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Highlights in this issue

- Focus: Catching-up processes in the euro area
- Drivers of diverging financing conditions across Member States
- Assessing the private sector deleveraging dynamics
- Rising sovereign risk premia and the profile of fiscal consolidation

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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 understand 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

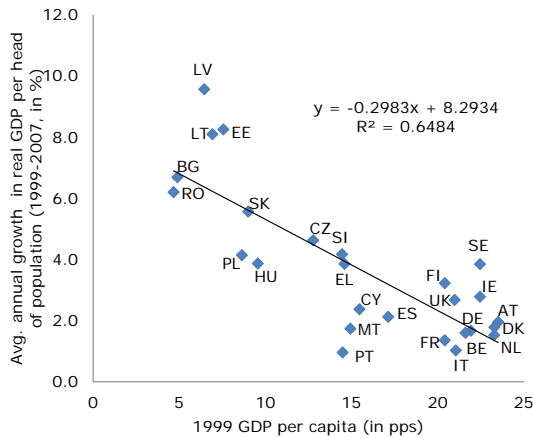
⁽¹⁾ Section prepared by Narcissa Balta.

⁽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.

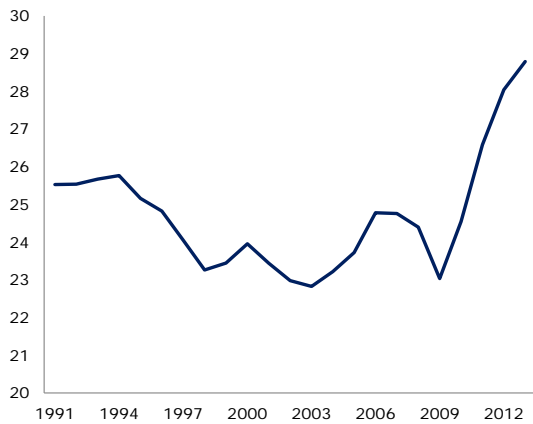
Graph I.1: GDP per capita in level and GDP growth, EU countries



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

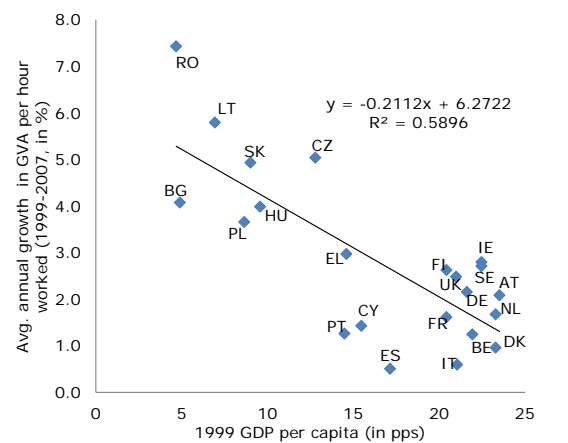
initially hit less severely than the more advanced ones. In the more recent years, however, divergence forces have resurfaced strongly with advanced countries rebounding more forcefully (e.g. DE) and less advanced ones experiencing protracted contraction. According to the Commission's winter forecast, 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

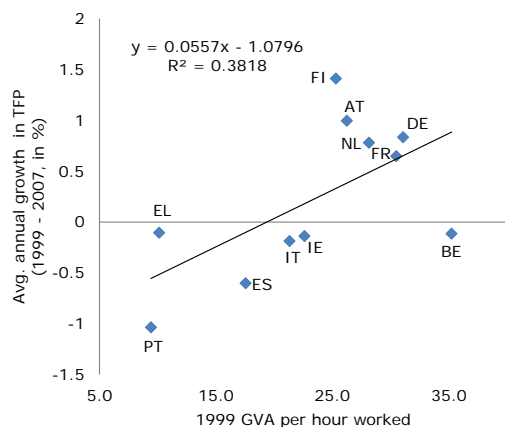


Source: AMECO.

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



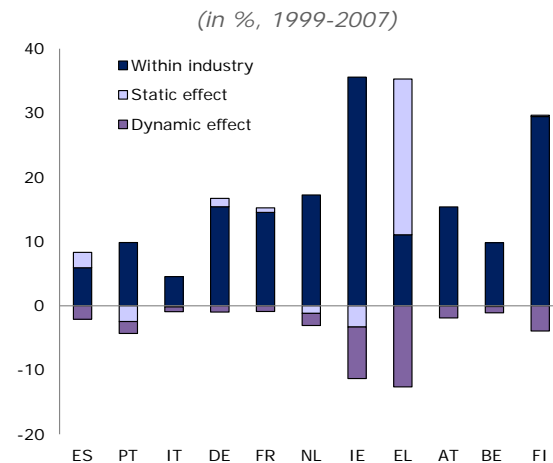
Source: DG ECFIN based on EU KLEMS.

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



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.

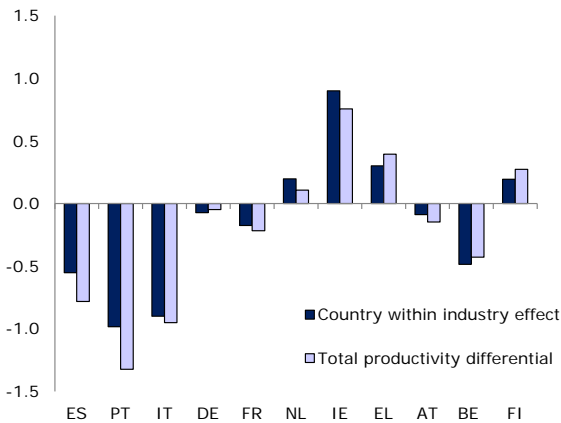
⁽⁵⁾ TFP performance, as measured by EU KLEMS, does not reflect the impact of changes in the quality of both labour and capital inputs, i.e. it measures disembodied technological change. For example, Ireland appears to have much lower TFP growth performance after euro adoption. This is due largely to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

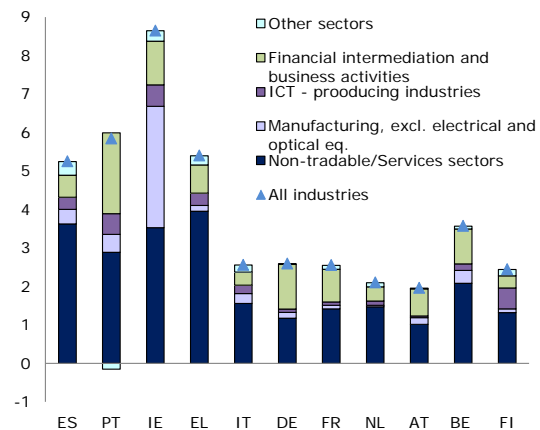
Despite the slowdown in the convergence process in the euro area, capital growth was quite strong in catching-up economies in pre-crisis years. Average growth in capital services over the period 1999-2007 ranged from 5¼% to 8¾% in catching-up economies, compared with a much more modest range of 2% to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



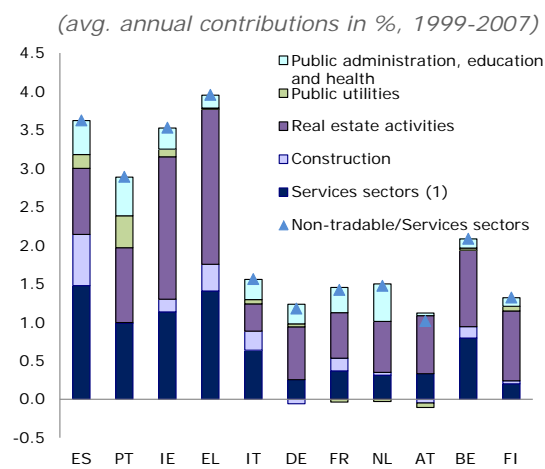
(1) ICT-producing ind.: electrical and optical eq., post and telecoms; Non-tradable/services: distribution, construction, hotels and restaurants, real estate, public utilities, public admin., education and health; Other sectors: other community, social and personal serv., agriculture, hunting and forestry,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

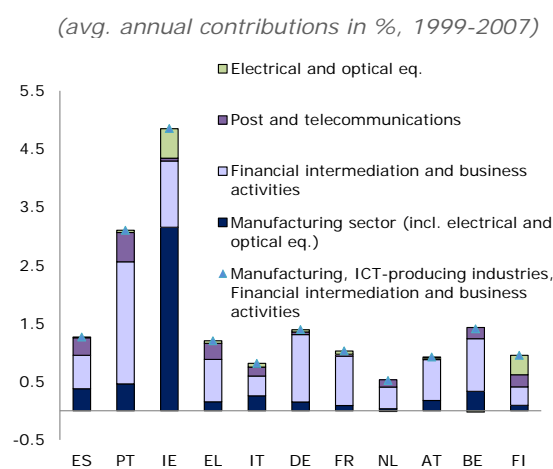
distribution industries: wholesale and retail industries, transport and storage, and hotels and restaurants). Even in countries such as Spain, where the construction sector went through a boom, capital accumulation was equally important in the services sectors as in the construction industry (see Graph 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



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

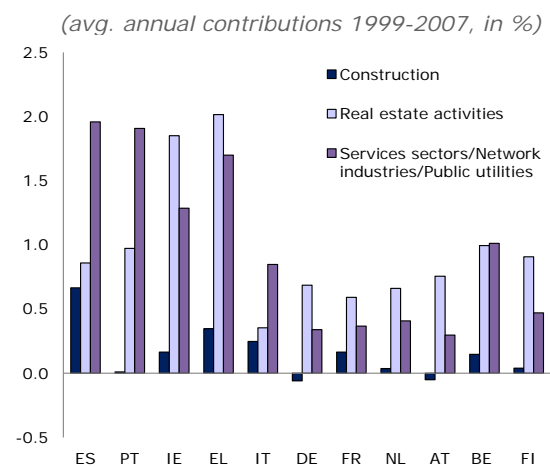
Graph I.9: Growth in capital services in medium and high-technology sectors



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)



(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⁾

⁽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,

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.

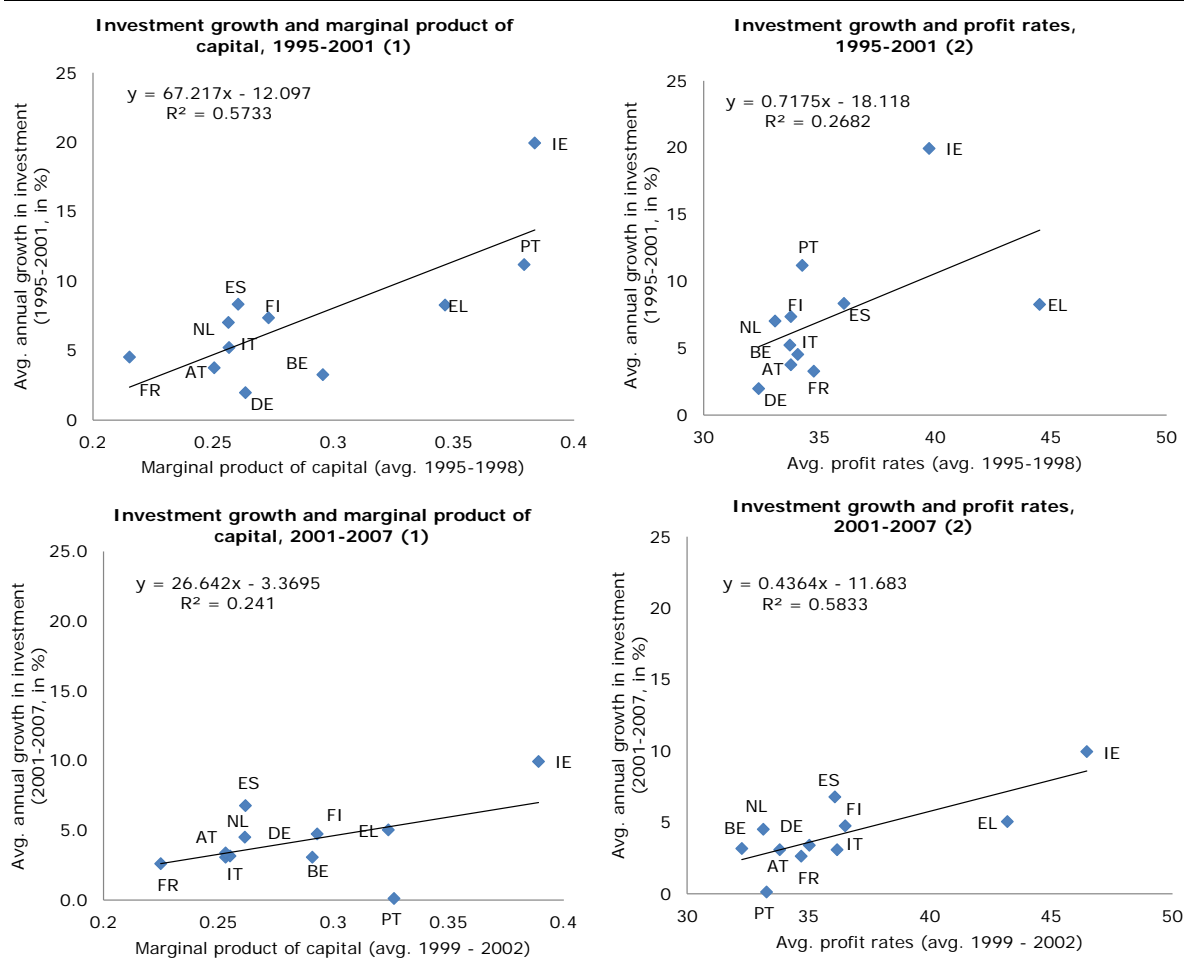
A systematic look at the drivers of capital accumulation in individual sectors over the two periods confirms the aggregate picture. In particular, during the first period (1995-2001), the sectoral data reveal that the non-tradable/services sectors and network industries enjoyed higher marginal productivity 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

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.

