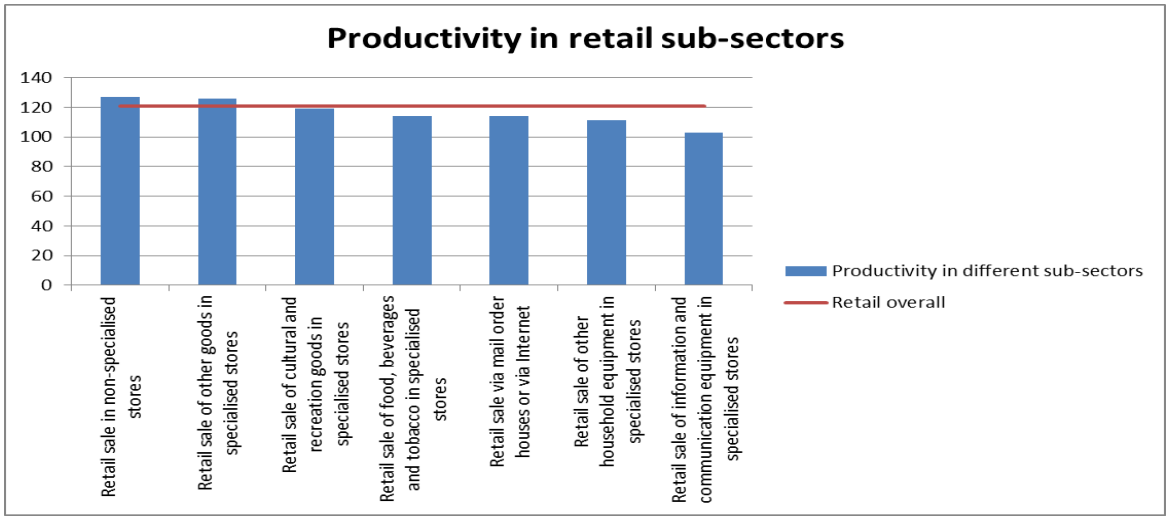
Figure 9.19: Evolution of allocative efficiency in retail



Source: Eurostat. The vertical axis indicates the allocative efficiency index. This index is calculated by approximating market shares with the employment of the firms in a size class. A positive allocative efficiency index indicates that more productive firms have higher market shares.

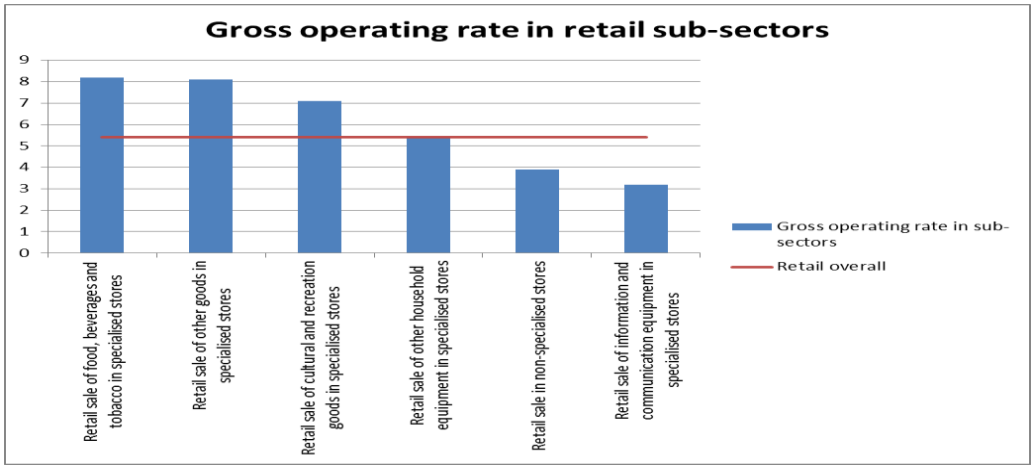
The performance of retail sub-sectors varies significantly. Retail sales in non-specialised stores (such as super- and hypermarkets) display the highest productivity among all retail sub-sectors. The profitability of this sub-sector measured by the gross operating rate is one of the lowest, far below the average for the sector as a whole. Retail sales of food, beverages and tobacco in specialised stores on the other hand display the highest profitability of all sub-sectors. However their productivity is below the sector's average. This could be explained by the inherent differences between these two sectors both in terms of average selling space and margins. Large stores such as supermarkets and hypermarkets run by large retail companies tend to be more productive and capable at the same time of applying smaller margins, which benefit consumers. Specialised food stores are usually based on a small surface and often run by small companies.

