Article
Real convergence in the euro area: evidence, theory and policy implications

An important lesson from the euro area sovereign debt crisis is that the need for sound economic policies does not end once a country has adopted the euro. There are no automatic mechanisms to ensure that the process of nominal convergence which occurs before adoption of the euro produces sustainable real convergence thereafter. The global financial crisis that started in 2008 has showed that some countries participating in Economic and Monetary Union (EMU) had severe weaknesses in their structural and institutional set-up. This has resulted in a large and protracted fall in real per capita income levels in these countries since 2008.

While there has been real convergence in the European Union (EU) as a whole since 1999 owing to the catching up of central and eastern European (CEE) economies, there has been no process of real convergence among the 12 countries that adopted the euro in 1999 and 2001. This lack of convergence is related to several factors, notably weak institutions, structural rigidities, weak productivity growth and insufficient policies to address asset price booms. Against this background, several factors appear crucial for ensuring real convergence in EMU: macroeconomic stability, and sound fiscal policy in particular; a high degree of flexibility in product and labour markets; favourable conditions for an efficient use of capital and labour in the economy, supporting total factor productivity (TFP) growth; economic integration within the euro area; and a more active use of national policy tools to prevent asset price and credit boom-bust cycles.

1 Introduction

While the concept of convergence has many dimensions, this article focuses on real convergence measured by real GDP per capita.[1] Sustainable real convergence is the process whereby the GDP per capita levels of lower-income economies catch up with those of higher-income economies on a durable basis. For convergence to be sustainable, long-term potential per capita growth must be consistent with an expansion of demand. Indeed, GDP growth that results from external factors such as a strong global demand shock, or a more benign shock such as the decline in interest spreads that occurred upon the launch of the euro, may prove to be unsustainable if not matched by higher growth potential.

In the literature on economic growth, real convergence is captured by the two complementary concepts of beta convergence (β-convergence) and sigma convergence (σ–convergence). The first type of convergence occurs when lower-

[1] The convergence criteria laid down by the Treaty on the Functioning of the European Union (Maastricht criteria), which measure nominal convergence, fall beyond the scope of this article.

income economies grow faster than higher-income economies, i.e. they experience a process of catching up. This is usually measured in terms of relative GDP per capita in purchasing power standards (PPS). The second concept refers to a reduction in the dispersion of income levels across economies. Real convergence requires that lower-income countries can grow faster in a sustainable manner than higher-income countries, with their income levels converging toward those of higher-income countries as a result. As such, real convergence mainly pertains to the β-dimension of convergence, with σ-convergence being a by-product; sustainable convergence is the key precondition for economies that are catching up to be resilient to shocks.

Sustainable real convergence supports the smooth functioning of Monetary Union over the medium term. First, achieving sustainable real convergence by means of sound national economic policies is important to support the economic and social cohesion of EMU, especially since euro area countries do not share fiscal transfer mechanisms similar to those in the US federal budget. While the Structural Funds and the Cohesion Fund – the financial instruments of EU regional policy – aim to narrow the development disparities among regions and Member States, they are more limited in scope than similar instruments in a federal state. Second, the sustainability of real convergence is important because for some euro area economies the process of catching up tends to drive up their inflation differential vis-à-vis the euro area average over the medium term. In a monetary union, this is usually associated with a lowering of real interest rates in the economies that are catching up, since short-term nominal interest rates are determined by the central bank's policy rate. Given this essential feature of monetary policy in a single currency area, great importance needs to be attached to fiscal and macroprudential policies that tame macro-financial cycles and ensure stability, so as to prevent countries becoming exposed to boom-bust cycles. A greater degree of cyclical divergence within the euro area would complicate the conduct of the single monetary policy.

This article reviews the mechanisms and incentives that have so far hampered sustainable real convergence among euro area countries. Section 2 presents some evidence of real convergence since the start of EMU, Section 3 discusses the reasons for the lack of sustainable real convergence in some euro area economies that adopted the euro at an early stage, Section 4 focuses on the key role of TFP growth in the convergence process, Section 5 examines the policies that could help bring about sustainable real convergence, and Section 6 concludes.

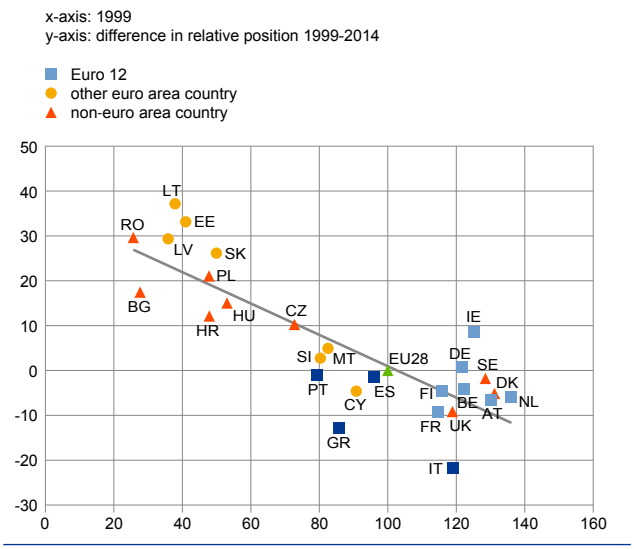
2 Evidence of real convergence

Between 1999 and 2014 some degree of real convergence took place among the 28 countries that now make up the EU (the EU28). As shown in Chart 1, both non-euro area EU countries (orange triangles) and countries that adopted the euro after 2002 (yellow circles) performed better over the period 1999 to 2014 than the rest of the EU countries, i.e. the 12 countries (Euro 12) that adopted the euro

Chart 1

GDP growth per capita relative to the EU28

(GDP per capita in PPS; EU28=100)



Sources: European Commission and ECB staff calculations.
Notes: Luxembourg is excluded because GDP per capita computations are distorted by the high number of cross-border workers. The dark blue squares represent those of the catching up economies in the Euro 12 that showed no convergence over this period (Greece, Spain and Portugal), and Italy, the Euro 12 country with the largest divergence.

before 2002 (blue squares). Estonia, Latvia, Lithuania, Romania and Slovakia have recorded the highest degree of convergence among the EU countries so far, followed by other countries in the CEE region.[2]

Little real convergence has taken place among the euro area economies since the establishment of the euro, despite initial expectations that the single currency would act as a catalyst for faster real convergence. There is no clear relationship between relative GDP per capita levels in 1999 and their relative growth between 1999 and 2014. In fact, looking at the period as a whole, there is some evidence of divergence among the early adopters of the euro, given that over 15 years a number of relatively low-income countries have maintained (Spain and Portugal) or even increased (Greece) their income gaps with respect to the average. Moreover, Italy, initially a higher-income country, recorded the worst performance, suggesting substantial divergence from the high-income group. While the crisis following the collapse of Lehman Brothers can partly explain the divergence observed in these countries, more deep-rooted factors were also at play. Ireland, for example, in spite of its severe financial crisis in the period 2008-12, shows some improvement, remaining among the higher-income countries.

