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Quarterly Report on the Euro Area

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- Assessing the private sector deleveraging dynamics
- Rising sovereign risk premia and the profile of fiscal consolidation

Economic and Financial Affairs

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Marco Buti
Director General

Regular readers of the Quarterly Report on the Euro Area will notice that this edition arrives in a new guise. After more than ten years of publication history, throughout which the Report has evolved and matured in both its style and content, this revamping should give it a fresh, contemporary feel. What has not changed, however, is the purpose for which the European Commission's Directorate-General for Economic and Financial Affairs (DG ECFIN) and its staff produce the report. The Quarterly Report will continue to serve as an outlet for promoting and contributing to a policy-driven research agenda for a post-crisis euro area economy. Its analysis aims to be both analytically rigorous and accessible also to non-specialists. At the same time, the research in the report will always correspond to a current policy question or identify new issues for economic policy and macrofinancial surveillance.

The changes and challenges the euro area and its constituent economies have been facing since the global economic and financial crisis erupted in 2008 have governed the main themes that the Quarterly Report has addressed in recent years. Much attention has been devoted to the crisis impact and the policy response at the EU and euro area level, but also to the origins and consequences of macroeconomic imbalances in the euro area. The Report has monitored both external and internal rebalancing processes underway as well as taking stock of the comprehensive overhaul of the euro area's policy framework. While these themes will remain a key focus of the Report, I see three further issues that require clearer answers in the coming years. The Quarterly Report will also cover these questions, which in some sense are the great 'known unknowns' of applied macroeconomics today:

First, there is still deep uncertainty surrounding the outlook for growth in both the short, medium and long term. The fall in output across many advanced economies since 2008, including in most countries of the euro area, begs the question over the structural and cyclical drivers underpinning it. Understanding how business cycles may have changed and how growth trends have been affected will require a better understanding of current resource utilisation and the outlook for productivity determinants. A further challenge will be to conduct such analysis for an environment marked by persistent pressures on demand from deleveraging processes and credit scarcity. Economic policy continues to crucially rely on sound assessments of cyclical positions, for instance in assessing the pace of consolidation, and the long-term growth outlook is one of the main determinants of debt sustainability.

A second question relates to balance sheet adjustment processes in the private sector. As the euro area and other advanced economies have been suffering a balance sheet recession marked by strong deleveraging pressures after rampant prior credit growth, we need to better understand balance sheet adjustments. How much private-sector deleveraging should we expect before saving and investment rates return to more growth-friendly levels? How should the economy's supply side respond to persistent deleveraging forces? We know from previous episodes of balance sheet consolidation that these processes can be protracted and associated with weak growth in demand and credit. Appropriate ways need to be found to shape this deleveraging in order to reduce macrofinancial vulnerabilities while mitigating their adverse effects on output and credit to the real economy.

In part related to this is a third issue concerning the links between finance and growth. Financial market inefficiency can come at a high social cost, as the gyrations in market risk perceptions and risk appetite over the past decade have shown. Financial institutions will remain indispensable in channelling credit to the real economy in the future, but we have yet to fully understanding how this core function can be promoted better. This will be as much about the design of better financial oversight and supportive monetary policy as it will be about understanding how various forms of risk behave. Although the draining of liquidity from the euro area periphery in 2011/12 was damaging, it is now thankfully reversing and we must build further on the insights that have thereby been won into the dynamics of capital flows in the euro area.

No single publication could be expected to fully address all these questions, but as part of an international research effort the Quarterly Report will help to push the analytical debate on these matters along. With the better functioning of Economic and Monetary Union as the ultimate goal, this report will help to detect progress and challenges along the way.

I. Catching-up processes in the euro area ([1])

Convergence forces are generally contributing to a narrowing of the income gaps between EU Member States through faster growth in catching-up economies. In the euro area, however, the convergence process appears to have stalled a few years after the inception of the euro. This essentially reflects a poor growth performance of catching countries, which can in turn be traced back to disappointing productivity and TFP growth.

Catching-up processes in the euro area were not hampered by insufficient capital, as converging economies benefited from large inflows of foreign capital in pre-crisis years. However, the observed capital accumulation pattern does not seem to have been conducive to rapid technological change and productivity growth. There is also evidence of capital misallocation, with the accumulation process becoming gradually less economically efficient during the first decade of the euro. Sectoral data show that, in most of the catching up economies, investment was high in all sectors during the pre-crisis period, but relatively more so in the non-tradable/services industries than in the manufacturing sector. While, in the very early years of the euro, investment tended to be allocated to sectors with a high productivity of capital, high profit mark-ups emerge as main drivers of investment accumulation in later years. This shift in drivers was associated with large capital flows into low productivity industries of the non-tradable/services sectors and could be suggestive of an accumulation process driven more by rent seeking than by efficiency considerations.

The weakness in productivity in the catching-up countries has been broad-based, affecting all economic sectors. It cannot be explained by human capital differences, as the skill structure improved over the last decade in the countries concerned. Although further analytical work is needed to better understand the drivers of TFP, insufficient investment in ICT and imperfect framework conditions in terms of competition and barriers to entry could be important explanations for the disappointing TFP performance.

This focus section reviews the euro-area's record in terms of Member States' income convergence. In pre-crisis years, strong convergence within the EU was accompanied by disappointing GDP per capita growth rates in some of the catching-up economies in the euro area (ES, PT and EL), but also in some Member States with a higher income per capita than the euro-area average (e.g. IT). Moreover, the crisis has substantially altered medium-term growth prospects in a number of euro-area Member States and particularly some of those engaged in an income catching-up process.

The patterns of convergence observed in the euro area during the pre-crisis period are reviewed on the basis of sectoral data and possible changes brought about by the crisis are discussed.([2]) The focus is divided into six sections. Section 1 presents the overall convergence record in the euro area. Section 2 looks at the role of productivity in the euro area convergence record in pre-crisis years. Section 3 reviews the evidence on capital (mis)allocation in the euro area. Section 4 discusses some key drivers of total factor productivity in the catching-up countries prior to the crisis. Section 5 looks at convergence prospects in the aftermath of the crisis. Finally, Section 6 draws conclusions.

I.1 Convergence patterns in the euro area

The evidence of convergence in terms of GDP per capita among euro area Member States after the adoption of the euro is mixed. Graph I.1 shows that while convergence among EU Member States was strong,([3]) catching-up processes within the euro-area were disappointing. Several euro area catching-up countries grew less rapidly than their GDP per capita level in 1999 would have suggested (i.e. these countries are located below the regression line in Graph I.1.). The cross-country correlation calculated for all EU Member States weakens significantly when the sample is restricted

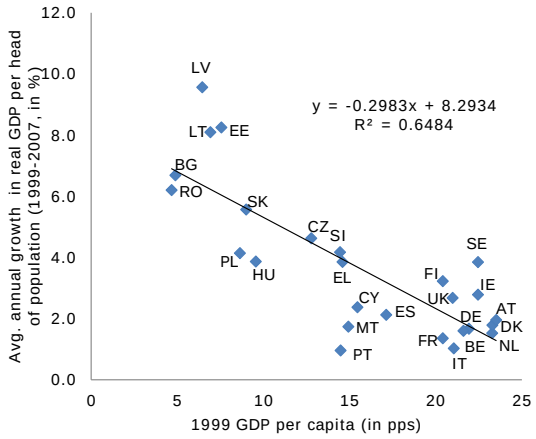
([1]) Section prepared by Narcissa Balta.