Figure 9.20: Evolution of labour productivity in the retail sub-sectors



Source: Eurostat. The labour productivity is in thousands Euros per employee.

Figure 9.21: Evolution of the profitability in the retail sub-sectors

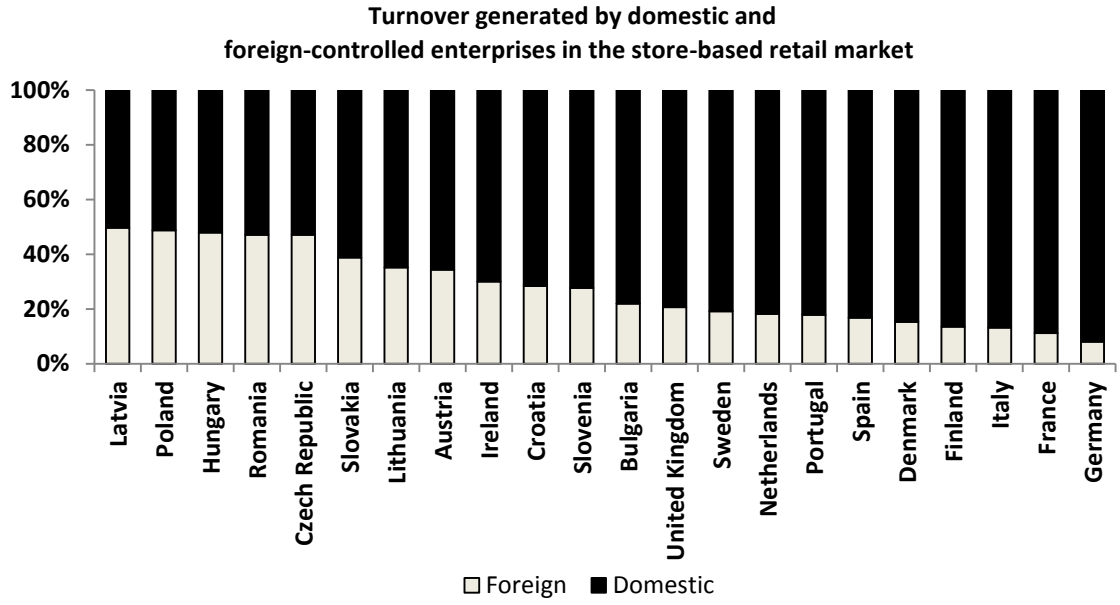


Source: Eurostat. The gross operating rate is the gross operating surplus/ turnover (in %).

Market integration in brick-and-mortar retail

Brick-and-mortar retail is characterised by cross-border expansion of companies establishing in other Member States. In particular the Eastern European markets are largely dominated by foreign capital.

Figure 9.22: Turnover generated by domestic and foreign-controlled enterprises in store-based retail



Source: Eurostat. The gross operating rate is the gross operating surplus/ turnover (in %).

Retailers wanting to establish in other Member States may face regulatory restrictions. Member States impose requirements relating to the size of retail outlets or to their location which may result in market entry barriers for certain store formats or business models and may affect secondary establishment. Such restrictions can have a negative impact on market structure and dynamics.[135]

In addition to establishment restrictions, retailers may face operational restrictions influencing their day-to-day business activities. As regards such restrictions, there is a worrying trend in some Member

[135] Staff Working Document underpinning the Single Market Strategy "A Single Market Strategy for Europe - Analysis and Evidence", http://ec.europa.eu/DocsRoom/documents/14012?locale=fr,p.39
Methodology: http://ec.europa.eu/DocsRoom/documents/13326/attachments/1/translations/en/renditions/native

States to introduce measures affecting mainly foreign retailers. In addition there are restrictions that affect input markets and food trade.