Focusing on pre- and post-crisis sub-periods, there was some temporary convergence before 2007 among the Euro 12. Before the global financial crisis there was faster growth in Greece and Spain than in the rest of the euro area. This catching up process was rapidly reversed over the period 2008-13, when these economies underwent a severe recession. In the case of Portugal, there is limited evidence of even temporary convergence in the pre-crisis period. Among the high-income countries, Italy's growth underperformed the euro area average over almost the whole period, leading to increased divergence (see Chart 2).

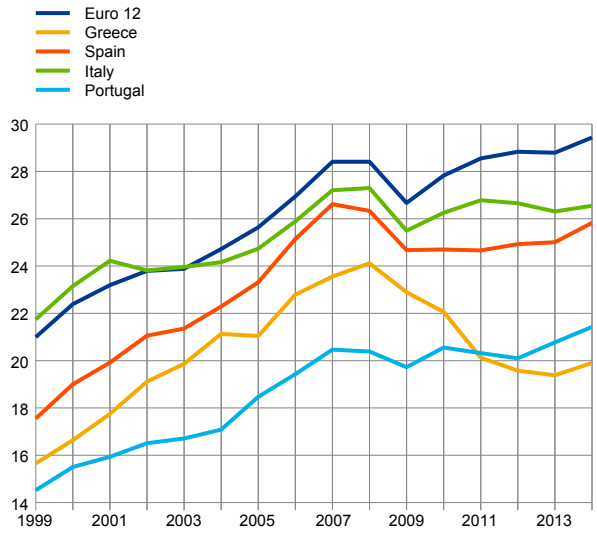
Similarly, in terms of income dispersion, there is some evidence of convergence among the EU28, but little evidence as regards the Euro 12. Dispersion of per capita income levels has increased overall for the Euro 12, after a temporary narrowing between 2006 and 2008 (see Chart 3). Some convergence in terms of reduced income dispersion is detected when looking at the EU28 as a whole, thanks to the catching up of CEE economies. However, the pace of the reduction of income dispersion seems to have slowed during the crisis period, i.e. since 2008.

[2] The stronger convergence performance of CEE countries deserves a deeper analysis, which is beyond the scope of this article. However, the increase in the economic integration of these countries within the EU over the sample period could explain part of their convergence performance. Some evidence of the positive effects of EU membership on relatively low-income countries, largely thanks to a greater degree of economic integration, is given in Crespo Cuaresma, J., Ritzberger-Grünwald, D. and Silgoner, M.A., "Growth convergence and EU membership", *Applied Economics*, Vol. 40, No 5, 2008, pp. 643-656.

Chart 2

Real GDP per capita in the Euro 12

(GDP per capita in 1,000 PPS)

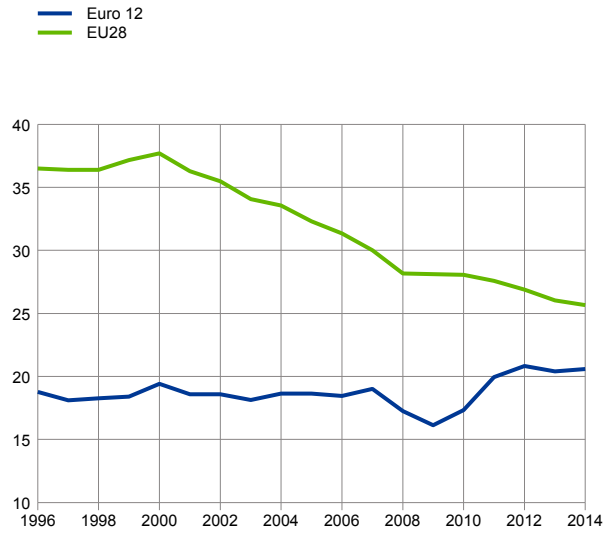


Sources: European Commission and ECB staff calculations.

Chart 3

Standard deviation of GDP per capita

(GDP per capita in 1,000 PPS)



Sources: European Commission and ECB staff calculations.
Note: Luxembourg is excluded (see the note to Chart 1).

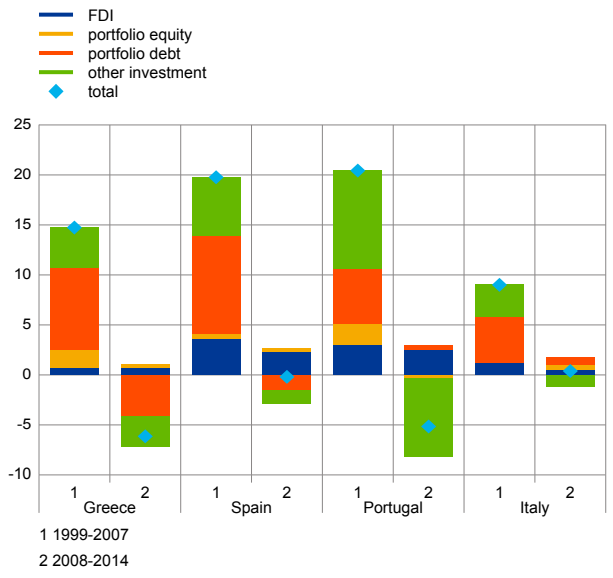
3 Reasons for the lack of real convergence

At the start of EMU many observers expected that deeper monetary and financial integration would trigger faster real convergence. As theory would predict (see Box 1), gross private capital inflows in the pre-crisis years were sizeable in those Euro 12 countries with per capita income levels significantly below the euro area average, including Greece, Portugal and, to a lesser extent, Spain. In the case of Italy, capital inflows were much lower (see Chart 4), as with most other high-income countries. Capital inflows to these countries mainly consisted of investment in debt instruments and banking flows, whereas inward foreign direct investment (FDI) was less significant. In principle, private capital flowing to lower-income euro area countries should have supported productivity gains and sustainable long-term increases in income levels in these countries. When the global financial crisis started, the amount of external private financing began to fall, and continued to decline substantially over the crisis period.

Chart 4

Gross private capital flows to Greece, Spain, Portugal and Italy

(cumulated flows in percentages of GDP)



Source: ECB.
Note: The item "other investment" excludes flows to the government and national central bank.

