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European Commission

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# Quarterly Report on the Euro Area

Volume 14, No 3 (2015)



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**Marco Buti**  
Director-General

Significant progress has been achieved in strengthening the architecture of the Europe's Economic Monetary Union (EMU) in recent years. Critical structural reforms have also been implemented in several Member States, which are starting to bear fruit. Today, the euro area is in a much better position to deal with the consequences of economic shocks than it was before the crisis.

Nevertheless, the euro area's recovery has been weak both by its own historical standards and in comparison with the recovery in other advanced economies (see Focus Section 1). The recent slowdown of the external environment, notably China, and increased volatility on financial markets may further weaken the economic outlook.

What could policies do to promote the economic recovery in the euro area and make it more robust to shocks? I have highlighted before the need for further efforts to design and implement credible structural reforms to reach a more sustainable growth path. And clear progress in completing the Economic and Monetary Union, in the line with the proposals of the Five Presidents' Report, is also indispensable.

This leaves me with the question of the role that fiscal policies can play in supporting the recovery and strengthening its resilience. Three aspects have to be considered.

First, fiscal policies need to address *sustainability concerns*. The aggregated government debt ratio of the euro area is expected to stabilise at high levels – around 94 percent of GDP in 2015. Highly-indebted Member States need to further consolidate their public finances and bring them on to a sustainable trajectory, not only to rebuild fiscal buffers, but to prepare them for the increased expenditures that ageing populations are expected to bring.

Second, fiscal policies support *macroeconomic stabilisation* by bringing output closer to its potential while avoiding pro-cyclical policies. One possibility without increasing the structural deficits is to strengthen the effectiveness of automatic stabilisers, which mechanically act to dampen fluctuations in economic activity while leaving the country's structural budgetary position unchanged. For instance, the consumption of households in economic downturns is usually supported by lower taxes and higher unemployment benefits. Certain policy measures could make the automatic stabilisers more effective at no budgetary cost over the cycle, such as making personal income taxes more progressive. Clearly, any such reform should be designed so as not affect incentives in the labour market and resource allocation.

Third, fiscal policies would also benefit from a *more effective coordination*. As specified in the Five Presidents' Report, coordination implies full implementation of the Stability and Growth Pact (SGP) by all Member States to preserve the credibility of the framework. Experience shows that the countries hit hardest by doubts about the implementation of the rules were those countries which suffered most during the crisis. Coordination should also aim to achieve an appropriate fiscal stance for the euro area as a whole. This is particularly important when monetary policy is constrained by the zero lower bound in policy interest rates and external demand proves less favourable than anticipated (as is likely to be the case given the slowdown in emerging markets). The overall euro area dimension should therefore be strengthened in the context of the European Semester.

# I. The euro area recovery in perspective <sup>(1)</sup>

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*This focus section compares the euro area recovery since the global financial crisis to two benchmarks: i) its recoveries from other major recessions and ii) the recoveries of other advanced economies since the global financial crisis. This twin perspective helps to draw some stylised facts about the current recovery and to better understand its particularities. Overall, the results indicate that the current recovery is weak both by the euro area own historical standards and in comparison with the recent recovery in other advanced economies, even those hit by systemic banking crises. The weakness has both structural and cyclical features. On the demand side, investment, both residential and non-residential, emerges as a key source of weakness in activity. The analysis also points to weaknesses in the euro area's labour market adjustment process. Due to slow growth, the euro area has also progressed less rapidly than other advanced countries hit by banking crises in tackling legacies of the crisis such as excessive private sector debt. Macroeconomic imbalances accumulated before the crisis and the incomplete architecture of the Economic and Monetary Union at the time have both aggravated the impact of the global financial crisis, transforming it into a sovereign crisis marked by damaging feedback loops between banks and sovereigns and sudden stops in capital flows. This has constrained macroeconomic policies and led to a less supportive macroeconomic policy response than in other advanced countries. In addition, repair of bank balance sheets has been comparatively slower than in other countries hit by systemic banking crises.*

## I.1. Introduction

Seven years since the beginning of the global financial crisis, the euro area's recovery remains subdued and fragile. This is despite improved framework conditions for growth since 2014, notably in terms of fiscal and monetary policy stances. To better understand the key features of the current recovery, this chapter presents a comparison of recent economic developments in the euro area with (i) similar cyclical episodes in the euro area over the past three decades and (ii) recent developments in other advanced countries. This combination of historical and cross-country perspectives sheds some light on the specific forces currently holding down growth in the euro area.

The chapter reviews a wide set of macroeconomic and financial indicators seven years before (Y-7) and after (Y+7) cyclical troughs (Y0). Due to data availability, coverage of the euro area is limited to the original 12 founders (or-quasi founders) of the euro (EA-12). In most advanced countries including the euro area, 2009 marks the low point of the latest business cycle (Y0). We first compare the ongoing euro area recovery to the recoveries following the two major recessions of the 1980s and 1990s (with troughs in 1983 and 1993). We then compare the recent performance of the euro area vis-à-vis selected advanced countries that were also hit by a systemic banking crisis during the

global financial crisis (Japan, Sweden, Switzerland, the UK and the US) as well as others that were not (Australia, Canada, Korea, New Zealand and Norway). <sup>(2)</sup> This allows us to control for the global developments that all these advanced countries were exposed to and to evaluate the relative impact of the initial banking crisis in the euro area and the sovereign debt turmoil that ensued. <sup>(3)</sup>

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<sup>(2)</sup> The tracking of banking crises comes from Babecký, J. et al. (2014), 'Banking, debt, and currency crises in developed countries: stylised facts and early warning indicators', *Journal of Financial Stability*, Vol. 15, pp. 1-17 who identify crises by means of expert survey and Leaven, L. and F. Valencia (2013), 'Systemic banking crises database', *IMF Economic Review*, Vol. 61, No 2, pp. 225-270 who in turn use specific quantitative definition of banking crisis. Specifically there is an agreement between both sources that a systemic banking crisis took place in most EA-12 countries in 2008 (for some countries lasting even after 2008): Austria, France, Germany, Greece, Ireland, Luxembourg, the Netherlands, Portugal and Spain. From the remaining OECD countries were selected five most developed economies, where according to the former sources, banking crises occurred in 2008 and five where it did not. Whereas in the past the banking crises were more isolated with a lot of idiosyncrasies, there was an extraordinary synchronization of banking crises in 2008 and recoveries starting in 2009. This makes this recent period especially suitable for cross-country comparison.

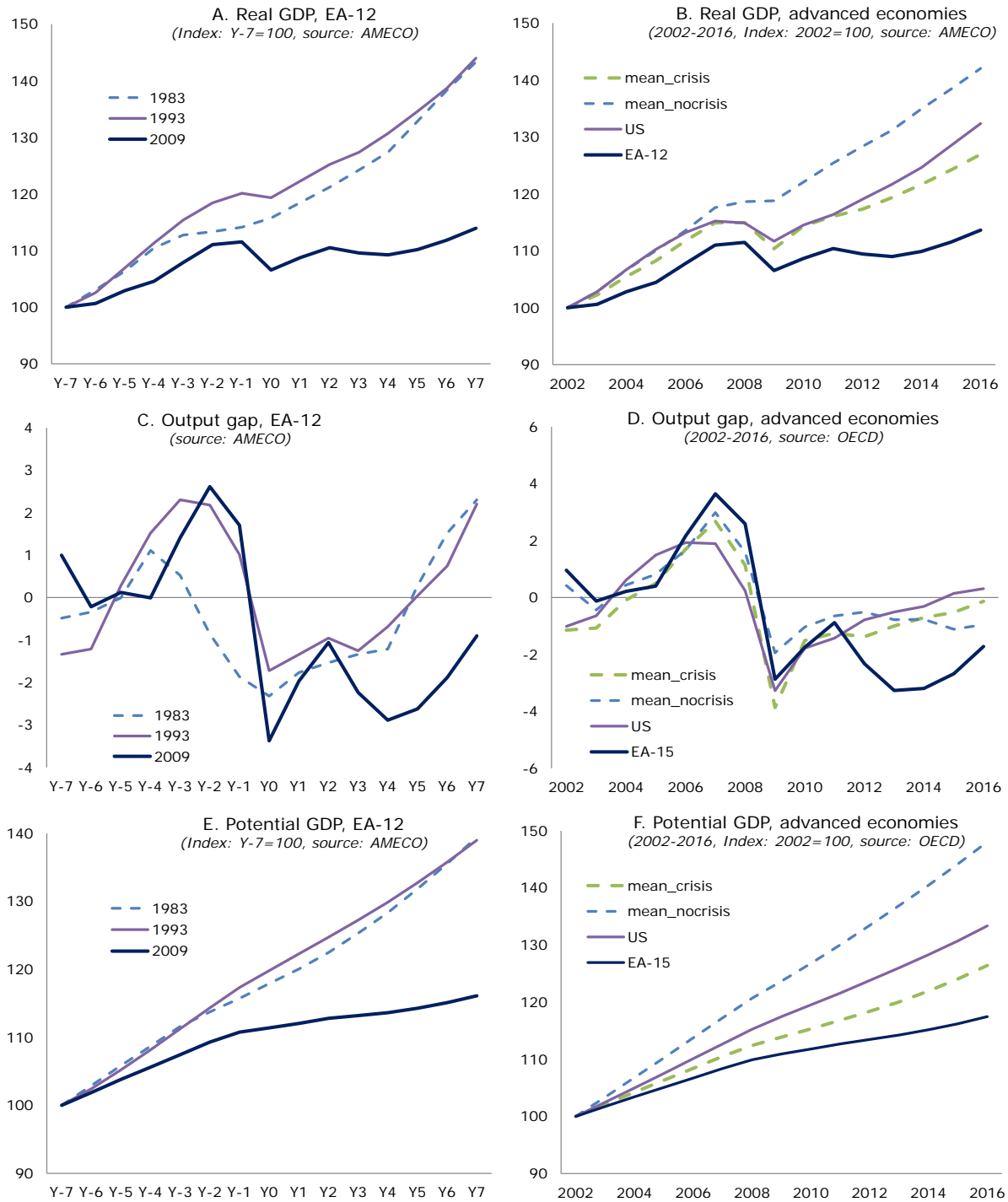
<sup>(3)</sup> To construct these two country groups, we use *un-weighted means* in order to avoid the risks that reported developments are dominated by one or two large countries. Given the importance of the US for the global economy, we also plot this country separately in all charts (still being included in the mean of crisis countries so that both groups include the same number of countries and covers all possible regions). For the euro area in turn we use *GDP-weighted aggregate* of the selected 12 Member States.

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<sup>(1)</sup> Section prepared by Eric Ruscher and Bořek Vašíček.



Graph I.1: Recoveries after major recessions and after the global financial crisis (1)



(1) Y0 is the year of cyclical trough in the EA, i.e. 1983, 1993 and 2009. 2009 is also the year when most advanced economies started to recover from the global crisis. For the recovery after 2009, Y6 (2015) and Y7 (2016) are based on the European Commission's Spring Forecasts. EA12 (15) is GDP-weighted aggregate of BE, DE, IE, EL, ES, FR, IT, LU, NL, AT, PT, FI, (SI, CY, MT). 'mean\_crisis' is the un-weighted mean of CH, JP, SE, UK, US. 'mean\_nocrisis' is the un-weighted mean of AU, CA, KO, NO, NZ.

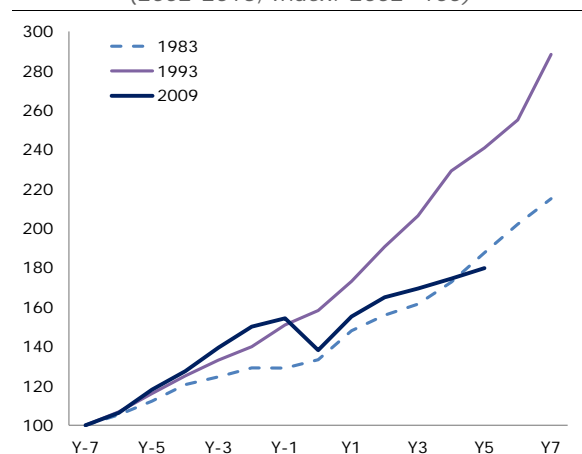
Source: AMECO, OECD.

## I.2. The euro area recovery is weak from both an historical and a cross-country perspective

Recoveries from major recessions have always tended to be sluggish and hesitant in most euro area countries, especially when compared to the US. Yet, developments in the euro area since the global financial crisis clearly stand out. The GDP growth recorded since 2009 has been substantially weaker than in the previous recoveries (Graph I.1A). This historical underperformance is not surprising for at least two reasons:

- First, the recovery has taken place in a less supportive global environment than in the 1980s or 1990s. World trade bounced back strongly after the 2008-09 global recession and was a strong source of support for the short-lived 2009-2010 recovery but, since 2011, the momentum in world trade has been much weaker than at similar stages of the business cycle before the launch of the euro (Graph I.2).

Graph I.2: **World trade**  
(2002-2016, Index: 2002=100)



(1) Y0 is the year of cyclical trough in the euro area, i.e. 1983, 1993 and 2009. 2009 is also the year when most advanced economies started to recover from the global financial crisis.

Source: OECD.

- Second, during the global financial crisis, most euro area countries were hit by systemic banking crises and a large literature has highlighted the sluggishness of recoveries after banking turmoil. (4)

(4) For recent references see for instance: Reinhart, C. M. and K. S. Rogoff (2014), 'Recovery from financial crises: Evidence from

However, the underperformance of the euro area recovery also stands out in comparison with other advanced economies. This is true even when benchmarking the euro area against other advanced countries that were also hit by systemic banking crises during the global financial crisis, notably the US (Graphs I.1B). The major reason for this deviation is, of course, the so-called sovereign debt crisis that hit in 2011 and led to financial fragmentation within the euro area, early withdrawal of fiscal stimulus, and a double-dip recession. The sovereign crisis was, to a large extent, precipitated by the banking crisis. Despite some heterogeneity within the euro area itself, the majority of the euro area countries examined performed worse than their OECD peers. (5)

### The growth weakness has cyclical features ...

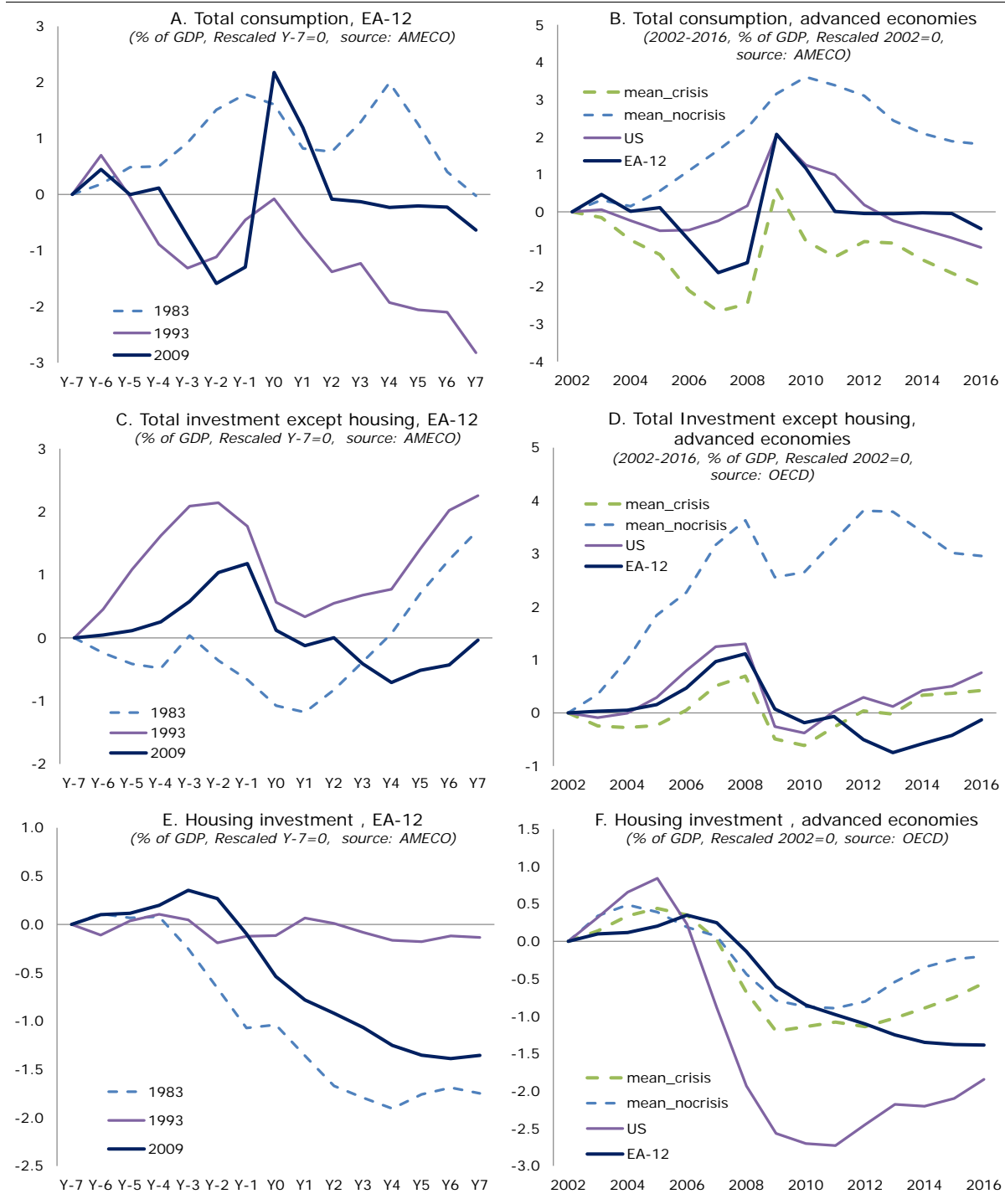
The weakness in the euro area's growth since the crisis is both cyclical and structural in nature. Whereas the immediate cyclical downturn triggered by the global financial crisis was deeper than in previous recessions (Graphs I.1C), it was quite similar to the experience of other advanced economies hit by systemic banking crises (Graphs I.1D). Indeed, until 2011 (Y2) the euro area negative output gap was closing in line with previous recoveries and other crisis-hit countries. However, as the sovereign debt crisis hit several Member States, cyclical developments in the euro area decoupled from other advanced countries. The deviation is all the more striking given that in the pre-crisis period, the euro area business cycle was relatively well aligned with other advanced economies. (6)

100 episodes', *American Economic Review*, Vol. 104(5), pp. 50-55, May; Jorda, O., M. Schularick and A. M. Taylor (2013), 'Sovereigns versus banks: credit, crises, and consequences', *Federal Reserve Bank of San Francisco Working Paper Series*, No 2013-37; Jorda, O., M. Schularick and A. M. Taylor (2013), 'When credit bites back', *Journal of Money, Credit and Banking*, Vol. 45, Issue s2, pp. 3-28; Claessens, S., A. Kose, L. Laeven, and F. Valencia (2013), 'Understanding financial crises: Causes, consequences, and policy responses', *CEPR Discussion Paper Series*, No 9310.

(5) For recent discussion of different aspect of the euro area crisis see: CEPR, (2015), 'The Eurozone crisis: A consensus view of the causes and a few possible solutions', *A VoxEU.org Book*, editors Baldwin, R. and F. Giavazzi.

(6) Although the global financial crisis had a bigger negative effect on countries that were also hit by systemic banking crisis than those that were not, the gap between the two closed relatively quickly. This suggests that the cyclical effect of banking crises might not be that persistent.

