

Oksanen, Heikki

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## New Output Gap Estimates for Assessing Fiscal Policy with Lessons for Euro Area Reform

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# New Output Gap Estimates for Assessing Fiscal Policy with Lessons for Euro Area Reform

*Heikki Oksanen*

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Telephone +49 (0)89 2180-2740, Telefax +49 (0)89 2180-17845, email [office@cesifo.de](mailto:office@cesifo.de)

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# New Output Gap Estimates for Assessing Fiscal Policy with Lessons for Euro Area Reform

## Abstract

Output gaps (OG) identify economic cycles and the cyclical and structural components in government budget balances. A new simple method for estimating OGs is presented here. The new results are more transparent than those published by the leading economic policy institutions. - The retroactive changes to the OGs as such do not indicate that they would have been incorrect. Instead, they naturally depend on what will happen afterwards, including changes in the fiscal and other policies conducted. - Fiscal policy in the euro area was tight in 2012-13, contributing to an unexpected fall in the GDP. Fiscal policy has generally amplified cycles in the euro area, except in 2009. - Procyclicality is caused by short-sighted fiscal discipline stemming from the mistrust among the member states. Policy reforms should focus on long-term sustainability and diminishing conflicts and mistrust. The numerous reform proposals should be assessed under two key criteria: (1) reducing mistrust across the members and (2) implementation without changes to the EU Treaty. Focussing on long-term sustainability meets them both.

JEL-Codes: E420, E620, H100.

Keywords: euro, fiscal policy, output gaps.

*Heikki Oksanen*  
*University of Helsinki / Finland*  
*hkk.oksanen@gmail.com*

Motto by the author (pursuing the tone of Mario Draghi in July 2012, when he convinced the financial world that the euro will be preserved): *‘Within the mandate of the EU Treaty, those responsible will eventually be ready to execute intelligent reforms to the euro. Everybody should trust that those reforms will be enough to preserve the euro for serving well the European economies and the rest of the world. Ambitious reform proposals that require changes to the Treaty only provoke mistrust and easily backfire.’*

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I am grateful to the participants at the *Euroframe* conference on 8 June in Milan for useful comments on the previous version (2018-05-21) and suggestions for further references. The main text is significantly shortened by moving material to the Technical appendix. I want to thank John Rogers for excellent editorial assistance. I take sole responsibility for any remaining deficiencies or errors.

## New Output Gap Estimates for Assessing Fiscal Policy with Lessons for Euro Area Reform

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**Executive summary**

This paper presents new output gap (OG) estimates based on the Hodrick-Prescott (HP) filter, to distinguish the cycle from a possible change in the trend of the GDP.

The HP filter has been often criticised on inadequate grounds. Using the method carefully can distinguish the cycle from changes in the trend in a way that compares well with the results from other methods. It is simple, based only on one single time series, the GDP. The results and their limitations can be easily understood also by non-experts

Our new application of the HP method makes an explicit link to the view about underlying growth of the economy in future. This is useful in two ways. (1) It makes explicit the question of what might be happening with respect to long-term growth prospects; this question is encountered continually, especially when a major shock hits the economy. (2) Under all OG estimation methods the phase of the cycle always depends not only on the current situation but also on the changes further on in the future. This means that all OG estimates, including those by the three main institutions, are uncertain and should be treated with caution.

The OGs are an important input for designing fiscal policy, including the rules for joint decision making in the euro area (and the EU).

The methods of producing the OGs in all the three institutions, the European Commission, IMF and OECD, are complex and liable to criticism, like pointing out that the real time OGs have been negative almost without exception. This has triggered a doubt that this might have caused a bias towards increased public debt. As no perfect estimates are available, a prudent conclusion is that parallel estimates are useful as they measure slightly different aspects of the economies.

While the retrospective revisions in the OG estimates have been used as criticism of their reliability, they do not necessarily indicate their weaknesses. The history after the Great Crunch is a case in point. The revisions of all the OG estimates, extending backwards to 2002, resulted from the fall in the EA11 GDP in 2009 and again in 2012-13.