The lack of sustainability in the process of real convergence in the pre-crisis years was mainly due to the combination of three factors. First, institutional conditions in some countries were not supportive of business innovation and underlying productivity growth. Second, structural rigidities and a lack of effective competition (especially in the non-tradable sector)

contributed to a misallocation of capital. This in turn prevented the supply potential of the economy from catching up with demand. Third, the sharp drop in real interest rates favoured exuberant credit growth and pushed up demand, engendering misguided expectations about future income.[3]

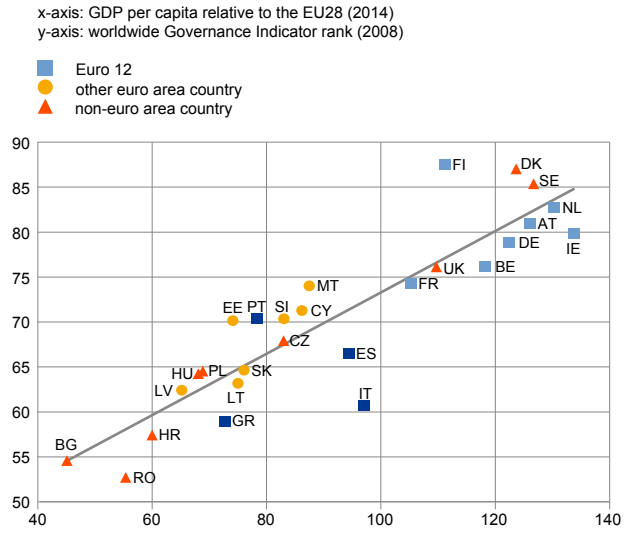
First, as regards institutional factors, the quality of domestic institutions and governance affects economies' per capita income growth. Countries with a higher ranking in terms of governance tend to exhibit higher income levels. The euro area countries that did not show convergence (or even diverged) in the pre-crisis years (Greece, Spain, Italy and Portugal) are also the countries with the lowest ranking in terms of governance in the Euro 12 (see Chart 5). This low ranking reflects a combination of factors including the effectiveness of government, the quality of the regulatory environment and the size of the informal economy. All these factors have a significant bearing on long-term growth.

Second, countries with structural rigidities were hit particularly hard during the global financial crisis, which contributed to the sharp reversal of convergence during this period. Some Euro 12 countries (especially Greece and Portugal) had very rigid product and labour markets before the crisis (see Chart 6).

Chart 5

Worldwide Governance Indicator rank and GDP per capita

(GDP per capita in PPS; EU28=100)

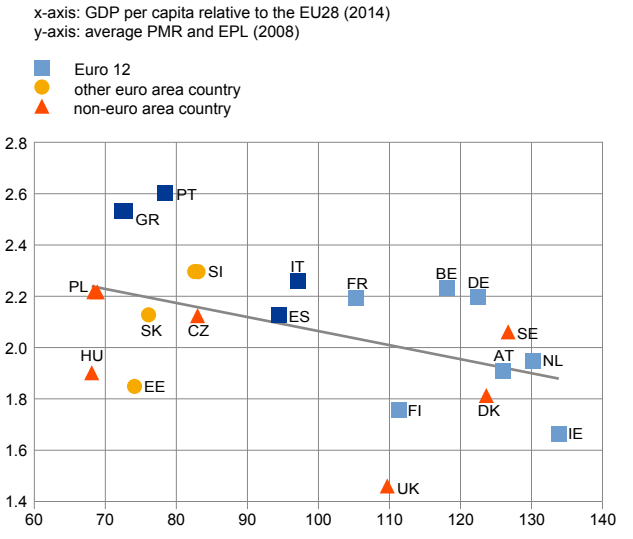


Sources: World Bank and Eurostat.
Notes: Worldwide Governance Indicators are the composite rank of average positions in six broad dimensions: voice and accountability, political stability and absence of violence/terrorism, government effectiveness, regulatory quality, rule of law, and control of corruption. Luxembourg is excluded (see the note to Chart 1). The dark blue squares represent those of the catching up economies in the Euro 12 that showed no convergence over this period (Greece, Spain and Portugal), and Italy, the Euro 12 country with the largest divergence.

Chart 6

Structural rigidities and GDP per capita

(GDP per capita in PPS; EU28=100)

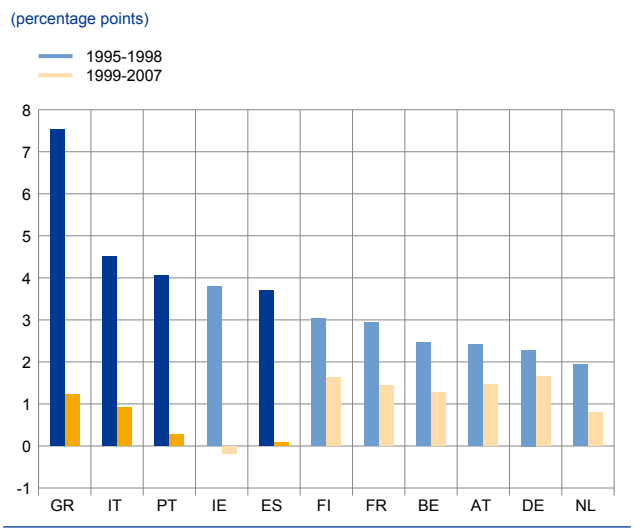


Sources: European Commission and Organisation for Economic Co-operation and Development (OECD).
Notes: The OECD product market regulation (PMR) indicators cover formal regulations in state control of business enterprises, legal and administrative barriers to entrepreneurship, and barriers to international trade and investment. The larger the value, the more rigid the regulations. The OECD employment protection legislation (EPL) indicators are synthetic indicators of the strictness of protection against individual and collective dismissals for workers with a regular contract. The summary indicators are obtained by factor analysis, in which each component is weighted according to the overall variance of the data. PMR and EPL data were unavailable for 2008 for Bulgaria, Croatia, Cyprus, Latvia, Lithuania, Malta and Romania. Luxembourg is excluded (see the note to Chart 1). The dark blue squares represent those of the catching up economies in the Euro 12 that showed no convergence over this period (Greece, Spain and Portugal), and Italy, the Euro 12 country with the largest divergence.

[3] See Borio, C., "The financial cycle and macroeconomics: what have we learnt?", *BIS Working Papers*, No 395, December 2012.

Chart 7

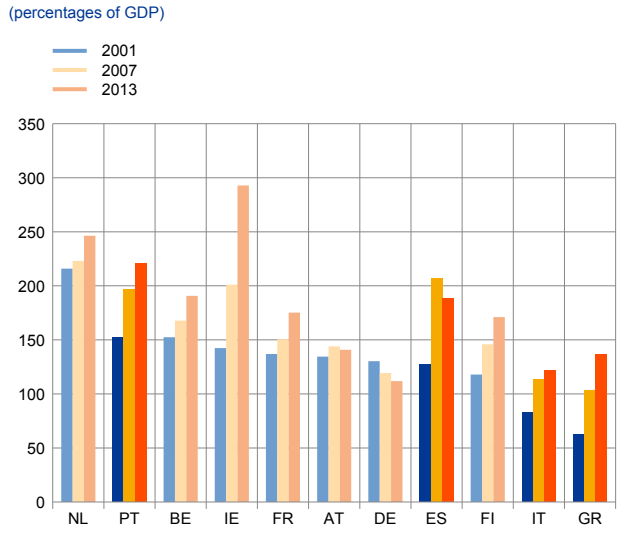
Real three-month money market rates in the Euro 12



Sources: European Commission and ECB staff calculations.
Notes: Nominal three-month money market rates are HICP-adjusted. The darker coloured columns represent those of the catching up economies in the Euro 12 that showed no convergence over this period (Greece, Spain and Portugal), and Italy, the Euro 12 country with the largest divergence.