Retail market integration through e-commerce

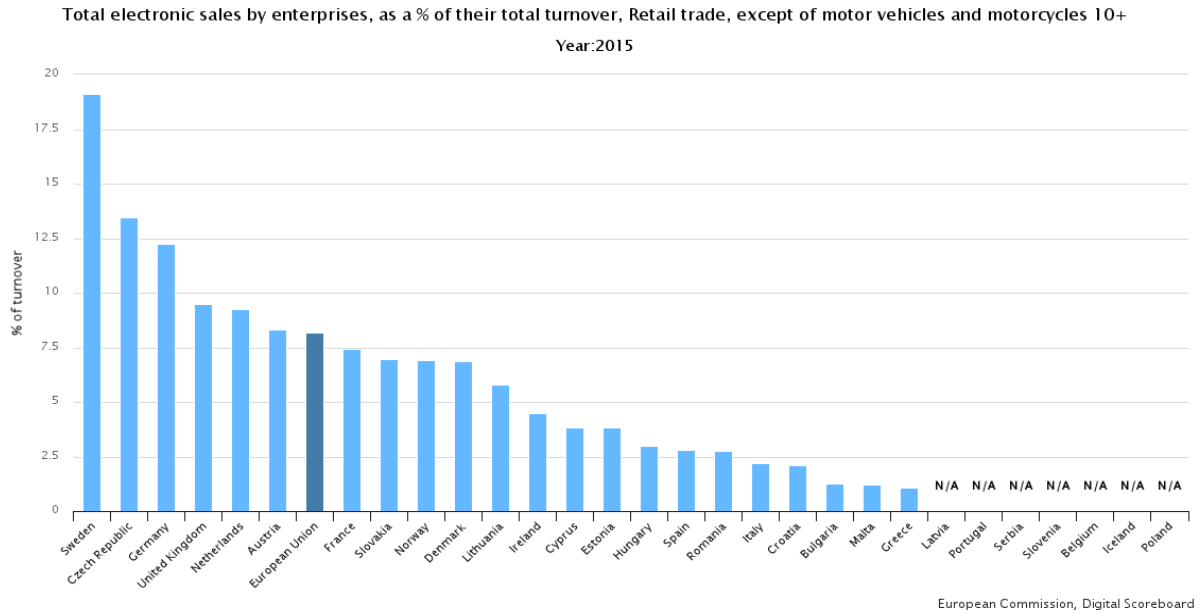
Growing at a rate of 22% a year, E-commerce challenges traditional retail. Many retailers, particularly smaller ones, still struggle to seize the opportunities offered by this technological change.

The e-commerce market is made up both of brick and mortar retailers selling online, and of purely online retailers ('pure players'). Pure players play an important role in e-commerce and account for a large share of the market. This is reflected in a high level of concentration of the e-commerce market (CR5 index of 35% on average, with strong variations at national level from 15.6% in Hungary to 76.6% in Germany[136]).

In 2015 19.1% of companies in the retail sector sold online, against 17% for the EU economy as a whole. This share has been steadily increasing since 2010, when it stood at 11.7%. The value of online sales has more than doubled between 2010 and 2015, reaching EUR 209 billion in 2015. However e-commerce is still only a fraction of the retail market. The value of store-based sales in 2015 was over EUR 2,500 billion, 12 times the value of online sales.

In 2015, electronic sales represented a little more than 7.5% of the turnover in the EU retail trade (except of motor vehicles). There are again significant differences between Member States.

Figure 9.23: Electronic sales in retail trade



Source: Eurostat. The gross operating rate is the gross operating surplus/ turnover (in %).

In terms of types of products sold, the online retail market also presents a structure that is different from the store-based market. Whereas over half of goods sold in stores are groceries, the online market is more fragmented. Clothing and footwear were the product category most sold online in 2015 (18%[137]), followed by consumer electronics (12%). Food and drink accounted for only 9% of sales value.