This observation triggers not only questions about fiscal (and other) policies in 2010-13, but more generally about procyclicality of fiscal policies in the euro area. Except for the year 2009, when the significant fall in GDP struck, there is overwhelming evidence that fiscal policy has been persistently procyclical. As the OGs are produced precisely for guiding towards counter-cyclical policies, the factors behind short-sightedness and procyclicality stand out. Our narrative for these phenomena is based on mistrust between the member states: they do not trust that all members are willing and capable of conducting fiscal policy so that they would credibly meet their public debt obligations in all foreseeable circumstances. As there are no easy ways to commit governments to sound policies in the long term sufficiently convincingly, the mistrust led to short-sighted fiscal rules.

The first round of the rules in the Stability and Growth Pact of 1997 became so simple that they did not work as they were not economically reasonable. This then led to new rules,

especially after the Great Crunch, which became so complex that there is now wide agreement that simplification is needed, but how to do this is a major open question.

This leads to assessing the various proposals to reform the euro. The main conclusion of analysing fiscal policies in the light of the OG estimates here is that a successful reform agenda must contain flexibility for counter-cyclical policy so that the national budgets work as stabilisers for both common and asymmetric shocks. But then, equally importantly, it follows that flexibility in fiscal policy in the short term can be allowed only if the sustainability of public finances in all member states is assured.

Sustainability has been tackled in the work of the experts, but the analyses have not duly covered all relevant policy areas. The reasons are understandable as many of them are under national competence. Examples of this are pension reforms and health care financing. The various proposals so far for increasing the old age retirement age have possibly been too complacent and in practice hindered serious discussion on significantly larger increases.

We use here two key criteria for assessing the reform proposals: (1) reducing mistrust across the members, and (2) implementation without changes to the EU Treaty. Our focus on assuring long-term sustainability meets them both.

Shifting focus from short-sighted fiscal rules to long-term sustainability is not only compatible with the current EU Treaty as agreed in Maastricht in December 1991, but even required by it. According to the Treaty the purpose of the excessive deficit procedure is to identify ‘gross errors’, and it says that government investment and all other relevant factors shall also be taken into account. Reasserting these principles, simplifying the rules significantly and enhancing reforms that strengthen the role and responsibility of the member states in assuring sound public finances can give a firm basis for preserving the euro as a currency that serves well the European economies and the rest of the world. Ambitious reform proposals that require changes to the Treaty only provoke mistrust and easily backfire.

In addition to our focus on long-term sustainability, two other proposals are useful and meet our criteria. Creating the necessary rules for orderly sovereign-debt restructuring in case of insolvency is one. It would help to eliminate bail-outs and thereby strengthen the responsibility of both governments and their creditors to behave prudently. Another is creation of a synthetic euro area safe asset backed by a standardised diversified portfolio of sovereign bonds with seniority status. It would help streamline monetary policy operations and break the excessive interdependence of banks and governments.

Several reform proposals also include a stabilisation fund for smoothing asymmetric shocks. However, they easily fuel suspicion that they lead to large permanent transfers, and thereby nourish mistrust and disputes. A quasi-automatic transfer mechanism based on relative OGs proposed in the present paper could be more efficient and help smoothing both large and small asymmetric shocks. The proposal contains a provision for reviewing the net transfers periodically so that no permanent transfers would take place.

More leeway for conducting counter-cyclical policies can be created by focusing on the long-term sustainability of public finances in all member states. It is an area of key importance for ensuring the viability of the euro. All reform proposals should be assessed under the two criteria here: do they diminish mistrust, and can they be implemented under the current EU Treaty. (end)

## 1. Introduction

Distinguishing the cyclical and more persistent changes in macroeconomic development by estimating output gaps (OGs), together with their projections a few years forward, has become a dominant feature in designing and assessing fiscal policy. In particular, they are used for identifying the cyclical and structural components in government budget balances and indirectly in assessing the sustainability of government debt. This way they provide crucial data for policy making in the euro area and in the European Union (EU) more generally, as well as for the surveillance work of the International Monetary Fund (IMF) and the OECD also on other countries.

The OG is defined as the percentage difference between the GDP (data for the past and a forecast for the future) and the level in each year that is estimated to represent the underlying ‘trend’ or ‘potential’, the term depending on the method used.

For comparing the OG estimates produced by different institutions it is not sufficient to compare only the OGs, but as the main interest is on the current year and the next and the forecasts for the GDP itself also differ, it is necessary to look at the underlying alternative estimates for the ‘normal’ level, be it called the ‘potential’ or ‘trend’, notably as those estimates are interesting also for other purposes.