Graph I.3: GDP — The demand side (1)



(1) Y0 is the year of cyclical trough in the euro area, i.e. 1983, 1993 and 2009. 2009 is also the year when most advanced economies started to recover from the global financial crisis. For the recovery after 2009, Y6 (2015) and Y7 (2016) are based on the European Commission's Spring Forecasts. EA12 is GDP-weighted aggregate of BE, DE, IE, EL, ES, FR, IT, LU, NL, AT, PT, FI. 'mean\_crisis' is the un-weighted mean of CH, JP, SE, UK, US. 'mean\_nocrisis' is the un-weighted mean of AU, CA, KO, NO, NZ. The ratios in the graphs have been rescaled to be equal to 0 in Y-7/2002.  
**Source:** AMECO, OECD.

### ... but also structural ones

The euro area suffers from long-standing structural weaknesses that seem to have been reinforced since the global financial crisis. Contrary to previous recessions, a clear inflection is visible in estimates of potential output after the global financial crisis (Graphs I.1E). The global crisis also seems to have had some effect on the potential output of some other advanced countries hit by banking crises, although to a much lesser degree (Graphs I.1F). The difference with the US is particularly striking. On the other hand, the potential of the countries not hit by banking crises appears to have been barely affected. This is broadly in line with some recent studies which suggest that the effect of financial crises on potential output is generalised and persistent, although varying in intensity according to the severity of financial turmoil. <sup>(7)</sup>

The effect of the crisis on potential output in the euro area reflects several factors, including slow capital accumulation, increases in the non-cyclical component of unemployment and, possibly, weaker total factor productivity (TFP). According to recent Commission analysis, the most likely scenario is that these factors should have a long but non-permanent effect. <sup>(8)</sup> However, hysteresis effects cannot be excluded at this stage and potential growth is, in any event, likely to remain lower than in most other advanced economies due to the combination of population ageing and sluggish TFP growth.

<sup>(7)</sup> Ball, L. (2014), estimates the average loss of potential output in 23 OECD countries following the global recession of 2008-2009 on output at 8.4%.

Ball, L. (2014), 'Long-term damage from the great recession in OECD countries', *NBER Working Paper Series*, No 20185.

Furceri, D. and A. Mourougane (2012), 'The effect of financial crises on potential output: New empirical evidence from OECD countries', *Journal of Macroeconomics*, Vol. 34, Issue 3, pp. 822-832.

<sup>(8)</sup> European Commission (2014), 'ECFIN's medium term projections: the risk of 'secular stagnation'', *Quarterly Report on the Euro Area*, Vol. 13, No 4, pp. 23-29.

See also Ollivaud, P. and D. Turner (2014), who argue that adverse effects after the global financial crisis come from lower trend productivity, due to a combination of both lower total factor productivity (TFP) and lower capital per worker. The latter is in turn related to a substantial misallocation of capital in the pre-crisis period.

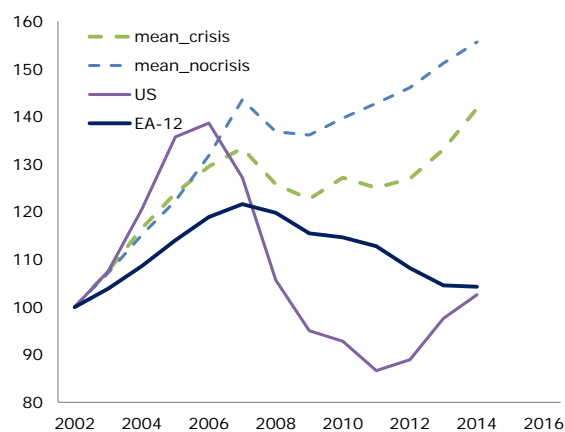
Ollivaud, P. and D. Turner (2014), 'The effect of the global financial crisis on OECD potential output OECD Countries', *OECD Economics Department Working Paper*, No 1166),

### I.3. Demand side: weak investment

A detailed look at the components of GDP sheds further light on reasons for the euro area weak growth. Consumption patterns do not show any distinctive differences compared to the previous recoveries (Graph I.3A). The share of consumption in GDP experienced an abrupt increase right after 2007, as spending on other GDP components, particularly non-residential and residential investment fell sharply. This pattern is also observed in the other crisis-hit countries (Graph I.3B). The euro area exports to the rest of the world by contrast, evolved comparatively better than in other crisis-hit countries.

In contrast with consumption and exports, non-residential investment in the euro area appears distinctly weak compared both to previous recoveries and to other advanced countries. Unlike in previous recoveries, non-residential investment has not experienced a major rebound since the cyclical trough and remains below pre-crisis levels both in absolute terms and as a share of GDP (Graph I.3C). While in the immediate aftermath of the global financial crisis, euro area non-residential investment suffered a similar drop as in other advanced countries hit by banking crises, it did not rebound in 2011 as it did elsewhere. Moreover, euro area investment experienced an additional drop with the onset of the sovereign debt crisis and has since turned into the main drag on the euro

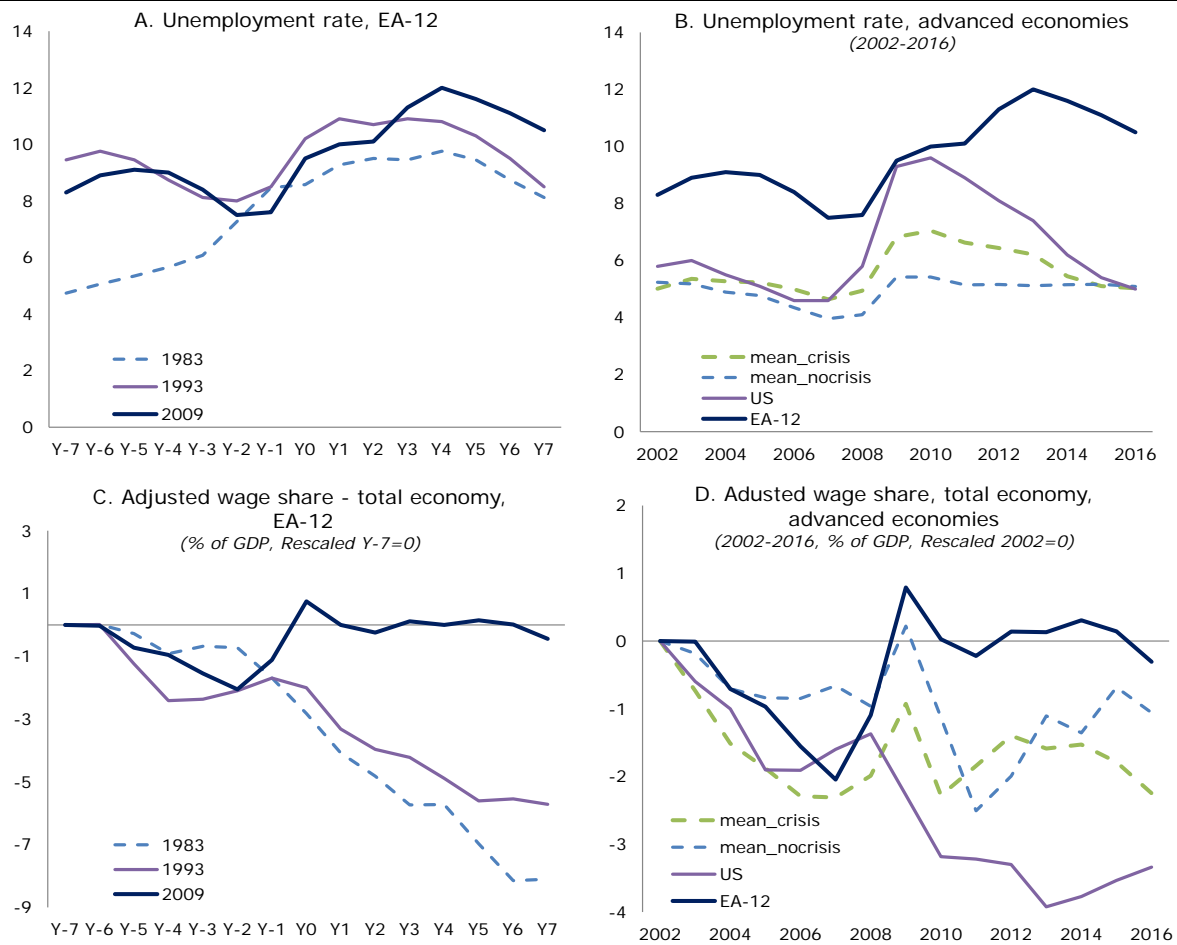
Graph I.4: **Real residential property prices, advanced economies (1)**  
(2002-2016, Index: 2002=100)



(1) EA-12 comprises of BE, DE, IE, EL, ES, FR, IT, LU, NL, AT, PT, FI. 'mean\_crisis' is an un-weighted mean of CH, JP, SE, UK, US. 'mean\_nocrisis' is an un-weighted mean of AU, CA, KO, NO, NZ.

Source: BIS.

Graph I.5: Labour market (1)



(1) Y0 is the year of cyclical trough in the euro area, i.e. 1983, 1993 and 2009. 2009 is also the year when most advanced economies started to recover from the global financial crisis. For the recovery after 2009, Y6 (2015) and Y7 (2016) are based on the European Commission's Spring Forecasts. EA12 is GDP-weighted aggregate of BE, DE, IE, EL, ES, FR, IT, LU, NL, AT, PT, FI. 'mean\_crisis' is the un-weighted mean of CH, JP, SE, UK, US. 'mean\_nocrisis' is the un-weighted mean of AU, CA, KO, NO, NZ. The ratios in the graphs C and D have been rescaled to be equal to 0 in Y-7/2002.

Source: AMECO.

area recovery (Graph I.3D).

Residential investment has also been a clear source of demand weakness in the euro area but, here, the historical and cross-country perspectives are less clear cut than for non-residential investment. ( ) The ratio of residential investment to GDP in the euro area has declined almost steadily since its peak in 2007 and is not forecast to increase significantly in 2015-16. This compares unfavourably with the flatter developments in residential investment observed after the 1992-93 recession (Graph I.3E) but is broadly in line with the patterns seen in the recovery of the 1980s.

While adjustment after an unsustainable boom was arguably needed in some euro area countries, the boom-bust features of residential investment in the euro area as a whole appear less pronounced than

in other advanced economies, particularly the US. The euro area is also alone among advanced economies in not having experienced a clear recovery in residential investment (Graph I.3F). The euro area protracted weakness is also reflected in a steady decline in real house prices since their peak in 2007 (Graph I.4). A price adjustment took place in most advanced economies after the crisis but, with the notable exception of countries such as the US, it has generally been relatively shallow and short-lived. House prices have generally been on an upward trend for several years now in most advanced economies but not in the euro area.

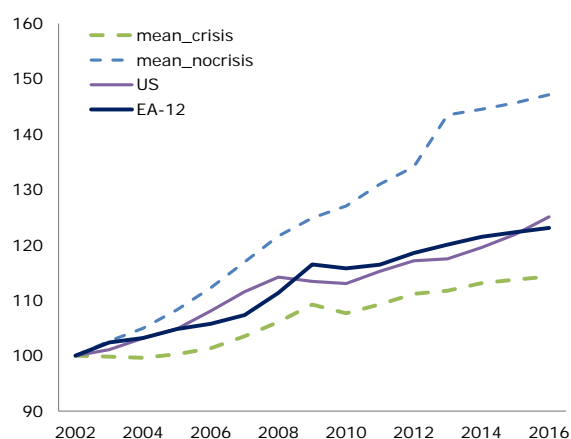
#### I.4. Labour market: slow adjustment

Developments in the euro area unemployment rate in the aftermath of the global financial crisis deviate both from previous recoveries (Graph

I.5A) and, even more so, from other advanced countries (Graph I.5B). The immediate unemployment increase was relatively muted <sup>(9)</sup> arguably due to generally stronger employment protection and the implementation of flexible working schemes in some euro area countries. However, the unemployment rate did not stabilise around 2009 as it did in other advanced countries. Instead unemployment began rising again after 2011, reaching 12 %.

A notable feature of the current euro area recovery is that the weakness of the labour market has not been fully reflected in labour cost developments. Despite a more pronounced and lasting deterioration in the labour market, unit labour costs have grown at a broadly similar pace as in the other crisis-hit countries (Graph I.6). Furthermore, the share of wages in GDP (or real unit labour cost), that recorded an increase after 2007 due, among other things, to labour hoarding, has not experienced the decline seen in previous euro area recoveries (Graph I.5C) or in the current US recovery (Graph I.5D).

Graph I.6: **Nominal unit labour cost, advanced economies (1)**  
(2002-2016, Index: 2002=100)



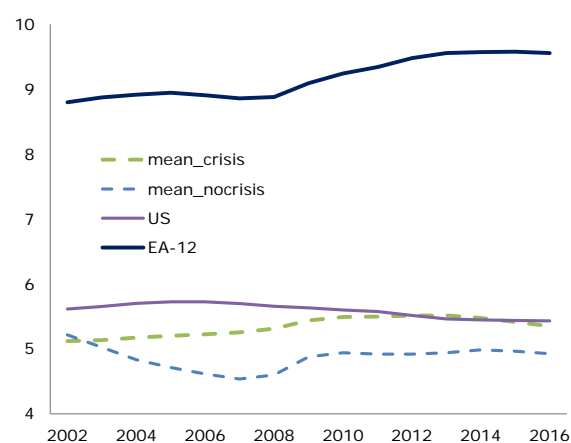
(1) EA-12 comprises of BE, DE, IE, EL, ES, FR, IT, LU, NL, AT, PT, FI. 'mean\_crisis' comprises of unweight mean of CH, JP, SE, UK, US. 'mean\_nocrisis' comprises of unweight mean of AU, CA, KO, NO, NZ.  
**Source:** AMECO.

Another evidence of the lack of wage adjustment is provided by the substantial increase in the non-cyclical part of unemployment with the

<sup>(9)</sup> The EA-12 unemployment rate increased from 7.5% in 2007 to 9.5% in 2009 as opposed to an increase in other banking-crisis hit countries from 4.6% to 6.8%, and especially in the US where it increased from 4.6% to 9.3%.

NAWRU/NAIRU reaching a historical high of 10% (Graph I.7). <sup>(10)</sup> There are several possible explanations for this increase in non-cyclical unemployment, including labour market rigidities, the need to reallocate labour away from sectors hit with long-term consequences from the banking crisis (e.g. housing) and hysteresis effects. As stressed before, European Commission analysis suggests that the most likely scenario is that the rise will last for some time but not be permanent. This analysis, however, depends crucially on the implementation of appropriate labour market policies and the risk of hysteresis effects should not be underestimated. <sup>(11)</sup>

Graph I.7: **NAIRU, advanced economies (1)**  
(2002-2016)



(1) EA-12 comprises of BE, DE, IE, EL, ES, FR, IT, LU, NL, AT, PT, FI. 'mean\_crisis' comprises of unweight mean of CH, JP, SE, UK, US. 'mean\_nocrisis' comprises of unweight mean of AU, CA, KO, NO, NZ.  
**Source:** OECD.

## I.5. A balance sheet perspective

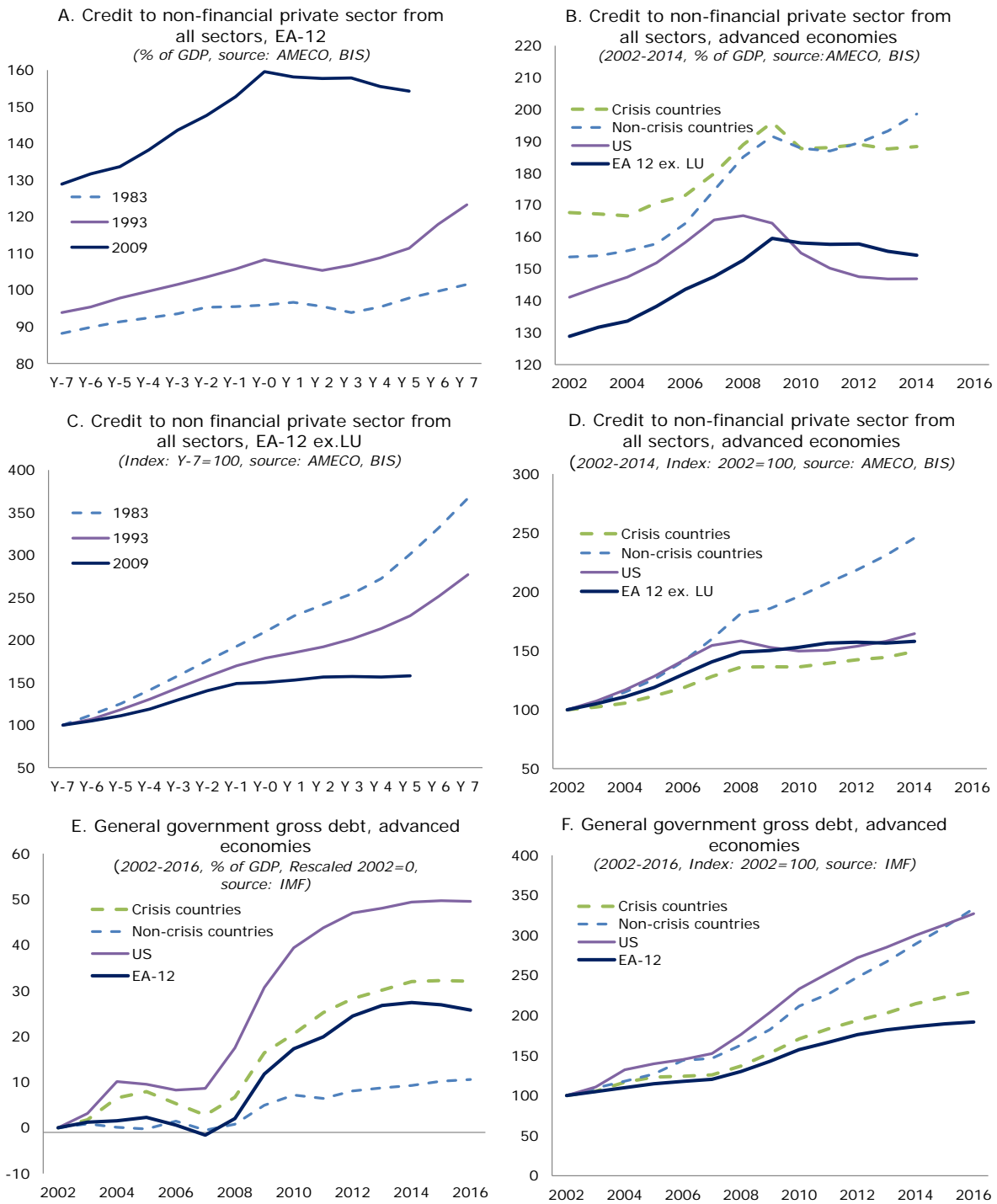
### A comparatively slow private sector deleveraging process ...

Financial factors have been key drivers of the latest business cycle in advanced economies. It is therefore not surprising that recent private sector debt developments look atypical by historical standards. As a share of GDP, debt in the euro area grew much faster in the years preceding the

<sup>(10)</sup> See also European Commission (2014), 'New estimates of Phillips curves and structural unemployment in the euro', *Quarterly Report on the Euro Area*, Vol. 13, No 1, pp. 21-26.

<sup>(11)</sup> For instance, Gali, J. (2015), 'Hysteresis and the european unemployment problem revisited', paper presented at ECB Forum on Central Banking, Sintra, 21-23 May 2015, for empirical evidence of past hysteresis effects in the euro area.