([2]) Catching-up economies: EL, ES, IE and PT. For an early pre-crisis assessment of catching-up processes in EMU see European Commission (2008), 'EMU@10: successes and challenges after 10 years of Economic and Monetary Union', European Economy, No 2 (June).

([3]) Graph I.1 displays a strong negative correlation between the level of GDP per capita at the launch of the euro (horizontal axis) and GDP growth over the period 1999-2007 across EU Member States. This corresponds to the so-called beta convergence equation in the economic growth literature: countries with lower GDP per capita tend to grow faster than others.

to the euro area, indicating a weaker convergence for the euro area than the EU as a whole. In addition, convergence forces appear to have been stronger during the decade before euro adoption.

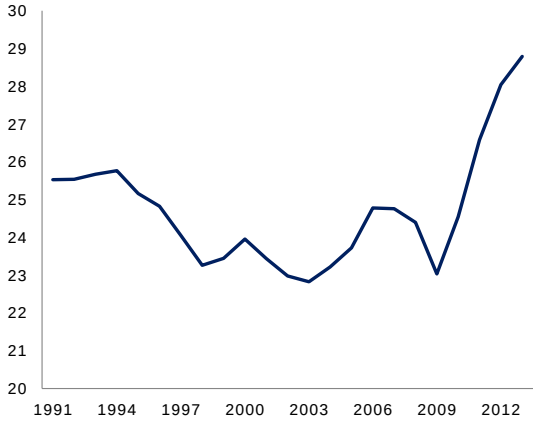
Graph I.1: **GDP per capita in level and GDP growth, EU countries**



Source: AMECO.

Graph I.2: **Country dispersion of real GNI per head of population, euro area**

(Cross-country standard deviation in % of average)



Source: DG ECFIN calculations based on AMECO.

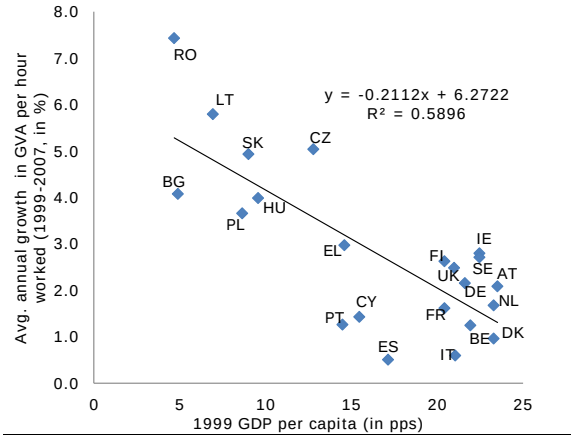
A similar conclusion emerges from Graph I.2, which shows that the cross-country dispersion of income per capita in the euro area decreased in the 1990s before picking up during the expansion phase of the previous cycle (2004-07). The increase in dispersion just before the crisis was due to a two-sided effect of slower catching-up (e.g. in PT, ES, EL) and lower growth in some countries with income per capita above the euro-area average (e.g. IT). Some convergence took place during the early stages of the crisis as less advanced countries were initially hit less severely than the more advanced ones. In the more recent years, however, divergence forces have resurfaced strongly with advanced countries rebounding more forcefully (e.g. DE) and less advanced ones experiencing protracted contraction. According to the Commission's winter forecast, dispersion is expected to widen further in 2013, reaching historical highs.

The next sections explore the slow convergence patterns observed in some less advanced euro-area Member States over the pre-crisis decade by looking at the main determinants of catching-up, productivity performance and capital accumulation.

I.2 Productivity performance during the pre-crisis years

Further evidence of weakness in the convergence processes comes from the data on the main driver of catching-up, namely labour productivity. Graph I.3 shows the relationship between the level of GDP per capita at the launch of the euro and performance in terms of labour productivity during the pre-crisis period. It indicates that EU Member States with comparatively lower GDP per capita have generally benefited from faster growth in productivity over the past decade. Nevertheless, this convergence mostly holds outside the euro area: a majority of euro-area catching-up countries (e.g. ES, PT, CY) are located clearly below the regression line, pointing to disappointing productivity performance.

Graph I.3: **GDP per capita in level and labour productivity growth, EU countries**

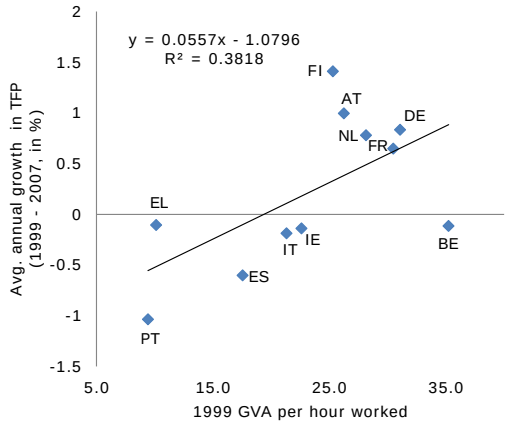


Source: AMECO.

To examine the structural drivers of labour productivity, this focus section uses sectoral data

from the EU KLEMS database. EU KLEMS growth accounting methodology allows assessing the efficiency with which inputs are used in the production process excluding the effect of changes in the quality of capital and labour inputs.(4)

Graph I.4: **Total factor productivity, selected euro area countries**



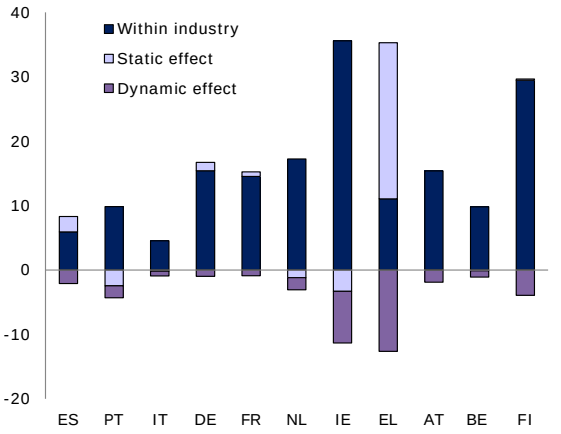
Source: DG ECFIN based on EU KLEMS.