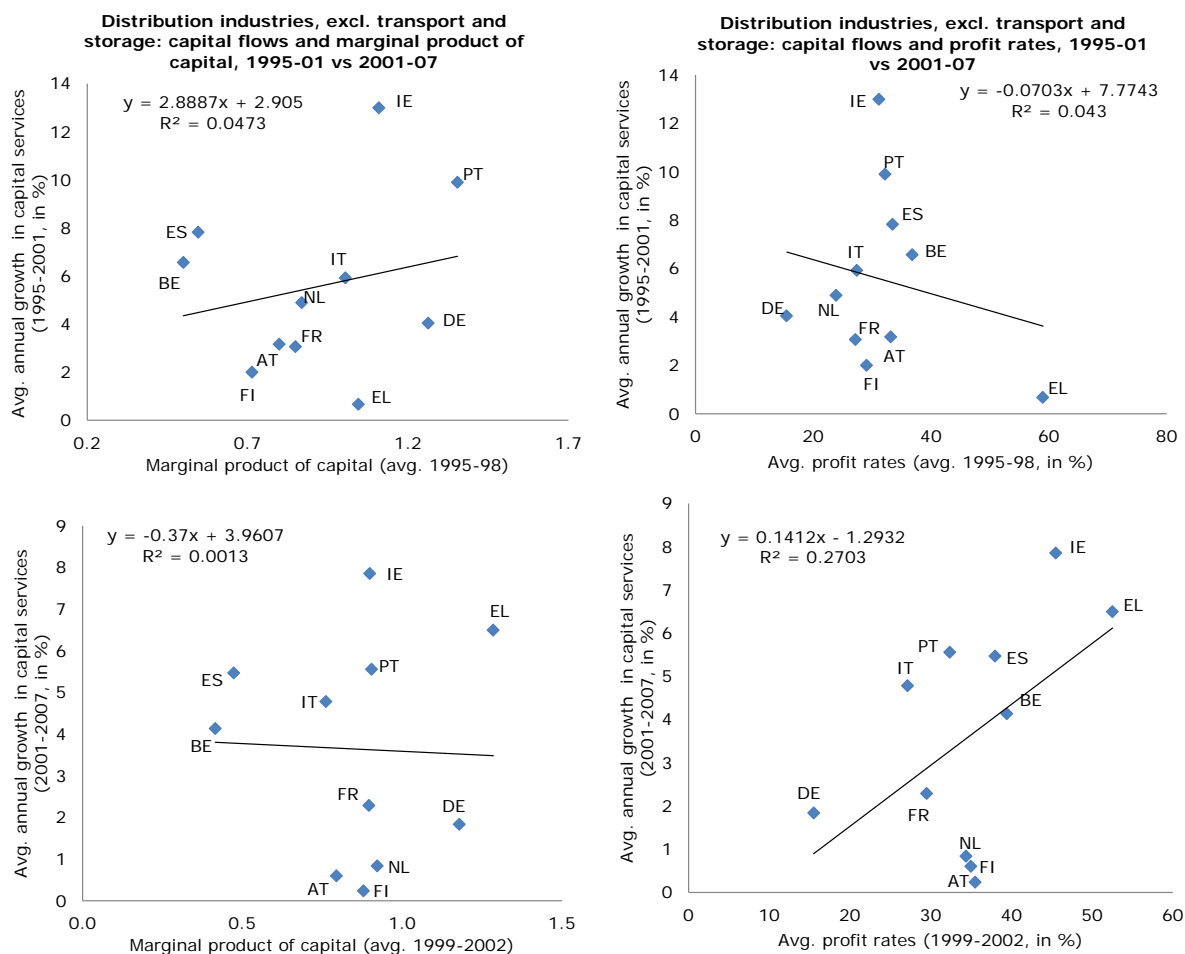
in IE) and transport and storage. In the network industries and some of the non-tradable/services sectors such as wholesale and retail trade, the marginal product of capital became negatively correlated with capital flows, while the opposite was true for profit rates (see the example of distribution 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

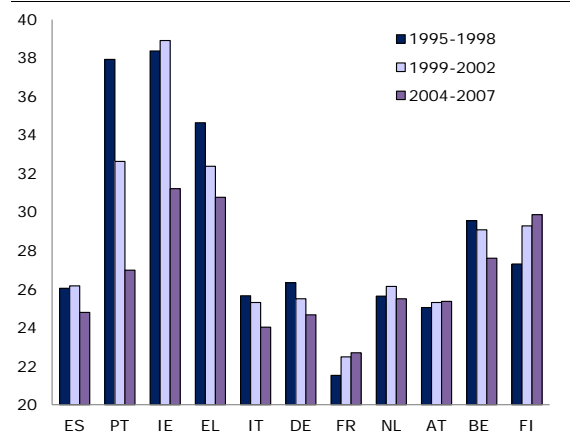


Source: DG ECFIN based on EU KLEMS.

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

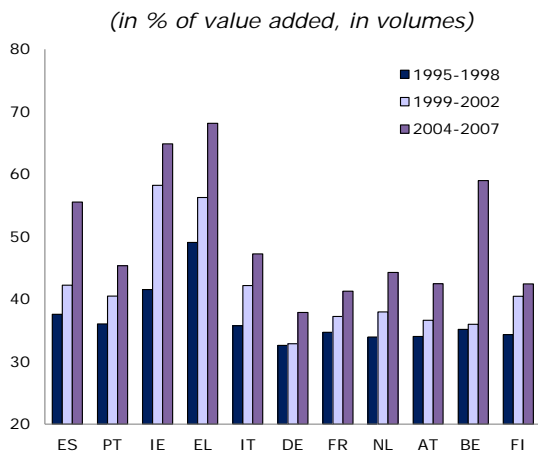


Source: EU KLEMS and WIOD (World Input-Output Database).

⁽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



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

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

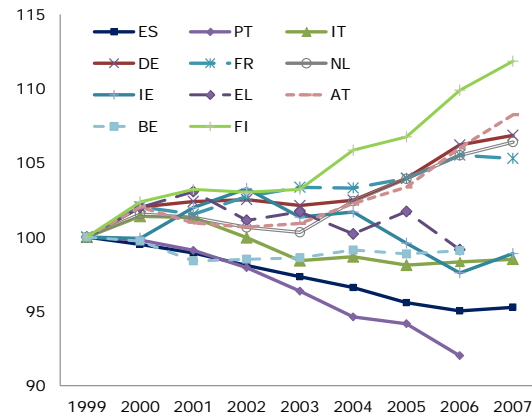
The catching-up economies do not seem to have fully followed the theoretical predictions of the endogenous innovation growth models as the surge in investment in pre-crisis years was not followed by faster TFP growth. This section explores sectoral data to look at possible explanations for this disappointing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

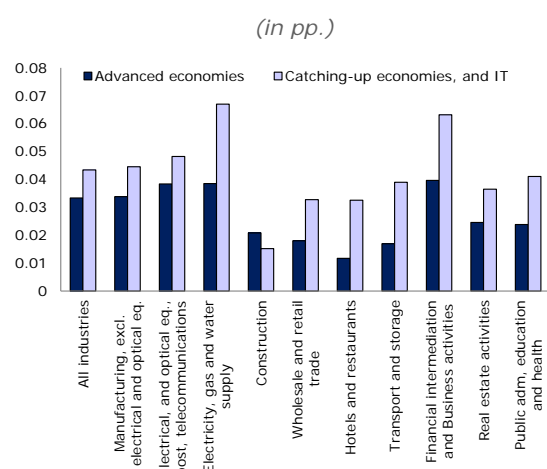
Human capital differences could not be the main factor explaining the TFP growth divergence between catching-up economies and most of the rest of the euro area as the skill structure in catching-up economies improved over the pre-crisis period.⁽¹⁰⁾ Graph I.16 shows the change in the average share of 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.

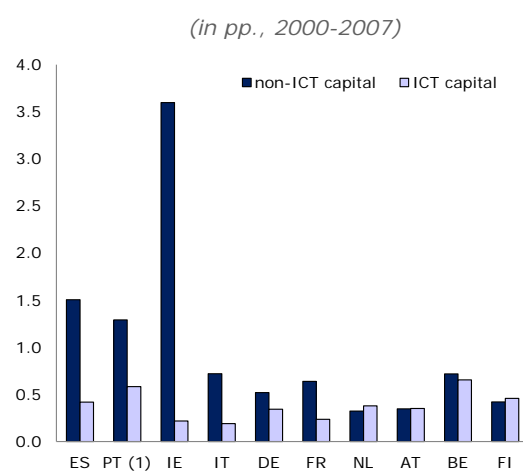
⁽¹¹⁾ Italy was included in the same group as the converging economies, owing to its similar starting position in terms of skill structure. Catching-up economies: EL, ES, IE and PT.

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



Source: DG ECFIN based on WIOD.

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



(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.

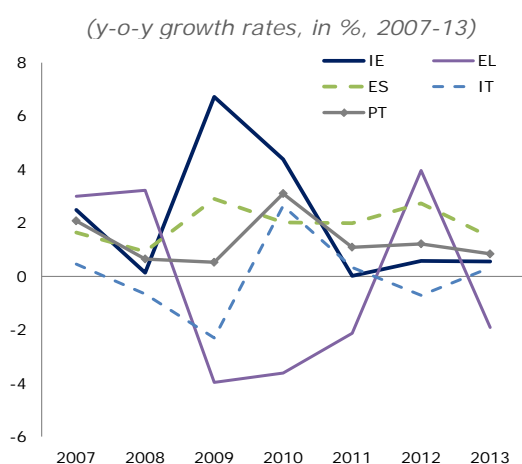
⁽¹⁴⁾ Bertola (2013), 'Policy coordination, convergence and the rise and crisis of EMU imbalances', 'Future of EMU' ECFIN Working Paper series (forthcoming).

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



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.

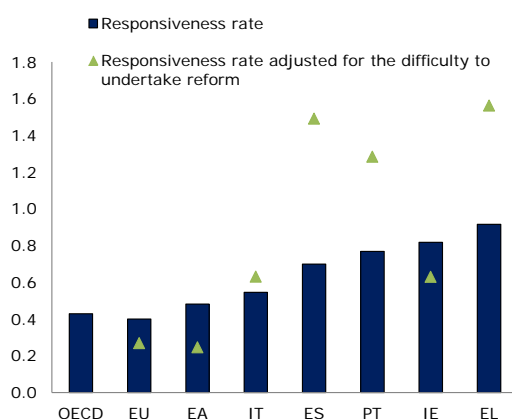
Third, a broad range of measures have been introduced to achieve administrative simplification and delicensing, improve SMEs' access to finance, modernise the public administration, promote the digitalisation of the economy and improve civil justice efficiency.

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.

II. Special topics on the euro area economy

II.1 Drivers of diverging financing conditions across Member States ⁽¹⁵⁾

The dispersion both of bank lending rates to the non-financial private sector and of overall financing costs for the corporate sector has increased considerably across the euro area throughout the recent crisis period. Such divergence has occurred despite the existence of a single monetary policy implemented through the provision of liquidity to the euro area banking sector under the principle of equal treatment. It does not seem to have been significantly affected by the ECB's new OMT programme. Available evidence suggests that greater cross-country variation in some structural characteristics of national banking systems, such as the quality of loan portfolios, profitability or the size of capital buffers, together with divergent financial positions of non-financial private sectors and sovereign funding costs, contributed to the increase in dispersion of bank lending rates at the country level.

This section analyses recent trends in the cross-country variation as regards bank lending rates for the non-financial private sector as well as in a broader composite financing cost indicator for the non-financial corporate (NFC) sector in the euro area. It also considers some potential underlying determinants of the increased cross-country divergence in financing costs, in particular possible sources of friction in monetary policy transmission.