Graph I.8: Private and public debt (1)



(1) Y0 is the year of cyclical trough in the euro area, i.e. 1983, 1993 and 2009. 2009 is also the year when most advanced economies started to recover from the global financial crisis. EA12 is GDP-weighted aggregate of BE, DE, IE, EL, ES, FR, IT, LU, NL, AT, PT, FI. 'mean\_crisis' is the un-weighted mean of CH, JP, SE, UK, US. 'mean\_nocrisis' is the un-weighted mean of AU, CA, KO, NO, NZ. The ratios in graph E have been rescaled to be equal to 0 in 2002.

Source: BIS, AMECO and IMF.

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peak of the current cycle than at similar stages of previous business cycle. Another defining feature of the ongoing recovery has been a deleveraging process marked by a protracted fall in the private sector debt ratio (Graph I.8A). By contrast, only short-lived falls in debt were registered during the recoveries of the 1980s and 1990s.

The private sector deleveraging process is also visible in other advanced economies hit by a systemic banking crisis but the pace of deleveraging has been somewhat faster in this group, particularly in the US, than in the euro area (Graph I.8B). By contrast, those advanced economies not hit by a banking crisis have mostly seen an inflexion in the rate of debt accumulation since the crisis rather than a persistent deleveraging process. Interestingly, both groups of countries (those that had banking crises and those that did not) experienced a similar pace of private debt accumulation before the global financial crisis, with debt ratios peaking at similar levels in 2009. This is at odds with a large empirical literature underlying credit expansion as one of the most reliable forerunners of banking crises. <sup>(12)</sup>

Differences in the speed of deleveraging between the euro area and other advanced economies hit by systemic banking crises mostly reflect differences in the speed of economic recovery. The deleveraging processes in advanced economies have been mostly 'passive' rather 'active' in nature. The global financial crisis has, at best, brought a stabilisation of credit levels (Graph I.8D) and drops in credit ratios can mostly be ascribed to increases in GDP. <sup>(13)</sup>

Overall, this suggests that the euro area may be locked into a vicious circle in which deleveraging leads to persistent investment weakness and slow growth, which in turn limits progress with deleveraging and further hampers investment. <sup>(14)</sup>

### ... against a background of rapidly increasing public debt ratios

In sharp contrast to developments in private debt, the public debt ratio has increased sharply as a share of GDP since 2008 in the euro area as well as in other countries hit by systemic banking crises, notably the US (Graph I.8E). This reflects a number of factors, including the use of automatic stabilisers, some discretionary support to the economy, and the fiscal cost of the banking crises. Unsurprisingly, the situation appears much more benign in the advanced countries not hit by a systemic banking crisis, where public debt ratios have increased only modestly in recent years. <sup>(15)</sup>

The rises in public debt ratios following the global financial crisis are broadly similar in the euro area and in the other countries hit by banking crises. From 2014 onwards, debt ratios have started to diverge somewhat in the two regions, with a downward inflection of the euro area ratio and broad stabilisation of the ratio in the other crisis-hit countries. Differences in GDP developments between the two regions mean that differences in consolidation efforts have been more visible when looking at debt levels rather than ratios (Graph I.8F).

## I.6. Policies and institutions

### Severe constraints on the economy's response to the crisis

A critical element to bear in mind, when comparing the euro area current recovery to the recoveries in other advanced economies, is that there have been severe constraints on the euro area policy response to the global financial crisis. The original institutional setup of the Economic and Monetary Union, with a centralised monetary policy and largely decentralised economic policies, turned out to have no mechanisms to avoid the build-up up of large macroeconomic imbalances or to cope with

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<sup>(12)</sup> See e.g. Babečy, J. et al. (2014), 'Banking, debt, and currency crises in developed countries: stylised facts and early warning indicators', *Journal of Financial Stability*, Vol. 15, pp. 1-17; Drehmann, M., C. Borio and K. Tsatsaronis (2011), 'Anchoring countercyclical capital buffers: the role of credit aggregates', *International Journal of Central Banking*, Vol. 7, Issue 4, pp. 189-240.

<sup>(13)</sup> The deleveraging process has been clearer when restricting the analysis to credit issued by banks (as opposed to total credit). In the euro area, a genuine decrease in the level of private credit by banks was observed between 2001 and 2014 as non-financial corporations moved away from bank financing.

<sup>(14)</sup> Barkbu, B. et al. (2015) argue that low growth per se is a significant determinant of low investments in the euro area

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coupled in some countries with high corporate leverage, financial constraints, and policy uncertainty.

Barkbu, B. et al. (2015), 'Investment in the euro area: why has it been weak?', *IMF Working Paper*, No 15/32.

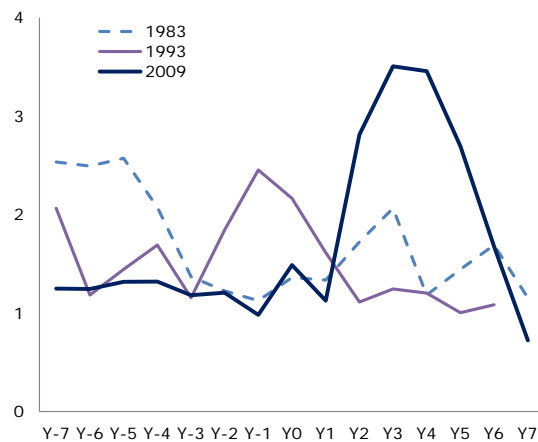
European Commission (2015), 'Investment dynamics in the euro area since the crisis', *Quarterly Report on the Euro Area*, Vol. 14, No 1, pp. 35-43, additionally points to high real interest rates as a reason for weak investment dynamics.

<sup>(15)</sup> Moreover, the average levels of debt in countries that were not hit by the banking crisis was substantially lower, standing in 2007 at 34% of GDP vs. 76% for crisis-hit countries and 65% for the euro area.



large financial shocks. The macroeconomic imbalances, accumulated in some Member States in the public and private sectors during the expansion phase and combined with a lack of crisis-fighting mechanisms and risk-sharing tools, acted as powerful shock amplifiers. Since 2011, the combination of pre-crisis policy mistakes and the incompleteness of the EMU's original governance architecture has hampered the adoption of optimal macroeconomic policies and entailed noxious feedback loops between the financial and the public sector, confidence crises, sudden stops in capital flows, and strong cross-border financial contagion effects.<sup>(16)</sup> This has led to significant centrifugal forces between Member States. Between 2011 and 2014, for example, cyclical divergences between Member States reached levels never seen at similar stages of the business cycle in the 1980s and 1990s (Graph I.9), thereby further complicating the design of macroeconomic policies.<sup>(17)</sup>

**Graph I.9: Cyclical divergences between euro area Member States**  
(standard deviation of output gaps in %)

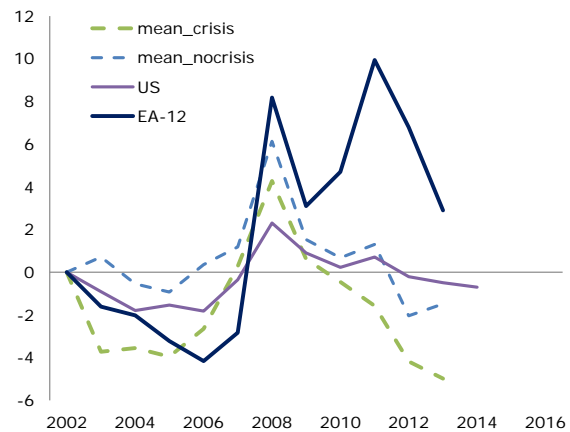


Source: AMECO.

The banking sector offers a typical example of a sub-optimal policy response. The impairment of private balance sheets and the asset quality deterioration that occurred during the global

financial crisis led to an increase in the leverage of the banking sector in all advanced economies, but particularly in the euro area (Graph I.10).<sup>(18)</sup>

**Graph I.10: Leverage of the banking sector, advanced economies (1), (2)**  
(2002-2016, Rescaled 2002=0)



(1) EA-12 comprises of BE, DE, IE, EL, ES, FR, IT, LU, NL, AT, PT, FI. 'mean\_crisis' comprises of unweight mean of CH, JP, SE, UK, US. 'mean\_nocrisis' comprises of unweight mean of AU, CA, KO, NO, NZ. The ratios in the graph have been rescaled to be equal to 0 in 2002. (2) The leverage of the banking sector is computed as the ratio of selected financial assets to total equity.

Source: OECD.

In several euro area countries, bank balance sheets were further undermined by the sovereign debt turmoil and the associated feedback loop between banks and sovereigns.<sup>(19)</sup> Until the launch of the Banking Union, the policy response to the excessive leverage of banks was typically slow and uncoordinated (as illustrated by previous stress tests).<sup>(20)</sup> Leverage has started declining only recently with the launch of the Banking Union and the associated asset quality review (AQR) and bank recapitalisation.<sup>(21)</sup> As a result, the euro area

<sup>(16)</sup> There is a vast economic literature discussing this issue. See for instance:

de Grauwe, P. (2013): 'Design failures in the eurozone: can they be fixed?', *LSE 'Europe in Question' Discussion Paper Series*, No 57  
Obstfeld, M. (2013), 'Finance at center stage: some lessons of the euro crisis', *European Economy, Economic Papers*, No 493.

<sup>(17)</sup> For a discussion of the drivers of these cyclical divergences, see: European Commission (2014), 'Growth differences between EA Member States since the crisis', *Quarterly Report on the Euro Area*, Vol. 13, No 2, pp. 7-20.

<sup>(18)</sup> Due to differences in accounting standards, e.g. different treatment of derivatives in the US and the EU, the levels are not fully comparable across countries. Neither there is an agreement on the best way to compute the leverage and capital ratios. Therefore, the OECD leverage ratio is different from the one used by EBA/IMF/BIS. Basel III agreement broadly suggests using the leverage ratio as a supplement to risk-weighted capital ratios. The capital requirements based on the Basel III capital ratio are supposed to be broadly implemented only in 2018. Therefore, in the current context the attention is to be paid only to the time evolution of leverage ratios rather than cross-country differences in their levels.

<sup>(19)</sup> Acharya V. et al. (2014), 'A Pyrrhic victory? Bank bailouts and sovereign credit risk', *The Journal of Finance*, Vol. LXIX, No 6, pp. 2689-2739.

<sup>(20)</sup> OECD (2014)', *OECD Economic Surveys: Euro Area*'.

<sup>(21)</sup> Greenwood, R. et al. (2015) show that banks commonly use asset sales in order to decrease leverage. During financial turmoils (such as the euro area sovereign debt crisis), the number of potential

economy has had to cope with an impaired banking sector for a substantially longer period of time than the other advanced economies hit from the banking crisis.

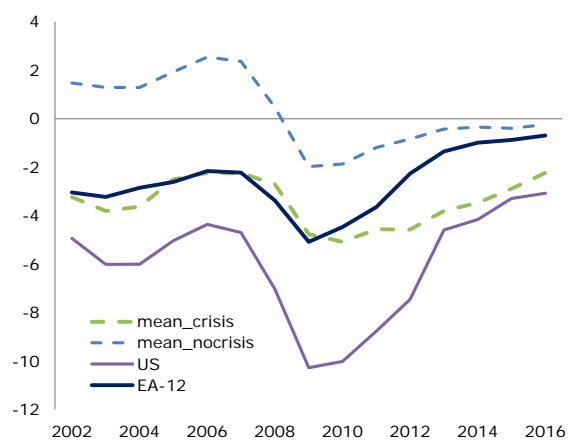
EU authorities have responded to the crisis by engaging in far-reaching reforms, including a strengthening of macroeconomic surveillance, the creation of crisis resolution mechanisms and the launch of the Banking Union. The implementation of these reforms has progressively lifted part of the constraints on macroeconomic policy, providing support to the euro area recovery. Nevertheless, while some of the macroeconomic imbalances accumulated before the crisis are gradually being corrected, public and private debt levels remain high in a number of Member States and continue to weigh on the recovery and restrict policy choices.

### Front-loaded fiscal consolidation

The fiscal position adjusted for the impact of the economic cycle can be tracked by the underlying government net lending on the potential GDP (Graph I.11). All advanced economies responded to the global financial crisis with a substantial fiscal stimulus. The stimulus, which peaked in 2009, was then followed by varying degrees of fiscal tightening, reflecting differences in the fiscal framework and availability of fiscal space.

The tightening was more front-loaded in the euro area than in other advanced economies hit by a systemic banking crisis due to factors such as severe debt sustainability concerns and the loss in market access experienced by some Member States. To prevent contagion to the whole euro area and restore confidence and stability, euro area leaders affirmed on several occasions their commitment to implement consolidation measures. While this commitment was crucial in a context of very high tensions, it also resulted in periods of pro-cyclical fiscal stance, as the public and the private sectors simultaneously deleveraged while growth was very weak.

Graph I.11: **Underlying government net lending, advanced economies (1)**  
(2002-2016, % of potential GDP)



(1) EA-12 comprises of BE, DE, IE, EL, ES, FR, IT, LU, NL, AT, PT, FI. 'mean\_crisis' comprises of unweight mean of CH, JP, SE, UK, US. 'mean\_nocrisis' comprises of unweight mean of AU, CA, KO, NO, NZ.

Source: OECD.

In contrast, policy sequencing has been more supportive in most other advanced economies that were not under considerable financial stress. On average, the fiscal stimulus of 2008-09 was of a similar size in the group of countries hit by a banking crisis and in the euro area. But the subsequent consolidation was considerably faster in the euro area. This has given the private sector more breathing space and allowed a more rapid reduction in private debt ratios. (22). The US stands out somewhat, with a larger stimulus in 2009-09 than in the rest of group of advanced countries hit by a banking crisis or in the euro area. For the 2010-12 period the US and the euro area consolidated at broadly similar paces although the US started from a fiscal stance that was considerably more supportive.

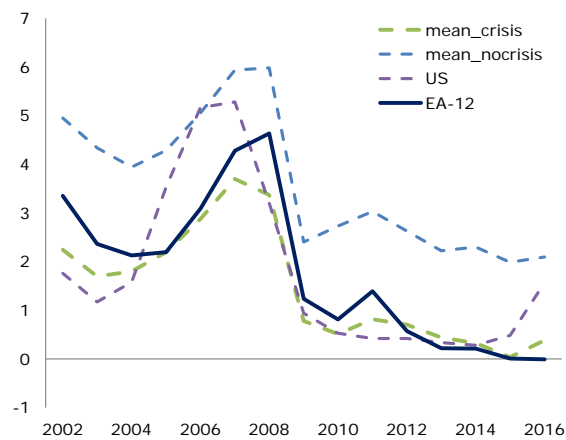
### Monetary policy: constrained choices at the zero lower bound

After the global financial crisis, short-term money market interest rates in the euro area quickly fell to historical lows (Graph I.12).

buyers can be limited and fire sales of bank assets can spread further distress across financial institutions. Greenwood, R. et al. (2015), 'Vulnerable banks', *Journal of Financial Economics*, Vol. 115, Issue 3, pp. 471-485

(22) Bornhorst F. and M. Ruiz-Arranz (2014) argue that deleveraging processes have much more damaging effects on growth when involving simultaneously the public and the private sectors. Bornhorst F. and M. Ruiz-Arranz (2014), 'Chapter 2: growth and the importance of sequencing debt reductions across sectors', *IMF, Jobs and growth: Supporting the European recovery*, editors: M. Schindler, H. Berger, B. B Bakker, A. Spilimbergo.

**Graph I.12: Nominal short-term interest rates, advanced economies (1)**  
(2002-2016, %)

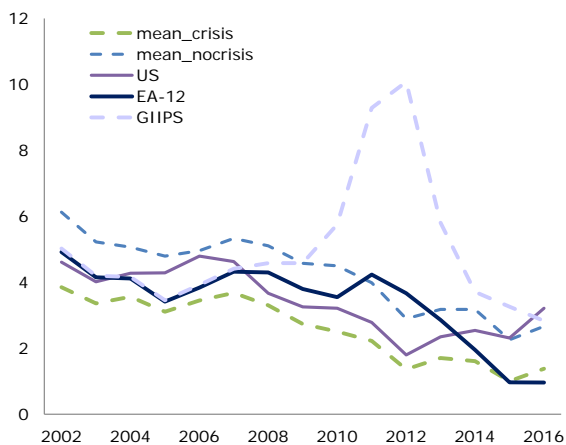


(1) EA-12 comprises of BE, DE, IE, EL, ES, FR, IT, LU, NL, AT, PT, FI. 'mean\_crisis' comprises of unweight mean of CH, JP, SE, UK, US. 'mean\_nocrisis' comprises of unweight mean of AU, CA, KO, NO, NZ.

Source: OECD

Monetary policy in the euro area was, however constrained by a weakening of the interest rate transmission mechanism, as the sovereign debt crisis led to financial fragmentation and an endogenous tightening of monetary conditions, especially in the Southern or peripheral Member States (Graph I.13).

**Graph I.13: Nominal long-term interest rates, advanced economies (1)**  
(2002-2016, %)



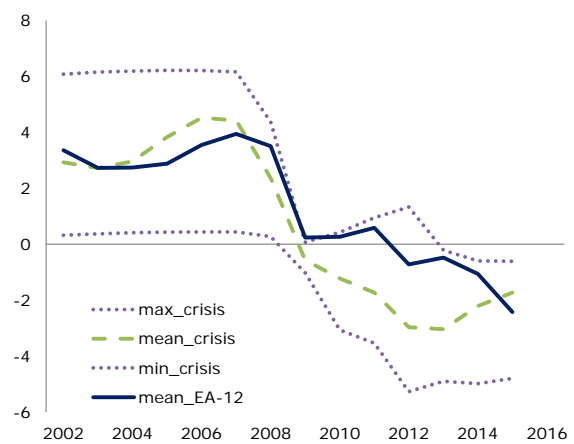
(1) EA-12 comprises of BE, DE, IE, EL, ES, FR, IT, LU, NL, AT, PT, FI. 'mean\_crisis' comprises of unweight mean of CH, JP, SE, UK, US. 'mean\_nocrisis' comprises of unweight mean of AU, CA, KO, NO, NZ.

Source: OECD.

The presence of the zero lower bound and the adoption of diverse and successive unconventional monetary policy measures complicate the

evaluation of monetary policy stances across major currency areas. The shadow rates that are constructed using term-structure models represent a useful indication of where policy rates might have been in the absence of the zero lower bound (Graph I.14). Conditional on the fact that these model-implied estimates carry a significant degree of uncertainty, the results suggest that notional policy rates in the euro area have been higher than in the other crisis-hit countries for most of the time since the global financial crisis. <sup>(23)</sup>

**Graph I.14: Shadow (short-term) policy rates, advanced economies (1)**



(1) 'max\_crisis' is the maximum value of 5 shadow policy rates: for JP, UK and US (Krippner) and UK, US (Wu-Xia) and 'min\_crisis' is correspondingly the minimum. 'mean\_EA-12' is mean value of 2 shadow policy rate for the EA (Krippner and Wu-Xia)

Source: Website of L. Krippner, Reserve Bank of New Zealand and J.C.Wu, Chicago Booth.

Convergence in shadow rates between the euro area and other advanced countries hit by a systemic banking crisis occurred only recently. The ECB introduced a negative deposit facility rate in June 2014 and subsequently launched a fully-fledged quantitative easing programme, while the US Fed concluded its asset purchases in late 2014.