Total factor productivity (TFP) – i.e. the efficiency with which inputs are being used in the production process – appears to be the main factor explaining the poor convergence in productivity in the euro area in pre-crisis years. The observed weak convergence in gross value added per hour worked was accompanied by a TFP divergence pattern. Northern countries (DE, AT, NL, and FI) saw higher TFP growth rates between 1999 and 2007 than the rest of the euro area. Graph I.4 shows an atypical positive correlation between the initial level of GDP per capita and average TFP growth rates over the period 1999-2007.(5) In most catching-up economies, TFP actually dropped over that period.

The divergence in labour productivity can partly be explained by structural factors such as possible shifts in the distribution of resources across industries and differences in industrial specialisation patterns. The industry-level data of EU KLEMS can be used to perform shift-share analysis on labour productivity growth.

Graph I.5: **Labour productivity growth decomposition, selected euro area countries**

(in %, 1999-2007)



Source: DG ECFIN based on EU KLEMS.

In Graph I.5, labour productivity growth is decomposed for each country into a *within-industry effect* (i.e. that identifies productivity improvements within each industry) and a *structural effect* (i.e. that identifies reallocation of factors towards industries with a higher initial level of labour productivity – *a static effect* – and/or towards industries with a higher rate of labour productivity growth – *a dynamic effect*). The analysis reveals that, for all euro-area countries, labour productivity was largely driven by productivity gains obtained in each industry (within-industry effect) for the period 1999-2007. However, for most catching-up economies (e.g. ES, PT), these gains were much smaller than in the rest of the euro area mainly due to the poor performance in the non-tradable/services sectors.

Moreover, even if several catching-up countries partly allocated resources towards industries with a higher initial productivity level (positive static effect in ES and EL), they have not channelled enough resources towards industries with higher productivity growth (negative dynamic effect). The latter effect was, to a great extent, determined by a shift in resources towards low-productivity growth non-tradable sectors such as construction, distribution industries, hotels and restaurants, public administration, education and health. The negative dynamic effect was generally more

(4) EU KLEMS database provides data at detailed industry level. For more details, see O'Mahony, M. and Timmer, M.P. (2009), 'Output, input and productivity measures at the industry level: the EU KLEMS database', *The Economic Journal 119* (June), F374-F403. Due to data availability in EU KLEMS, euro area means EA11: BE, EL, ES, IE, IT, DE, FR, NL, AT, PT and FI.

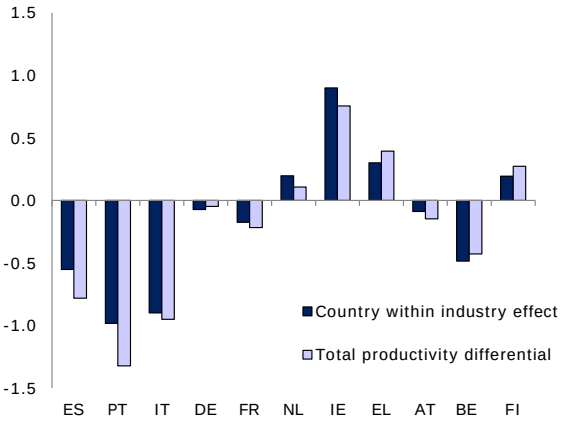
(5) TFP performance, as measured by EU KLEMS, does not reflect the impact of changes in the quality of both labour and capital inputs, i.e. it measures disembodied technological change. For example, Ireland appears to have much lower TFP growth performance after euro adoption. This is due largely to the exclusion from the TFP residual of capital input quality composition changes during the period (i.e. shifts from non-ICT to ICT inputs).

pronounced in the catching-up economies than in the rest of the euro-area.

Graph I.6 shows another decomposition of labour productivity. This time, growth differentials between the catching-up economies and the euro-area average are decomposed into a component that measures the differences that would have occurred even without any difference in industrial specialisation (i.e. country within-industry effect) and a specialisation effect. The graph shows that, over the pre-crisis period, the country within-industry effect explains much of the total growth differential, indicating that differences in labour productivity growth between the catching-up economies and the euro-area average would have been present even without any difference in industrial specialisation. However, the different industrial specialisation patterns did lead to a further increase in the differential (e.g. ES, PT).

Graph I.6: **Labour productivity differentials**

(relative to EA11 average, 1999-2007)



Source: DG ECFIN based on EU KLEMS.

Overall, over the pre-crisis decade, labour productivity was not a driver of convergence for catching-up economies. The evidence presented above points towards a strong divergence in TFP compounded by adverse structural shifts in the allocation of resources towards industries with lower productivity growth, i.e. industries of the non-tradable/services sectors. Given that the catching-up economies have been major recipients of capital flows over the period, it might well be argued that in some cases some form of capital misallocation was present. This is the subject of the next section.

I.3 Capital (mis)allocation across sectors

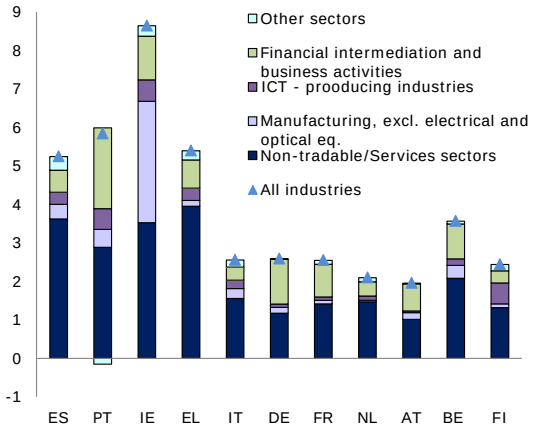
Despite the slowdown in the convergence process in the euro area, capital growth was quite strong in catching-up economies in pre-crisis years. Average growth in capital services over the period 1999-2007 ranged from 5¼% to 8¾% in catching-up economies, compared with a much more modest range of 2% to 3½% in the more advanced economies.

The investment picture at the sectoral level

Graph I.7 plots the average annual growth in capital services between 1999 and 2007 and each sector's contribution to capital growth. The non-tradable/services sectors come out as the main recipient of capital inputs for all euro-area economies, reflecting to some extent the growing importance of the services sector in advanced economies. However, the importance of the non-tradable/services sector as a recipient of capital flows relative to the other sectors in the economy was much bigger in the catching-up economies (except in IE).