Chart 8

Private sector debt in the Euro 12



Sources: European Commission and ECB staff calculations.
Notes: Private sector debt is the sum of the unconsolidated debt of households and non-financial corporations. The darker coloured columns represent those of the catching up economies in the Euro 12 that showed no convergence over this period (Greece, Spain and Portugal), and Italy, the Euro 12 country with the largest divergence.

In the labour market, these rigidities included a high degree of employment protection and wage bargaining systems that were not supportive of flexible wage adjustments. In the product markets, several sectors, including network industries, were sheltered from competition, which slowed down the adjustment of profit mark-ups during the crisis. The rigidities that hampered the adjustment of wages and prices significantly lengthened the process of reallocating labour and capital from crisis-hit sectors (e.g. construction) to faster growing sectors and increased the costs of the adjustment in terms of unemployment and income losses.

Third, in the pre-crisis years, a credit-driven domestic demand boom and erroneous expectations about future economic growth prospects masked the weak growth potential in a number of countries. Compared with the average of the pre-euro area years (between 1995 and 1998), real interest rates dropped very sharply, especially in the southern euro area countries, and also in Ireland (see Chart 7). The substantial drop in real interest rates in these economies was a result of two factors: (i) substantial convergence in nominal interest rates before and after the introduction of the euro, and (ii) a rise in inflation in these countries above the euro area average during the early years of EMU.[4] Moreover, the credit-driven domestic demand boom that continued for many years led to an overestimation of growth potential in a number of countries, particularly in Greece and Spain. As a result, fiscal policy was too pro-cyclical during the boom years, as budgets were based on the assumption that the high revenues generated by unsustainable domestic demand would continue to be generated in the years to come. With the onset of the severe crisis, fiscal revenues dropped sharply in a context of insufficient fiscal buffers, resulting in a rapid increase of public debt.

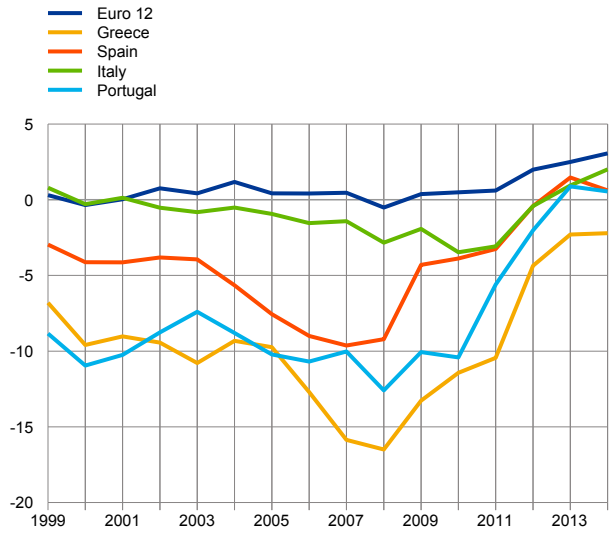
The excessive private sector credit growth in some countries led to rising debt levels in the corporate and/or household sector. Ireland, Spain and, to a lesser extent, Greece and Portugal recorded a substantial increase in private sector indebtedness (see Chart 8). The risks related to the sharp credit growth and increasing indebtedness were insufficiently addressed by the national authorities.

[4] For a more detailed explanation, see the article entitled “Monetary policy and inflation differentials in a heterogeneous currency area”, *Monthly Bulletin*, ECB, Frankfurt am Main, May 2005.

Chart 9

Current account balances in the Euro 12

(percentages of GDP)



Source: European Commission.

In particular, macroprudential tools to limit excessive borrowing were either not used or were too weak to dampen credit growth sufficiently in these economies.

Excessive growth of credit and domestic demand also led to the accumulation of very large external imbalances in the pre-crisis years. The current account deficit increased significantly over the pre-crisis years in Greece, Spain and Portugal. In Italy, a higher-income country, the current account deficit remained moderate (see Chart 9). Large cumulative current account imbalances in economies that are catching up are not necessarily problematic if the accumulation of large foreign liabilities is later matched by current account surpluses. If such current account deficits finance productivity-enhancing investments that lead to higher export revenues in the future, a temporary increase in current account deficits can turn out to be sustainable. However, the convergence pattern of these euro area countries did not meet this condition in the pre-crisis period, since the accumulation of capital was heavily biased towards low-productivity, non-tradable sectors. While the expansion of external imbalances in Spain mainly reflected excessive investment in some segments of the private sector (particularly construction), in Greece overspending in the public sector was the main contributor to the gap between savings and investment. In Portugal low public and private savings played a significant role.

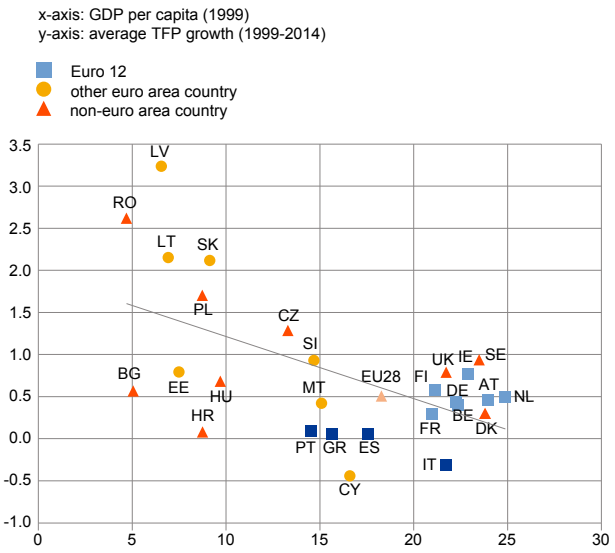
4 The role of productivity growth in the convergence process

The financial flows channelled to the low-income countries failed to generate productivity convergence in the pre-crisis period. TFP measures the efficiency with which labour and capital inputs are used in the production process and is a key driver of convergence (see Box 1). As a group, the EU28 countries with lower income levels tended to exhibit higher TFP growth, supporting the convergence process (see Chart 10). However, this was mostly due to CEE countries. In fact, Euro 12 countries with higher initial income levels even tended, on average, to experience higher TFP growth than the lower-income euro area countries.[5] The labour productivity growth of some economies that are catching up, especially Greece, Spain and Portugal, was disappointing. In Italy TFP growth largely underperformed the euro area average and was among the lowest in the EU28.