In this context, it is important to note that due to the different funding structure of the euro area economy, several unconventional measures implemented by the ECB were specifically aimed at alleviating the liquidity position of the banking sector (e.g. introducing fixed-rate, full-allotment mode in its refinancing operations, expanding the

<sup>(23)</sup> The interpretation of the shadow rate as a proxy for the monetary stance should be subject to appropriate caution, though, as it may not fully capture the impact of unconventional measures along the yield curve.

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list of eligible collateral or extending the maturity of its refinancing operations) and thus might not be reflected fully in shadow rate models developed for assessing the impact of monetary policy on capital-market-based funding costs.

## **I.7. Conclusions**

The comparative analysis of recoveries allows us to derive some general conclusions about the euro area current situation. The current weakness in growth has both structural and cyclical roots. Potential growth appears to have been more affected by the crisis than in previous recoveries or in other advanced countries, even those hit by banking crises. The output gap closure has also been slower than in the past and slower than in other advanced economies, as the sovereign debt crisis of 2011 substantially decoupled the euro area from the global business cycle.

The current recovery also stands out in terms of the weakness of domestic demand. Both from a historical and cross-country perspective, investment is the key source of current demand sluggishness. Developments in both residential and non-residential investment appear unusually sluggish. The vicious circle that seems to have developed between deleveraging, weak investment activity and slow growth is of major concern.

The analysis also points to weaknesses in the euro-area adjustment process, notably in terms of labour market. Labour cost adjustments have been slow in relation to the observed surge in unemployment, pointing to a more substantial increase in the non-cyclical component of unemployment than in most other advanced economies.

The euro area has also progressed less rapidly than other advanced countries hit by banking crises in tackling the crisis legacy of excessive private sector debt. However, this largely reflects lower GDP growth ('denominator effect') and developments in

private debt levels have been broadly similar across the two regions.

In terms of policy mix, it seems that in the years since the global financial crisis, the euro area has faced tighter financing conditions than other crisis-hit countries, a difficulty that has been further exacerbated by periods of pro-cyclical fiscal policy. The euro area policy response has been constrained by the macroeconomic imbalances accumulated before the crisis as well as the incompleteness of the EMU original. The comparatively slow repair of bank balance sheets has been an impediment to growth and a good example of how sub-optimal policy responses were, partly as the result of the EMU's original design.

Looking ahead, the analysis offers both sources of comfort and causes of concern. On the positive side, the fact that reforms have been (or are being) put in place to improve labour and product markets in some Member States, and that the EMU works better, should support growth in the short to medium term. The reforms implemented in Member States such as Spain and Ireland are already starting to show positive results. Progress can be also seen in the euro area's banking sector, which has recently seen acceleration in deleveraging. Finally, after the strong consolidation phase of the sovereign crisis, the euro area overall fiscal stance has now turned broadly neutral. On a more cautious note, the euro area weak adjustment capacity and sluggish potential growth have so far shown only limited signs of improvement. Similarly, there has been only scant evidence so far that the main source of demand has shifted from external to domestic components. Further reforms are needed both at Member State and European level to put the euro area recovery on a more solid growth path. Further structural reforms in Member States should go hand-in-hand with resolute steps to complete the EMU architecture, with particular emphasis on completing the financial union.

## II. An assessment of the relative quality of the EU output gap estimates <sup>(24)</sup>

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*This focus section assesses the performance of the EU's production function methodology for quantifying output gaps since its introduction in EU policy surveillance procedures in 2002. In particular, we assess how the methodology has performed compared with that used previously (the Hodrick-Prescott filter) in terms of gauging the euro-area business cycle. We also compare it with the equivalent OECD and IMF methodologies in terms inter alia of stability, real-time reliability and financial crisis performance. The analysis shows that the PF methodology is superior to both the HP filter and the methods used in other international organisations. This vindicates the decision to adopt it for estimating output gaps as the 'commonly agreed' reference method to be used in EU fiscal surveillance procedures. Nevertheless, while it has clearly done well in relative terms since it was first used, the analysis also recognises the extent of the output gap errors made in the pre-crisis period. This stresses the importance of continuing to improve the EU's commonly agreed methodology, with a particular focus on attenuating procyclicality risks in the upswing phase of the business cycle.*

### II.1. Introduction<sup>(25)</sup>

Real-time estimates of the output gap <sup>(26)</sup> are inevitably surrounded by a large element of uncertainty, since potential output is not directly observable and actual GDP is subject to significant *ex post* revisions. Many studies have documented the extent of the uncertainty, highlighting the fact that the sign, as well as the magnitude, of output gaps estimated in real time are subject to large revisions when new information becomes available. <sup>(27)</sup> Policy-makers are aware of these uncertainties but nevertheless accept that estimates of potential growth and the output gap are indispensable in assessing the cyclical position of the economy and its productive capacity. Accordingly, output gap indicators have been used as an operational surveillance tool in the Stability and Growth Pact (SGP), since its inception in the second half of the 1990s, for calculating indicators such as the structural (i.e. cyclically adjusted) fiscal

balance. The doubt surrounding underlying output gap calculations means that the main focus has been on changes in, rather than the level of, the structural balance.

Initially, a purely statistical detrending method, the Hodrick-Prescott (HP) filter, was used to calculate output gaps in the SGP context. However, following sustained criticism of the HP filter, especially its end-point bias problems, EU policy-makers adopted the production function (PF) approach for surveillance purposes. This is based on a more comprehensive analytical framework and alleviates the risk of end-point biases.

In the aftermath of the financial crisis and following the strengthening of EU policy surveillance procedures, the growing importance of the output gap estimates produced by the PF method for all of the EU's 28 Member States (due to their usage in the calculation of structural budget balances), has been accompanied by sustained criticism from academics, policy think-tanks and policy-makers. The method's relative stability and real-time reliability have been called into question, with criticism focusing on three areas:

- It has been argued that the real-time reliability gains from moving to the PF method have not been worth the **additional complexity** involved (with greater intricacy linked to the growing preference for embedding multivariate estimation approaches in the PF framework). In

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<sup>(24)</sup> Section prepared by Kieran Mc Morrow, Rafal Raciborski, Werner Roeger and Valerie Vandermeulen.

<sup>(25)</sup> Whilst this analysis focusses only on the euro area, the conclusions also apply to the majority of the EU's 28 Member States.

<sup>(26)</sup> The output gap is defined as the difference between actual and potential GDP.

<sup>(27)</sup> See Orphanides A. and S. van Norden (2002), 'The unreliability of output gap estimates in real time', *The Review of Economics and Statistics*, Vol.84, Issue 4, pp. 569-583; Nelson E. and K. Nikolov (2003), 'UK inflation in the 1970s and 1980s: the role of output gap mismeasurement', *Journal of Economics and Business*, Vol. 55, Issue 4, pp. 353-370; Cayen J.-P. and S. van Norden (2005): 'The reliability of Canadian output-gap estimates', *The North American Journal of Economics and Finance*, Vol.16, Issue 3, pp. 373-393; Marcellino M. and A. Musso (2011), 'The reliability of real-time estimates of the euro area output gap', *Economic modelling*, Vol.28, Issue 4, pp. 1842-1856; *Deutsche Bundesbank* (2014): 'On the reliability of international organisations' estimates of the output gap', *Monthly Report*, Vol.66, No 4, pp. 13-37.

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addition, it has been suggested that the HP filter may actually provide more reliable results; <sup>(28)</sup>

- With the entry into force of the European Fiscal Compact in January 2013 (and its requirement that the structural deficit of the euro-area Member States be less than 0.5 %), the questioning of the **stability** and **real-time reliability** of the output gaps produced by the PF method has intensified considerably. These estimates are regularly compared with (and criticised as being inferior to) those produced by other international organisations such as the OECD and the IMF; and
- Most importantly, it is argued that the EU's method and those of the OECD and the IMF do a particularly poor job in the **upswing phase** of cycles, where most fiscal policy errors occur. This was dramatically demonstrated in the run-up to the financial crisis (2006-2008). The procyclicality evident in this period can be explained only partially by a systematic optimistic bias in output gap methodologies. The scale of the *ex post* output gap revisions for the pre-crisis period points to a more fundamental weakness in the way the methods handle investment in the boom phase of cycles. This point has been raised by Bank of International Settlements (BIS) economists suggesting that the conventional output gap calculation should be supplemented with information on the financial cycle to identify investment booms and so produce 'finance-neutral' output gaps (see Box II.1 for details of the BIS work). <sup>(29)</sup>

Against this background, we try here to assess the performance of the EU's PF method since its introduction in 2002, using the output gap estimates for the euro area as the focus of the

analysis. <sup>(30)</sup> More specifically, we address two interrelated questions:

- How has the methodology performed, in terms of its **revisions** record, compared with the previous HP filter approach? And
- What is its **real-time reliability** compared with the OECD and IMF methodologies?

## II.2. Comparison between the PF methodology and the HP filter approach

EU policy-makers moved from the HP filter to the PF approach in the autumn of 2002. The current section assesses whether this was a prudent decision. More specifically, it compares the **revision** properties of the PF and HP methods since 2002 by:

- looking at the short-term stability of the estimates, i.e. how much they are revised from one forecast to the next;
- comparing the long-term real-time reliability of the methods;
- assessing the performance of the methods during the financial crisis; and
- examining the economic plausibility of the estimates, in particular whether the optimism in 2002 as to the ability of indicators such as capacity utilisation to reduce the cyclicality of trend total factor productivity (TFP) estimates was justified.

### Short-term stability of PF and HP estimates

Given their central role in EU fiscal surveillance procedures, the relative stability of output gap estimates is an important input into the policy making process. Large short-term revisions in estimates undermine the credibility of a method, with significant knock-on implications for crucial policy target variables such as the change in the structural fiscal balance.

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<sup>(28)</sup> This latter viewpoint is very much the conclusion of an April 2014 *Bundesbank* analysis which showed, using a HP filter with a smoothing parameter of 6.25 (compared with a parameter of 100 used in the EU's equivalent HP method up to 2002), more reliable output gap estimates than those of the OECD and the IMF. While the procyclicality issues with a HP 6.25 renders it highly problematic for fiscal policy surveillance purposes, nevertheless the *Bundesbank* analysis suggests that, at least for monetary policy purposes, the choice between a HP filter and the PF approach is far from clear-cut.

<sup>(29)</sup> See: Borio C., P. Disyatat and M. Juselius (2013): 'Rethinking potential output: embedding information about the financial cycle', *BIS Working Papers*, No 404.

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<sup>(30)</sup> As it is universally accepted that output gap uncertainty is a fact of life for all estimation methods and that output gap estimates are inevitably subject to large revisions, the relative revisions performance of the EU's PF method, rather than the absolute size of those revisions, is considered in this focus section.

### **Box II.1: Finance-neutral output gaps: a useful complement to the EU's production function method?**

In a series of papers, Borio et al. (2013, 2014) make a case against the use of inflation as the conventional gauge of the cyclical stance of an economy. Instead, they propose using information about the financial cycle to produce 'finance-neutral' output gaps, which they argue could help in alerting policy makers to the role of asset prices in the dynamics of business cycles. This approach distinguishes itself from more conventional methods not only by its replacement of cyclical indicators (variation of unit labour costs, capacity utilization etc.) with financial indicators (real interest rates, credit growth and property prices), but also by its reliance on a relatively simple, reduced-form econometric model.

Borio et al. apply the following model, which derives from the Hodrick-Prescott (HP) statistical filter, but extend it with a set of financial variables:

$$\begin{aligned} (1) \quad & y_t = p_t + c_t \\ (2) \quad & p_t = 2p_{t-1} - p_{t-2} + \varepsilon_t^p \\ (3) \quad & c_t = \phi c_{t-1} + \gamma z_t + \varepsilon_t^c \end{aligned}$$

Above  $y_t$  is output in  $t$ ,  $p_t$  is potential output,  $c_t$  is the output gap,  $\varepsilon_t^p$  and  $\varepsilon_t^c$  are white noise processes with zero mean and variances,  $V^p$  and  $V^c$ , respectively, and  $\gamma$  is a vector of coefficients on a vector of contemporaneous and lagged exogenous financial variables  $z_t$ , respectively. Equation (3) allows for the output gap to be an AR(1) process with AR coefficient  $\phi$ . Potential output process (2) is an integrated process of order 2. The vector of exogenous financial variables,  $z_t$ , includes credit growth, house price inflation and the real interest rate and their lags. In the estimation some lags and/or variables may be dropped due to a lack of significance.

The finance-neutral approach attempts to capture the effects of asset price booms on the real economy and in turn on public finances. These effects can include weakened financial and supply constraints, for instance through mortgage finance and misallocation of resources, for example towards the construction sector.

However, in its original form, it does not embed any description of the supply-side structure of the economy, in contrast with the production function used in EU fiscal surveillance. In effect, by definition, it can only be useful for those national economies which tend to experience asset bubbles or large credit fluctuations. In the euro area, the obvious candidates would be Spain and Ireland. Indeed, the approach has been found to be less useful for countries like France and Greece, for which the financial variables typically turn out to be non-significant. However, the finance-neutral output gap approach can only be viewed as complementary to more structural approaches, even for countries where the financial cycle has historically had a large amplitude. Tests performed for Spain and Ireland reveal that Borio et al.'s approach predicts a large positive (finance-neutral) gap before the 2009 crisis, a development that is not fully captured by the conventional models. However, Borio et al.'s approach tends to produce much more persistent cycles, which results in a much 'coarser' view on the cyclical stance of an economy, even for those countries which have been experiencing large financial cycles. This is because it ignores cyclical indicators, which capture important economic developments (e.g. unemployment movements) which are typically only weakly (or not at all) correlated with financial variables. For example, the finance-neutral gaps tend to be strongly positive during the whole period of the 2000s, hence clearly missing the downturns of most European economies after the dot-com bubble burst. Overall, the finance-neutral output gap concept could become a useful tool to complement the more conventional, structural output gaps. This is particularly so in view of the last financial and economic crisis, which according to most economists had its origins in the financial sector. However, they cannot be considered the only, or even the main, instrument for assessing the cyclical position of national economies.

#### References:

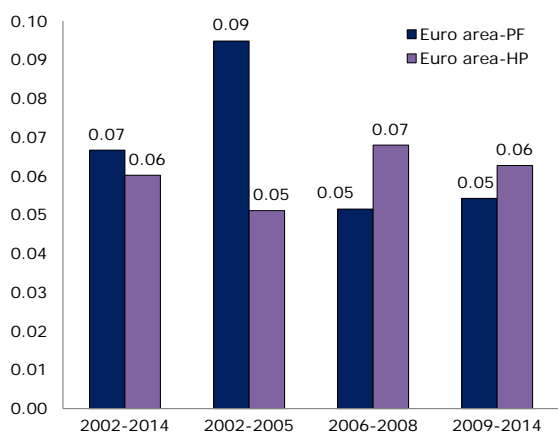
Borio, C., P. Disyatat and M. Juselius (2013), 'Rethinking potential output: Embedding information about the financial cycle' Bank for International Settlements Working Paper No 404

Borio, C., P. Disyatat and M. Juselius (2014), 'A parsimonious approach to incorporating economic information in measures of potential output' Bank for International Settlements Working Paper No 442

Consequently, forecast-to-forecast stability in estimates is an important criterion when evaluating a method's performance. Graph II.1 summarises the forecast-to-forecast revisions for the PF and HP methods for the 2002-2014 period.

The graph shows that both methods produce estimates that are relatively stable in the short term (with average revisions, over all European Commission forecast vintages from 2002-2014, of only 0.06 pp). While we do see an improvement in the relative stability performance of the PF method over the entire period, we must conclude that the methods do not differ greatly in this respect.

Graph II.1: Short-term (forecast-to-forecast) stability of output gap estimates, euro area (1)(2) (pps)



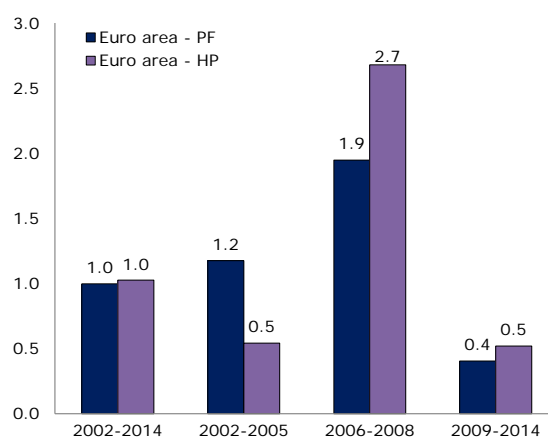
(1) Produced by the PF and HP filter methods.  
 (2) Period average revisions to estimates.  
**Source:** DG ECFIN calculations.

### Long-term real-time reliability of PF and HP estimates

While relatively stable short-term output gap estimates are important, stability should not come at the expense of long-term real-time reliability. Here we compare real-time and *ex post* PF and HP filter estimates for the euro area for 2002-2014 using the Commission's autumn forecast vintages. The autumn 2014 vintage is used as the *ex post* reference, with the scale of the differences between real-time and *ex post* estimates used as an indication of the methods' relative reliability. The results are shown in Graph II.2. The main conclusions are:

- Over the period as a whole, revisions under the methods differ relatively little overall.

Graph II.2: Long-term reliability of output gap estimates, euro area (1)(2) (pps)



(1) Produced by the PF and HP filter methods.  
 (2) Period average absolute revisions to real-time vs *ex post* estimates.

**Source:** DG ECFIN calculations.

- While the average 2002-2014 revisions under the methods may be similar, this hides a much more interesting and nuanced dynamic picture when one looks at trends over time. Graph II.2 suggests that the relative reliability of the PF method has gradually improved over time. While the HP filter outperformed the PF method in the early years of its existence (2002-2005), the relative performance of the latter improved dramatically in the run-up to the crisis (2006-2008), partly perhaps thanks to the introduction in autumn 2005 of the 'hours worked' factor. As regards the post-crisis period (2009-2014), the PF method outperformed the HP filter (due *inter alia* to the introduction of the TFP method in autumn 2010) and
- While a method's relative revisions performance is important, policy-makers should not lose sight of absolute revisions. Graph II.2 shows that both methods made big mistakes in calculating euro-area output gaps in the pre-crisis period, with extremely large average annual *ex post* revisions of 2 pps for the PF method and 2.75 pps for the HP filter. Consequently, any future research agenda should focus on how the methods can be adapted to reduce revisions in the upswing stage of cycles by addressing the optimistic bias inherent in the potential or trend growth rates produced in both cases. Once the extent of the growth optimism had been exposed with the Lehman Brothers default in September 2008,

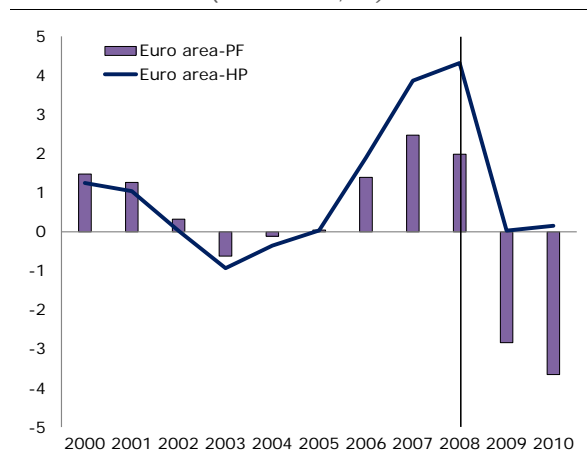


the backward smoothing of revisions to the level of potential output in the pre-crisis years led directly to revisions in those years that were multiples of those made in 2002-2005 and 2009-2014.