Graph I.7: **Decomposition of growth in capital services by main sector (1)**

(avg. annual contributions in %, 1999-2007)



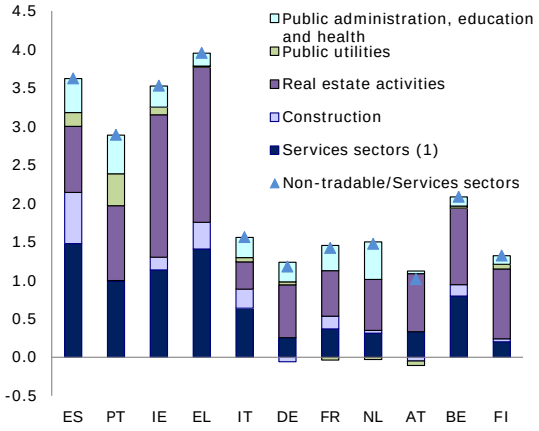
(1) ICT-producing ind.: electrical and optical eq., post and telecoms; Non-tradable/services: distribution, construction, hotels and restaurants, real estate, public utilities, public admin., education and health; Other sectors: other community, social and personal serv., agriculture, hunting and forestry, mining and quarry.
Source: DG ECFIN based on EU KLEMS.

Among the non-tradable/services sectors, in the catching-up economies, the highest contribution to growth in capital services over the period 1999-2007 came from construction and real estate activities, but also from other services sectors (i.e.

distribution industries: wholesale and retail industries, transport and storage, and hotels and restaurants). Even in countries such as Spain, where the construction sector went through a boom, capital accumulation was equally important in the services sectors as in the construction industry (see Graph I.8). Moreover, a significant contribution from investment in public utilities (i.e. electricity, gas and water supply) is notable, while in the advanced economies this sector's contribution is almost insignificant.

Graph I.8: **Growth in capital services in non-tradable / services sectors**

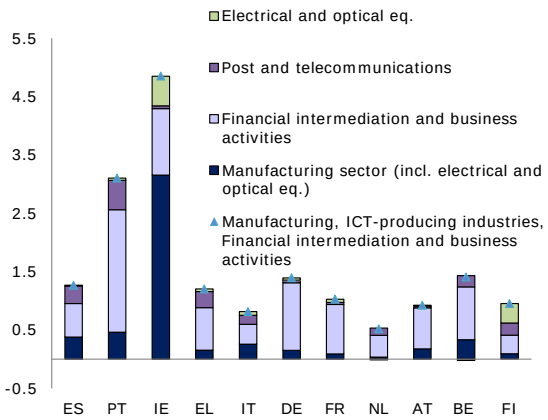
(avg. annual contributions in %, 1999-2007)



(1) Services sectors: distribution industries, hotels and restaurants.
Source: DG ECFIN based on EU KLEMS.

Graph I.9: **Growth in capital services in medium and high-technology sectors**

(avg. annual contributions in %, 1999-2007)

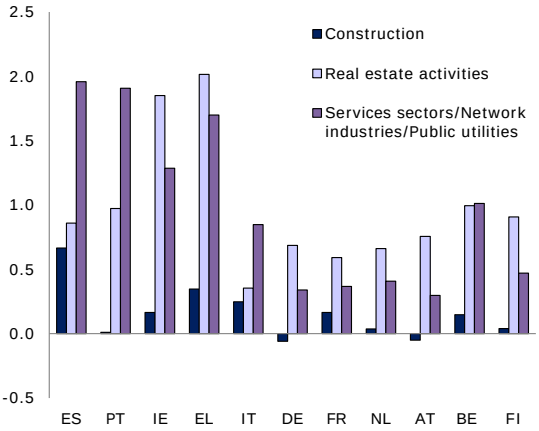


Source: DG ECFIN based on EU KLEMS.

Graph I.9 shows the specific contribution to capital accumulation of the medium- and high-technology sectors in the decade preceding the crisis. In advanced economies, investment within this group went mostly into financial intermediation and other business activities industries, while in the catching-up economies a non-negligible contribution can be observed from the manufacturing sector and the ICT-producing industries, notably from the network industries, (i.e. post and telecommunications).

Graph I.10: **Growth in capital services, construction and real estate activities vs. other services sectors (1)**

(avg. annual contributions 1999-2007, in %)



(1) Services sectors: distribution industries, hotels and restaurants; Network industries: post and telecommunications; Public utilities: electricity, gas and water supply.
Source: DG ECFIN based on EU KLEMS.

Overall, converging countries in the euro area benefited from large inflows of foreign capital in pre-crisis years. A popular explanation for the disappointing convergence process is that capital was not channelled to the most productive uses but was largely diverted to the bubble-prone low productivity construction sector (e.g. ES, IE, but also EL).(6) The evidence presented above paints a more complex picture, as capital accumulation was important not only in the bubble-prone construction sector but also in several service sectors such as distribution industries and network industries (Graph I.10). Furthermore, capital

(6) Residential structures are included in the stock of capital services of the other industries of the economy, as an input to the production function in that industry. Therefore, the real estate activities sector is likely to capture more of the residential investment, rather than the construction sector.

accumulation in manufacturing was not slower in catching-up than in more advanced economies.

Even if as shown in the previous section the non-tradable/services sectors seems to be one of the main sources for the large negative differential in productivity performance between the catching-up economies and the euro area, the investment picture at sectoral level indicates that this cannot be due to the lack of capital. The next section looks into possible reasons for which capital has flown into lower productivity sectors.

Drivers of investment decisions

A central prediction of economic growth theory is that economic integration and financial market integration should lead to higher income levels across countries, while less advanced economies should grow faster than more advanced ones, either because of more rapid capital accumulation (the neoclassical growth model) or because of technology diffusion and innovation (endogenous growth models).

There is strong evidence that the pattern of convergence changed considerably in the euro area prior to the crisis. This can be shown by looking at investment growth over two different periods: the years just before and after the inception of the euro (1995-2001) and the later pre-crisis period (2001-2007).

Graph I.11 (left panel) shows that, over the first period, catching-up economies followed the theoretical predictions of the growth models in terms of capital accumulation. The neoclassical paradigm predicts higher capital flows to lower-income economies because the marginal product of capital is higher than elsewhere in these countries. Such a convergence pattern was followed by the catching-up economies in the late 1990s and early years of the euro. Investment increased in all converging economies more than in the rest of the euro-area (notably in IE, but also in PT and EL) and capital initially flew towards the catching-up economies in search of more productive uses, supported by strong financial integration among the euro area countries.(7)

However, over the second period (2001-07), Graph I.11 (left panel) displays a weaker correlation between investment and marginal return on capital, indicating that the neoclassical convergence model started to give signs of weakness relatively rapidly after the euro adoption.

Turning to profitability, as measured by the ratio of gross operating surplus to real value added, Graph I.11 (right panel) shows that while the correlation between capital accumulation and the marginal product of capital decreased between the early years of the euro and the later pre-crisis period, the correlation between capital accumulation and profit rates became significant from the first to the second period.