Banking sector and monetary policy

The banking sector plays a central role in the financial system of the euro area as it channels the dominant share of funding from savers/lenders of capital to spenders/borrowers, in particular in the domestic non-financial private sector. The banking sector provides about 80% of total debt financing to the non-financial private sector in the euro area, compared to less than 50% in the US.

The importance of the banking sector is reflected in the operational framework of the Eurosystem, which satisfies the liquidity needs of the euro area

credit institutions through its liquidity-providing refinancing operations. By setting the conditions at which banks borrow from the Eurosystem, the ECB directly affects short-term money-market interest rates. Moreover, market expectations about the future evolution of the policy rates should be reflected in medium and long-term interest rates. In addition, one of the guiding principles of the Eurosystem's operational framework is equal treatment of all credit institutions irrespective of their size and location in the euro area, which implies identical conditions for all credit institutions in the euro area in their transactions with the Eurosystem. As a result, bank lending and deposit rates are normally also indirectly affected by changes in the ECB's monetary policy stance.

The existence of a single monetary policy implemented through provision of liquidity to the euro area banking sector under the principle of equal treatment suggests that bank lending and deposit rates throughout the euro area should normally only diverge as much as required by variations in underlying fundamentals (e.g. financial health of the respective credit institutions, counterparty risk). Efficient markets eliminating evident arbitrage opportunities should ensure that costs of different forms of funding (loans, bonds and equity) should not exceed what is justified by differences in the idiosyncratic risk associated with each specific funding form. Hence, prolonged periods of diverging trends in the costs of funding within the euro area could, ceteris paribus, indicate the emergence of some friction in the transmission of monetary policy.

Cross-country divergence in financing costs

Since the euro area banking sector is the direct counterparty of the Eurosystem's liquidity-providing refinancing operations and thus the first step in the monetary policy transmission process, this section starts by looking at the dispersion of bank lending rates for the non-financial private sector across euro area countries.⁽¹⁶⁾ It continues with a discussion of cross-country variation in a composite financing cost indicator for the NFC sector which also reflects costs of capital-market-

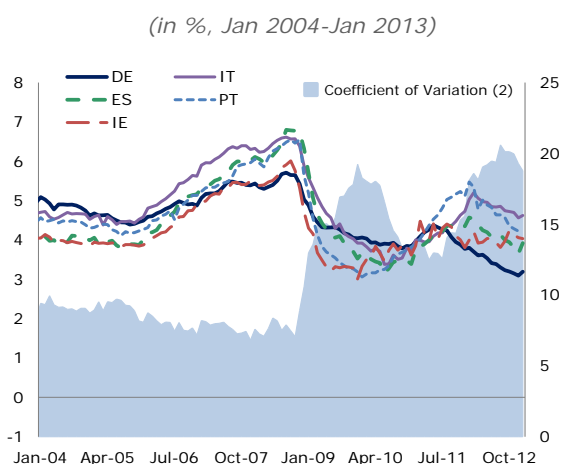
⁽¹⁵⁾ Section prepared by Anton Jevčák and Lucian Briciu.

⁽¹⁶⁾ Coefficient of variation (STDEV/AVG) and quartile dispersion coefficient ($100*(Q3-Q1)/(Q3+Q1)$) are used to assess dispersion, with only the former measure presented in the charts, as they display similar evolution over time.

based funding, not available to the household (HH) sector.

Although monthly data display considerable volatility, the most recent data suggest that the cross-country divergence in bank lending rates might have peaked in the second half of 2012 (see Graph II.1.1 and Graph II.1.2).

Graph II.1.1: Interest rates on bank loans to households (1)



(1) Weighted average of MFI (excluding MMFs and CBs) lending rates on loans for house purchase, consumption and other lending; total amount for new business in euro for all maturities; selected countries. (2) Based on data available for 10 out of 12 countries which were part of the euro area throughout the whole period under consideration (since January 2004).

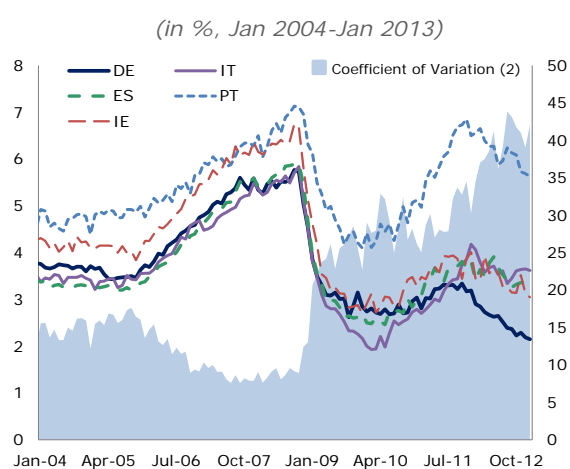
Source: ECB, DG ECFIN calculations.

The dispersion of bank lending rates initially surged for the whole non-financial private sector in late 2008/early 2009. While the variation in bank lending rates for the household sector more or less reversed throughout 2010, the variation in bank lending rates for the NFC sector remained broadly stable at an elevated level between mid-2009 and mid-2011. Bank lending rates then started to diverge again for the whole non-financial private sector in the second half of 2011 before some renewed stabilisation/marginal reversals occurred in the second half of 2012.

The divergence in bank lending rates was more pronounced in the corporate sector than for households. In January 2013, the highest corporate lending rates were recorded in Greece, Cyprus, Portugal and Slovenia, followed by Malta, Italy and Spain. This does not bode well for recovery and rebalancing prospects in these economies as it is

obviously more difficult for domestic companies to expand their export market share without access to affordable funding. The highest bank lending rates to households (captured by a weighted average of lending rates for house purchase, consumption and other purposes) were registered in Slovakia, Cyprus and Italy in January 2013. However, statistics for this sector are somewhat blurred by varying shares of fixed-rate mortgages, which imply country-specific differences in the transmission from money market to lending rates.

Graph II.1.2: Interest rates on bank loans to non-financial corporations (1)



(1) Total amount of MFI (excluding MMFs and CBs) loans for new business in euro for all maturities; selected countries. (2) Based on available data for 10 euro area countries.

Source: ECB.

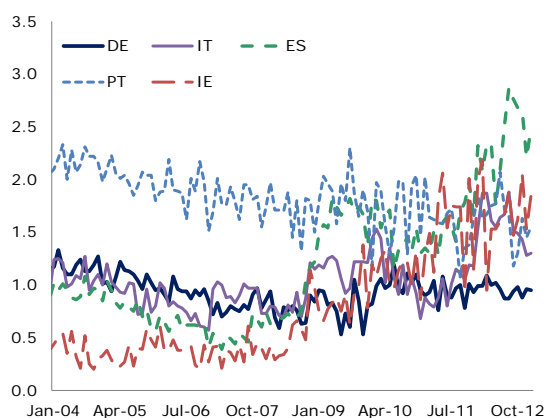
In parallel to the increasing cross-country divergence in bank lending rates, spreads between interest rates on small and larger loans to NFCs have also increased since late 2008 (Graph II.1.3). Although these spreads have increased in most euro area countries, including Germany, the largest divergence can be observed in Spain and Ireland. As a result, costs of bank funding for smaller start-up companies in the peripheral economies are likely to be even more expensive than suggested by the dispersion in lending rates for the whole NFC sector. This intra-sectoral divergence is exacerbated by the fact that SMEs tend to have fewer alternative financing routes via debt and equity markets than large corporations.

Taking into account capital-market-based sources of financing (both debt and equity), a broader synthetic measure of the financing costs faced by the non-financial corporate sector can be

computed (Composite Financing Cost Indicator, CFCI), at both euro area and Member State level. The CFCI for NFCs is based on the costs of three different financing instruments, namely bank credit, corporate bonds and quoted equity, which are weighted according to their outstanding amounts at the end of the period (stocks).⁽¹⁷⁾ Such country-specific CFCIs can be constructed for nine euro area countries for which data are available for all three types of financing.

Graph II.1.3: Interest rate spread between smaller and larger loans to non-financial corporations (1)

(in %, Jan 2004-Jan 2013)



(1) Interest rate spread on MFI (excluding MMFs and CBs) loans to NFC up to and above EUR 1 mio.; for new business in euro for all maturities; selected countries.

Source: ECB.

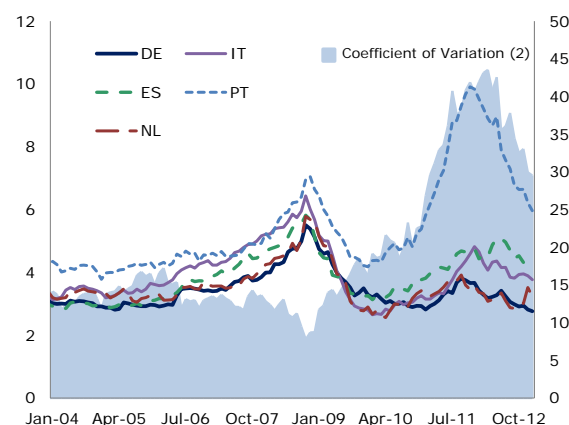
After having declined considerably between late 2008 and early 2010, the euro area CFCI followed an upward trend until late 2011. Subsequently, it started to indicate again a gradual easing in the financing costs of NFCs. However, while financing costs had by late 2012 decreased to historical lows

⁽¹⁷⁾ In the CFCI calculation, the cost of bank credit is measured by the weighted average of Monetary and Financial Institutions' (excluding Money Market Funds and central banks) interest rates for all maturities charged on new loans to NFCs (data provided by the ECB). The cost of corporate bonds is based, at the euro area level, on the composite yield for non-financial corporate benchmark bonds (calculated by Merrill Lynch). In the absence of similar data at country level, the cost of corporate bonds in a given country is proxied by euro area corporate bond yields plus the country-specific risk captured by the swap spread (government bond yield – euro swap rate). As a large part of the corporate bond issuance in the euro area concentrates around the 5Y tenor, the calculation is based on interest rates for this maturity. Finally, the cost of equity funding for NFCs is approximated by the dividend yield for main equity indices in every euro area country (calculated by Bloomberg). At the euro area level, the dividend yield for Eurostoxx50 is used.

in some of the so-called 'core' countries, notably Germany and Austria, they remain elevated in some vulnerable euro area countries such as Portugal and Spain, despite recent declines (Graph II.1.4).

Graph II.1.4: Composite financing cost indicator for NFCs (1)

(Jan 2004-Jan 2013)



(1) For selected countries. (2) Based on available data for 9 EA countries.

Source: ECB, Ecwin, Bloomberg, DG ECFIN calculations.

Dispersion indicators based on country-specific CFCIs for NFCs broadly followed an upward trend from late 2008 up to mid-2012 but they started trending downwards during the second half of 2012. Compared to bank lending rates, the increase in cross-country variation seems to have been higher for corporate bond yields⁽¹⁸⁾ and lower for dividend yields. As a result, dividend yields currently exhibit the lowest and bond yields the highest cross-country variation, while the opposite was true until the onset of the global financial crisis in late 2008.

Pass-through of the key ECB policy rate to market and bank lending rates

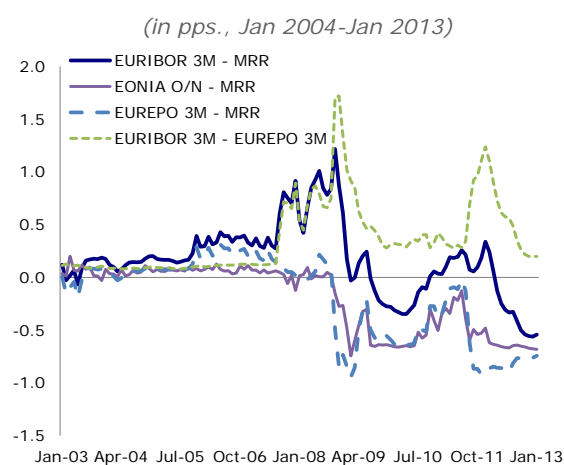
While spreads between money market rates and the key ECB policy rate decreased and even turned negative during the crisis period, spreads between retail bank lending rates and money market rates increased. This suggests that apart from friction in money markets, developments within national

⁽¹⁸⁾ It should, however, be noted that the precise level of dispersion is more uncertain for corporate bond yields, as in the calculation of the country-specific CFCIs these are just proxied by a formula including government bond yields (see previous footnote).

banking sectors may also have affected the transmission mechanism (see the next section for a discussion of possible underlying factors).