### Performance of methods around the turning point of the financial crisis

Graph II.3 shows enormous differences between the output gap estimates produced by the two methods around the turning point of the crisis, with the HP filter pointing to a zero output gap for 2009 and 2010 in the spring 2009 forecast vintage, compared with an average of roughly -3.25 % for the PF method. Following the economic turmoil provoked by the onset of the financial crisis in September 2008, it is not credible that about eight months later the HP filter was estimating a zero output gap for the post-crisis years, 2009 and 2010. The PF method's estimate of -3.25 % for the same years was undoubtedly more consistent with the economic conditions in the euro area at the time, with the 'hours worked' change in 2005 contributing strongly to its performance around this crucial cyclical turning point.

Graph II.3: PF vs HP output gaps, euro area (1)(2)  
(2000-2010, %)



(1) Spring 2009 forecast exercise.

(2) Turning-point of financial crisis: 2008-2010.

Source: DG ECFIN calculations.

### Economic plausibility of PF and HP estimates

In addition to the introduction of hours worked in 2005, EU policy-makers included a new TFP estimation method in the PF framework in

2010.<sup>(31)</sup> This helped further enhance the credibility of the overall methodology. For example, a comparison of the real-time and *ex post* output gap estimates for the euro area under the HP and Kalman Filter (KF) TFP approaches since the crisis shows clearly that the introduction of the latter did lead to significant reliability gains. For the 2010-2014 period as a whole, the average reduction in revisions with the KF method was of the order of one third.

The impact of the KF TFP method is particularly visible in terms of the overall output gap. Graph II.4 shows output gaps for the euro area from the autumn 2014 forecast using the following three methods:

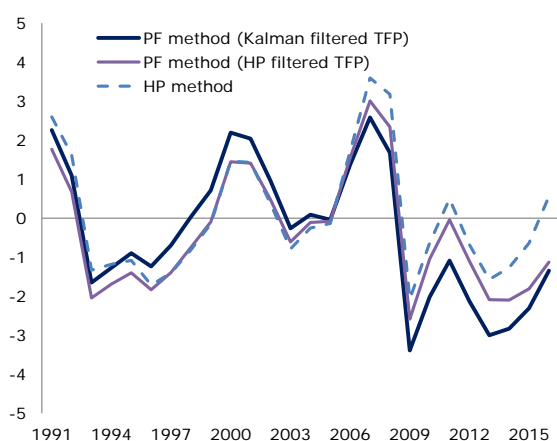
- the official PF methodology, which includes the KF TFP method;
  - a version of the PF methodology which replaces the KF TFP method with the old HP filtered TFP approach used up to autumn 2010; and
  - the HP filter methodology on actual GDP, which was the official method used up to autumn 2002.
- Graph II.4 shows that, for 1996-2006, the shift to the KF TFP method explains almost all of the difference in output gaps estimated under the old HP method and the new PF method. From 2006, the HP output gap is always higher than the PF output gap, with the PF output gap using the HP TFP component somewhere in the middle. Graph II.4 supports the view that introducing the KF TFP method in 2010 has further improved the economic plausibility of the estimates produced by the PF method, in that it led directly to a larger negative output gap in all of the years since the crisis. The gain

<sup>(31)</sup> The old HP filtered TFP approach was replaced by a Kalman Filter (KF) approach. This decision was based on the evidence in the literature that multivariate methods (i.e. KF) lead to improved real-time output gap estimates compared with univariate filters (i.e. HP). According to D'Auria F., et al. (2010) on the EU's PF methodology, the change towards a bivariate method for the extraction of trend TFP was expected to help in avoiding both an overestimation of trend TFP in 'good' times and an underestimation in 'bad' times.

D'Auria F., C. Denis, K. Havik, K. McMorrow, C. Planas, R. Raciborski, W. Röger and A. Rossi (2010), 'The production function methodology for calculating potential growth rates and output gaps', DG ECFIN, *European Economy, Economic Papers*, No 420,

is particularly evident in 2011, when the alternative HP filtered TFP method would have produced an overall output gap of zero for the euro area as a whole. The PF estimates – substantially more negative than the HP filter estimates for each of the years since the start of the crisis – are much more consistent with the evidence from other cyclical indicators for this period.

Graph II.4: **Average size of output gap of total economy, euro area (1)**  
(1991-2016, %)



(1) Autumn 2014 vintage estimated with the old HP method (used up to 2002) and two variants of the PF method (one using HP filtered TFP; the other using KF TFP).

Source: DG ECFIN calculations.

### Overall evaluation of relative performances of the PF and HP methodologies: was the shift to the PF method justified?

The previous sections have provided a significant amount of evidence to vindicate the decision at EU level to shift to the PF method in 2002. Apart from the obvious advantage of providing policy-makers with a more comprehensive framework for evaluating structural and fiscal policies and for analysing economic trends, the PF method has outperformed the HP filter method in a number of other important respects:

- At the level of the euro area as a whole, it has a consistently **better real-time reliability** record since 2006, producing substantially lower absolute revisions than the HP filter over the pre-crisis (2006-2008) and post-crisis (2009-2014) periods;
- As predicted in 2002, it has proven itself at important cyclical turning points by **alleviating**

**the risk of end-point biases**, with this gain dramatically demonstrated in the spring 2009 forecast, which was dominated by the crisis. It produced more intuitive output gap levels for 2009-2010 (-3 %/-3.5 %) than the end-point-bias-afflicted HP filter estimate of zero to slightly positive; and

- The adoption of the new TFP methodology in autumn 2010, with trend TFP estimates corrected with capacity utilisation, has **reduced its overall cyclical** as compared with that of the HP filter. As the TFP gap constitutes a major component of the overall output gap, it is not surprising that any improvements from using the bivariate TFP method would translate into more intuitive overall output gaps.

While the PF method has clearly done well in relative terms, this section also stresses the importance of recognising the extent of output gap errors made in the pre-crisis period.

### II.3. Comparison with the equivalent OECD and IMF methodologies

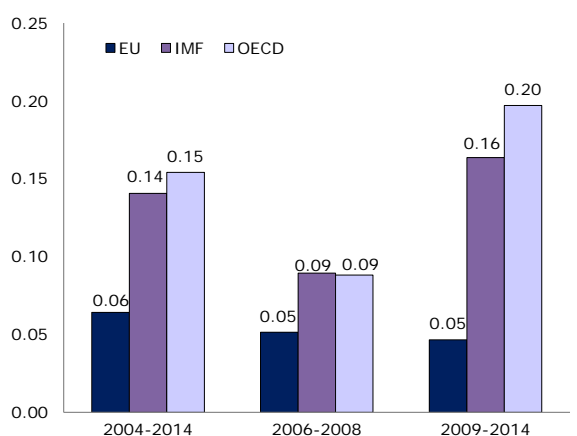
The previous section stresses the better performance of the EU's PF method over the 2002-2014 period, as compared with the HP filter. Nevertheless, a more pertinent issue is how it has performed compared with the equivalent OECD and IMF methods. Here we assess the respective performances of the EU, OECD and IMF methods over the period as a whole (2004-2014), and in the pre-crisis (2006-2008) and post-crisis (2009-2014) sub-periods. For a longer-term perspective, we go on to examine the results from an equivalent comparative revisions exercise published by the German *Bundesbank* in April 2014, which covered the 1980-2010 period. The *Bundesbank* compared the output gap revisions from the IMF and the OECD methodologies with those using a HP filter. Since it did not include the EU methodology in its comparison, we have applied the same approach to the EU estimates for the same period, in order to compare the degrees of uncertainty surrounding estimates from the EU, OECD and IMF methods.

#### Short-term stability of EU-PF vs OECD and IMF estimates

As with the PF/HP comparison, this section starts with an evaluation of the relative short-term stability of EU, OECD and IMF output gap

estimates. Graph II.5 summarises forecast-to-forecast revisions for the three institutions for 2004-2014. Unlike the PF/HP comparison, where stability differences were relatively small, Graph II.5 shows that the forecast-to-forecast revisions for the EU method are substantially smaller than both the IMF's and the OECD's for the period as a whole. This outperformance is particularly striking for the 2009-2014 sub-period, where EU revisions are roughly a third of the IMF's and a quarter of the OECD's. This could have non-negligible implications for policy-relevant fiscal indicators such as the change in the structural fiscal balance. While more research is needed to explain the source of these post-2008 differences, one possible explanation is that they are linked to the introduction of the multivariate TFP method in 2010.

Graph II.5: Short-term (forecast-to-forecast) stability of output gap estimates, euro area, (1),(2) (pps)



(1) Produced by the EU-PF vs the IMF and OECD methods.  
 (2) Period average revisions to estimates.  
 Source: IMF, OECD, DG ECFIN calculations.

### Long-term real-time reliability of EU-PF vs OECD and IMF estimates

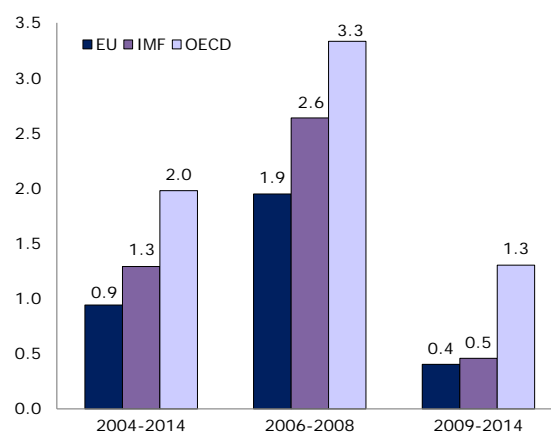
Graph II.6 compares real-time and *ex post* (i.e. autumn 2014) output gap estimates for the euro area as a whole for 2004-2014 (autumn vintages), as produced by the EU, IMF and OECD methods. It shows the average absolute revisions for the three sets of estimates for the period as a whole and for the pre-crisis (2006-2008) and post-crisis (2009-2014) sub-periods. The autumn 2014 vintage is used as the *ex post* reference in all three cases. The scale of the differences between the

real-time and *ex post* estimates provides an indication of the relative reliability of the IMF, OECD and EU approaches.

The key conclusions to be drawn from Graph II.6 are as follows:

- For the **period as a whole**, the real-time reliability of the estimates produced by the EU method is significantly better than in the case of the IMF and OECD methods. The average absolute revisions for the EU method are less than half those of the OECD method (0.9 vs 2.0) and significantly smaller than those of the IMF method (0.9 vs 1.3);
- While errors in the **pre-crisis period** were significantly higher for all three institutions (than for the period as a whole and the post-2008 period), the EU method is much more reliable than that of the IMF and especially that of the OECD; and
- For the **2009-2014 period**, the real-time reliability performances of the EU and IMF methods converge substantially, but the OECD's performance remains very much an outlier, with revisions roughly three times greater. The EU and IMF real-time and *ex post* estimates are strikingly similar for each year of this period.

Graph II.6: Long-term reliability of output gap estimates, euro area (1),(2) (pps)

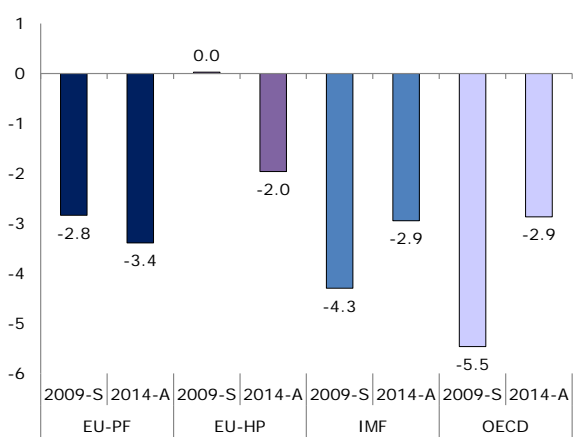


(1) Produced by the EU-PF vs the IMF and OECD methods.  
 (2) Period average absolute revisions to real-time vs *ex post* estimates.  
 Source: IMF, OECD, DG ECFIN calculations.

## Performance of EU vs IMF and OECD methods around the turning point of the financial crisis

As to relative performances around the time of the crisis, Graph II.7 shows the real-time (spring 2009) and *ex post* (autumn 2014) output gap estimates for 2009 from the EU (PF and HP filter), IMF and OECD methods.

Graph II.7: Real-time (spring 2009 forecast) and *ex post* (autumn 2014 forecast) output gap estimates, euro area (1)  
(pps)



(1) EU (PF and HP), IMF and OECD methods.

Source: IMF, OECD, DG ECFIN calculations.

The graph shows that, in spring 2009, forecasts for the 2009 euro-area output gap ranged very widely, from a zero forecast from the HP filter (implying that most of the effects of the crisis were structural) to -4.3 % and -5.5 % from the IMF and the OECD respectively (implying the opposite, i.e. that most of the effects were cyclical), with the EU PF method in the middle (-2.8 %). Five and a half years later (in autumn 2014), the revisions for 2009 suggest that not only did the PF method do significantly better than the HP filter, but also that it did much better than the IMF's and, especially, the OECD's. In fact, the *ex post* estimates produced by the IMF and OECD methods (-2.9 %) are almost identical to the EU's initial (i.e. real-time) spring 2009 estimate (-2.8 %).

### Average spread of estimates and number of years in which the sign of the output gap changes

One of the most recent attempts to evaluate the reliability of international organisations' output gap

estimates was published by the *Bundesbank* in April 2014. It focuses on the output gaps produced by the OECD and the IMF methods, but not those using the EU PF methodology.<sup>(32)</sup> The main criteria it uses to evaluate the real-time reliability of the OECD and IMF estimates are the **average spread** of the estimates and the **number of years in which the sign of the output gap changes**.

The purpose of the current section is to extend the *Bundesbank's* analysis to include the output gap results from the EU's PF methodology for the 1980-2010 period and then to assess the relative real-time reliability of the output gaps produced by all three institutions. We replicated the *Bundesbank* approach for the output gaps produced by the EU's common methodology using the bi-annual Commission forecast vintages for 2004-2014 (a total of 19 vintages). The analysis is restricted to the three G-7 countries in the euro area: Germany, France and Italy. For these three countries, we examined the output gap estimates for each year in the two periods covered in the *Bundesbank* analysis, i.e. 1980-1997 and 1998-2010. The output gap spread for a given year is calculated as the difference between the maximum and minimum values and the change in the sign of the output gap over the different vintages is identified. The first part of Table II.1 shows the average spread for the two periods and the second part gives the number of times that an estimate changed its sign, at least once, for a given year in each period. Table II.1 shows that applying the *Bundesbank* approach to the EU's methodology would lead to the following conclusions:

- On the first criterion of real-time reliability (the **average spread** of output gaps), the EU's methodology is consistently and, in a significant number of countries/periods, substantially better than the equivalent IMF and OECD methodologies; and
- On the second criterion of real-time reliability (the **number of years in which the sign of the output gap changed**), the EU's methodology is at least as good or substantially better for the three euro-area countries in five of the six periods in question (the exception being 1980-1997 for Italy).

<sup>(32)</sup> The *Bundesbank* analysis covered the G-7 economies (United States, Japan, Germany, France, UK, Italy and Canada).

Table II.1: Assessment of real-time reliability of OECD, IMF and EU PF output gap methodologies (1)

	Average spread of output gaps (maximum value for a year over the 19 different forecast vintages less the minimum value)			Number of years in which the sign of the output gap changed		
	IMF	OECD	EU PF (ECFIN calculations) (2)	IMF	OECD	EU PF (ECFIN calculations) (2)
Germany 1980-1997	3.6	3.1	1.1	7	8	4
1998-2010	1.9	1.9	1.2	5	4	4
France 1980-1997	1.6	2.2	1.4	5	5	2
1998-2010	2.6	2.7	2.1	11	8	7
Italy 1980-1997	4.2	2.0	1.8	10	5	7
1998-2010	3.1	3.3	1.9	10	11	7

(1) Two assessment criteria: average spread of output gap estimates and number of years in which the sign of the output gap changes.

(2) Calculations apply the methodology used in the study on the reliability of international organisations' estimates of the output gap published in April 2014, in the Bundesbank Monthly Report.

Source: DG ECFIN calculations.

#### II.4. Concluding remarks

This focus section provides evidence that vindicates the decision to adopt the PF methodology for estimating output gaps as the 'commonly agreed' reference method to be used in EU fiscal (and, by default, structural policy) surveillance procedures. While uncertainty will always be a feature of output gap calculations for the euro area, we have seen that in relative terms the stability, real-time reliability and financial crisis performance of the PF methodology has been superior to the HP filter, OECD and IMF methodologies.

Not only does the EU's methodology do better over the 2004-2014 period in terms of relative stability and reliability, but it crucially outperforms the HP, OECD and IMF methods around the turning point of the crisis. In spring 2009, estimates for the euro area's output gap in 2009 ranged very widely, from an economically implausible zero estimate from the HP filter to -4.3 % and -5.5 % respectively from the IMF and the OECD, with the EU PF method in the middle (-2.8 %). Five and a half years later (in autumn 2014), the IMF and OECD *ex post* estimates for 2009 for the euro area (-2.9 %) were almost identical to the real-time spring 2009 estimate produced by the EU's methodology (-2.8 %).

In addition, the relatively large OECD and IMF revisions for 2009, compared with the EU's, suggest that the respective methodologies led to a fundamentally different assessment of the impact

of the financial crisis. The extremely large negative output gaps for 2009 predicted by the IMF and the OECD in spring 2009 were consistent with a view at that time that the effects of the crisis on potential output would be relatively limited and temporary in nature. The much smaller negative gaps produced by the EU's methodology suggested a less benign interpretation, namely that the impact on potential would be much more significant and prolonged (a view subsequently confirmed by economic developments in the post-2008 period). This interpretation is supported by a recent *Bundesbank* analysis which stresses that the IMF and the OECD initially interpreted the drop in actual output post-2009 as a cyclical phenomenon. It was not until the economic recovery proved weak that the preceding upward movement in potential output was seen to be unsustainable.

While the relative performance of the EU's methodology suggests that it is well-designed, unfortunately its absolute performance, especially in the pre-crisis period (2006-2008), leaves a lot to be desired. Although it outperforms the HP, OECD and IMF methods in terms of reliability over the pre-crisis period, this provides little comfort from a fiscal surveillance perspective, since it is now clear that big output gap (and consequently structural budget balance) errors were made over this period. Consequently, we must conclude that excessive optimism in the pre-crisis period with respect to underlying growth trends in the EU underlines, yet again, that handling the upswing stage of cycles remains the Achilles heel of all mainstream output gap estimation methods. It

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explains why commentators are right to issue regular warnings that most significant fiscal and structural policy errors are made in the ‘good times’.

Finally, one can legitimately argue that the pre-crisis period was a once-in-a-generation financial shock and that the real-time reliability performance of the commonly agreed EU method was exceptionally good around the turning point of the crisis and in the subsequent post-crisis years. Whilst this is a valid line of argumentation, nevertheless it is important to continue to improve the EU’s commonly agreed methodology,

with a particular focus on attenuating the procyclicality risks in the upswing phase of cycles.

In this regard, the annual Work Programme of the Economic Policy Committee's (EPC) Output Gap Working Group (OGWG) is the vehicle via which the EU Member States can bring forward suggestions for further improvements to the method. The current 2015 Work Programme focusses on areas such as: the working age population; refinements of the NAWRU and TFP calculations; exploring the possibility of integrating recent structural reforms into the method; and including additional explanatory macro variables in the methodology.