In the present paper we present a new application of the Hodrick-Prescott (HP) filter for estimating the ‘trend’ and the results are compared to the estimates of the three main institutions mentioned above.<sup>1</sup>

In the present paper we cover the years from 2002, with special emphasis on the Great Crunch of 2008-09 and how it led to a ‘new normal’ as estimated in real time, and as a further issue, on how the policies in the subsequent years shaped the developments, affecting the retrospective estimates of the ‘trend’ or ‘potential’ GDP before and after the Great Crunch.

It will be shown that our new application of the HP filter appears as a useful and reasonably simple method in distinguishing the short-term movements from the more long-term trends, producing the results for the ‘new normal’ over those years. There is no need to accept it as the only method for estimating the OGs. On the contrary, using several parallel methods may be useful for complementing the picture. The HP as a single variable method, using only the GDP series, is a viable alternative as it is simple, relatively easily understood and does not rely on macroeconomic theories that are always controversial.

Also, the HP filter does not pretend to produce the only correct estimate on the ‘trend’ of any variable as the result depends on the value set by the user for a certain smoothing parameter for which there is no unique objective basis. Here, we use for our annual time series the commonly applied value of 100. It distils the short-to-medium term cycles from the possible

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<sup>1</sup> While the work on the new HP application reported here was underway, Hamilton (2017) published an article entitled ‘Why you should never use the Hodrick-Prescott filter’. The advice ‘never say never’ seems appropriate here. The HP filter has been used for many different types of time series and for various purposes. It is possible that in forecasting one or two years forward his proposal to replace the HP filter by a simple projection based on the most recent data, say, over the past four years, is relevant for some variables and cases. However, in estimating the ‘normal’ level of GDP for the current year and the next for calculating the OG we are not even trying to forecast the GDP, the short-term forecast being produced separately (using conventional practices based on a bulk of relevant data and judgement).



underlying deceleration of the growth and possible long-term fluctuations extending over 19.8 years on average (Casey, 2018, 19). The graphs in the Technical appendix, page 29 (henceforth TA, p. 29) illustrate that the value of 100 for the smoothing parameter applied on the GDP series over the past few decades seems a reasonable presumption as compared to the log-linear trend or a significantly smaller value of 6.25 promoted by Deutsche Bundesbank (2014), which implies a ‘trend’ that follows more closely the actual GDP data and therefore smaller amplitude of the OGs.

While the Hodrick-Prescott filter (HP filter) developed in the 1990s was the first customary method for estimating the trend of the GDP, data on the stock of capital and the labour market was supplemented to estimate the reference level. The IMF and the OECD shifted to the new method calling it the production function approach (PF) and labelling the result as ‘potential GDP’ instead of ‘trend’. In 2002 the European Commission (EC) introduced its own PF estimates and gave them a dominant role, though continuing to produce also the HP estimates until today (Havik et al., 2014).

The competing OG estimates have spurred quite heated controversies as they are at the same time vitally important in designing fiscal policy and problematic to define and measure. The debate has only intensified recently, particularly due to the difficulty in judging the causes and consequences of the Great Crunch of 2008-09 and onwards.

In this paper we shall mostly work on the data on the aggregate of the 11 EU member states that formed the euro area in 1999 (EA11), adding observations on its four largest members (Germany, France, Italy and Spain) and the US.

### ***Short critical survey of previous studies on the OG estimates***

Deutsche Bundesbank (2014) launched a fierce attack on the OG estimates of the IMF and the OECD. It proclaimed that they are biased towards loose fiscal policy and an unintended increase in public debt and that the large retrospective revisions of these estimates disqualify their use for policy recommendations. Largely to reduce the retrospective revisions the Bundesbank promotes an HP-filter application with a smoothing parameter of 6.25 for estimating the ‘trend’ of the GDP.

The issue of retrospective revisions of the OG estimates is most relevant, but minimising the retrospective revisions the way Bundesbank proposes, also reduces the OG estimates in real time by feeding into the ‘trend’ estimate part of the cyclical movements. Thus, the purpose of identifying and measuring the cycles is partly dismissed.

To avoid this, the revisions of the OG estimates should be seen as natural and acceptable consequence of their nature: it is obvious that the OG for any given year will be revised even several times according to the developments taking place after the year in question. Also the sign of the OG may easily change as the estimates are often not far from zero. This may happen especially if a major shock hits the economy. Thus, the revisions are not comparable to revisions of economic data in general, but they provide interesting information of what was expected and what then happened.