[5] For a review of the role of TFP and the lack of convergence in the euro area, see "Catching-up processes in the euro area", *Quarterly report on the euro area*, Vol.12, No 1, European Commission, March 2013, pp. 7-18.

Chart 10
GDP per capita and average TFP growth

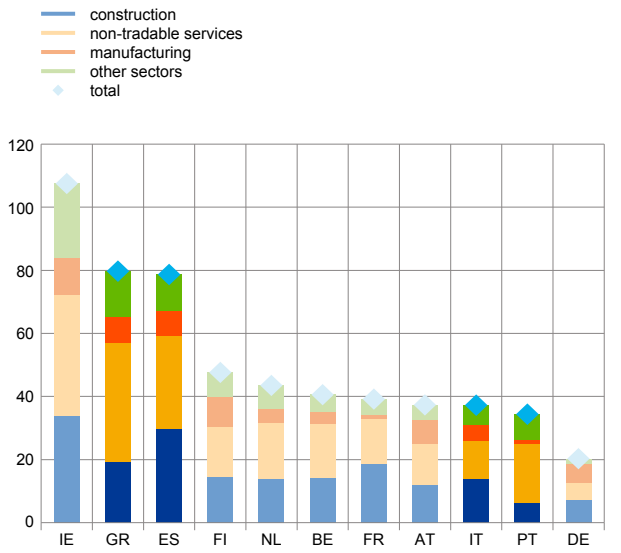
(GDP per capita in 1,000 PPS, percentage changes)



Sources: European Commission and ECB staff calculations.
Notes: Luxembourg is excluded (see the note to Chart 1). The dark blue squares represent those of the catching up economies in the Euro 12 that showed no convergence over this period (Greece, Spain and Portugal), and Italy, the Euro 12 country with the largest divergence.

Chart 11
Breakdown of growth in value added by sector in the Euro 12

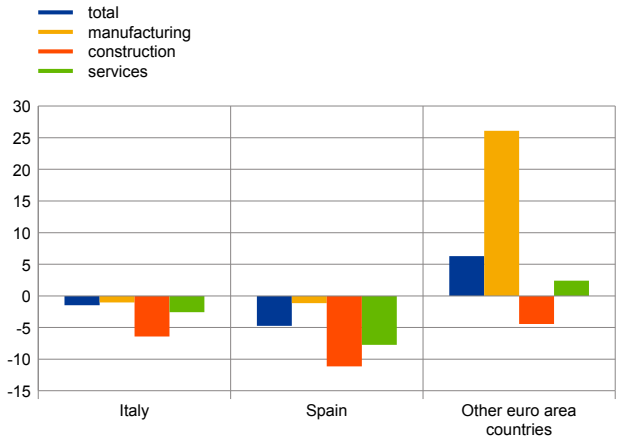
(cumulative growth contribution between 1999 and 2007)



Sources: European Commission, based on EU KLEMS and ECB staff calculations.
Notes: No data are available for Luxembourg. For Belgium and Portugal, growth is computed between 1999 and 2006, since no observation is available for 2007. "Construction" includes real estate activities. "Non-tradable services" refers to distribution/wholesale, hotels, and community/social services. "Other sectors" refers to agriculture and mining, electricity, transport, and financial intermediation. The darker colour columns represent the catching up euro area economies (EA12) with no convergence (Greece, Spain and Portugal) and Italy, the EA12 country with the largest divergence over this period.

Chart 12
TFP growth by sector in the Euro 12

(percentage changes)



Sources: European Commission, based on the EU KLEMS database, and ECB staff calculations.
Notes: No data are available for Greece and Portugal. "Other euro area countries" refers to Belgium, Germany, France, the Netherlands, Austria and Finland. "Total" includes other sectors, such as agriculture and mining, electricity, transport, and financial intermediation. The 2007 value for Belgium is extrapolated from 2006. Aggregates are unweighted.

The weak overall TFP performance reflected in part the sectoral growth composition in some countries. After the introduction of the euro, capital was increasingly channelled towards sectors with low marginal product of capital, i.e. weak productivity, but high rents.[6] Such sectors typically included non-tradable (services) sectors that were largely sheltered from competition, including distribution and network industries. The main reason for the much larger increase in value added in the pre-crisis years in Greece and Spain than in other Euro 12 countries (excluding Ireland) was a shift of resources towards non-tradable (services) sectors, including construction in the case of Spain. In Portugal, where growth was subdued even before the crisis, the non-tradable (services) sector also played a larger role in the increase in value added. In Italy, the sectoral value added composition was broadly similar to that of other large euro area countries (see Chart 11).

[6] According to Acemoglu and Robinson, the ultimate explanation for excessive rents is economic and political institutions that are not sufficiently "inclusive", and possibly even "extractive", in nature. See Acemoglu, D. and Robinson, J. A., *Why Nations Fail,* Profile Books, 2012.

In some euro area countries TFP growth was also disappointing in the tradable sector. As well as the allocation of capital to low-productivity sectors, it appears that in certain economies even potentially high-productivity sectors showed a weak productivity performance. In Spain and Italy, for instance, TFP growth in the period 1999-2007 was not only weaker in the services and construction sectors compared with the average of other euro area countries, but also in the manufacturing sector (see Chart 12). This suggests more widespread weaknesses in the business environments of these countries in the pre-crisis years, which is one of the factors that prevented them from realising their full capacity for innovation.[7]

Box 1

The conceptual framework behind economic growth and the key role of TFP in convergence

This box explains how the theory of economic growth has corroborated the key roles of TFP and technology in the convergence process through time. This is done by considering two classes of models: (i) those assuming an exogenous technology path, and (ii) those that introduce endogeneity into the technology path.

In the first class of models, referred to as neoclassical models, the level of technology determines the effectiveness of the production process. Solow[8], in his seminal paper, assumes that both population and technology grow at an exogenous rate, whereas the stock of capital is determined by savings. The larger the existing stock of physical capital in the economy, the larger the amount of savings that is needed to offset depreciation and keep capital at its current level. Eventually the economy will reach a point at which there are just enough savings to maintain capital at its current level. In this steady state, capital per unit of effective labour will no longer increase and all relevant per capita variables will grow at the rate of technological progress.

The Solow model's explanation for different growth rates among countries is that countries have different stocks of physical capital and are therefore at different points on their balanced growth paths. One of the crucial assumptions of the Solow model is that the marginal return to capital decreases, which means the more capital there is in the economy, the smaller the benefit from adding another unit of it. Consequently, if the economy has a small stock of capital, the benefits from increased investment are high.