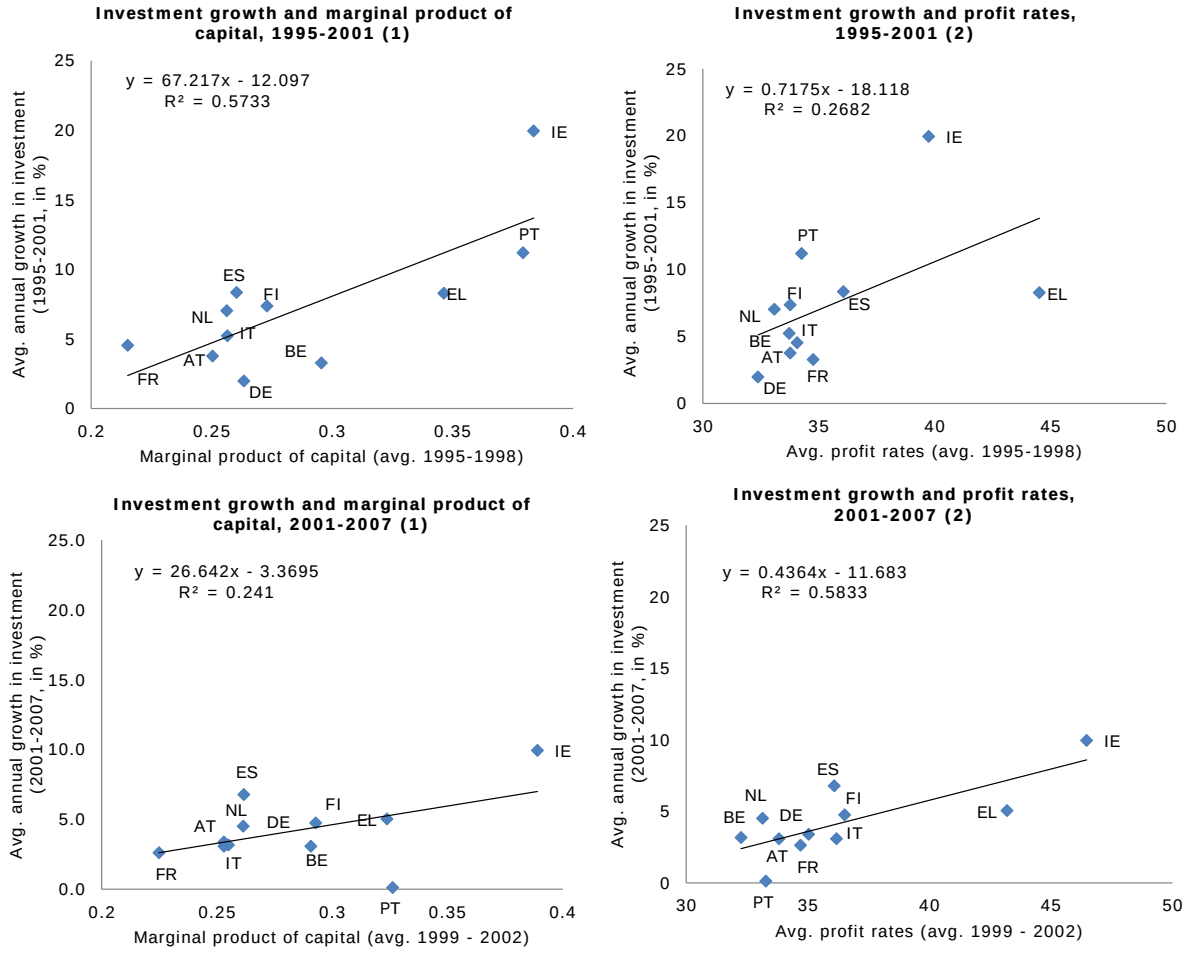
A systematic look at the drivers of capital accumulation in individual sectors over the two periods confirms the aggregate picture. In particular, during the first period (1995-2001), the sectoral data reveal that the non-tradable/services sectors and network industries enjoyed higher marginal productivity of capital than the manufacturing sector in most catching- up economies.(8) Moreover, capital flows were following the marginal productivity of capital in most sectors. The only sectors where the positive correlation was not significant were the financial intermediation and other business activities industries, public utilities and hotels and restaurants. Furthermore, in some non-tradable/services sectors such as construction, transport and storage, profit rates were even negatively correlated with capital flows, showing that marginal productivity of capital was the main driver of investment decisions.

In the later pre-crisis period, 2001-2007, capital flows started to decouple from the marginal product of capital and to be more strongly correlated with profit rates. The only sectors where marginal productivity of capital was still positively correlated with capital flows across euro-area Member States in this period were the manufacturing sector (mainly driven by investment

(7) The evidence of convergence based on capital accumulation for ES is relatively more mixed. The capital to hours worked ratio did not increase significantly despite large increases in capital services. Contrary to IE, which also saw large increases in labour supply, the rate of capital accumulation in ES was not high enough to offset the increase in labour services (i.e. capital intensity did not increase). In ES, labour seems to have been the main driving force of capital accumulation, as the country is the only catching-up economy that has benefited from large capital inflows despite a low marginal product of capital.

(8) IE was the only catching-up economy benefiting from higher marginal returns on capital in both manufacturing and most of the services sectors.

Graph I.11: **Investment growth vs marginal product of capital and profit rates**