McMorrow et al. (2015) complement the Bundesbank analysis by assessing also the performance of both PF and HP estimates published regularly by the EC as these were not covered by the Bundesbank. They conclude that the EU's PF method has performed better than the HP filter and the PF estimates by the IMF and the OECD.

McMorrow et al. (2015) discredit the HP method referring especially to its poor performance in the estimates of the EC for the HP trend of the GDP in spring and autumn 2009. Their

judgement turns out to be dubious, caused by failed mechanical statistical procedures in dealing with the well-known end-of-the-sample bias in the HP estimates: the HP formula gives a high weight to the latest observations of the original data series, which tends to bend the end of the estimated HP-filtered trend upwards or downwards depending on the latest data. As the main interest is usually exactly in those years, i.e. in the current conditions and one-to-two years ahead, the statisticians have attempted to find operational solutions to deal with it. However, no mechanical solution would work well in all cases. The HP estimates of the EC in the year 2009, when the direness of the economic situation had emerged, turn out to be one such failed case.

The graphs in TA, p. 31, show that the sources of the swings in the HP-based OG estimates by the EC in spring and autumn 2009 were in the mechanically produced extensions of the GDP forecasts composed. They were the swings in those extensions that caused the instability in the HP estimates. Noting this, we can conclude that the HP filter can produce useful results when used carefully.

Several recent studies also compare the merits of the parallel and often competing estimates for the OG in terms of their stability in the short term and proneness to revision even after several years. For example, Busse (2016) and Kuusi (2017) investigate the impacts of the revisions of the output gaps and cyclically adjusted budget balances under the fiscal framework in the EU. Recent IMF Working papers on improving the estimates for potential output and OG (Blagrove et al., 2015, and Alich, 2015) develop improvements to their PF methodology.

Practically all studies conclude that the OG estimates are indispensable for policy making – distinguishing the cycle from the trend (and both of these from any specific factors) is both important and not straightforward. First, it is useful to admit that before the Great Crunch of 2008-09, the OG estimates used in policy making failed to guide the policies to dampen the boom. Second, the retrospective revisions of the OG estimates for 2006-2013 is not an adequate reason to abandon them altogether. Instead, the OG estimates should be looked at constructively, though critically.

### ***Purpose, scope and outline of the present paper***

The motivation of the present paper is that there is scope for improvements. Admitting that no perfect method will appear, we shall present new OG estimates produced with a new application of the HP filter. Special emphasis is given to the transparency and simplicity of the method so that the results can be understood also by non-experts and policy makers.

In Section 2 we present our new real time estimates for the OGs based on the HP-filtered trend of the GDP. ‘Real time’ means here that we use the data and short-term forecasts available at the time. We focus on the estimates for the current year and the next. Our results are then compared to the estimates published by the EC, IMF and OECD in the context of their regular forecasts over the period 2002-2017.<sup>2</sup>

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<sup>2</sup> The data set required to perform these tasks is quite large: it contains all the forecasting vintages of the EC in 2002-2017 gathered from the original sources and made freely available by the FIRSTRUN (Fiscal Rules and Strategies under Externalities and Uncertainties) project; it contains data by EU member for several macroeconomic indicators, and the historical data goes back to 1960. We do not use all indicators but mainly those for the GDP, estimates of the potential GDP and the trend estimated by their HP application (and by implication for the respective OGs), the various budget balance indicators, etc. Similar data

We report the results for the aggregate of the 11 EU member states that formed the euro area in 1999 (EA11), its four largest members and the US.<sup>3</sup> The novel idea in the present application is to make it explicit that the estimates for the trend GDP and the OG for the current year and the next will always depend on the assumed path of the GDP in the consecutive years.

In Section 3 we shall discuss the main use of OG estimates for policy design, which is to separate the cyclical and structural components of government budget balances. Especially their projections based on planned fiscal policies obtain pivotal importance under the (complex) fiscal policy rules for the euro area (*Vade Mecum on the Stability and Growth Pact*, European Commission, 2017a). In this context we present the data on the retrospective revisions of the OG estimates and the real time and retrospective estimates for the ‘new normal’ level of the GDP after the Great Crunch.