Thus, according to Solow's model it is the high expected return on investment in capital-"poor" economies that motivates capital flows from rich to poor countries. The increased investment causes the economy to move upwards on the balanced growth path: this is the so-called "catching up" phenomenon. As a consequence, economies converge towards the same steady state level of income. This convergence is conditional on economic agents across countries having identical preferences and on all other features of economies also being identical. The resultant theory of conditional convergence implies that if there are persistent differences

7 For an overview of the role of sectoral productivity developments as regards convergence in the euro area, see Sondermann, D., "Productivity in the euro area: any evidence of convergence?", *Working Paper Series*, No 1431, ECB, Frankfurt am Main, April 2012.

8 Solow, R., "A contribution to the theory of economic growth", *Quarterly Journal of Economics,* Vol. 70, No 1, 1956, pp. 65-94.

across countries in preferences and other institutional features, divergence is possible not only in terms of levels of income, but also in terms of growth rates.

The empirical evidence has cast some doubts on the validity of the Solow model for explaining the observed speed of convergence across the world. In reality, neither differences in capital stocks nor capital flows that are high enough to account for the variation of income levels in the world can be observed. Barro and Sala-i-Martin[9] investigated the convergence hypothesis for both US states and an international sample of countries. Even though they were able to find evidence of convergence in both samples, they showed their empirical estimate of the speed of convergence of 2% per year to be much lower than the level theory would suggest.

While the neoclassical theory provides an appealing theoretical framework, in practice it does not provide an explanation of the sources of convergence outside the very narrow "conditional" theory. Differences in the effectiveness of production factors and varying speeds of technological progress could be one explanation for income differences across countries. However, by not being able to explain where differences in the level of these important variables come from or how progress can be created, the theory fails to explain how income convergence can be generated. Because the behaviour of individuals already results in the best possible outcome in these types of model, and because the growth rate is determined exogenously, it is also impossible for economic policy to improve a country's growth performance, for example by providing incentives to save and invest.

To overcome this problem, the second class of models introduces endogeneity into the technological process by explicitly modelling innovation and learning. Two general approaches can be distinguished: (i) the modelling of increased productivity through increasing returns to production factors (either capital or labour), and (ii) the explicit modelling of research and development (R&D) activities as a separate sector of the economy.

Increasing returns to production can be introduced by assuming that human capital, like physical capital, can be increased through investment. Uzawa[10] and Lucas[11] explicitly include human capital as a factor of production in their frameworks: investment in human capital corresponds to the time individuals spend in education. A better qualified workforce is assumed to have a positive influence on the rest of the economy (a so-called externality), which increases growth. One conclusion of neoclassical theory was that capital will flow from rich to poor countries and contribute to the catching up process in countries where capital is scarce. Since human capital, i.e. a country's workforce and its knowledge, is not as mobile as physical capital and is less likely to move abroad, models that include human capital as a growth factor can help to explain why persistent differences in income growth performance can be observed across countries. Endogenous growth models are therefore much better suited to providing input into policy decisions.

9 Barro, R.J. and Sala-i-Martin, X., "Convergence", *Journal of Political Economy*, Vol. 100, No 2, 1992, pp. 223-251.

10 Uzawa, H., "On a two-sector model of economic growth II", *Review of Economic Studies*, Vol. 30, No 2, 1963, pp. 105-118.

11 Lucas, R.E., "On the mechanics of economic development", *Journal of Monetary Economics*, Vol. 22, Issue 1, 1988, pp. 3-42.

An alternative way to endogenously create growth, and for convergence to be explained in a theoretical model, is by "producing" innovation in a separate sector of the economy. The introduction of such an R&D sector allowed Romer[12] to explain how permanent growth is possible. Like investment in human capital, increased research activities lift the level of knowledge and technological advancement not only for the individual research facility but for the economy as a whole and therefore have a positive influence on economic growth. To overcome the income difference and catch up with more advanced economies, poorer countries need a high rate of technological growth.

All in all, the endogenous growth models seem to better explain the observed speed of convergence across the world and allow policy-makers to design strategies that can boost TFP. According to these models, efforts towards a better-qualified workforce, increased R&D spending, openness and competition promote productivity, the dissemination of new technological developments and, therefore, economic growth and convergence.

5 How sustainable real convergence can be achieved

Against the background of the above evidence of lacking real convergence within the Euro 12, this section reviews the ways in which economic policies could foster sustainable convergence and resilience to negative shocks.[13] The analysis of the evidence for and causes of the lack of convergence shows that three main conditions need to be met to achieve sustainable convergence: (i) macroeconomic stability must be maintained, (ii) the affected economies must increase their degree of economic flexibility, and (iii) conditions for TFP growth must be improved.

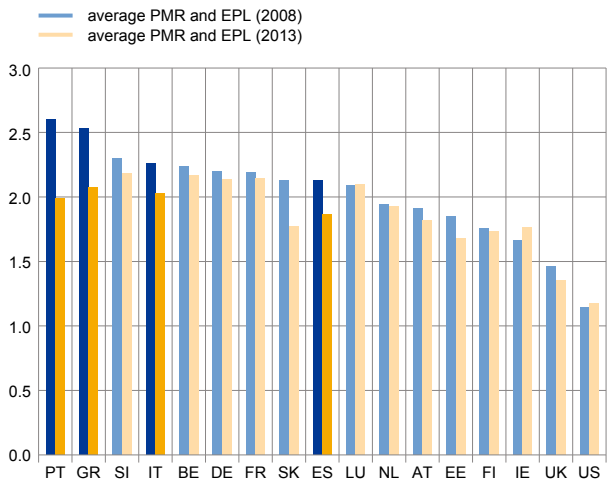
The first condition for sustainable real convergence is macroeconomic stability. The previous section showed how domestic institutions and structural features contributed to the accumulation of imbalances in a group of euro area countries, leading to an increasing gap between demand growth and supply-side potential. Since the crisis, the euro area countries subject to an EU-IMF financial adjustment programme have made progress in restoring their macroeconomic balances and have also implemented significant structural reforms. In most of these countries, the current account imbalances have largely disappeared. This has partly reflected a marked adjustment in unit labour costs. Fiscal balances have also improved substantially compared with the very high fiscal deficit-to-GDP ratios observed during the crisis years. However, stock imbalances, such as high external, private and public sector debt, still remain very high in many countries. In order to fully overcome these legacies of the crisis, it is important to consolidate the competitiveness gains achieved during the crisis and to maintain a stability-oriented fiscal policy stance that ensures that public indebtedness returns to sustainable levels in the coming years.

12 Romer, P., "Increasing returns and long-run growth", *Journal of Political Economy,* Vol. 94, No 5, 1986, pp. 1002-1037.