### III. Special topics on the euro area economy

#### III.1. Inflation developments in the euro area — an update <sup>(33)</sup>

*This section reviews recent inflation developments in the euro area, using a simple open-economy version of the Phillips curve. It also discusses the inflation outlook in the near future.*

*Inflation has been exceptionally low for a prolonged period in the euro area and the other main economic areas. Our results show that the current subdued inflation in the euro area can be explained in large part by the fall in oil prices, but subdued domestic cost pressures due to weak economic activity have also played a role. The weaker euro has only partly dampened these downward price pressures.*

*Looking forward, positive base effects stemming from energy-price and core inflation are expected to raise headline inflation. Particularly strong base effects in December 2015 and January 2016 are expected to raise it by around 0.5 pps in each of those months. Although various inflation expectation measures remain below historical averages, they point to gradually increasing inflation in the euro area in the coming years.*

#### Introduction

Inflation in the euro area, as measured by the harmonised index of consumer prices (HICP) has been exceptionally low in 2015. It bottomed out in January at -0.6 % and is currently hovering around zero, whereas in 2013 and 2014 it had averaged 1.4 % and 0.4 % respectively. These levels are significantly below the long-term average of 1.8 %. The subdued inflation is largely driven by a strong fall in commodity prices, but sizeable economic slack in some Member States has also contributed.

The first part of this section explains recent low inflation rates using a Phillips curve framework which shows the relationship between inflation and real economic activity or domestic cost pressures. The curve can be augmented with several factors, such as expectations, exchange rates or oil prices,

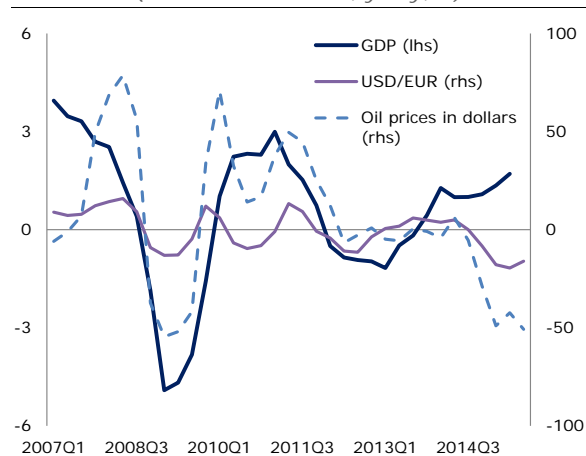
reflecting price rigidities and the effects of imported goods on inflation, for example. <sup>(34)</sup>

We first estimate a backward-looking Phillips curve, which includes, as explanatory variables, the output gap (as a gauge of cyclical price pressures), oil prices and the exchange rate, to examine the respective contributions of these variables to the current subdued inflation rates. <sup>(35)</sup>

The second part of the section reviews the inflation outlook. In particular, we estimate base effects which measure the extent to which atypical HICP movements 12 months earlier contribute to the annual inflation rate in coming months if the month-on-month change follows the normal trend. <sup>(36)</sup> The discussion on the inflation outlook is further informed by an overview of recent developments in inflation expectations.

#### Recent inflation developments in a Phillips curve perspective

Graph III.1.1: Main factors affecting inflation  
(2006Q1 – 2015Q3, y-o-y, %)



Source: Data Insight.

The main external factors impacting inflation rates have faced exceptional volatility since 2014 (see

<sup>(33)</sup> Section prepared by Lauri Vilmi.

<sup>(34)</sup> For an overview of the Phillips curve literature, see Gordon, R. J. (2011), 'The history of the Phillips curve: consensus and bifurcation', *Economica*, Vol. 78, No 309, pp. 10-50.

<sup>(35)</sup> We do not try to measure expectations and their role in price-setting, but assume that expectations are formed with an autoregressive process based on past inflation rates.

<sup>(36)</sup> For further discussion, see 'Box 6: Base effects from the volatile component of the HICP and their impact on HICP inflation in 2014', *ECB Monthly Bulletin*, February 2014, pp. 51-53.

Graph III.1.1). Oil prices have fallen strongly since the third quarter of 2014, with Brent crude dropping from around USD 110 to around USD 50 per barrel in September 2015 on the back of increased supply, particularly in the United States and weaker-than-expected demand for commodities. Other commodity prices have also plunged, adding negative price pressures.

The weakening of the euro from almost USD 1.40 in March 2014 to around USD 1.10 in September 2015 has dampened the downward impact of lower commodity prices on inflation. The previous appreciation of the euro has been reversed as euro-area and US monetary policies are diverging in response to differing cyclical conditions.

In addition to external factors, large economic slack in some Member States has also contributed to low inflation. Although economic growth has picked up somewhat in 2015, domestic cost pressures have remained weak, reflecting a still-negative output gap.<sup>(37)</sup> Estimates in the European Commission's spring forecast, based on the production function methodology, show a negative output gap of -2.8 % for 2014, narrowing to -1.1 % by 2016.

The estimated open-economy Phillips curve for the euro area is produced as follows:

$$\pi_t = c + \alpha\pi_{t-1} + \beta gap_t + \gamma\Delta oil_t + \delta\Delta exr_t + \varepsilon_t$$

where quarterly changes in HICP ( $\pi_t$ ) are explained by its lag ( $\pi_{t-1}$ ), constant term (c) and other explanatory variables.<sup>(38)</sup> Country-specific estimations for the four largest Member States use the same variables, but have slightly different lag structures depending on the model diagnostics. Domestic cost pressures are measured by the output gap ( $gap_t$ ), which, under certain assumptions as regards production technology and labour-market structure, approximates real marginal costs.<sup>(39)</sup> As energy and imported goods

account for a significant degree of volatility in the HICP series, we control these factors by augmenting the Phillips curve with the quarterly percentage change of Brent crude prices in dollars ( $\Delta oil_t$ ) and the EUR/USD exchange rate ( $\Delta exr_t$ ). The last term is an independently and identically distributed error term.<sup>(40)</sup>

We use a purely backward-looking Phillips curve rather than the hybrid version, as market-based inflation expectations have recently correlated strongly with oil price developments.<sup>(41)</sup> A hybrid Phillips curve for the euro area would provide very similar results as regards the drivers of recent inflation rates, but would emphasise more the role of falling inflation expectations and ascribe a smaller role to other factors. However, it would not explain inflation developments significantly better than the specification used here.<sup>(42)</sup>

Estimation results show that the simple backward-looking Phillips curve provides a good explanation of observed inflation in the euro area (see Table III.1.1). All estimated parameters have the expected signs and are statistically significant.<sup>(43)</sup> According to the Phillips curve estimates, lower oil prices account for a significant proportion of the most recent fall in inflation (see Graph III.1.2). In the first half of 2015, they reduced inflation by an average of around 1.4 pps. Negative output gap is also a driver of weak inflation, with an estimated average contribution of -0.4 pp since the second quarter of 2014. Meanwhile, the depreciation of the euro against the dollar has started to add positive price pressures, with an estimated positive impact of around 0.7 pp in the second quarter of 2015.

The drivers of inflation dynamics vary significantly across Member States. Inflation has been affected more strongly by oil-price and EUR/USD exchange-rate movements in Spain than in other large Member States. According to country-specific

<sup>(37)</sup> For example, growth of unit labour costs has been subdued in the euro area since the beginning of 2013. Also, annual producer price inflation (excluding construction and energy) remained negative in July.

<sup>(38)</sup> We use quarterly data for the period 2005Q1 to 2015Q2 for all variables. Only data for the past 10 years are used, as there is evidence of a steepening of the Phillips curve since the mid-2000s. See, for example, 'Analysing euro-area inflation using the Phillips curve', *Quarterly report on the euro area*, Vol. 13, No 2, pp. 21-26. The curve is estimated with the method of ordinary least squares.

<sup>(39)</sup> The Hodrick-Prescott filtered real GDP is used as a proxy for the output gap; the spring forecast data for real GDP growth for 2015

and 2016 and stable trend to 2020 are added to the series in order to mitigate end-point problems.

<sup>(40)</sup> A specification using nominal effective exchange rates (against a narrow basket excluding some emerging economy currencies, e.g. Russia) provides very similar estimates, though the specification using the EUR/USD exchange rate has a slightly higher coefficient of determination.

<sup>(41)</sup> See the discussion at the end of the section.

<sup>(42)</sup> With one-year-forward two years ahead inflation expectations, the coefficient of determination would increase from 0.84 to 0.89.

<sup>(43)</sup> We tested different lag structures for explanatory variables, but only the previous month's inflation rate seems to have a statistically significant impact on current inflation rates.



Phillips curve estimations, oil prices contributed close to -2 pps to the inflation rate in the second quarter of 2015 in Spain, but only around -1 pp in Germany. (44) The estimated contribution of the exchange rate in the second quarter of 2015 was lowest in Italy, but this is due to a slower estimated inflation process there, whereby past euro depreciations are expected to contribute positively to inflation in Italy in the coming quarters. Larger negative output gaps (economic slack) are estimated to have contributed an average of around -0.3 pp to Italian and Spanish inflation since 2013, whereas output gaps have had only a minor impact on inflation in Germany and France.

Table III.1.1: Estimated parameters

Euro area	Estimated Phillips Curve parameters (p-values)	
Constant	0.264	(0.000)
Lagged inflation	0.242	(0.000)
Output gap	0.093	(0.000)
Oil prices	0.021	(0.000)
USD/EUR	0.025	(0.003)
Period	2005Q1 to 2015Q2	
R <sup>2</sup>	0.84	
<b>Germany</b>		
Constant	0.339	(0.000)
Output gap	0.078	(0.000)
Oil prices	0.014	(0.000)
Lagged oil prices	0.008	(0.007)
Lagged USD/EUR	0.02	(0.039)
Period	2005Q1 to 2015Q2	
R <sup>2</sup>	0.71	
<b>France</b>		
Constant	0.287	(0.000)
Output gap	0.112	(0.000)
Oil prices	0.017	(0.000)
Lagged oil prices	0.008	(0.003)
2 Periods Lagged Oil prices	0.008	(0.000)
Lagged USD/EUR	0.027	(0.001)
Period	2005Q1 to 2015Q2	
R <sup>2</sup>	0.82	
<b>Italy</b>		
Constant	0.238	(0.001)
2 Periods Lagged inflation	0.362	(0.002)
Output gap	0.084	(0.003)
Oil prices	0.009	(0.001)
Lagged oil prices	0.009	(0.006)
Lagged USD/EUR	0.017	(0.125)
Period	2005Q1 to 2015Q2	
R <sup>2</sup>	0.7	
<b>Spain</b>		
Constant	0.396	(0.000)
Output gap	0.101	(0.024)
Oil prices	0.022	(0.000)
Lagged oil prices	0.016	(0.005)
Lagged USD/EUR	0.039	(0.043)
Period	2005Q1 to 2015Q2	
R <sup>2</sup>	0.58	

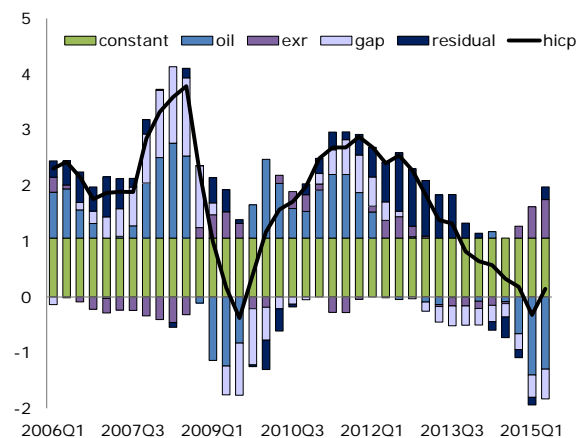
Source: DG ECFIN calculations.

The estimated Phillips curves fail to explain a relatively large part of negative inflation, particularly in Spain, but also in Italy, since the end of 2013 and this is reflected in a large residual term in that period. This may be due to a larger-than-assumed contribution from the

(44) Higher energy intensity and possible larger second-round effects in Spain could explain these differences. See also Balta N., K. Fischer, P. Nikolov and L. Vilmi ‘Member State vulnerability to changes in the euro exchange rate’, *Quarterly report on the euro area*, Vol. 13, No 3, pp. 27-33.

economic slack than assumed in the estimation or to the effects of exchange rate changes being larger and emerging more slowly. (45)

Graph III.1.2: Impact of different factors on annual HICP inflation (2006Q1 – 2015Q2, %)



Source: DG ECFIN calculations, Data Insight.

### Positive base effects affecting inflation in the near future

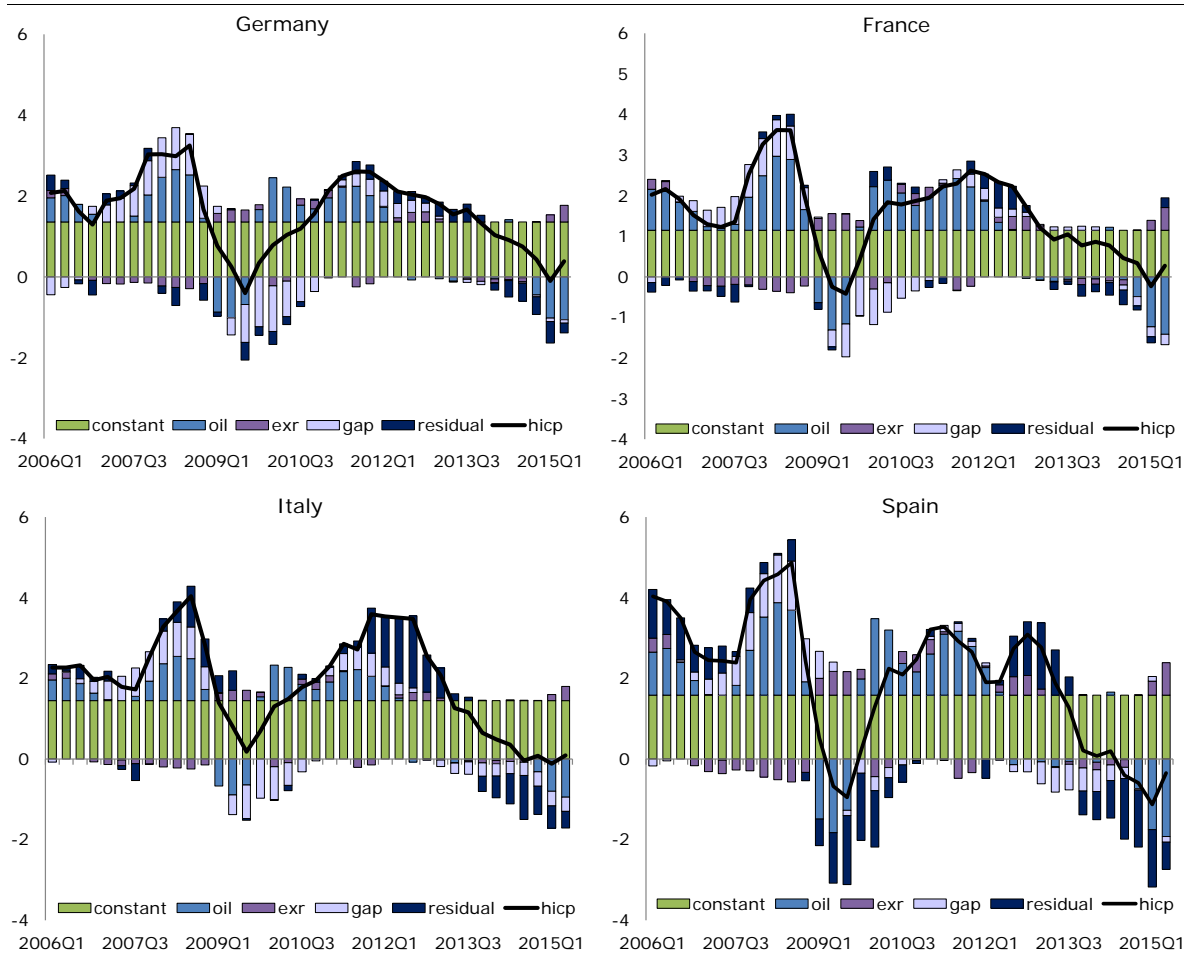
To shed light on expected inflation developments in the near future, we estimate the base effects of headline HICP and break them down into effects stemming from the core, energy and food-price components. (46) The base effect for each month is calculated as the difference between the average monthly change in the seasonally adjusted price indices for January 1996–August 2015 and actual monthly change 12 months earlier. There is no single uniformly agreed methodology for calculating base effects, but our approach closely follows that used in the ECB *Monthly Bulletin* (2008). (47)

(45) A larger contribution from the economic slack might reflect larger slack than estimated, a structural change in the Phillips curve or possible non-linearities in the curve. For a discussion of the possible steepening of the Phillips curve, see Jordan C. and L. Vilmi ‘Analysing euro-area inflation using the Phillips curve’, *Quarterly report on the euro area*, Vol. 13, No 2, pp. 21-26.

(46) The breakdown does not sum up to the aggregate figure, as the base effect and seasonal adjustment is calculated separately from each component. Therefore, it merely illustrates the sources of the base effects.

(47) For a further discussion of base effects, see for example, ‘Box 6: Accounting for recent and prospective movements in HICP inflation: the role of base effects’, *ECB Monthly Bulletin*, December 2008, pp. 63-64.

Graph III.1.3: Inflation drivers: four largest euro-area Member States  
(2006Q1 – 2015Q2, %)

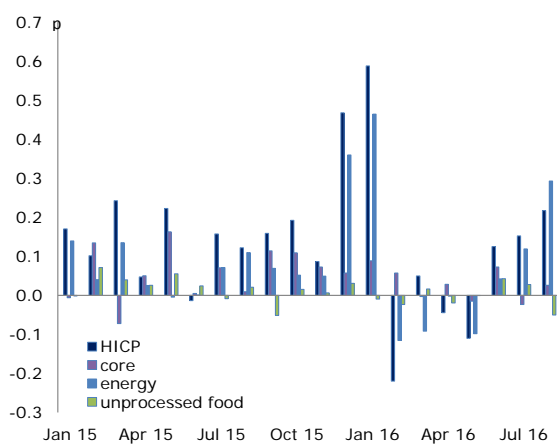


Source: DG ECFIN calculations, Data Insight

Base effects are expected to raise inflation rates in the second half of 2015 (see Graph III.1.4), particularly in December (estimated base effects of 0.45 pp), and January 2016 (0.6 pp). Later in 2016, the estimated base effects are relatively small, reflecting the normalisation of month-on-month inflation rates 12 months earlier but the slump in oil prices from July to September 2015 will lead to further positive base effects in the HICP energy component in the third quarter of 2016.

A large part of the positive base effects stems from energy price developments, reflecting the significant fall in oil prices since the second quarter of 2014. However, base effects in core inflation are also expected to add price pressures, especially from September to November 2015, as processed food and non-energy industrial goods prices fell 12 months earlier. On the other hand, the base effects stemming from unprocessed food prices are expected to be modest. The base effects from core

Graph III.1.4: Estimated base effects from various subcomponents  
(Jan 2015 – Aug 2016, pps)

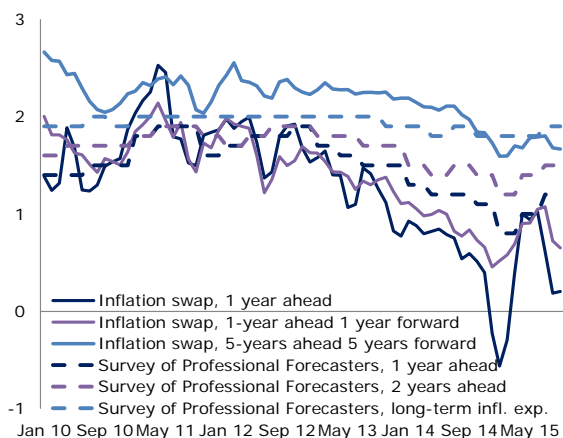


Source: DG ECFIN calculations, Eurostat.

inflation are expected to be close to zero from February 2016, which reflects smaller month-on-month price changes in core categories since February 2015.