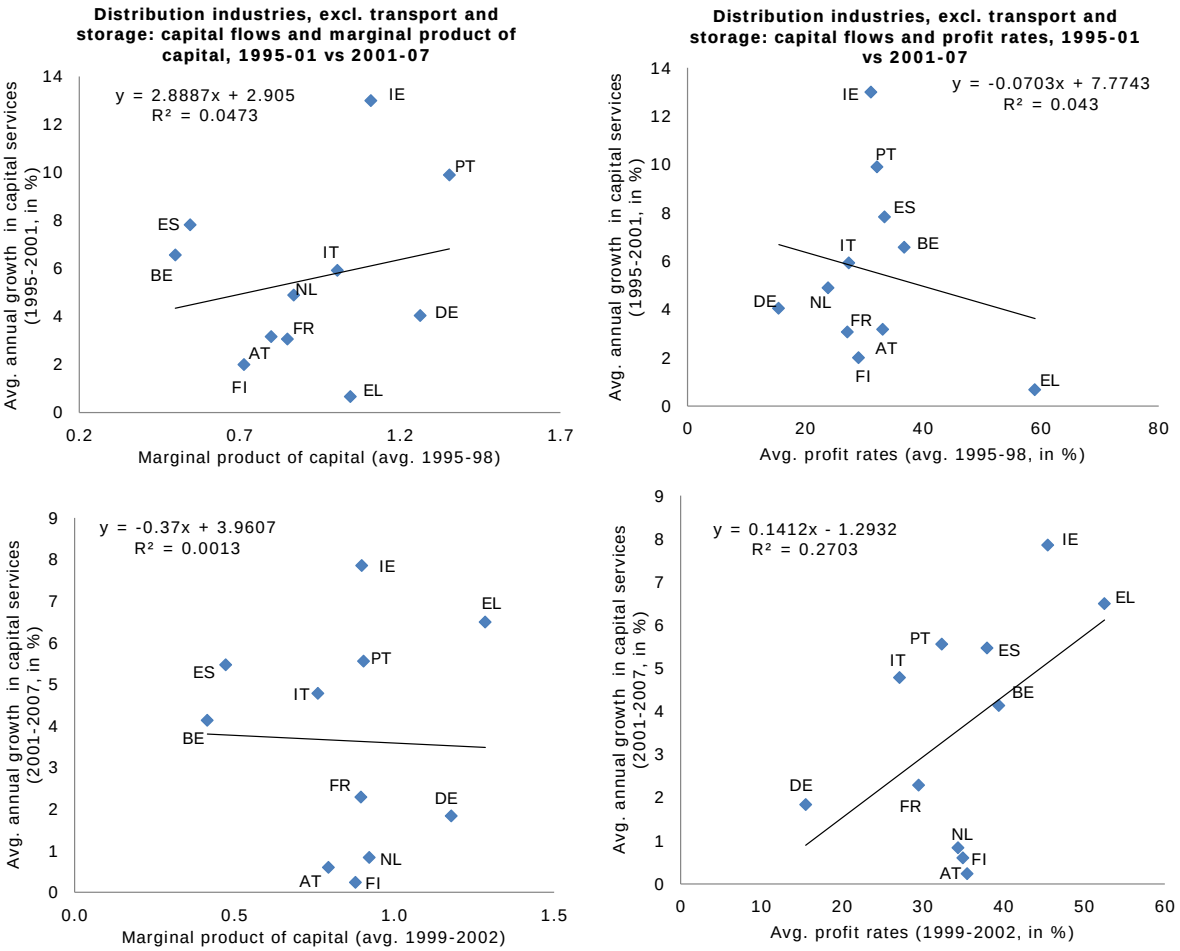
(1) The marginal product of capital defined as the ratio of value added to capital services stock, in volumes. (2) Profitability as measured by gross value added corrected for the wage bill, in % of real value added.
Source: DG ECFIN based on EU KLEMS.

in IE) and transport and storage. In the network industries and some of the non-tradable/services sectors such as wholesale and retail trade, the marginal product of capital became negatively correlated with capital flows, while the opposite was true for profit rates (see the example of distribution industries in Graph I.12). Profit rates in most of the catching-up economies were particularly high (relative to the other euro-area Member States) despite a low marginal productivity of capital in network industries (post and telecommunications), public utilities (electricity, gas and water supply), distribution industries (wholesale and retail trade), financial intermediation and business activities and real estate.

Overall, the analysis of the industry-level data of the EU KLEMS database indicates that capital flew towards the converging economies during the pre- and early-euro period, 1995-2001, due to higher marginal product of capital in these countries, notably in the non-tradable/services sectors and network industries. However, during the later pre-crisis period of 2001-2007, capital continued to flow towards most of the catching-up economies (but to a lesser extent to PT) driven not so much by marginal productivity of capital as by higher profit mark-ups in some of the services sectors and network industries.

This shift the drivers of investment in some converging countries from the marginal productivity of capital towards profit mark-ups is puzzling as developments in the two variables are normally closely related and tend to move into the same direction. However, marginal productivity of capital was on a decreasing trend in all catching-up economies in the years preceding the crisis (see Graph I.13). This reflects the combined effects of

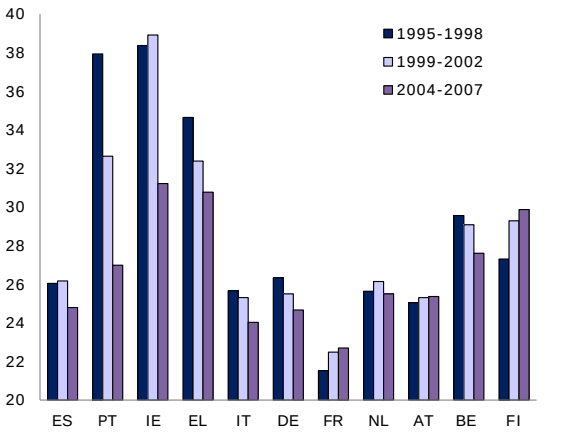
Graph I.12: **Distribution industries, excl. transport and storage: capital flows vs marginal product of capital and profit rates**



Source: DG ECFIN based on EU KLEMS.

diminishing returns on capital accumulation and, more importantly, weak TFP performance. Despite the decrease in the marginal productivity of capital, total capital compensation remained high in pre-crisis years thanks to a rise in profit mark-ups (see Graph 14). When the marginal product of capital decreases, capital compensation decreases as well unless the profit mark-up increases.(9) The persistently high compensation of capital explains the persistence of capital flows to catching up economies over that period. The reasons for the rise in profit mark-up in catching-up economies, despite the observed surge in the wage bill in the non-tradable/services sectors, would need to be explored further but are probably related to a combination of monopolistic power and booming demand.

Graph I.13: **Marginal product of capital**



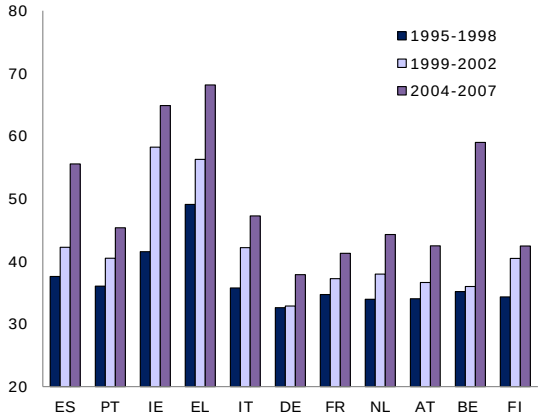
Source: EU KLEMS and WIOD (World Input-Output Database).

(9) Total capital compensation is a function of the marginal product of capital and the profit mark-up. In a monopolistic setup, the output price is set by firms at a mark-up, function of the elasticity of demand to the price change, over marginal cost.

Supporting this interpretation is the fact that the rises in the profit mark-up and the decoupling between profit rates and marginal product of capital were notable mostly in the more sheltered non-tradable/services sectors. As the EU services market integration was still an on-going process during the period, it is likely that the necessary framework conditions to facilitate firm entry and exit and limit rent-seeking behaviour were not fully functioning in these sectors.

Graph I.14: **Gross operating surplus**

(in % of value added, in volumes)



Source: EU KLEMS and WIOD (World Input-Output Database).