13 The role and impact on growth of structural reforms in the euro area is reviewed in the article entitled "Progress with structural reforms across the euro area and their possible impacts", *Economic Bulletin*, ECB, Frankfurt am Main, Issue 2, 2015, pp. 59-71.

Chart 13

Product market regulation (PMR) and employment protection legislation (EPL)



Sources: ECB staff calculations and OECD.
Notes: See the notes to Chart 6 regarding the OECD PMR and EPL indicators. For the United States, no PMR data are available for 2013, thus only EPL is shown. The darker coloured columns represent those of the catching up economies in the Euro 12 that showed no convergence over this period (Greece, Spain and Portugal), and Italy, the Euro 12 country with the largest divergence.

The second condition for sustainable convergence is increased economic flexibility that can contribute to a correction of the pre-crisis misallocation of capital. As shown in the previous section, some of the countries with lower income per capita levels (e.g. Greece, Spain and Portugal) have suffered from particularly high levels of rigidity in their product and labour markets. During the crisis period such rigidities increased the economic costs of the adjustment and led to a sharper fall in potential growth than in other countries. A key step for ensuring a sustainable growth model in the euro area economies with a need to converge is the elimination of the deep structural deficiencies that caused the widespread misallocation of capital and labour prior to the crisis. This can be reinforced through measures that increase competition in the markets for goods, services and labour (see Box 2). While the countries subject to financial assistance programmes have since the onset of the crisis implemented significant reforms that have narrowed the gap in economic flexibility compared with other euro area countries (see Chart 13), further efforts are needed to close even this gap, let alone bring them up to the level of the countries with the most flexible product and labour markets worldwide.

The third condition for sustainable convergence is the achievement of higher TFP growth. As seen in Section 4, there was a tendency towards weak (or even falling) TFP in some of the lower-income euro area countries before the crisis, even in high-productivity sectors (e.g. manufacturing). Country-specific domestic policies should foster the main drivers of TFP by focusing on three main policy areas: (i) improving the quality of labour, e.g. by increasing the proportion of highly skilled workers, (ii) improving the quality of capital by fostering the adoption of innovation and technology, and (iii) creating an institutional framework that supports innovation in businesses.[14]

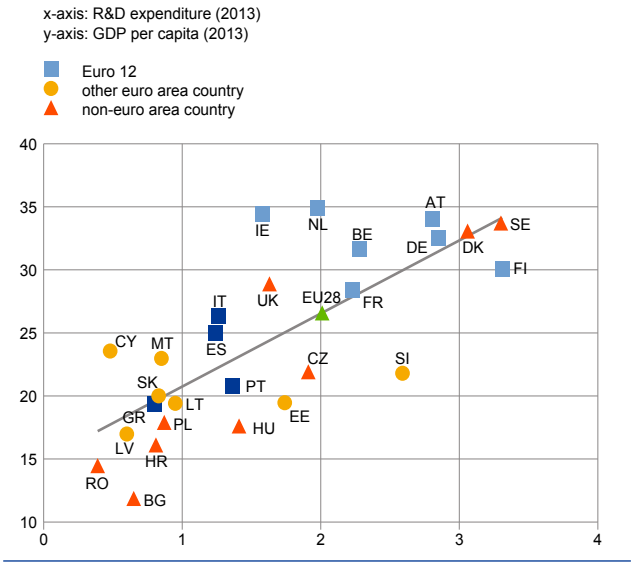
Productivity is clearly linked to the quality of labour. During the first years of EMU the misallocation of resources towards low-productivity sectors created an increased demand for low-skilled workers in some economies that are catching up. This had a negative impact on human capital by creating misguided incentives for leaving education early. Well-targeted active labour market policies may help to gradually channel the active labour force to more technologically advanced sectors.

[14] For more on the main drivers of TFP in the euro area, see the article entitled "The drivers of total factor productivity in catching-up economies", *Quarterly report on the euro area*, European Commission, Vol.13, Issue 1, April 2014, pp. 7-19.

Chart 14

R&D expenditure and GDP per capita in 2013

(R&D expenditure as a percentage of GDP; GDP per capita in 1,000 PPS)



Sources: European Commission and Eurostat
Notes: For Ireland, R&D expenditure refers to 2012, as no value was available for 2013. Luxembourg is excluded (see the note to Chart 1). The dark blue squares represent those of the catching up economies in the Euro 12 that showed no convergence over this period (Greece, Spain and Portugal), and Italy, the Euro 12 country with the largest divergence.

TFP performance is also clearly linked to investment in information and communications technology (ICT) sectors and in technological progress that increases growth potential. Economic theory says that increased research activities increase the level of knowledge and technological advancement for the economy as a whole and therefore have a positive influence on real convergence (see Box 1). Countries that spend more on R&D tend to exhibit higher income levels (see Chart 14).

Sound domestic institutions are essential for attracting investment in human capital and FDI, and for the creation of new firms. Incentives for private sector innovation may not be effective if firms have to operate in an environment where there are heavy domestic regulatory burdens, inefficient public administration and judicial systems, or insufficient measures against corruption, or where they have to compete with a large informal economy. Both EU-wide and domestic policies must improve public governance conditions, fight corruption and create the conditions for firms to operate smoothly and efficiently.

Greater economic integration should also support the convergence process. Financial market integration contributed to the channelling of capital flows to lower-income euro area countries before the crisis. However, owing to delays in the completion of the single market for services at the European level, many domestic barriers to competition remain largely in place in services sectors, particularly in Greece, Spain and Portugal, as well as in Italy. Completing the Single Market by removing the remaining regulatory barriers in sectors sheltered from competition would promote a more efficient allocation of capital and speed up the diffusion of new technologies, in particular in the lower-income euro area countries that have more closed services markets. There is also a clear role for common European policies to play in removing the remaining cross-country sectoral barriers by deepening the Single Market. As explained in more detail in Box 2, the Single Market is far from being completed.

Capital market integration should contribute to a more efficient allocation of capital. As shown in Section 3, capital flows to lower-income euro area countries before the crisis were mainly of the debt-creating type. At the same time, equity flows, which are potentially more conducive to higher productivity growth, were fairly low, reflecting in part the underdeveloped nature of capital market integration in the euro area. The development of a capital markets union and a situation where equity provides a greater share of financing is needed to improve the allocation of capital among the euro area economies (see also Box 2).[15]

[15] For the role of the financial sector in fostering real convergence in the euro area, see also Praet, P., "The financial cycle and real convergence in the euro area", speech at the Annual Hyman P. Minsky Conference on the State of the US and World Economies, Washington D.C., 10 April 2014.