Spreads between overnight money market rates (EONIA) and the ECB's main refinancing rate (MRR) have been negative since late 2008, reflecting non-standard measures implemented to safeguard monetary policy transmission, in particular injections of excess liquidity through fixed-rate full-allotment refinancing operations (Graph II.1.5). However, following a spike at the end of 2008, the spread between interest rates on unsecured (EURIBOR 3M) and secured (EUREPO 3M) money market transactions increased again during the second half of 2011, before declining gradually throughout 2012. Changes in risk premia thus seem to have influenced monetary policy transmission across different segments of money markets and possibly contributed to market fragmentation.

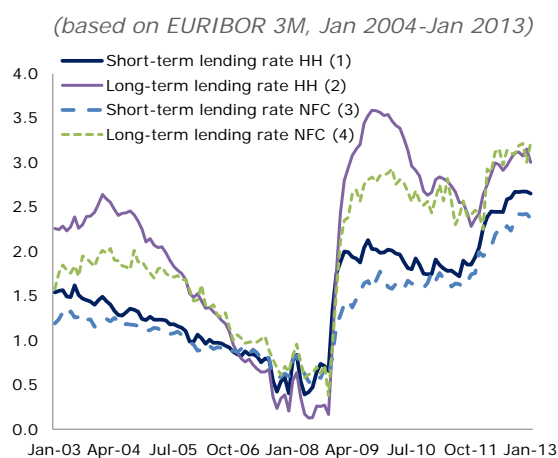
Graph II.1.5: Spreads between the main refinancing rate and money market rates, euro area



Source: Ecwin.

After an initial jump in late 2008 and early 2009, spreads between retail bank lending rates and money market rates stabilised at the short end and declined somewhat at the long end (Graph II.1.6). They started increasing again in the second half of 2011 before stabilising well above longer-term averages in late 2012. The easing of funding conditions on euro area sovereign debt markets in late 2012 thus was not simultaneously mirrored in bank lending rates to the non-financial private sector.

Graph II.1.6: Spreads between bank lending rates and money market rates, euro area



(1) MFI (excluding MMFs and CBs) lending rates on new loans to households for house purchase with interest rate fixation up to 1 year (2) Idem with interest rate fixation over 1 year (3) Lending rates on new loans to non-financial corporations with interest rate fixation up to 1 year (4) Idem with interest rate fixation over 1 year.

Source: ECB, Ecwin.

Possible structural determinants of bank lending rates in different euro area countries⁽¹⁹⁾

Bank lending rates in the euro area seem to diverge beyond what is justified purely by banks' retail interest expenditure, as net interest income has in general been higher for those banking sectors which charge higher bank lending rates (Graph II.1.7).

In 2012H1 (the last period for which data are available), banking sectors⁽²⁰⁾ in Cyprus, Slovenia and Spain recorded the highest net interest income in the euro area compared to the size of their balance sheets (among the countries for which all data are available), and they were also among the five countries (together with Portugal and Italy) with the highest composite MFI lending rates to the non-financial private sector⁽²¹⁾. At the same time, compared to 2008 the cross-country variation

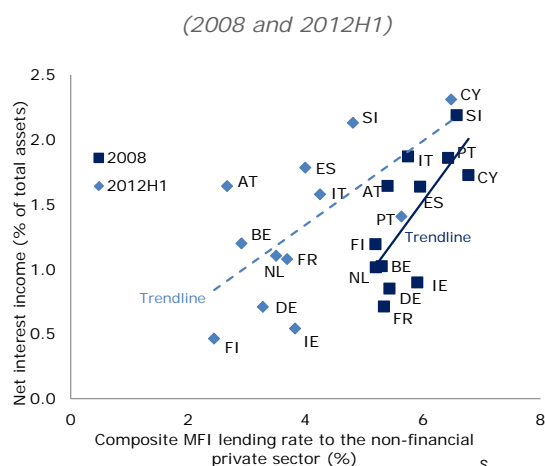
⁽¹⁹⁾ Charts in this sub-section include all euro area countries (based on 2008 composition) for which all relevant data are available.

⁽²⁰⁾ National banking sectors are in this section defined as including domestic banking groups and stand-alone banks as well as foreign-controlled subsidiaries and branches.

⁽²¹⁾ Weighted average (by outstanding amounts) of MFI (excluding MMFs and CBs) interest rates on loans (total amount for new business in euro for all maturities) to HHs and NFCs; data available for 12 euro area countries.

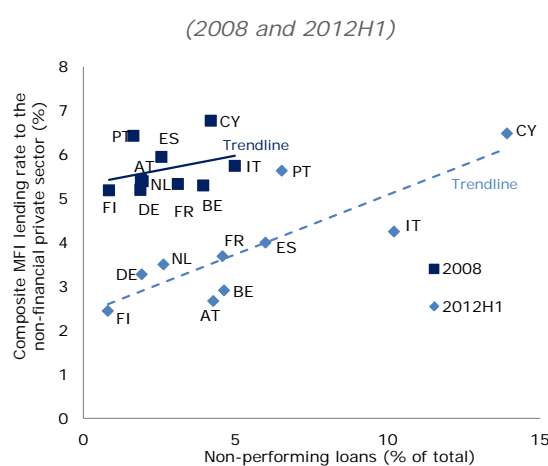
in net interest income did not increase as much as the dispersion of bank lending rates, indicating that adjustments in lending rates reflected more than divergent interest expenditure.

Graph II.1.7: **Bank lending rates and net interest income**



Source: ECB.

Graph II.1.8: **Quality of loan portfolio and bank lending rates**



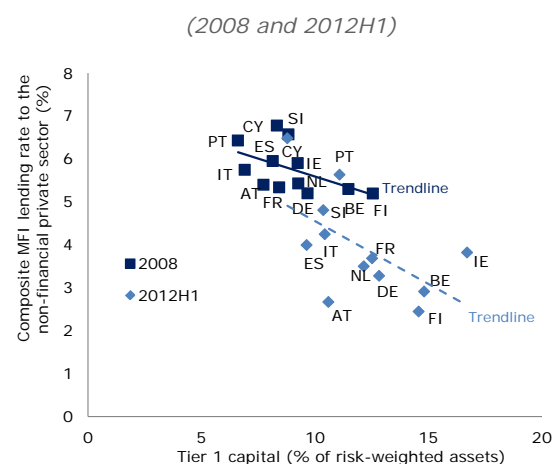
Source: ECB.

Greater variation in loan portfolio quality appears to be one of the structural determinants of the recent divergence in bank lending rates. The four countries whose banking sectors exhibited the highest share of non-performing loans (NPLs) in 2012H1 (Cyprus, Italy, Portugal and Spain), were also among those with the highest composite MFI lending rate to the non-financial private sector (Graph II.1.8). At the same time, the cross-country

variation in the share of NPLs has increased across the euro area since 2008. This might have contributed to the growing divergence in lending rates, as banks facing the prospect of relatively larger losses on their loan portfolios increased interest margins on new lending.

Larger differences in the availability of capital buffers also seem to account for some of the increase in the dispersion of bank lending rates. In 2012H1, the six banking sectors posting the lowest Tier 1 capital ratios included the five banking sectors with the highest composite lending rates to the non-financial private sector (Cypriot, Portuguese, Slovenian, Italian and Spanish) (Graph II.1.9). At the same time, the cross-country variation in Tier 1 ratios and thus loss absorption capacity has increased since 2008, allowing for a large divergence in bank lending rates.

Graph II.1.9: **Tier 1 capital ratio and bank lending rates**

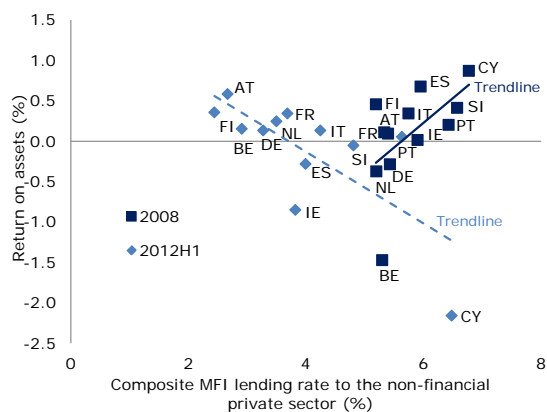


Source: ECB.

Banking sectors charging higher lending rates displayed lower profitability in 2012H1, contrary to the trend observed in 2008 (Graph II.1.10). All six banking sectors charging the highest lending rates to the non-financial private sector in 2012H1 (Cypriot, Portuguese, Slovenian, Italian, Spanish and Irish) achieved lower returns on assets than banking sectors requiring lower lending rates. In contrast, at the outset of the global financial crisis in 2008, higher lending rates had in general gone hand in hand with higher profitability. This suggests that at the current juncture, higher lending rates may reflect the need to (at least partially) offset losses suffered on impaired assets.

Graph II.1.10: **Bank lending rates and return on assets**

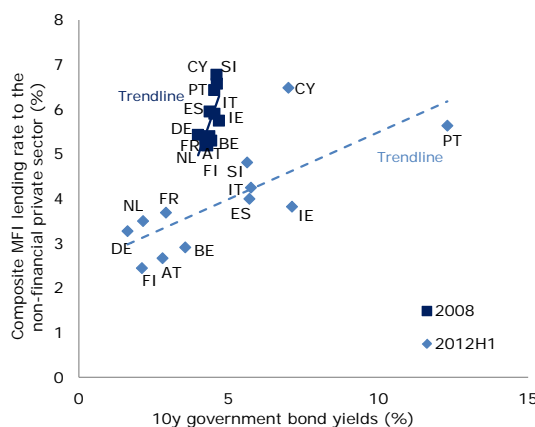
(2008 and 2012H1)



Source: ECB.

Graph II.1.12: **Sovereign Funding Costs and bank lending rates**

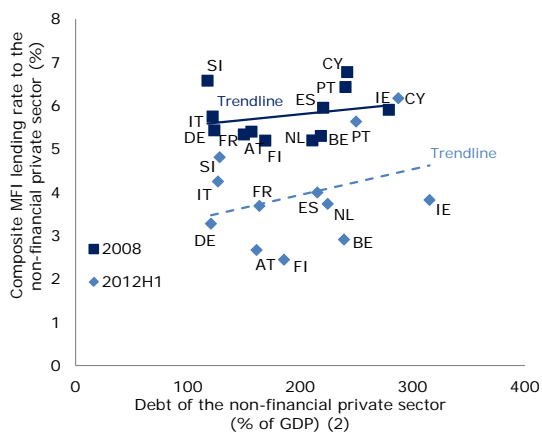
(2008 and 2012H1)



Source: ECB, Eurostat.

Graph II.1.11: **Indebtedness of the private sector and bank lending rates (1)**

(2008 and 2012H1)



(1) Data for Cyprus and Netherlands for 2011 instead of 2012H1 (2) Loans and securities other than shares; non-consolidated data.

Source: ECB, Eurostat.

Cross-country variation in the financial positions of non-financial private sectors, which has increased somewhat since 2008, is likely also to affect credit risks faced by national banking sectors and is thus reflected in bank lending rates (Graph II.1.11). In 2012H1, private sector indebtedness (relative to GDP) was the highest in Ireland, Cyprus and Portugal, which were also among the countries with higher-than-average composite MFI lending rates to the non-financial private sector.

Finally, banking sectors charging the highest lending rates to the non-financial private sector in 2012H1 were located in the countries where sovereign funding costs were also relatively elevated (Graph II.1.12). This suggests that the existence of feedback loops between the financing conditions of sovereigns and the respective private sectors was another factor which contributed to increased cross-country variation in bank lending rates.

Conclusions

The dispersion of bank lending rates charged to the non-financial private sector as well as that of overall financing costs for the NFC sector has increased considerably across the euro area throughout the recent crisis period. Such divergence has occurred despite the existence of a single monetary policy implemented through the provision of liquidity to the euro area banking sector under the principle of equal treatment.

The increase in cross-country variation in bank lending rates has been more pronounced in the corporate sector than for households. At the same time, spreads between interest rates on small and larger loans to NFCs have also increased since late 2008. Compared to bank lending rates, the increase in cross-country variation seems to have been higher for corporate bond yields and lower for dividend yields.

Although monthly data display considerable volatility, the most recent data suggest that the

divergence in bank lending rates might have peaked in the second half of 2012. In addition, country-specific CFCIs for the NFC sector indicate a significant reduction in cross-country variation since mid-2012.

The re-pricing of risk premia in different money market segments appears to have influenced the spreads between the key ECB policy rate and money market rates. Moreover, while spreads between money market rates and the MRR decreased during the crisis period, spreads between retail bank lending rates and money market rates increased, suggesting that apart from friction in money markets, developments within national

banking sectors may have also affected the transmission mechanism.

This seems to be confirmed by the fact that cross-country variations in some structural characteristics of national banking systems, such as the quality of loan portfolios, profitability or the size of capital buffers, have increased throughout the crisis period, partly reflecting diverging trends in the overall economic situation. These parameters, together with cross-country variation in financial positions of non-financial private sectors and in sovereign funding costs, are likely to account for much of the increase in dispersion of bank lending rates at the country level.