[136] Euromonitor
[137] Euromonitor.

In the future the retail market will be multichannel. It is therefore important that Member States review their regulatory frameworks to take account of these developments and this should include evaluating the level playing field between brick-and-mortar retail and e-commerce.

Conclusion on retail

Performance and market conditions differ across retail subsectors. Grocery retail is dominated by brick and mortar shops. Given the specificities of this sub-sector, physical presence is likely to play a relatively important role also in the future. Integration will therefore continue to happen to a large extent through establishment across borders. This is why it is crucial to ensure that Member States' regulations respect free movement of goods and freedom of establishment.

For non-grocery retail e-commerce is completely changing the market conditions. Integration happens through cross-border retail sales. Member States should provide a regulatory framework supportive to the development of e-commerce and ensure a level playing field between physical and on-line retail.

9.5. Conclusion

EU cross–border trade and foreign direct investments in the services sector point to an insufficient integration of the service markets in the EU. The persistence of regulatory restrictions such as those affecting the professional services, the construction services or the distributive trade services is keeping the Single Market for services well below potential.

The limited exposure to competition from abroad and the protection of incumbent firms stall innovation, hamper productivity growth and the efficient allocation of resources. Lack of integration in the Single Market for services has a negative impact not just on the countries with high levels of restrictions but also on other Member States that cannot benefit from the full potential of the Single Market. In addition, given the interconnections between manufacturing and business services, the poor performance of this sector has an impact on the productivity of manufacturing.

Structural reforms are the main instrument for the removal of restrictions. However, technological developments such as e-commerce, data analytics, digitalisation and new business models, especially those involving the collaborative economy are contributing to reducing the impact of those restrictions by increasing the tradability of services.

9.6. References

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BACKGROUND STUDIES

Chapter 3 "*Investment and sources of productivity growth*" is based on the background study "Single market transmission mechanisms before, during and after the 2008/2009 crisis: a quantitative assessment" carried out by the Austrian Institute for Economic Research (WIFO) in cooperation with the National Institute of Economic and Social Research (NIESR), for the European Commission, 2016.

Chapter 4 "*Knowledge-based capital, productivity and allocative efficiency*" is based on the background report "Single market transmission mechanisms before, during and after the 2008/2009 crisis: a quantitative assessment" carried out by the Austrian Institute for Economic Research (WIFO) in cooperation with the National Institute of Economic and Social Research (NIESR), for the European Commission, 2016; and on the background report "Total factor productivity growth: drivers, components and frontier firms" carried out by the National Institute of Economic and Social Research (NIESR), the Instituto Valenciano de Investigaciones Económicas (IVIE), and the University of Valencia, for the European Commission, 2016.

Chapter 6 "*Integration in the Single Market*" is based on the background report "Single market transmission mechanisms before, during and after the 2008/2009 crisis: a quantitative assessment" carried out by the Austrian Institute for Economic Research (WIFO) in cooperation with the National Institute of Economic and Social Research (NIESR), for the European Commission, 2016; and on the background report "The evolving composition of intra-EU trade over time" carried out by The Vienna Institute for International Economic Studies (wiiw), The Centre for International Research and Economic Modelling (CIREM), and The Economic and Social Research Institute (ESRI), for the European Commission, 2016.

Chapter 8 "*Construction Value Chain*" is based on the background report "The European construction value chain: performance, challenges, role in the GVC" carried out by ECORYS Nederland BV (Ecorys) in cooperation with the Vienna Institute for International Economic Studies (wiiw) and the Austrian Institute of Economic Research (WIFO), for the European Commission, 2016.

Chapter 9 "*Integration and performance of services in the EU*" is based on the background report "EU wholesale trade: analysis of the sector and value chains" carried out by AIT Austrian Institute of Technology, Innovation Systems Department, IDEA Consult, and the Vienna Institute for International Economic Studies (wiiw), for the European Commission, 2016.