Box 2
The role of the Single Market

The Single Market is a pillar of Europe's economic integration. Since 1993 the objective of the Single Market has been to guarantee the free movement of people, goods, services and capital. Over the past two decades or so it has been continuously modified to keep pace with more recent developments, such as the growing importance of the services sector and the digital economy. The Single Market aims to enhance competition within Europe, facilitate an efficient allocation of resources and allow European companies to compete in global markets.

By reducing obstacles to trade, labour mobility and competition, and by favouring technological diffusion, the Single Market should support real convergence in the euro area. Countries with a specialisation in industries with increasing economies of scale should derive more benefit from the Single Market, as there is greater scope to improve efficiency in these industries; this also applies to countries with more protected sectors, as the benefit of liberalisation will be greater for them. A more integrated euro area will lead to more resilient economies and foster sustainable growth, particularly in countries that have shown greater vulnerabilities during the crisis. Some features of the Single Market that can foster sustainable convergence in the euro area still require further improvement. This box focuses on the free movement of services, labour and capital.

While progress on the free movement of goods has been significant, the exchange of services across national borders is still lagging behind. Even though services account for over 70% of the EU economy, the services sector shows much less trade integration than the goods market. Although this is partially due to the non-tradable nature of some services, there are still non-negligible barriers as regards tradable services.

The EU Services Directive of 2006 specifically targets trade and competition in the services sector. Its objective is to reduce product regulations that constitute barriers to cross-border trade in services, especially for small and medium-sized enterprises. An evaluation of the success of the Directive conducted by the European Commission in 2012 revealed promising results (see Monteagudo et al.[16]). The implementation of the Directive is seen leading to the greatest improvements in countries with many and/or high barriers, in particular, Greece, Spain, Italy and Portugal (see Chart). Removing barriers allows enterprises from lower-income countries to compete in foreign markets and facilitates the exchange of ideas and technology.

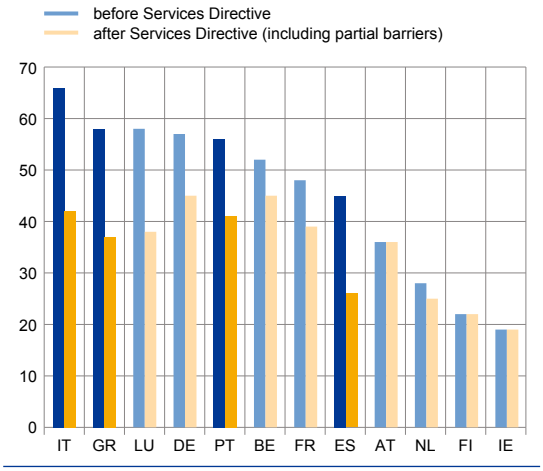
Estimations of the impact of the Services Directive on GDP growth show a positive EU-wide effect of around 0.8%.[17] Country-specific effects depend on the degree to which the Directive has been implemented, as well as on the importance of the various sectors for individual economies. For those EU economies that are more behind in services sector regulation than others, the benefits can

16 Monteagudo, J. et al., "The economic impact of the Services Directive: A first assessment following implementation", *European Economy Economic Papers*, No 456, European Commission, Brussels, 2012.

17 "Report from the Commission to the European Parliament, the Council, the European Central Bank, the European Economic and Social Committee, the Committee of Regions and the European Investment Bank. A single market for growth and jobs: an analysis of progress made and remaining obstacles in the Member States", *Contribution to the Annual Growth Survey 2014*, European Commission, Brussels, November 2013.

Chart

Effect of the EU Services Directive on the number of cross-border barriers



Sources: Monteagudo et al. and ECB staff calculations.
Note: The darker coloured columns represent those of the catching up economies in the Euro 12 that showed no convergence over this period (Greece, Spain and Portugal), and Italy, the Euro 12 country with the largest divergence.

be particularly large, as shown by a positive effect of 1% and 1.4% of GDP in Greece and Spain respectively. In a scenario where all barriers to trade and services are completely abolished, additional GDP gains of up to 1.6% could be realised. Fully eliminated barriers would have the further beneficial effect of increasing productivity by a figure in the range of 5% (Portugal) to 7% (Greece).

Another key element of the Single Market is labour mobility. EU citizens have the right of free movement, i.e. the right to live and work in any EU country and to be treated equally by local employers. As mentioned in Box 1, labour mobility can contribute to convergence by moving human capital and skills, but, more importantly, it can also be an important shock absorbing mechanism in the face of country-specific or sectoral shocks. Over the last decade, intra-EU labour mobility has been driven mainly by income and wage differentials between the eastern and western Member States. More recently, it has also been driven by the growing differences in labour market performance, especially between euro area countries.

During the crisis, there was a rise in labour inflows into the more resilient economies, such as Germany and Austria. However, the scale of these flows has been relatively small. In fact, while labour mobility is an area where a significant number of policies have been implemented at the EU level, it is still well behind US standards. In response to the sharp rise in unemployment resulting from the protracted crisis, there have been a number of policies aimed at removing obstacles to labour mobility, such as the new EU Directive on professional qualifications (in force from January 2016), the creation of a pan-European job search network (EURES) in 2014 and the new Directive on supplementary pension rights in 2014.

Finally, the single market for capital appears far from complete. Important steps in the creation of a single capital market were the Payment Services Directive in 2007, which laid out the harmonisation of payment services, and the Single Euro Payments Area (SEPA). The latest step in capital markets integration is the capital markets union, announced by the European Commission at the beginning of 2015,[18] which is aimed at further integration of financial markets, improved access to finance for firms and the creation of more investment opportunities for European households and enterprises. Well-functioning capital markets will also facilitate the mobilisation of private financing in the context of the Investment Plan for Europe, launched in November 2014.

[18] "Building a Capital Markets Union", *Green Paper*, No 63, European Commission, Brussels, February 2015.

6 Conclusions

While CEE countries have been catching up to the EU average over the past 15 years, progress towards real convergence among the 12 countries that formed the euro area in its initial years has been disappointing. Experience has shown that initial convergence can unravel quickly in the face of exogenous shocks if it is not underpinned by a sound institutional framework and structural conditions that are conducive to productivity growth.

The crisis has shown that large capital flows to low-income countries can only contribute to sustainable real convergence if resources are efficiently allocated in the economy. One of the key factors that ensure success in a monetary union is a sufficiently flexible economy where price signals allow resources to be properly channelled towards high-productivity sectors. It is equally important to complement the single monetary policy with counter-cyclical fiscal and macroprudential tools at the national level in order to address at an early stage the risk of boom-bust cycles
in euro area economies that are catching up.

Pursuing sustainable convergence is mainly a national responsibility. However, efforts at the national level should be complemented by structural reforms at the European level aimed at deepening the Single Market. Deepening the Single Market would allow country-specific shocks, especially to low-income countries, to be better absorbed. This is particularly important for the capital markets union, where substantial and swift progress is still needed.