II.2. Assessing the private sector deleveraging dynamics ⁽²²⁾

The negative impact of excessively high debt stocks and rapid credit expansion on financial stability and economic growth has become evident during the current financial and economic crisis. The necessary balance sheet adjustment process is still ongoing, with adverse consequences for economic activity. Against this background, analysing the extent of the needed deleveraging, its path and the impact on major macroeconomic and financial aggregates is crucial. The present section contributes to this work (i) by analysing how deleveraging dynamics in the non-financial sector might be influenced by the underlying credit market conditions in the euro area and (ii) by discussing some key conditions that should be in place in order to minimise the impact of deleveraging on economic activity. Overall, the analysis points to strong credit market pressures on both the supply and demand side in some euro area countries. In most of these countries, however, depressed activity means that apparent deleveraging, as measured by debt-to-GDP ratios, is progressing only slowly despite significantly negative credit flows.

Introduction

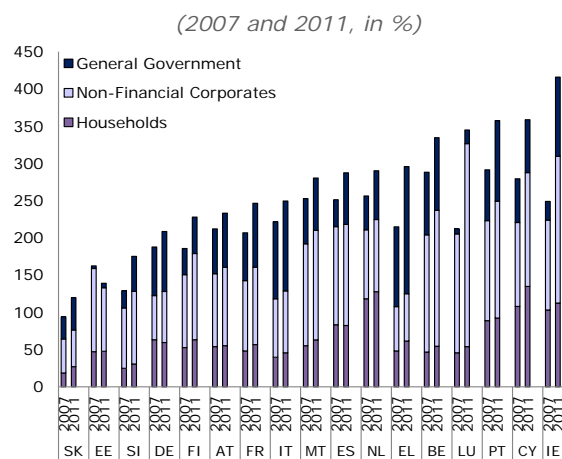
Indebtedness grew significantly in several euro area Member States before the current crisis, driven mainly by the boom in real estate prices and construction, distortionary taxation which induced both households and firms to take on debt, low interest rates, financial sector innovation and less tight lending standards. The crisis itself has also been a driver of increased debt in the public sector. In many euro area Member States, indebtedness measured against GDP was significantly higher by the end of 2011 when compared to pre-crisis levels (Graph II.2.1).

In addition, the current levels of indebtedness are excessive in some Member States, taking into account not only income prospects and assets held,

but also the underlying potential spillovers and systemic effects.⁽²³⁾

Based on past experience, the necessary reduction of these excessively high levels of debt is likely to take many years and be associated with strong contraction in economic activity. Nevertheless, macroeconomic stability, financial deepening and other legal or institutional features may justify different levels of sustainable debt and, consequently, different deleveraging needs and paths across Member States. Understanding the extent of deleveraging and underlying balance-sheet adjustment and the impact on the main macroeconomic aggregates and financial stability is, hence, crucial at this juncture.

Graph II.2.1: Debt to GDP ratio by sector, euro area Member States (1)



(1) Households, Non-Financial Corporates and General Government refer to S14_S15, S11 and S13 sectors, respectively, in European System of Accounts (ESA) terminology.

Source: Eurostat.

Against this background, Reinhart (2012)⁽²⁴⁾ identifies five main drivers of deleveraging, as measured by the reduction in the debt-to-GDP ratios: economic growth; increased savings (including through fiscal consolidation); increases

⁽²²⁾ Section prepared by Carlos Cuerpo Caballero, Ines Drumond and Peter Pontuch.

⁽²³⁾ For a more detailed analysis on the likelihood and the extent of deleveraging pressures at a sectoral level for EU countries, the interested reader may refer to Cuerpo, C., I. Drumond, J. Lendvai, P. Pontuch, and R. Raciborski (2013). 'Indebtedness, deleveraging dynamics and macroeconomic adjustment,' *European Economy Economic Papers*, forthcoming.

⁽²⁴⁾ Reinhart, C. (2012), 'Financial repression back to stay', available at <http://www.bloomberg.com/news/2012-03-11/financial-repression-has-come-back-to-stay-carmen-m-reinhart.html>.

in inflation; financial repression;⁽²⁵⁾ and debt restructuring. Of all the options, an increase in the growth rate of real GDP is certainly the favoured ‘policy option.’ However, as pointed out by Buiter and Rahbari (2012),⁽²⁶⁾ growth is not a policy but an outcome each Member State enjoys depending on (i) the policies and institutions in place; (ii) the external environment; (iii) affordable funding for the sovereign and other systemically important institutions; and (iv) luck. Therefore, one may find different patterns of deleveraging across euro area Member States, depending, inter alia, on different economic growth prospects.

The present section contributes to this debate by providing additional insights on how deleveraging dynamics in the non-financial sector might be influenced by the underlying credit market conditions in the euro area. Despite being generally independently addressed in the literature, the link between balance-sheet adjustments in the non-financial private sector and deleveraging pressures in the banking sector is clear: deleveraging in the banking sector, by influencing credit supply negatively, is a driver of non-financial private sector deleveraging, and the latter, by affecting economic activity, has an impact on the banks’ balance-sheet adjustment (e.g. through non-performing loans). In this context, this section explores this link by first assessing credit supply and demand conditions in the different euro area Member States and then analysing the changes in the euro area household and non-financial corporate debt-to-GDP ratio in the light of these supply and demand conditions.

Credit supply and demand pressures

Credit market conditions are a key factor affecting the dynamics of the ongoing balance-sheet adjustment in several Member States. The analysis in this section focuses on a set of variables that influence or reflect either credit supply or demand conditions. Keeping in mind that no variable can be labelled as exclusively demand- or supply-related, the variables are chosen depending on whether they predominantly reflect either one of the two sides of credit market conditions.

⁽²⁵⁾ Defined by Reinhart (2012) as policies leading to consistent negative real interest rates (that are equivalent to a tax on bondholders and, more generally, savers) thus easing the burden of servicing that debt.

⁽²⁶⁾ Buiter, W. and E. Rahbari (2012), ‘Debt of nations’, *Citi GPS*, November 2012.

The set of credit supply-related indicators considered includes the following variables reflecting financial soundness, an important factor affecting credit supply (Bernanke and Lown, 1991, Woo, 1999, Bédouac et al., 2005):⁽²⁷⁾ ECB consolidated banking data on overall non-performing loans (specifically the increase relative to 2007 levels), the Tier 1 capital ratio and the banks’ return on equity. Banks’ exposure to high risk foreign claims as percentage of GDP is also added, so as to capture potential negative external spillover effects. Sovereign CDS spreads are also included in this set of variables to address the link between sovereigns and the banking sector.

These indicators of financial sector soundness are supplemented with information from two surveys. First, the Eurosystem Bank Lending Survey (BLS), which provides information about changes in banks’ credit standards as applied to the approval of (i) loans or credit lines to enterprises and (ii) loans for house purchase granted to households.⁽²⁸⁾ In order to obtain a smoothed measure of lending tightness, a trailing 1-year average of the net percentage of banks that tightened their credit standards is used. Second, the survey on the access to finance of SMEs (SAFE) in the euro area – providing information on loan application success in the past six months – is used to construct a loan request failure rate, equal to the percentage of requests that did not receive all or most of the amount requested.

On the credit demand side, two measures of perceived economic conditions are included in the set of indicators, namely the Consumer Confidence Indicator and the Economic Sentiment Indicator, both published by the European Commission. The unemployment rate and the house price trend (relative to 2007Q4) are also added to the demand proxies. Changes in house prices influence households’ wealth and the overall sentiment, hence providing information about households’ willingness to take on debt. Moreover, prices in the

⁽²⁷⁾ Bernanke, B. and C. Lown (1991), ‘The credit crunch,’ *Brookings Papers on Economic Activity* 2:1991, pp. 205-247; Woo, D. (1999), ‘In search of capital crunch: Supply factors behind the credit slowdown in Japan,’ *IMF Working Paper* 99/3; Bédouac, L., G. de Bondt, A. Calza, D. Marqués Ibáñez, A. van Rixtel, and S. Scopel (2005), ‘Financing conditions in the euro area,’ *ECB Occasional Paper*, 37/2005.

⁽²⁸⁾ According to de Bondt et al. (2010), the BLS is a leading indicator of bank lending to both enterprises and households: De Bondt, G., A. Maddaloni, J.-L. Peydró, and S. Scopel (2010), ‘The euro area bank lending survey matters: Empirical evidence for credit,’ *ECB Working Paper*, 1160/2010.

housing market affect the amount of mortgage loans granted, not only due to demand but also through supply side effects by affecting the value of collateral (financial accelerator effect).

These proxies are supplemented with direct survey data. BLS data are used to include information about changes in demand for (i) loans or credit lines to enterprises and (ii) loans for house purchase granted to households. Question Q5 from the SAFE survey – ‘External financing needs over the past 6 months’ – is also used. A net balance is calculated by taking the difference between the percentage of firms where financing needs increased and those where they decreased and calculating the 1-year trailing average.

The supply and demand indicators are then used to compare individual Member States, either through visual stress maps or through a composite indicator. There are several arguments in favour of such a relative approach in assessing credit market conditions. First, it might be unfeasible to devise country-specific absolute thresholds for each variable, given data limitations and identification problems. Moreover, a relative analysis complemented by an assessment of the overall credit market conditions may provide a useful first approximation of actual tensions faced by individual Member States. Finally, borrower creditworthiness is a relative concept and investors tend to judge debtors (countries or sectors) from a relative rather than an absolute point of view.

The credit supply and demand variables are first analysed within a stress map of credit supply and demand conditions. For each variable, the range of the graph is given by the maximum and minimum observation among all Member States with available data. A weighted average of all available EU Member States is provided as a visual reference. Variables are plotted on a regular or inverted scale ensuring that a larger map corresponds to more adverse conditions.

Graph II.2.2 provides an illustration using the Italian and Estonian cases as examples of, respectively, a vulnerable Member State and a Member State facing more limited deleveraging pressures. The Italian stress maps signal credit supply pressures in the face of subdued credit demand. On the other hand, less stress is signalled on both the supply and demand side for Estonia,

which went through a fast adjustment at an earlier stage of the crisis, just before joining the euro area.

To obtain an overall view of the 17 euro area Member States, the information contained in each of the individual variables is aggregated into composite indicators of credit demand and supply pressures. These overall indicators are based on the average ranking of Member States. More specifically, the percentile-based rank of each Member State is calculated for each variable. The average rank is then calculated separately for supply and demand variables and scaled between 0 and 10. The results are reported in Graph II.2.2.e.

There is thus a group of four Member States (Cyprus, Greece, Portugal and Slovenia) with strong credit market pressures that are likely to affect the short-term deleveraging dynamics. Italy, Spain and the Netherlands constitute a second group experiencing significant credit market pressures. Within these two subsets, the supply side seems to dominate in Cyprus, Slovenia and Portugal. Demand pressures tend to prevail in Spain and the Netherlands. Short-term pressures appear to be limited in Germany, Estonia, Malta and Finland, while they are moderate in the other Member States.

In order to complement this static grouping, Graph II.2.2.f. shows the evolution of the credit pressure indicators over the last year. Supply pressures have deteriorated recently in the Netherlands and Slovenia, while credit demand has weakened in Italy.⁽²⁹⁾

This assessment can next be used to interpret the ongoing deleveraging patterns observed in the euro area, focusing especially on the contributions to the change in the debt-to-GDP ratio.

Credit conditions and current deleveraging patterns

According to empirical evidence presented in McKinsey (2010), ‘belt-tightening’ processes are the most common forms of deleveraging processes.⁽³⁰⁾ During such processes, deleveraging

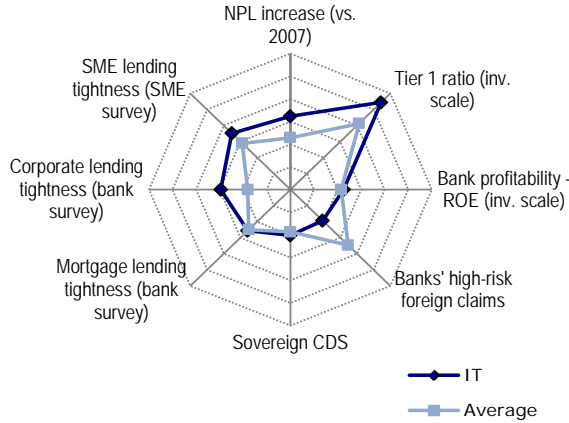
⁽²⁹⁾ It is worth noting that this pattern is partly influenced by the construction of the BLS survey variables (trailing one-year average tightening).

⁽³⁰⁾ McKinsey Global Institute (2010). ‘Debt and deleveraging: The global credit bubble and its economic consequences.’