Positive base effects point to increasing inflation over the next 12 months. Although base effects provide useful information on expected inflation developments, they cannot be taken as actual projections, as they technically assume that future monthly inflation will follow its historical average. Therefore, they do not take into account changes in inflation trends or temporary factors such as oil price movements or tax measures. However, the upward trend in inflation is consistent with both market- and survey-based inflation expectations (see Graph III.1.5).

Graph III.1.5: **Market and survey-based inflation expectations**  
(Jan 2010 – Sep 2015, %)



Source: Bloomberg, DG ECFIN calculations, ECB

Inflation expectations in the euro area fell gradually from mid-2013 and bottomed out in January 2015 at historically low levels, following the slump in oil prices and weak domestic cost pressures. They recovered gradually in spring 2015 amid stabilising

oil prices, the weaker euro and the improved short-term economic outlook in the euro area, against the background of further monetary accommodation by the ECB. In summer 2015, a further fall in oil prices and market turmoil relating to uncertainty in Asian economies triggered a drop in short-term swap-based expectations and added volatility in medium- and longer-term expectations.

Both short- and long-term inflation expectations remain below their historical averages, but point to a gradual rise in inflation towards the historical average in the coming years. For example, the ECB's Q3 2015 *Survey of Professional Forecasters* points to inflation of 1.5% in two years' time and 1.9% in five years' time. Similarly, swap-based inflation expectations show average inflation of 1.1% one-year forward two years ahead, but around 1.7% five-year forward five years ahead.<sup>(48)</sup> The Commission's spring forecast also foresees steadily increasing inflation rates in the coming years, though the path of the rebound in the short term is significantly influenced by ongoing volatility in oil prices.

### Conclusions

Inflation in the euro area is currently very low, with lower oil prices adding downward price pressures and large economic slack, particularly in some Member States. These factors have had an especially strong impact in Spain, where inflation seems to be particularly sensitive to oil price movements and economic slack has been sizeable.

Looking forward, inflation is expected to pick up gradually in the euro area, supported by the weaker euro, positive base effects and gradually narrowing output gap. Base effects are estimated to be particularly strong in December 2015 and early 2016, when they may cause swings in the inflation rate.

<sup>(48)</sup> Market-based inflation expectations such as inflation swap-rates are also influenced by inflation risk and liquidity premiums, so the measured rate does not necessarily reflect underlying inflation expectations directly.

### III.2. Performance of the Irish financial assistance programme <sup>(49)</sup>

Ireland went into recession in 2008, after a decade of strong economic growth. Imprudent fiscal policies in the run-up to the crisis resulted in a large deficit when cyclical and asset-related revenues disappeared. At the same time, the banking sector was undergoing a severe crisis and needed significant support. A sovereign debt crisis started to unfold. As a result, Ireland requested financial assistance from the EU and the IMF. This was granted in December 2010, accompanied by an economic adjustment programme, the key objectives of which were to restore financial market confidence in the Irish banking sector and sovereign, and allow Ireland to make a sustained return to the markets. While the €85 billion financial envelope bought time, the programme was designed to restore the viability of the financial system and the sustainability of public finances, and introduce reforms that would support growth and stability over the medium term.

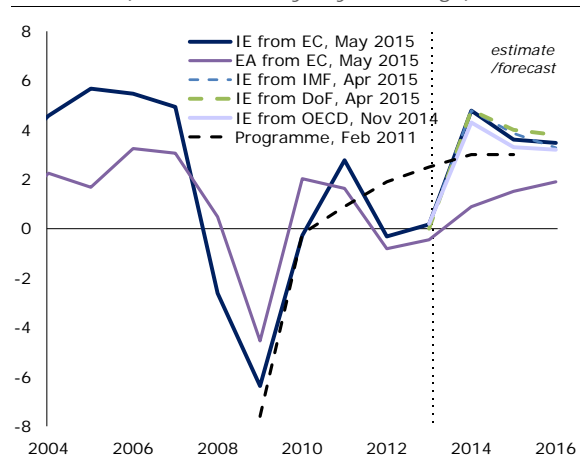
The European Commission has recently finalised an ex post evaluation of the economic adjustment programme. It found that the financial envelope had proven sufficient to meet Ireland's financing needs until it regained market access at sustainable rates. Measures to redress the financial sector, bring public finances back to a sustainable path and support growth were broadly appropriate and effective. The economy has returned to robust growth, unemployment is decreasing and productivity and cost-competitiveness have improved. While challenges remain in addressing the legacies of the crisis, the programme can be seen as a success.

#### The run-up to the programme

From the mid-1990s until the early 2000s, Ireland experienced a phase of healthy economic growth that enabled it to catch up with other euro-area countries. Economic reforms, favourable demographics, rising educational attainment and the deepening of the EU single market had a positive impact on labour-force participation,

labour productivity, foreign direct investment (FDI) and exports. Productivity growth in the tradable sector exceeded the euro-area average.

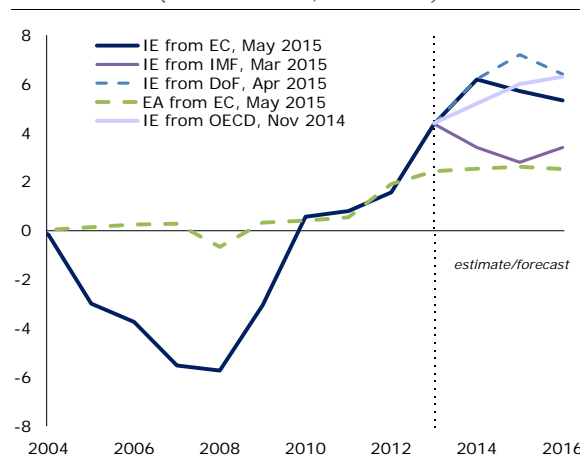
Graph III.2.1: Real GDP growth (2004 – 2016, y-o-y % change)



Source: DG ECFIN, IMF, OECD, Department of Finance (DoF), Economic Adjustment Programme.

Although Ireland maintained high growth rates through the early 2000s until 2007 (Graph II.2.1), the underlying drivers of economic activity had changed. Productivity gains slackened and were outpaced by accelerating wage growth.

Graph III.2.2: Current account balance (2004 – 2016, % of GDP)



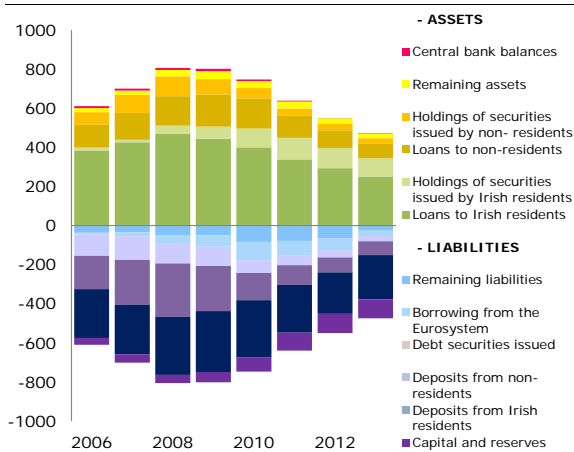
Source: DG ECFIN, IMF, OECD, Department of Finance (DoF).

Consumer and producer prices rose much faster than in most other euro-area Member States. Unit labour costs rose and gradually eroded price-competitiveness. Ireland lost export market shares, imports grew rapidly and the current account went into deficit in 2005 (Graph II.2.2).

<sup>(49)</sup> Section prepared by Alessandro Angelini on the basis of European Commission, DG ECFIN (2015): 'Ex post evaluation of the economic adjustment programme for Ireland (2010-2013)', *Institutional Papers*, No 4.

On the back of low interest rates and lax credit standards, the risks taken by banks and the parallel increase of corporate and household indebtedness became excessive. The banking system became oversized and highly leveraged, increasingly relying on international money market funds. In 2008, the total assets of the domestic banking sector amounted to about €800 billion (Graph II.2.3).

**Graph III.2.3: Composition of assets and liabilities of the Irish domestic banking system**  
(2006 – 2013, EUR billion)



Source: Central Bank of Ireland

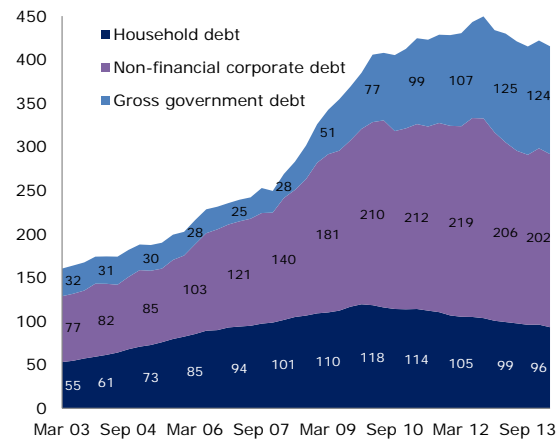
In 2008, the loan-to-deposit (LTD) ratio was exceeding 200 %<sup>(50)</sup>. Rapid credit expansion led to over-investment and overheating in real estate, and accelerated consumer spending. By the end of 2008, private-sector debt had reached 282 % of GDP, up from 143 % five years earlier, while public debt was still relatively low (see Graph II.2.4). In the following two years, private debt continued to increase, accompanied by a surge in public debt, mainly due to the cost of supporting the banks. Financial regulation and prudential supervision proved inadequate and failed to rein in credit growth and bank balance-sheets.

High exposure to the property market and heavy reliance on inter-bank lending made the Irish banking sector particularly vulnerable to shifts in the housing market and to the global financial crisis. The housing market started to slow down in 2007 and then experienced sharp falls in new construction, transactions and prices. As a result, increasing losses on banks' loans were expected.

<sup>(50)</sup> IMF, Ireland — third review under the extended arrangement, p. 28, August 2011.

Also, short-term inter-bank lending dried up as the global financial crisis intensified following the collapse of Lehman Brothers in September 2008.

**Graph III.2.4: Ireland, evolution of public and private debt (excluding financial sector)**  
(2003 – 2014, % of GDP)



Source: ECB, National Accounts data (CBI).

From 2008, GDP began to fall and unemployment rose dramatically (Graphs II.2.1 and II.2.10). Ireland's main trading partners (the euro area, the United States and the UK) were going through a deep and sharp recession and this exacerbated the underlying vulnerabilities of the Irish economy. Irish GDP declined by 9 % in real terms and by 16.2 % in nominal terms in 2008-2010. By end-2010, the unemployment rate had risen to 13.9 %, up from 4.7 % at the end of 2007, with the construction sector accounting for half of the decline in total employment.

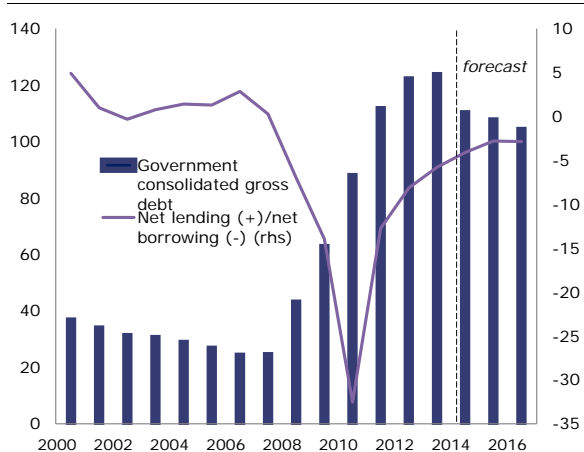
In order to overcome banks' funding problems and address potential capital shortfalls, the Irish authorities initially issued guarantees on banks' liabilities and provided substantial capital support. They also established an agency for the purchase, management and disposal of non-performing assets. Before the start of the programme, the Government had injected €46 billion (about 28 % of GDP) into five domestic financial institutions, but uncertainty about the value of impaired assets and the high cost of banking-sector support continued to undermine confidence in the Irish sovereign and banks. The solvency of the sovereign and that of the banking system became directly intertwined.

Liquidity support from the Eurosystem reached unprecedented levels (see Graph II.2.3). The

Central Bank of Ireland (CBI) provided emergency liquidity assistance (ELA) to banks left with only a limited amount of eligible collateral for standard monetary policy operations with the European Central Bank (ECB). By November 2010, Eurosystem support to Irish banks (including ELA) amounted to €140 billion, or around 85 % of Irish GDP.

The crisis exposed significant weaknesses in public finances. Fiscal policy choices in Ireland's long boom years turned out to have been highly pro-cyclical; expenditure commitments and tax reductions were funded from cyclical and asset-based revenues that disappeared when the housing market crashed and the crisis hit.

Graph III.2.5: Fiscal deficit and public debt (2000 – 2016, % of GDP)



Source: DG ECFIN.

The combination of shrinking fiscal revenues and high banking-sector costs triggered a sovereign debt crisis. From mid-2008, five fiscal consolidation packages were implemented, with a total net deficit-reducing impact of 9 % of GDP in 2008-2010, but this was not enough to reverse the increases in public deficit and debt. In 2010, the total fiscal deficit amounted to 32.5 % of GDP, of which 11.1 % was underlying deficit, excluding one-off rescue measures for the financial sector. General government gross public debt soared from 24 % of GDP in 2007 to over 87.4 % in 2010 (Graph II.2.5).

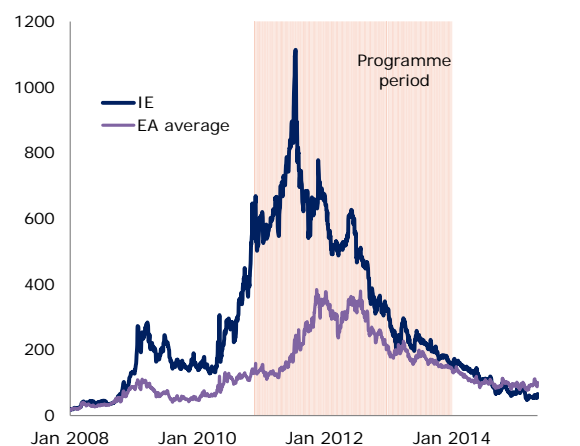
The relative flexibility of the Irish economy was conducive to rapid adjustment. It was imperative to regain competitiveness, *inter alia* through internal devaluation. There was an abrupt fall in real unit labour costs, particularly in 2010, inflation

plummeted between 2009 and 2010, and the real effective exchange rate started to improve as early as 2009. The current account deficit narrowed as a result of the improvement in cost-competitiveness and a contraction of domestic demand.

### Overview of the programme

By November 2010, financial market concerns about the solvency of the Irish sovereign had pushed spreads of Irish sovereign bonds to record highs (Graph II.2.6). Given the overall context, such market interest rates were not sustainable. As a result, Ireland asked for financial assistance from the EU (through the European Financial Stabilisation Mechanism - EFSM), EU Member States (in the form of European Financial Stability Facility - EFSF - and bilateral loans) and the IMF, which was granted in December 2010. The Dáil (lower house of the Irish Parliament) approved a programme setting out policy reform commitments to be fulfilled in return for regular instalments of financial assistance.

Graph III.2.6: 10-year sovereign yield spread against euro-area average (1) (Jan 2008 – Apr 2014, bps)



(1) EA average includes AT, BE, FI, FR, IT, ES, NL, SI and SK.

Source: Bloomberg.

The involvement of the Irish authorities in the preparation of the programme was substantive, could build on existing credible national plans and aimed to ensure that Ireland retained the ownership of the related commitments. The fiscal and structural reforms set out in the programme were largely aligned with the Irish National Recovery Plan (NRP) for 2011-2014, a programme prepared by the Government in 2010.

The immediate priority was to ensure enough funding to break the financial-sovereign spiral of uncertainty and to buy the Irish authorities enough time to institute the necessary reforms. The programme provided €67.5 billion in funding to add to the €17.5 billion of Irish reserves, resulting in an overall package of €85 billion (about 50 % of GDP). At the time, there was great uncertainty as to the actual needs of the financial sector and whether the Exchequer would be able to absorb these costs. In a context of high financial market volatility and uncertainty as to the capital needs of the Irish banks, the choice was made to have a substantial financial envelope with sizeable contingency reserves. The financing package was intended to be a credible solution that would be sufficient also under adverse scenarios.

The key objective of the programme reforms was to restore financial market confidence in the Irish banking sector and sovereign and allow Ireland to make a sustained return to the markets. While the large envelope bought time, the programme was designed to address the immediate difficulties of the Irish economy by:

- restoring the viability of the financial system;
- consolidating public finances; and
- introducing reforms that would support medium-term growth and stability.

These three strands, which can be thought of as addressing immediate, short-term and medium-term challenges, were seen as mutually reinforcing.

While constrained by policies introduced since 2008, the financial-sector reforms aimed to draw a line under the immediate funding needs of the banking sector and gradually introduce the changes necessary to return it to a properly functioning state and to profitability. This was seen as crucial to breaking the vicious financial-sovereign loop that had proven so damaging to the Irish economy.

The programme included a financial-sector strategy involving a fundamental downsizing and reorganisation of the banking sector. The financial sector was to be stabilised and recapitalised, following an in-depth assessment of its needs, with non-viable banks being resolved or merged. The supervisory and resolution frameworks were also

to be strengthened. Measures to clean up bank balance-sheets and return the sector to a viable state, in which it could lend to the economy and underpin growth, were of equal, although not as immediate importance, to ensure that the sector could survive without relying further on state support.

The fiscal consolidation and fiscal governance reforms were aimed ultimately at ensuring the sustainability of public finances. They sought to contain the continued increase in public debt due to a large underlying general government deficit. In doing so, the consolidation under the programme continued on from the substantial efforts made over the previous years and built on the existing fiscal priorities of the Irish authorities (which had already been taking shape within the framework of the Excessive Deficit Procedure that was ongoing since early 2009). The measures to be taken under the programme were front-loaded which could have risked further depressing growth while it was still vulnerable. However, the need to contain public debt was of primary interest in order to allow a sustainable return to the markets. With a view to establishing an appropriate budgetary policy for the future, the programme required the implementation of a strong set of measures to improve fiscal governance over the medium term.

The programme also contained structural reforms aimed at facilitating economic adjustment and boosting employment, competition and growth. The relatively limited scope of structural reform conditionality was justified by the strong fundamentals and flexibility of the Irish economy as a whole. Nevertheless, in view of high and rising long-term unemployment and significant skills mismatches, the programme included measures to tackle impediments to hiring on both the demand side (wage-setting) and the supply side (activation, skills and work incentives). The product market and sectoral reforms targeted the more longstanding economic inefficiencies holding back growth.

### Overall results of the programme

The Commission has recently finalised its *ex post* evaluation of the economic adjustment

programme<sup>(51)</sup>. As explained in detail below, it concludes that the programme was rightly focused on the main challenges faced by Ireland at the time and the measures were broadly appropriate and effective in achieving the objectives.

The €85 billion envelope proved sufficient to meet Ireland’s financing needs until it regained market access at sustainable rates. Ireland received the full amount of external assistance, i.e. €67.5 billion, despite its financing needs proving less than initially envisaged. This allowed the Treasury to replenish the cash buffer and facilitated the full and sustained return of the Irish sovereign to financial markets before the end of the programme.