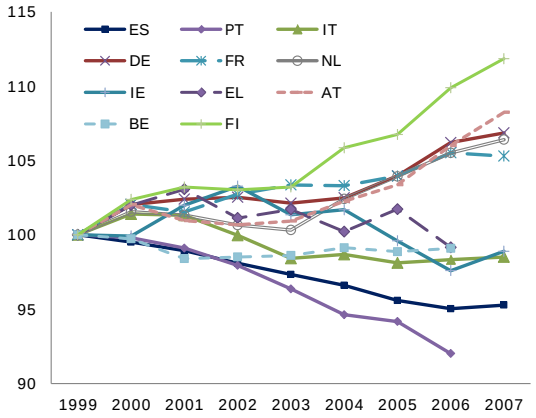
I.4 A closer look at the drivers of TFP and growth in converging economies

The catching-up economies do not seem to have fully followed the theoretical predictions of the endogenous innovation growth models as the surge in investment in pre-crisis years was not followed by faster TFP growth. This section explores sectoral data to look at possible explanations for this disappointing result.

The weakness of productivity observed in the catching-up economies was broad-based affecting both sectors where employment grew fast (mostly construction and services) and those were employment gains were more limited, such as manufacturing. All catching-up economies, as well as some other economies with income above the euro-area average (e.g. IT), saw their TFP performance deteriorating between the launch of the euro and the crisis (see Graph I.15). Despite high rates of capital accumulation, TFP performance was particularly disappointing in some sectors, notably in manufacturing, but also in network and distribution industries like wholesale and retail trade. In general, some convergence in TFP with the euro-area technological leaders was only observed in the financial intermediation and other business industries, a sector in which some of the technological leaders (e.g. DE) did not perform very well.

Graph I.15: **TFP performance**

(avg. annual growth rates, in %, 1999-2007)



Source: EU KLEMS and WIOD (for PT and EL).

Human capital differences could not be the main factor explaining the TFP growth divergence between catching-up economies and most of the rest of the euro area as the skill structure in catching-up economies improved over the pre-crisis period.([10]) Graph I.16 shows the change in the average share of high-skill hours worked between the periods 1995-2001 and 2001-2007.([11]) The increase in the overall share of high-skill hours worked in catching-up economies is notable in manufacturing, but even more so in market services industries, with the exception of the construction sector.

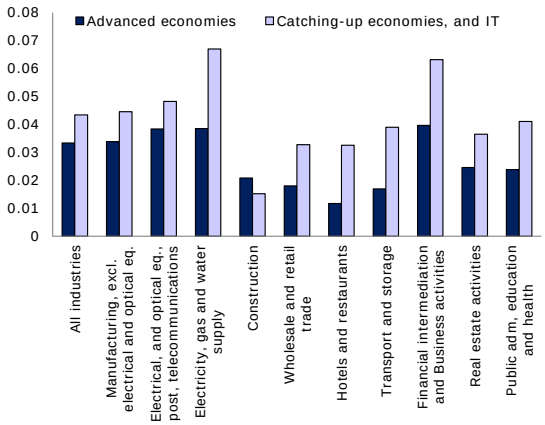
Looking at the quality of capital inputs in the converging economies, the relative contribution to value added of the non-ICT component of capital seems to be much greater in the catching up Member States than in the rest of the euro-area (Graph I.17).

([10]) Some catching-up economies (e.g. PT) but also some more advanced economies (e.g.IT) started from a very low initial position, and are still struggling with a high share of low-skill workers compared to the more advanced economies, despite significant progress.

([11]) Italy was included in the same group as the converging economies, owing to its similar starting position in terms of skill structure. Catching-up economies: EL, ES, IE and PT.

Graph I.16: **Change in the overall share of high-skill hours worked, between 1995-01 and 2001-07**

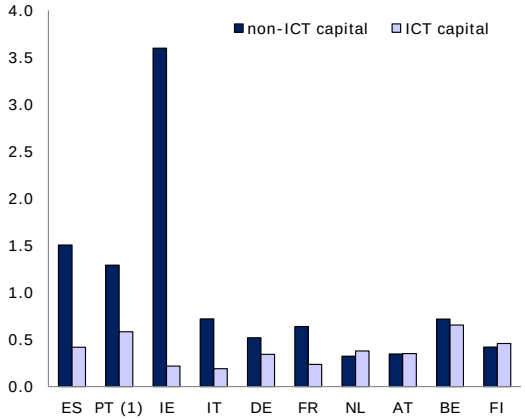
(in pp.)



Source: DG ECFIN based on WIOD.

Graph I.17: **Contribution to value added growth of non-ICT and ICT capital**

(in pp., 2000-2007)



(1) Portugal: 2000-2005.
Source: EU KLEMS.

This pattern can also be observed at the sectoral level with the exception of the ICT-producing industries. For the intensive ICT-using services industries (i.e. wholesale and retail trade, financial intermediation and other business activities), the comparatively low importance of ICT investment is particularly notable in wholesale and retail trade, while all less-intensive ICT-using industries (e.g. construction, real estate activities, hotels and restaurants, transport and storage) have a comparatively large contribution from the non-ICT component. Overall, this evidence suggests that the large capital inflows witnessed by the converging economies have not succeeded in increasing the relative contribution to growth of the ICT-component of capital relative to its non-ICT component.

Other structural factors that could offer an explanation for disappointing TFP performance in the catching-up economies relate to their economic and industrial structures as well as the quality of their institutions. A large body of economic literature links an economy's degree of openness and flexibility (both for labour and product markets) to its productivity performance.([12]) Moreover, the bulk of empirical evidence supports the view that a lack of competition and restrictive product market regulation hinder technology transfer and slow down productivity growth.([13]) Furthermore, empirical evidence shows a significant relationship between measured productivity growth and changes in institutional quality, indicating that some of the poor performance in productivity convergence could have been rooted in institutional convergence processes that had, in some of the catching-up economies, slowed down significantly in the pre-crisis period.([14])

In terms of capital allocation, the evidence presented in Section I.3. offers an explanation for the observed strong preference of capital flows for the non-tradable/services sector in the catching-up economies. Larger capital accumulation in the services sectors, in itself, need not hinder convergence processes, as services sectors have a higher weight in most advanced economies. However, the fact that large capital flows in certain network industries and non-tradable sectors were driven by arbitrage opportunities in terms of profit rates rather than productivity of capital could have been detrimental to innovation and, consequently, further hindered TFP performance.

([12]) See European Commission (2009), 'Trade costs, openness and productivity: Market access at home and abroad', *Industrial Policy and Economic Reform Papers*, 10, January 2009.

([13]) Nickell (1996) and Blundell, Griffith and Van Reenen (1999) provide support for the positive impact of competition on productivity growth. Cited in Aghion, P. and P. Howitt (2005), 'Growth with quality-improving innovations: An integrated framework', *Handbook of Economic Growth*, Vol. 1A, Ed. By P. Aghion and S. Durlauf, Elsevier B.V.

([14]) Bertola (2013), 'Policy coordination, convergence and the rise and crisis of EMU imbalances', 'Future of EMU' ECFIN Working Paper series (forthcoming).