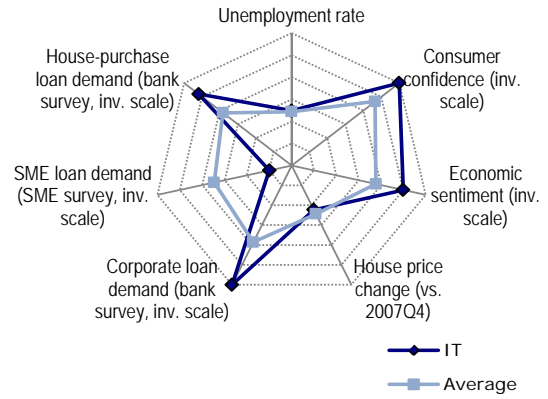
Graph II.2.2: **Stress maps and composite indicator of credit supply and demand conditions (1)**

(most recent 2012 data) (2)

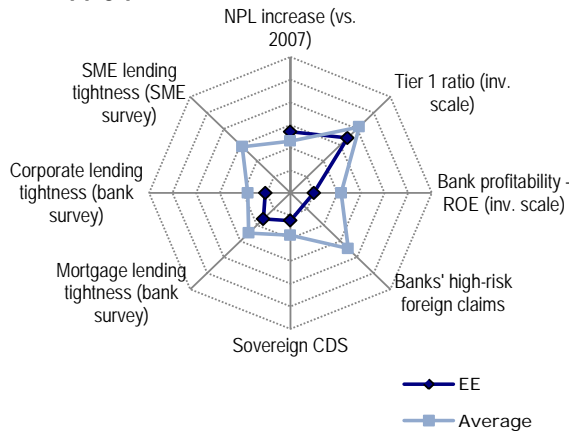
a. Supply pressures, IT



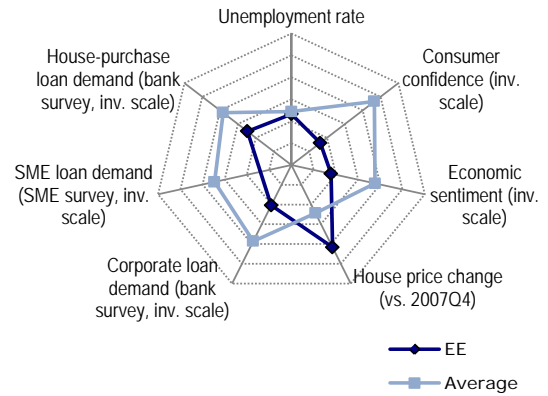
b. Demand pressures, IT



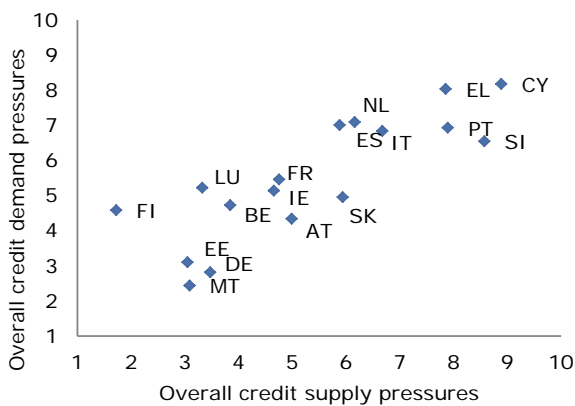
c. Supply pressures, EE



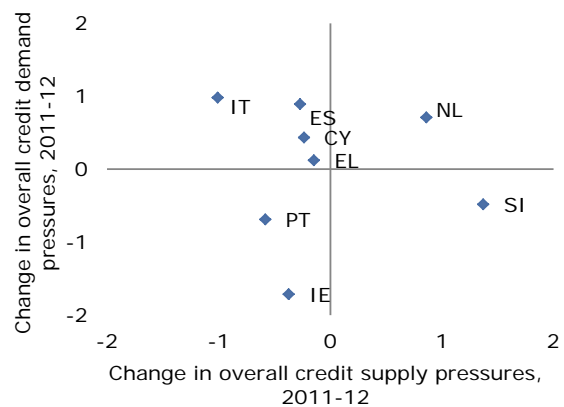
d. Demand pressures, EE



e. Overall pressures, euro area countries



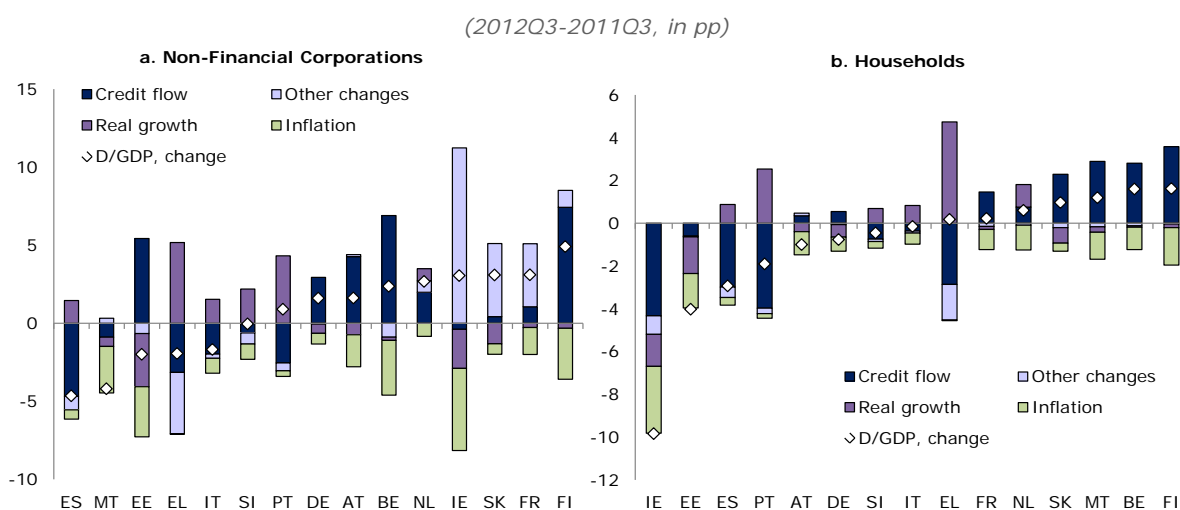
f. Changes of pressures, selected euro area countries



(1) Panels a to d cover IT and EE. Similar charts for other Member States can be obtained from the authors.
 (2) The various panels cover the most recent available data (four quarters to 2012 Q2, or Q3 or Q4).

Source: ECB, BIS, IMF, Datastream, Eurostat, DG ECFIN.

Graph II.2.3: **Decomposition of y-o-y changes in debt-to-GDP ratios, euro area countries (1)**



(1) Quarterly data for Cyprus and Luxembourg are not available after 2011Q2.

Source: Eurostat.

in the private sector, defined as a reduction in the debt-to-GDP ratio, generally materialises through positive credit growth below the nominal GDP growth rates.

When faced with high deleveraging pressures, however, the pace and extent of the adjustment may vary across countries, reflecting the existent heterogeneity in credit market dynamics, the variety of financial institutional frameworks, and different deleveraging needs, as mentioned in the introduction. In particular, deteriorating credit conditions can become a differentiating factor turning ‘belt-tightening’ into a deleveraging process characterised simultaneously by disrupted credit markets and economic recession. Falling net credit can add to other downside pressure on activity (e.g. from a weak external environment, policy uncertainty or fiscal consolidation) so that depressed growth offsets the credit flow effect and leads to a temporary increase of the debt ratio.

Balance sheet recessions are commonly seen as a borrower phenomenon (Koo, 2011).⁽³¹⁾ Uncertainty over aggregate macroeconomic conditions, shocks to asset prices, excessive debt taking or tightening credit conditions usually lead to a change in the risk attitude of the private sector towards debt minimisation. Deleveraging efforts

involving firms and households imply a first-order impact on economic growth via subdued consumption and investment expenditure. Moreover, balance sheet repairing episodes could be hampered by credit supply constraints as the banking sector deleverages and financial risks materialise.

In order to assess the impact of credit developments on deleveraging, the changes in the euro area household and non-financial corporate debt-to-GDP ratio are decomposed into their main components: the numerator effect, depending on net credit flows and other changes, including nominal holding gains/losses and other changes in volumes,⁽³²⁾ and the denominator effect, depending on real GDP growth and inflation.

GraphII.2.3, in particular, shows the decomposition of the year-on-year changes in non-financial corporation and household debt-to-GDP ratios, from 2011Q3 to 2012Q3 (the latest data available).

Recent developments have been quite heterogeneous across euro area Member States, ranging from large drops in firms’ leverage in Spain, Estonia, Greece, Italy and Malta, and in households’ leverage in Ireland, Estonia, Spain and Portugal, to significant increases in France, Finland

⁽³¹⁾ Koo, R. (2011). ‘The world in balance sheet recession: causes, cure and politics,’ *Real-World Economics Review*, 58, pp. 19-37.

⁽³²⁾ Notably reclassifications, write-offs and write-downs.

and Belgium (in both corporate and household sectors).

Among the countries experiencing deleveraging in the corporate sector, negative net credit flows appear as a significant contributor in Spain, Greece and Italy. On the contrary, both real GDP growth and inflation are driving the ratios down in Estonia and Malta. At the same time, the Portuguese corporate debt ratio has increased despite negative credit flows due to a negative real growth effect, whereas for Ireland the increased ratio is due to wide-ranging positive debt valuation effects,⁽³³⁾ which were not fully compensated by nominal growth (real GDP and inflation effect). Moreover, negative valuation effects, together with debt restructuring elements, are visible in the other changes contribution for Greece.

On the household side, negative net credit is the main deleveraging force in Spain, Portugal, Slovenia and Greece, partially or even completely offset by the impact of economic recession. The situation is particularly acute in Greece, where strong negative GDP growth effects are impeding effective private sector deleveraging, despite very negative net credit flows. Ireland and Estonia underwent a larger correction in the debt ratio as real growth and inflation joined forces with negative credit flows. Lastly, Austrian and German households appear to be growing out of debt as they deleveraged through economic growth while keeping positive net credit flows.

All countries signalled as experiencing credit market pressures in the previous section seem to share the deleveraging process characterised by simultaneous disrupted credit markets and economic recession: negative GDP growth (and thus positive contribution to the leverage ratio) and negative net credit flows (negative contribution to the ratio), except for the Netherlands, where credit still flows and Ireland, with positive real growth. As discussed in the previous section, credit demand pressures dominate in the Netherlands, while Ireland has recently improved on both credit supply and demand conditions (after the restructuring of the financial sector). Looking ahead, a healthy and stable financial sector appears to be of critical relevance, in order to minimise any

spread of contagion effects from private sector deleveraging to the rest of the economy.

Conclusion

After a prolonged phase of large credit flows to the private non-financial sector, many euro area countries currently face large deleveraging pressures. Overly indebted households and firms will have to go through a protracted adjustment period as credit markets adjust.

There are several possible scenarios under which deleveraging in the private sector could take place. Negative feedback loops between aggregate economic conditions, private sector willingness to take on debt and credit provision could, if left unchecked, turn adjustment or 'belt-tightening' processes (i.e. deleveraging through positive credit flows lower than nominal GDP growth) into a deleveraging process characterised by large negative credit flows and economic contraction, or may even lead to temporary re-leveraging despite negative credit flows, due to offsetting economic depression.

The current situation is also challenging to the extent that the high levels of debt apply not only to the private sector but also to the public sector, particularly in the most vulnerable Member States where the financial and non-financial sectors face significant deleveraging pressures. These simultaneous deleveraging needs, the negative feedback loop between the sovereign and the banking sectors, and the link between financial and non-financial private sector deleveraging (translated into credit supply and demand pressures) represent a significant drag on economic growth. As all the domestic institutional sectors need to reduce their debt burden simultaneously, there is not much room for manoeuvre to break the deleveraging spiral by having some sectors in the economy increasing their level of indebtedness and supporting the economic recovery.

Against this background, a well-capitalised and viable financial system is clearly important for achieving a healthy adjustment process, by guaranteeing adequate credit provision so that firms and households willing to borrow are able to do so at reasonable cost. However, in order to minimise the impact of private sector balance-sheet restructuring on economic activity and financial stability, the search for growth drivers is also of

⁽³³⁾ Influenced in particular by the appreciation of the dollar with respect to the euro over the last four quarters (around 12%), given the high share of dollar-denominated debt in the Irish corporate sector.

critical importance to the extent that those drivers are able, at least partially, to offset the transitory fall in domestic demand. This is of particular relevance in the aforementioned current circumstances as the room for manoeuvre by the public sector to attenuate the underlying negative consequences for economic activity is extremely limited in countries whose public sector is also highly indebted⁽³⁴⁾ and for which sovereign yields have increased significantly during the crisis.