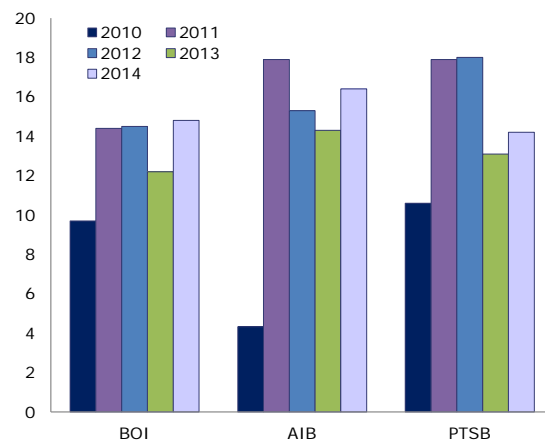
The programme was effective in restoring creditors’ confidence in the financial system. The two pillar banks returned to the debt market by the end of 2012 and to profitability by the end of 2014. However, while the Government has already sold some of its stakes, a significant portion of the banking sector still relies on state-injected capital. The large upfront recapitalisation (covering rigorously assessed projected losses) significantly improved the banks’ capital structure (Graph II.2.7) and was crucial in restoring confidence in their solvency, given the absence of well-established firewalls at the time<sup>(52)</sup>.

Significant progress has been made in terms of downsizing the banking sector and addressing funding vulnerabilities, as indicated by the significant reduction in reliance on the Eurosystem and the improved LTD ratio (Graph II.2.8). Banking supervision has significantly improved.

At the end of the programme, a decline in non-performing loans (NPLs) had yet to be seen, and this represented a continuing burden on banks’ profitability; NPLs did start to decline in 2014, however. Financial-sector governance has a direct impact on balance-sheet repair in the banks and the real economy. While direct intervention in banks (e.g. recapitalisation, deleveraging and restructuring) was very front-loaded, reforms to broader financial-sector governance (e.g. the

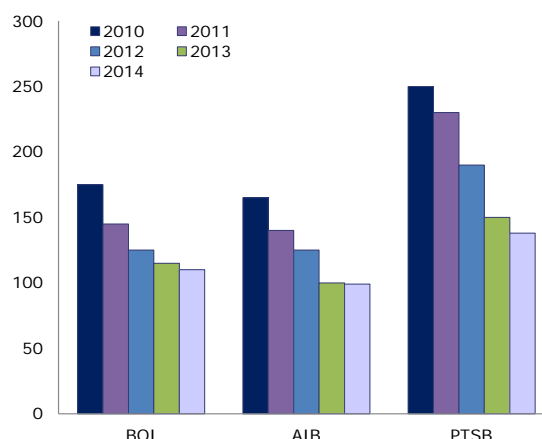
insolvency framework and credit registry) were scheduled relatively late in the programme.

Graph III.2.7: Tier 1 capital ratio (2010 – 2014)



(1) 2014 data refer to CET1 capital (Basel III transitional).  
Source: Irish banks’ annual reports.

Graph III.2.8: Loan-to-deposit ratio (2010 – 2014)



Source: Irish banks’ annual reports.

In the specific context of Ireland in 2010, not bailing-in unguaranteed and unsecured senior creditors of domestic banks was appropriate and reflecting complex considerations. In theory, a bail-in is preferable insofar as it limits the costs for the State and encourages proper risk pricing. Bail-in provisions are now enshrined in the new EU regime. However, a careful assessment concluded that the conditions for such a bail-in were not present in Ireland nor in the EU at the time. With no legal framework in place to manage such an exercise, the legal and economic risks were considered too great in light of the potential benefits. The risks of spill-overs to the Irish and

<sup>(51)</sup> European Commission, DG ECFIN (2015), ‘Ex post evaluation of the economic adjustment programme for Ireland (2010-2013)’, *Institutional Papers*, No 4.

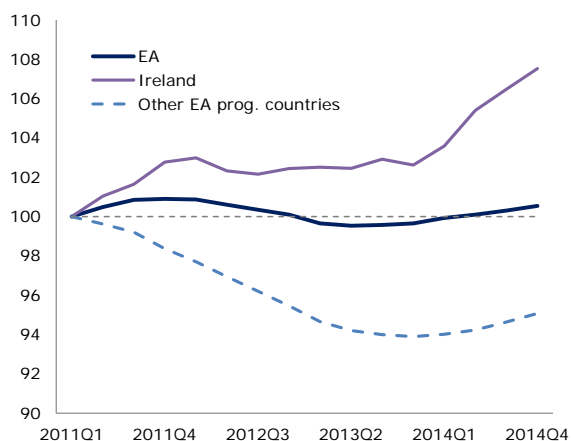
<sup>(52)</sup> At the time, there was no harmonised European resolution framework. This was introduced through the Bank Recovery and Resolution Directive (BRRD) and the Single Resolution Mechanism (SRM) in the course of 2014.



EU financial systems were highly uncertain and perceived to be very high, especially given the absence of a proper EU bank resolution framework.

Ireland achieved, with some margin, the fiscal targets in the programme. They had been realistic and Ireland benefited from a fiscal windfall due to the European Council's decision to reduce the interest rate on the EFSF and EFSM loans. The overachievement helped to foster a virtuous circle of good news and credibility for the programme. The changes on both the revenue and spending sides have made public finances more sustainable. Tax system reforms have broadened the tax base and should reduce its volatility. The public wage bill has been reduced and social support expenditure has been made more efficient, avoiding sharp across-the-board cuts. However, the sharp decrease in public investment might have negative repercussions for future growth.

Graph III.2.9: **Real GDP growth**  
(2011Q1 – 2014Q4, Index: 2011Q1=100)



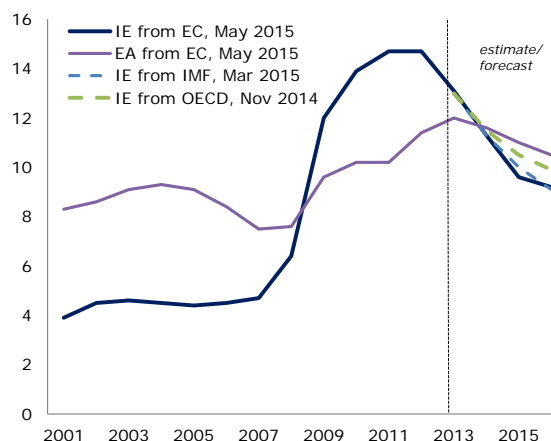
Source: Eurostat.

The fiscal governance measures taken over the programme years should in principle lay the ground for counter-cyclical fiscal policy in good times, which is necessary if debt is to be reduced quickly in the coming years. The programme contained a number of key reforms to enhance fiscal credibility and anchor long-term debt sustainability. The test of the institutional strength of the fiscal framework will come when economic expansion starts to produce revenue windfalls and political pressure for additional spending makes itself felt.

Overall, Ireland's recovery in the course of the programme was substantially stronger than that in

peer countries (Graph II.2.9). Net exports bolstered growth, while domestic demand remained subdued owing to depressed disposable incomes, high unemployment, the large debt burden and continued deleveraging.

Graph III.2.10: **Unemployment rate**  
(2001 – 2016, %)



Source: DG ECFIN, IMF, OECD.

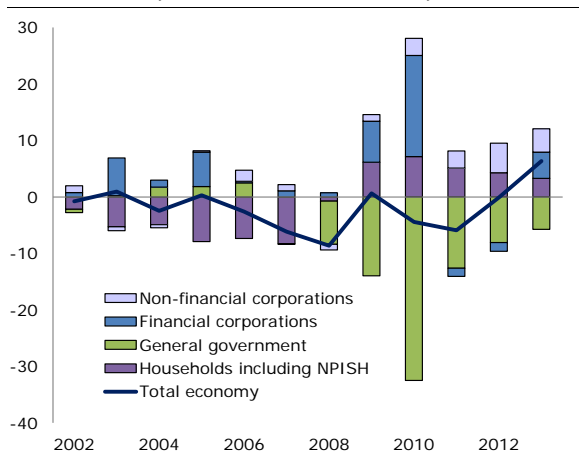
The economy has now returned to growth and is set to expand robustly until the end of the forecast horizon in 2016 (Graph II.2.1). Real output is forecast to exceed its pre-recession level in 2015. While net exports are still expected to contribute positively, domestic demand is taking over from net trade as the main driver of GDP growth, due to private consumption and investment. GNP has also returned to robust growth.

The unemployment rate continued to rise, reaching 14.7% in 2011 and 2012. The dominant engine of growth, the export sector, tends to be less job-intensive, so could not quickly compensate for employment losses in other more labour-intensive sectors, such as construction. In 2013, the unemployment rate started to fall, however; in 2014, it dropped below the euro-area average and is now projected to decrease further (Graph II.2.10). Structural reforms introduced under the programme to tackle both demand- and supply-side impediments to hiring should support sustainable employment, but will take time to have an impact. The new active labour-market policies and reforms to address skills mismatches should help to raise the employment rate among young and lower-skilled workers over the medium term.

Productivity and cost-competitiveness continued to improve in the course of the programme. Hourly

labour-cost growth in Ireland has consistently lagged behind that in the euro area as a whole since the onset of the crisis. Real unit labour costs and the related real effective exchange rate have also fallen significantly. Following substantial price adjustment before the programme, consumer-price inflation remained muted in the face of subdued wage pressures and weak domestic demand. In the coming years, rising demand should keep inflation around the euro-area average.

Graph III.2.11: Ireland, financial surplus (+) or deficit (-) by sector (2002 – 2013, % of GDP)



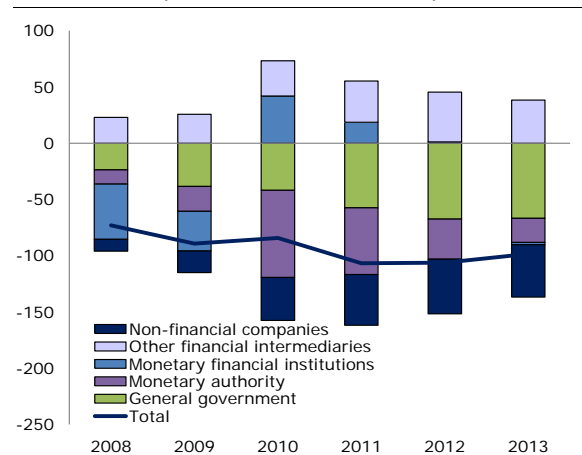
Source: DG ECFIN, Central Statistics Office (Ireland).

The current-account balance was positive throughout the programme period and reached 4.4 % of GDP in 2013. Net exports grew significantly in 2011 and continued to increase, albeit more slowly, in 2012 and 2013. This was despite the slowdown affecting Ireland's main trading partners and the 'patent cliff' in the pharmaceutical sector. In 2014, net exports accelerated again, but this was also on the back of rapid increases in contract manufacturing which may be mostly linked to the activities of multinational corporations and could prove to be temporary, with a limited impact on long-term employment. In this context, strong export performance is also expected to generate significant surpluses in 2015-2016 (Graph II.2.2).

Deleveraging and balance-sheet adjustment have been substantial, but debt levels remain high (Graphs II.2.4, II.2.11 and II.2.12). The public sector managed to reduce its net borrowing, while the private sector moved into surplus. As a result, the Irish economy as a whole became a net lender to the rest of the world in 2013.

This is particularly true for private households and non-financial corporations, which have been aggregate net lenders since 2009. However, this favourable development in terms of flows is not yet reflected in stocks. Ireland's net international investment position still showed net liabilities of around 100 % of GDP in 2013.

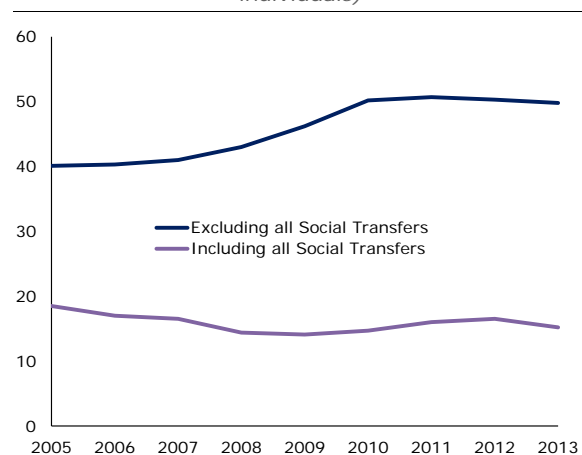
Graph III.2.12: Ireland, net international investment position by sector (2008 – 2013, % of GDP)



Source: DG ECFIN, Central Statistics Office (Ireland).

While the CBI gradually reduced its liabilities *vis-à-vis* the Eurosystem, the Irish Government and non-financial corporations only stabilised their debt position with the rest of the world.

Graph III.2.13: At-risk-of-poverty rate before and after social transfers (2005 – 2013, 60 % median income threshold, % of individuals)



Source: Central Statistics Office (Ireland), SILC 2014.

In the context of a sharp rise in unemployment, the economic crisis caused significant hardship in Irish society. The programme avoided sharp across-the-

board reductions in social support, so the comprehensive social safety-net that Ireland already had in place continued to function effectively and mitigated increases in relative poverty (Graph II.2.13). Indicators of enforced deprivation have risen, however.

Challenges remain in addressing the legacies from the crisis. High private and public indebtedness continue to weigh on domestic demand and growth. Banks continue to repair their balance-sheets by unwinding their still-large stock

of NPLs and this also affects credit supply. Long-term and youth unemployment remain serious challenges and there is a risk of some cyclical unemployment becoming structural. The Irish economy depends on its capacity to attract FDI and remains vulnerable to changes in global patterns of product specialisation, shifts in the structure of value chains and losses in competitiveness. Continued progress on the structural reforms undertaken as part of the programme should allow future growth to be more sustainable.



## IV. Recent DG ECFIN publications

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### 1. Institutional Papers

European Economy. Institutional Papers. 008. September 2015  
Tax Reforms in EU Member States 2015. Tax policy challenges for economic growth and fiscal sustainability  
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European Economy. Institutional Papers. 007. September 2015  
The Economic Adjustment Programme. Cyprus, 6th Review – Spring 2015  
[http://ec.europa.eu/economy\\_finance/publications/eqip/pdf/ip007\\_en.pdf](http://ec.europa.eu/economy_finance/publications/eqip/pdf/ip007_en.pdf)

European Economy. Institutional Papers. 006. July 2015  
Post-Programme Surveillance Report. Portugal, Spring 2015  
[http://ec.europa.eu/economy\\_finance/publications/eqip/pdf/ip006\\_en.pdf](http://ec.europa.eu/economy_finance/publications/eqip/pdf/ip006_en.pdf)

European Economy. Institutional Papers. 005. July 2015  
Post-Programme Surveillance Report. Ireland, Spring 2015  
[http://ec.europa.eu/economy\\_finance/publications/eqip/pdf/ip005\\_en.pdf](http://ec.europa.eu/economy_finance/publications/eqip/pdf/ip005_en.pdf)

European Economy. Institutional Papers. 004. July 2015  
Ex post evaluation of the economic adjustment programme for Ireland (2010-2013)  
[http://ec.europa.eu/economy\\_finance/publications/eqip/pdf/ip004\\_en.pdf](http://ec.europa.eu/economy_finance/publications/eqip/pdf/ip004_en.pdf)

European Economy. Institutional Papers. 003. July 2015  
Energy Economic Developments - Investment perspectives in electricity markets  
[http://ec.europa.eu/economy\\_finance/publications/eqip/pdf/ip003\\_en.pdf](http://ec.europa.eu/economy_finance/publications/eqip/pdf/ip003_en.pdf)

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The 2015 Stability and Convergence Programmes: an overview  
[http://ec.europa.eu/economy\\_finance/publications/eqip/pdf/ip002\\_en.pdf](http://ec.europa.eu/economy_finance/publications/eqip/pdf/ip002_en.pdf)

European Economy. Institutional Papers. 001. July 2015  
Quarterly Report on the Euro Area (QREA), Vol.14, No.2 (2015)  
[http://ec.europa.eu/economy\\_finance/publications/eqip/pdf/ip001\\_en.pdf](http://ec.europa.eu/economy_finance/publications/eqip/pdf/ip001_en.pdf)

### 2. Discussion papers

European Economy. Discussion Papers. 016. September 2015  
Felix Roth  
Political Economy of EMU. Rebuilding Systemic Trust in the Euro Area in Times of Crisis  
[http://ec.europa.eu/economy\\_finance/publications/eedp/pdf/dp016\\_en.pdf](http://ec.europa.eu/economy_finance/publications/eedp/pdf/dp016_en.pdf)

European Economy. Discussion Papers. 015. September 2015  
Vivien A. Schmidt  
The Eurozone's Crisis of Democratic Legitimacy. Can the EU Rebuild Public Trust and Support for European Economic Integration?  
[http://ec.europa.eu/economy\\_finance/publications/eedp/pdf/dp015\\_en.pdf](http://ec.europa.eu/economy_finance/publications/eedp/pdf/dp015_en.pdf)

European Economy. Discussion Papers. 014. September 2015  
Charles Wyplosz  
The Centralization-Decentralization Issue  
[http://ec.europa.eu/economy\\_finance/publications/eedp/pdf/dp014\\_en.pdf](http://ec.europa.eu/economy_finance/publications/eedp/pdf/dp014_en.pdf)

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### 3. Other publications

Spring forecast 2015

[http://ec.europa.eu/economy\\_finance/publications/european\\_economy/2015/pdf/ee2\\_en.pdf](http://ec.europa.eu/economy_finance/publications/european_economy/2015/pdf/ee2_en.pdf)

### 4. Regular publications

Business and Consumer Surveys (harmonised surveys for different sectors of the economies in the European Union (EU) and the applicant countries)

[http://ec.europa.eu/economy\\_finance/db\\_indicators/surveys/index\\_en.htm](http://ec.europa.eu/economy_finance/db_indicators/surveys/index_en.htm)

Business Climate Indicator for the euro area (monthly indicator designed to deliver a clear and early assessment of the cyclical situation)

[http://ec.europa.eu/economy\\_finance/db\\_indicators/surveys/documents/2013/bci\\_2013\\_11\\_en.pdf](http://ec.europa.eu/economy_finance/db_indicators/surveys/documents/2013/bci_2013_11_en.pdf)

Key indicators for the euro area (presents the most relevant economic statistics concerning the euro area)

[http://ec.europa.eu/economy\\_finance/db\\_indicators/key\\_indicators/index\\_en.htm](http://ec.europa.eu/economy_finance/db_indicators/key_indicators/index_en.htm)

Monthly and quarterly notes on the euro denominated bond markets (looks at the volumes of debt issued, the maturity structures, and the conditions in the market)

[http://ec.europa.eu/economy\\_finance/publications/bond\\_market/index\\_en.htm](http://ec.europa.eu/economy_finance/publications/bond_market/index_en.htm)

Price and Cost Competitiveness

[http://ec.europa.eu/economy\\_finance/db\\_indicators/competitiveness/index\\_en.htm](http://ec.europa.eu/economy_finance/db_indicators/competitiveness/index_en.htm)



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- [http://ec.europa.eu/economy\\_finance/publications/occasional\\_paper/index\\_en.htm](http://ec.europa.eu/economy_finance/publications/occasional_paper/index_en.htm)  
(the Occasional Papers)
- [http://ec.europa.eu/economy\\_finance/publications/qr\\_euro\\_area/index\\_en.htm](http://ec.europa.eu/economy_finance/publications/qr_euro_area/index_en.htm)  
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