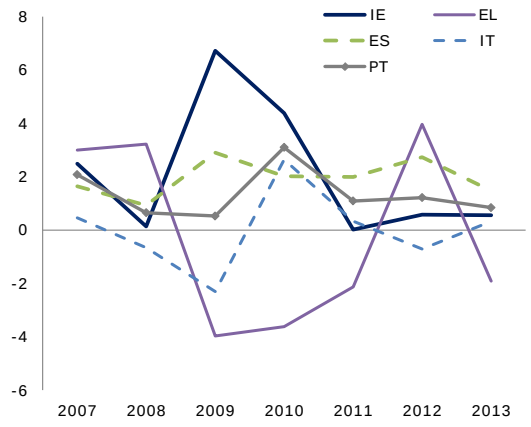
A final argument relates to the composition of financial flows into catching-up economies. Over the period 1999-2007, these were dominated by debt-type flows and intermediated by the banking sector. In contrast, equity finance (i.e. equity portfolio investment and FDI), which is considered to be more favourable to fostering innovations and technological change, played a much more modest role. Credit financing is likely to have benefited incumbents and/or local players more than new entrants, and therefore, likely to have favoured the observed pattern of capital accumulation.

I.5 Developments since the crisis

The overall record of the euro area in terms of income convergence during the pre-crisis period appears to be mixed. Some converging countries have shown comparatively disappointing rates of income and productivity growth, as well as a build-up of large financial imbalances. The crisis has triggered a protracted process of correction of these imbalances that has temporarily magnified growth divergence forces. There are, however, some grounds for medium-term optimism regarding convergence processes in the euro area. In the aftermath of the crisis, labour productivity is starting to slowly pick up, even if in some vulnerable countries this is due to some extent to on-going labour shedding (Graph I.18).

Graph I.18: **GVA per hours worked**

(y-o-y growth rates, in %, 2007-13)



Source: DG ECFIN based on EU KLEMS.

Furthermore, during the crisis a range of structural reforms were adopted in most catching-up economies (notably EL, PT, IE, but also ES) as well as in some other countries with income above the euro-area average (e.g. IT) in the non-tradable/services sectors as part of the financial assistance programmes or the enhanced macroeconomic surveillance framework adopted at EU level as a response to the crisis. The adopted measures, notably the review of the framework conditions, are likely not only to foster competition in product and service markets, but also facilitate entry and improve the efficiency of the business environment.

First, progress has been made in removing barriers to competition and opening important market segments in the services sector through full implementation of the sector-specific Services Directive, with amendments aimed at reducing barriers to entry and simplifying the regulatory framework for several non-tradable sectors (e.g. wholesale and retail trade, construction, real estate activities) as well as the regulated professions and the recognition framework for professional qualifications.

Second, measures have been taken to enhance transparency and improve market functioning in network industries such as energy and transport, but also in post and telecommunications, notably through the gradual liberalisation of prices in the energy sector in some catching-up countries, but also through measures aimed at unbundling between incumbent operators and infrastructure managers in the network industries. Moreover, the powers of the competition and national regulatory authorities have been strengthened and made more independent in order to ensure that the necessary framework conditions for product and services market integration are created. The review of the framework conditions has been complemented in some of the catching-up economies (PT, but also IT), by measures to accelerate judicial procedures, foster the specialisation of courts and judges, reduce litigation and modernise the use of the judicial service.

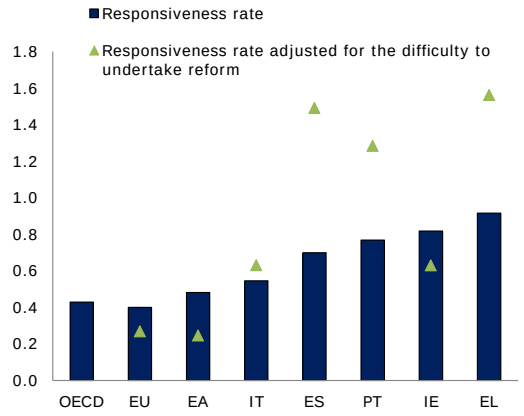
Third, a broad range of measures have been introduced to achieve administrative simplification and delicencing, improve SMEs' access to finance, modernise the public administration, promote the digitalisation of the economy and improve civil justice efficiency.

Once fully implemented, the structural reforms are likely to bring substantial benefits in terms of raising productivity growth and potential growth prospects over the medium term, while limiting

capital misallocation risks. In some sectors implementation might prove challenging and time-consuming as significant legislative changes and ratifications by national parliamentary assemblies might be needed, as well as political struggles against vested interests. However, the reforms in the non-tradable/services sectors must be fully implemented as soon as possible in order to ensure successful product and services market integration in the euro area in terms of efficient capital allocation and investment conducive to income convergence and productivity growth over the medium-term.

The overall reform intensity has substantially increased in the catching-up economies over the last two years, market pressures allowing for long-overdue politically difficult reforms to be undertaken, as shown by the OECD reform responsiveness indicators, which place the euro-area converging economies at the top rank in 2011-12 (see Graph I.19).

Graph I.19: **Reform intensity, 2011-12**



Source: OECD, Going for Growth 2013.

I.6. Conclusions

The overall record of the euro area in terms of income convergence since the launch of the euro appears mixed. In the decade preceding the crisis, most of the euro area catching-up countries showed comparatively poor performance in productivity growth despite massive net capital inflows. This poor productivity performance mirrors comparatively weak TFP growth across most sectors but also reflects, to some extent, poor reallocation of resources towards more productive sectors.

Convergence processes were also hampered by capital misallocation. Capital seems to have flown mostly into non-tradable/services sectors characterised by a combination of low marginal productivity of capital and high profit rates, the latter probably reflecting imperfect framework conditions in terms of competition and barriers to entry. Capital misallocation was probably also facilitated by easy credit financing intermediated by the banking sector (as opposed for instance to FDI), a form of finance which tends to favour incumbent firms.

Overall, despite improvements in human capital skills, the observed capital accumulation pattern in the catching-up economies does not seem to have fostered the emergence of strong drivers of long-term productivity growth such as innovations. As a consequence, the rate of technological change as the ultimate source of growth has not been conducive to pushing forward the convergence processes over the medium term.

There are, however, grounds for some medium-term optimism regarding convergence processes in the euro area. Even if the catching-up economies have been hardest hit by the crisis, the policy response has been comprehensive and a broad range of reforms aimed at bringing about structural changes in these economies have been adopted. They are likely to bring substantial benefits in terms of raising productivity growth and potential growth prospects over the medium term, while limiting capital misallocation risks, if fully implemented.

The observed pre-crisis convergence patterns suggest that the monitoring of TFP drivers and of possible adverse feedback loops from capital misallocation to productivity must be further studied, while convergence prospects must play a central part in the euro area's enhanced macroeconomic surveillance framework in the years to come.