A positive contribution from external demand acted as a natural growth substitute in past deleveraging episodes (see the example of the Nordic countries in the 1990s). Positive net exports

help in rebalancing the growth pattern towards more productive, less labour-intensive tradable sectors, while supporting economic recovery and bringing down debt ratios. In this context, structural reforms assume particular relevance not only by guaranteeing a durable rebalancing process but also by attenuating the negative impact of deleveraging and ensuring the right conditions for sustainable economic growth. In addition, and given the procyclical nature of financial flows, the right financial supervision tools, notably in relation to macro-prudential supervision, must be developed to guarantee that the new lending will support the rebalancing process and excessive imbalances will be avoided in the future.

⁽³⁴⁾ In some cases due to excessive private indebtedness (mainly financial) that was transformed into public sector debt.

II.3. Rising sovereign risk premia and the profile of fiscal consolidation ⁽³⁵⁾

Higher sovereign risk premia can have important valuation effects on bank balance sheets. A vulnerable banking sector, already suffering recapitalisation pressures from loan losses, faces additional pressures from declining sovereign bond prices, forcing banks to raise lending costs. This sovereign risk channel constitutes a potentially important transmission from sovereign bond prices to the private sector. For highly indebted countries in the euro area this section shows that the negative output effects of higher sovereign risk premia and expectations of sovereign default can exceed those of fiscal consolidation, implying that the counterfactual of no consolidation could make such countries worse off. This illustrates that the risks to backloading fiscal consolidations, in particular doubts that the necessary consolidation will be implemented at all in the future, could be amplified by the costs of raising expectations of sovereign default, especially if there is no credible long-term consolidation strategy in place.

The increase in debt-to-GDP ratios and rise in sovereign risk premia in some of the euro area's most vulnerable countries have fostered an intensive debate about the best fiscal policy response. Critics of fiscal consolidations claim that fiscal austerity worsens the demand shortfall in an economy which is already hit by negative demand shocks. In addition, they argue that currently monetary policy can do little to accommodate consolidation efforts and that a credit constrained private sector will also be unable to offset negative public demand shocks via an increase in private borrowing. However, these arguments do not take credit constraints of the public sector into account, including risks of losses of market access particularly when part of the debt is held by foreign investors. The recent past has shown that where debt is held by foreigners, the economy may face risks of sudden stops. Countries facing higher risk premia thus need to address the sovereign credit risk by bringing public finances back to sustainable levels. An expectation of sovereign debt restructuring not only increases sovereign borrowing costs but also has detrimental effects on

the domestic banking system, which typically holds a sizeable amount of bonds issued by domestic governments.

A similar debate rages about the size of the fiscal multiplier. Those who believe in a small multiplier (e.g. Cogan et al. (2010)) favour consolidation while those who point to estimates of a larger multiplier (as found in e.g. Auerbach and Gorodnichenko (2012)) argue for postponement of consolidation.⁽³⁶⁾ While the discussion on multipliers provides information about the short-term income losses of consolidation measures, it is not the only criterion on which one should base fiscal policy decisions, because multiplier calculations usually assume that under the alternative – no consolidation – scenario, the perceived risk of government debt restructuring would remain unchanged. However, countries with high and strongly rising sovereign debt have faced ever higher financing costs (and in some cases even a complete loss of financial market access). This in turn has had repercussions for the private sector.

An important transmission channel to the private sector which has been emphasised in recent discussions is the vulnerability of the domestic banking sector, which already suffers recapitalisation pressures from loan losses and faces additional pressure from declining government bond prices. Corsetti et al. (2012) refer to this as the 'sovereign risk channel'.⁽³⁷⁾ These authors use a dynamic stochastic general equilibrium (DSGE) model augmented by a simple banking sector and analyse the effects of fiscal retrenchment under alternative debt levels. They find that for debt-to-GDP ratios in excess of 115%, retrenchment packages could actually avoid an initial decline in output, as the sovereign risk channel turns out to dominate the direct effects of spending cuts.

This section analyses the sovereign risk channel using a two-country DSGE model with a banking

⁽³⁵⁾ Section prepared by Jan in 't Veld and Werner Roeger.

⁽³⁶⁾ Cogan, J. T. Cwik, J. Taylor and V. Wieland (2010), 'New Keynesian versus Old Keynesian government spending multipliers', *Journal of Economic Dynamics and Control*, 34(3), pp 281–95. Auerbach, A. and Y. Gorodnichenko (2012), 'Measuring the output responses to fiscal policy', *American Economic Journal-Economic Policy*, 4, pp. 1–27.

⁽³⁷⁾ Corsetti, G., K. Kuester, A. Meier and G. Mueller (2012), 'Sovereign risk, fiscal policy and macroeconomic stability', *IMF Working Paper* 12/33.

sector (see Kollmann et al. (2013)).⁽³⁸⁾ This is a model for an economy within a monetary union and is particularly suited to an analysis of vulnerable countries in the euro area.

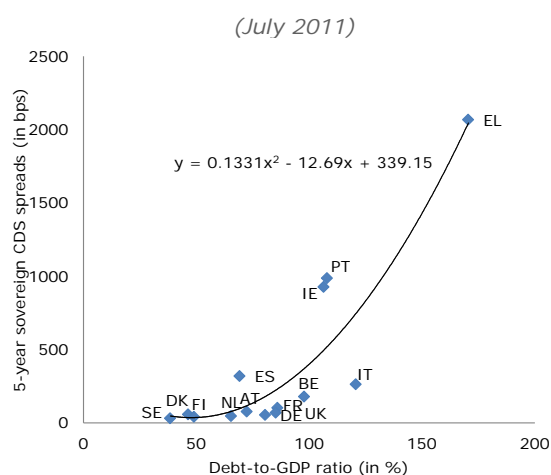
Sovereign default risk and government debt: some empirical evidence

The quantitative results presented in this section depend crucially on the sensitivity of the sovereign default probability to the level of government debt. Theoretical models of government default (see for example Arellano (2008)⁽³⁹⁾) typically predict a non-linear and convex relationship. Such a relationship is often found in the empirical literature. Bi (2012) models the interaction between sovereign default risk and fiscal policy using a DSGE model in which, due to the existence of fiscal limits (which measure a government's ability to service its debt), the model produces a non-linear relationship between the default risk premia and the level of government debt.⁽⁴⁰⁾ Default risk premia start to emerge when the debt level reaches a point where sovereign default becomes possible and once risk premia begin to rise, they do so rapidly. Graph II.3.1 shows the relationship between CDS spreads for government bonds (5-year maturity) and the level of government debt (as a share of GDP) for EU countries in 2011.

It can be seen that, for low levels of government debt (below 60% of GDP), CDS spreads are not sensitive to variations in debt levels. Between 60% and 90%, spreads increase more strongly with an increase in government debt. Roughly speaking, a 10 pps. increase of government debt increases the CDS spread by around 10 bps., a number often found in pre-financial crisis empirical estimates (e.g. Ardagna et al., 2007, Laubach, 2009, Poghosyan, 2012).⁽⁴¹⁾ Non-linearities become more severe for debt levels beyond 90%. There

remains a sizeable dispersion, however. Some countries like Belgium manage to retain low CDS spreads despite relatively high levels of government debt, while other countries such as Spain or Portugal face much higher CDS spreads for similar levels of government debt. This suggests that the slope between default risk and government debt is likely to be country-specific. Nevertheless, the average relationship depicted suggests that beyond debt levels of 120%, a 10 pps. increase of government debt can be associated with an increase in the CDS spread of around 200 bps. These empirical relationships are used in this section to analyse the importance of the sovereign risk channel.

Graph II.3.1: Sovereign CDS spreads vs debt-to-GDP ratios, EU countries (1)



(1) The figure shows average 5-year sovereign CDS spreads (bps.) for July 2011, against end-2011 general government debt (as % of GDP) with fitted 2nd-order polynomial.

Source: Bloomberg.

The model

The simulations presented below are based on a two-country DSGE model, where the euro area is divided up into vulnerable (EL, IE, PT, IT, ES) and non-vulnerable countries. The model differs from a standard DSGE model in two respects. First, there is a banking sector and, second, private households are divided up into (risk-averse) savers, (less risk-averse) equity owners and debtor households. The distinction between savers with different risk attitudes allows a distinction to be made between deposits (of risk-averse households) and bank capital (of equity owners). This distinction introduces limited risk sharing within the aggregate household sector and allows for

⁽³⁸⁾ Kollmann, R., M. Ratto, W. Roeger and J. in 't Veld (2013), 'Fiscal policy, banks and the financial crisis', *Journal of Economics Dynamics and Control*, 37(2), pp.387-403. .

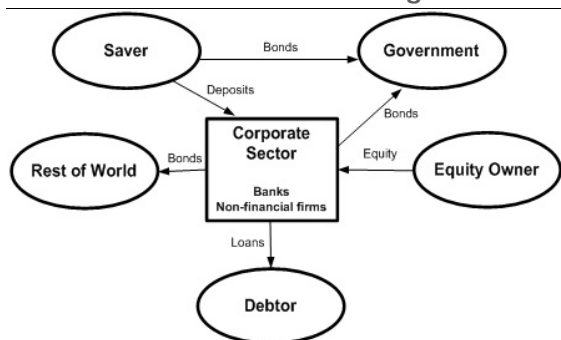
⁽³⁹⁾ Arellano, C. (2008), 'Default risk and income fluctuations in emerging economies', *American Economic Review*, 98, pp. 690-712.

⁽⁴⁰⁾ Bi, H. (2012), 'Sovereign default risk premia, fiscal limits, and fiscal policy', *European Economic Review*, 56, pp. 389-410.

⁽⁴¹⁾ Ardagna, S., Caselli, F. and T. Lane (2007), 'Fiscal discipline and the cost of public debt service: Some estimates for OECD countries', *The B.E. Journal of Macroeconomics*: Vol. 7(1); Laubach, T. (2009), 'New evidence on the interest rate effects of budget deficits and debt', *Journal of the European Economic Association*, 7(4): 858-85; Poghosyan T. (2012), 'Long run and short run determinants of sovereign bond yields in advanced economies', *IMF Working Paper* 12/271. .

larger fluctuations in borrowing costs. Graph II.3.2 shows the structure of financial relationships between different types of households and the corporate sector (for a more detailed description of the model and simulation experiments, see Roeger and in 't Veld (2013)⁽⁴²⁾).

Graph II.3.2: **The structure of the QUEST model with banking**



Source: DG ECFIN.

In the analysis, the sovereign risk channel becomes important because of the vulnerability of the banking sector, which is exposed to sovereign wealth effects from variations in government bond prices. The banking sector is briefly described hereunder so that the transmission mechanism from expected sovereign losses to the real economy can be better understood.

Banks issue shares to equity owners, who receive dividends from bank lending activities. Banks engage in mortgage lending and they hold government bonds. While government bonds are probably important for banks as collateral in refinancing operations, their demand is not modelled explicitly but taken as exogenous. This is sufficient for the purpose of analysing the effects of declining bond prices on banks' balance sheets. Banks are assumed to hold government perpetuities which pay a coupon each period. Expected sovereign restructuring is modelled as a change of expectation about future coupon payments, which results in variations of current sovereign bond prices. Given the limited types of activities of banks, the aggregate banking sector has a simple balance sheet. On the asset side it consists of loans and government bonds. Deposits and bank capital constitute the liability side.

Bank activities are restricted by a capital requirement constraint which penalises the bank if its capital falls below a certain threshold. The bank has various options for responding to loan losses or the loss of value of sovereign bonds, which both erode the current value of its capital. It can reduce lending or recapitalise in order to re-establish an optimal bank capital to asset ratio. In general, banks will act in both directions. Initially, the penalty on excess leverage determines how the bank finances loan supply in order to minimise financing costs. Thus, with a high penalty, banks are forced to recapitalise (reduce dividends, issue new shares) via the equity market and compete for investment funding with non-financial firms. This increases the rate of return on equity and thereby spreads the loss of the banking sector to corporate investment. Thus, introducing bank holdings of sovereign bonds allows modelling of spillover effects from the sovereign to the private sector. In a standard macro model without a banking sector, higher sovereign default expectations would not have significant macroeconomic effects since households would weigh sovereign asset losses against lower future tax payments, i.e. in present value terms households would not be strongly affected.

Merler and Pisani-Ferry (2012)⁽⁴³⁾ calculated sovereign bond holdings of domestic banks for euro area countries and found that these asset holdings had increased between 2007 and 2011. Especially domestic banks in countries in southern Europe tend to hold relatively large shares of domestic sovereign debt as a percentage of GDP (EL: 16.1%, IE: 9.6%, PT: 20.8%, IT: 16.9%, ES: 15.9%). In 2007 these holdings were below 10% of GDP. The increase partly reflects foreign investors' reluctance to roll over debt. For the simulations it is assumed that domestic banks' holdings of sovereign debt amount to 12% of GDP. The curvature parameter of the bank's cost of deviating from target bank capital implies that a 1 pp rise in the bank capital ratio lowers the spread between the bank lending rate and the deposit rate by 40 bps. This is a critical parameter in the model that depends crucially on the degree of risk aversion of depositors. This parameter, as well as all other behavioural and technological parameters, is taken from the estimated model for the euro area in Kollmann et al. (2013).

⁽⁴²⁾ Roeger W. and J. in 't Veld (2013), 'Expected sovereign defaults and fiscal consolidations', *European Economy Economic Paper*, (forthcoming).

⁽⁴³⁾ Merler, S and J. Pisani-Ferry (2012), 'Who's afraid of sovereign bonds?', *Bruegel Policy Contribution*, 2012/02.

Policy experiment

The remainder of this section assesses the effects of fiscal consolidation in an environment with rising sovereign debt. It deviates from the standard practice of calculating multipliers, which assumes that without consolidation the economy would move along a pre-existing steady-state path. The analysis hereunder takes an intermediate step and assesses explicitly various ‘no fiscal consolidation’ scenarios. These scenarios are generated by adverse shocks to the euro area periphery, and their size is calibrated in such a way that the debt-to-GDP ratio rises by 10 pps. permanently in the absence of consolidation. The 10 pps. increase is chosen because a persistent reduction in government spending of 1% of GDP (over 10 years) roughly stabilises the initial debt-to-GDP ratio. The scenario is generated by two adverse shocks: mortgage losses, which build up to 2.5% of (one year’s) GDP after five years, and a permanent drop in house prices of 6%. These shocks are roughly representative of the types of shocks that have been hitting euro area periphery countries and which, through the workings of automatic stabilisers, have led to an increase in debt ratios. However the size of the adverse financial shocks is restricted so as to generate only a 10% increase in public debt.

The alternative ‘no fiscal consolidation’ scenarios differ by the imposed elasticity of the sovereign risk premium to the increase in the debt-to-GDP ratio. Scenario 1 is the (standard) no-fiscal-consolidation scenario and shows the evolution of the economy under the adverse shock and the assumption that financial markets do not expect the resulting increase in government debt to have an impact on the probability of government default. However, the no-consolidation scenario should be interpreted with caution insofar as the problem of high public debt would have to be addressed at a later stage in any case. The output effect of the necessary consolidation would thus occur at a later stage. Scenarios 2a and 2b are no-fiscal-consolidation scenarios under alternative assumptions about default expectations of financial markets. Scenario 2a shows the response of the economy under benign revision of sovereign default expectations (in normal times and for low levels of government debt (below 60%)). In this case an increase in the debt-to-GDP ratio of 10 pps. raises 5-year CDS spreads by 20bps, implying a cumulative probability of sovereign default over

five years of 1%. Scenario 2b shows the response of the economy without fiscal consolidation for a more rigorous revision of default expectations. This scenario corresponds to what can be inferred from sovereign CDS spreads for euro area countries with a debt level above 120% in 2011, i.e. in a situation of significant financial market uncertainty (see Graph II.3.1). In this case a 10 pps. increase in the debt ratio raises CDS spreads by 200 bps, implying a cumulative probability of sovereign default over five years of 10%. Scenario 3 shows a fully credible consolidation scenario that reduces the debt-to-GDP ratio by 10 pps. It is a permanent reduction in government consumption of 1% of GDP, which offsets the increase in public debt due to bank losses and deleveraging.

The difference between Scenarios 3 and 1 shows the impact of an expenditure-based fiscal consolidation, everything else being equal. The baseline scenario does not take into account that consolidation would only be delayed. This is not shown in scenarios 1, 2a and 2b in Graph II.3.3. GDP falls by 1% following the spending cuts, i.e. the first year fiscal multiplier is equal to one (see Graph II.3.3). The consolidation also has a negative impact on private consumption and investment, as in a monetary union nominal interest rates are unchanged and the real interest rate increases. The contractionary effects of the consolidation lead to a larger increase in the debt-to-GDP ratio than in the baseline shock scenario in the first year (see Table II.3.1, panels 1 and 3). Only in later years does the debt-to-GDP ratio decline. In the benign no-consolidation scenario 2a, the expected 10 pps. increase in the debt-to-GDP ratio would only affect default probability by 0.2% p. a. and GDP would be 0.2% lower. The higher default probability raises financing costs for firms and households and private demand declines further (see also Table II.3.1, panels 2.a and 2.b).

If instead the situation is such that financial investors revise their default expectations more strongly – in line with assumptions underlying Scenario 2b – the short-run cost of allowing for a permanent increase in government debt is 1.6%. The risk premium on 5-year government bonds increases by about 200 bps, while the risk premium on 5-year corporate bonds increases by a similar amount in the first year, but falls back in following

Table II.3.1: **Impact of bank losses and deleveraging shocks**

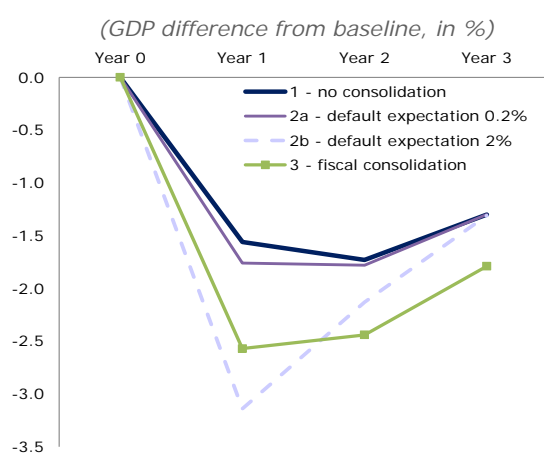
(in percent difference from baseline)

1: Bank losses and deleveraging				2.a: Bank losses and deleveraging + default expectation 0.2%					
	year	1	2	3		year	1	2	3
GDP		-1.56	-1.73	-1.30	GDP		-1.76	-1.78	-1.30
Consumption		-1.20	-1.19	-0.74	Consumption		-1.47	-1.24	-0.74
Corporate investment		-4.77	-3.26	-0.28	Corporate investment		-5.50	-3.50	-0.28
Residential investment		-8.85	-13.91	-14.24	Residential investment		-8.93	-13.86	-14.23
Rate of return equity (5yr)		60.78	20.93	-7.66	Rate of return equity (5yr)		79.66	22.29	-8.09
Debt-to-GDP ratio		1.73	2.85	3.30	Debt-to-GDP ratio		1.74	2.83	3.24
Price sov. bond (5yr)		2.31	2.23	2.05	Price sov. bond (5yr)		-0.83	-0.95	-1.13

2.b: Bank losses and deleveraging + default expectation 2%				3: Bank losses and deleveraging + reduction government expenditure					
	year	1	2	3		year	1	2	3
GDP		-3.14	-2.13	-1.31	GDP		-2.57	-2.44	-1.79
Consumption		-3.28	-1.63	-0.75	Consumption		-1.35	-0.85	-0.09
Corporate investment		-10.62	-5.29	-0.35	Corporate investment		-6.55	-5.14	-1.74
Residential investment		-9.53	-13.54	-14.12	Residential investment		-7.59	-11.57	-12.04
Rate of return equity (5yr)		213.73	32.59	-10.82	Rate of return equity (5yr)		78.89	28.49	-5.63
Debt-to-GDP ratio		1.78	2.62	2.82	Debt-to-GDP ratio		2.12	2.49	2.03
Price sov. bond (5yr)		-10.26	-10.5	-10.68	Price sov. bond (5yr)		2.92	2.94	2.78

Source: DG ECFIN.

years. The increase of capital costs lowers corporate investment in the first two years.

 Graph II.3.3: **GDP impact of bank losses and deleveraging shocks**


Source: DG ECFIN.

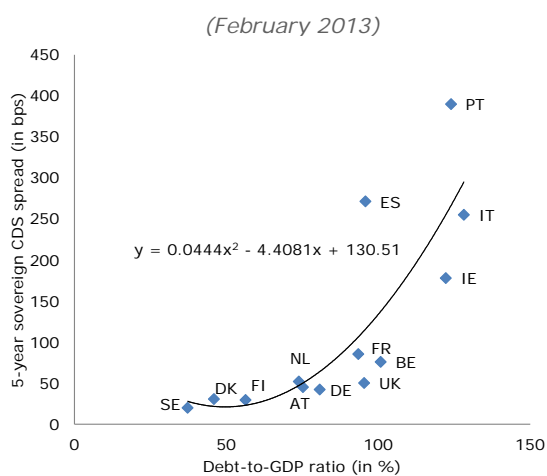
In these sovereign risk channel scenarios the increase of capital costs for firms is short-lived. This is due to the fact that the financing needs for banks arise mainly in the first year in case a sovereign default is only expected and does not materialise (as assumed here). This happens because sovereign bond prices drop immediately once the probability of debt restructuring increases. This only requires temporary recapitalisation efforts (e.g. lower bank dividends), and therefore funding costs will only rise temporarily. Residential investment also declines, though by less than corporate investment since the loan rate increases by less than the rate of return on equity (the loan rate is a weighted average of the return on equity and the deposit rate, with weights equal to the capital and deposit share).

Concluding remarks

These scenarios show the potential costs of higher sovereign risk premia and expectations of sovereign default. This has important implications

for fiscal consolidation needs in highly indebted countries. While at the current juncture the costs of fiscal consolidation in terms of GDP growth are greater because of higher than normal fiscal multipliers, a counterfactual of no fiscal consolidation could for the countries concerned have more detrimental effects if it leads to expectations of sovereign default which put further pressure on the banking system when banks need to maintain high levels of capital. Based on a highly non-linear convex relationship between debt levels and CDS spreads, this section shows that a further increase in debt-to-GDP ratios in highly indebted countries can sovereign spreads spill over into higher private sector borrowing costs. While this does not change the fact that multipliers — as defined relative to the initial state — are larger now, it indicates that in case of sovereign stress there is no alternative to determined consolidation; as otherwise the consequences would be much worse.

Graph II.3.4: **Sovereign CDS spreads vs debt-to-GDP ratios, EU countries (1)**



(1) Same as Graph II.3.1, but average CDS spreads for February 2013, against forecast for 2013 general government debt (as % of GDP). No CDS spreads available for Greece.

Source: Bloomberg, European Commission Winter Forecast 2013.

This also has possible implications for the consolidation path for highly indebted countries. Those arguing in favour of backloading fiscal consolidations assume that conditions would return to normal even in the absence of consolidation, so that multipliers would be smaller then (a quite strong assumption) and hence the short-term costs of consolidating would be lower. In addition, they argue that nominal rigidities in wages and prices generally favour slower, more gradual adjustment to fast frontloaded ones. But if a slower consolidation path risks raising fears in financial markets due to implementation risks and doubts about the determination to reforms, backloading consolidation would cause immediate costs from raising expectations of sovereign default. Finally, delaying fiscal consolidation would not help to address the nominal rigidities and may even perpetuate them, unless these are tackled by structural reforms.

It should also be acknowledged that there is wide dispersion in CDS spreads across countries, with some being able to attain low CDS spreads despite large debt ratios. Moreover, since the announcement of Outright Monetary Transactions (OMT) by the ECB in the second half of 2012, sovereign risk premia have fallen significantly and the relationship between debt levels and CDS spreads has weakened (see Graph II.3.4).⁽⁴⁴⁾ But while the announcement of OMT has helped to lower perceived default risks, it is not unconditional support but is subject to clear conditionality. The consequences of no consolidation remain an important consideration when judging the appropriate stance of fiscal policy. In the scenarios shown here the costs of expected defaults are heavily frontloaded to the first year, while they could be more spread out over a longer horizon for more realistic scenarios. Further analysis is required to quantify these effects in a more general context.

⁽⁴⁴⁾ While for a country with a debt level of 120% a further 10 pps. increase was, in July 2011, associated with an increase in the CDS spread of 200 bps., in February 2013 this was 60 bps.

III. Recent DG ECFIN publications

1. Occasional Papers

EUROPEAN ECONOMY. OCCASIONAL PAPERS. 130. March 2013
Financial Assistance Programme for the Recapitalisation of Financial Institutions in Spain - Second Review of the Programme Spring 2013

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http://ec.europa.eu/economy_finance/publications/occasional_paper/2013/pdf/ocp129_en.pdf

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Fiscal Sustainability Report 2012 – December 2012

http://ec.europa.eu/economy_finance/publications/european_economy/2012/pdf/ee-2012-8_en.pdf

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http://ec.europa.eu/economy_finance/db_indicators/surveys/documents/2013/bci_2013_03_en.pdf

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http://ec.europa.eu/economy_finance/db_indicators/key_indicators/index_en.htm

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http://ec.europa.eu/economy_finance/publications/bond_market/index_en.htm

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