In section 4 we look at the sources of those revisions as the economic factors that cause the revisions may not be only exogenous but significantly also determined by economic policy. The question is to what extent were the policies responsible for the further fall in GDP in 2012-13 and hence for the revisions to the OG estimates. We shall discuss the conflicting views on this, highlighting the evidence of the persistent procyclicality of fiscal policy in the euro area.

In Section 5 we discuss the lessons for the ongoing discussion on reforming the euro area architecture more generally. Identifying the problems correctly is indispensable for dealing with them. Procyclical fiscal policies seem to be a central issue. The use of the OG estimates and other features of the Stability and Growth Pact (SGP) need to be properly addressed. Counter-cyclical flexibility in the short term requires that sustainability of public finances in the long term is assured. This is an angle from which we assess the various proposals for reforming the euro.

Sections 6 gives a summary and concludes the paper.

## 2. New OG estimates generated by the HP method

### *Real time OG estimates for EA11 and others*

The new OG estimates are the deviations of the observed (and forecast) data from a HP-filtered trend of the GDP, which is derived using our new application: the GDP series as an object is based on the real time data on the GDP, including its short-term forecast by the respective institution (for the EA11 by the EC; for the US by the IMF) and its extension to future years. The extension is composed as follows: (1) the official forecasts of the respective institution for the current and coming years ( $t$  and  $t+1$ ) are taken as given, (2) an *assumption*

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covering the real time estimates by the IMF and the OECD are downloaded from their respective freely available data banks.

<sup>3</sup> We use a fixed composition of the 11 member states to avoid any effects of new members coming in. The EA11 accounts for 96% of the GDP in the euro area (EA19) in 2017. As our real time data on the OGs will start from 2002, we could have included Greece, which became a euro member in 2001. However, as it is a special case, it is left out. Its share of the EA11's GDP was at its peak around 2.5% and 1.7% in 2017, so including or excluding it from our aggregate hardly affects our results. In 2017 the four largest members accounted for 79% of GDP in the EA11 and 76% of the full EA of 19 members.

for the *underlying* long-term rate of GDP growth from year  $t+2$  onwards is injected, and (3) the GDP from year  $t+2$  onwards is additionally set to adjust so that the OG estimated for year  $t+1$  will fade away by year  $t+5$  (an illustration using stylised data is presented in TA, p. 31-33).

The assumption on the future GDP is vital in our application. It is one source for tracking the revisions of the OG estimates afterwards: the OG will be revised due to the deviation of the GDP from its previously assumed path. Extending the GDP series into the future also allows us to cope with the possible end-point bias in the HP-filter applications. As the assumed underlying future growth is set by the user, any number of alternative results can be generated.

For the baseline, the underlying long-term growth rates for the EA11 countries are roughly based on the work of the Ageing Working Group (AWG) in the EU. In the AWG reports 2001, 2006 and 2009 the rough figure for EA11 GDP long-term growth was 1.5 % pa. In the report 2012 it was lowered to 1.3%.<sup>4</sup> As the views of long-term growth obviously started to change earlier, we set the figure at 1.4% for our calculations for 2010 spring and autumn forecasting vintages, and 1.3% from autumn 2011 onwards (the assumptions of the AWG report 2012 were published in 2011). For the four largest countries the growth assumptions are similarly based on the country-specific assumptions in the AWG reports.

The assumption that the OG in year  $t+1$  closes by year  $t+5$  follows the conventional practice in the AWG work and elsewhere when long-term projections are constructed; in the TA, p. 38, we report a sensitivity test showing that extending the adjustment to year  $t+8$  for the strongly negative OG in autumn 2009 changes the result only moderately.

The GDP data used starts from 1960 and the extended data runs until 2040, long enough to feed into the calculation the assumed underlying growth rate in future. For estimating the HP-filtered trends we use logarithmic series (as the GDP series normally grow exponentially) and 100 as the HP smoothing parameter, which is a conventional practice with macroeconomic annual data (as noted above and illustrated in the TA, p. 29).

The new results are based on real time data from the forecasting rounds over 2002-2017. They are then compared to the real time OG estimates published by the three institutions (EC, IMF and OECD) for the EA11, and the TA, p. 33-34, reports the corresponding results for the US and the four largest member states in the EA. All autumn forecasting vintages over 2002-2017 are treated, together with the spring forecasting vintages over 2007-2010 (to cover in more detail the developments over the crisis).

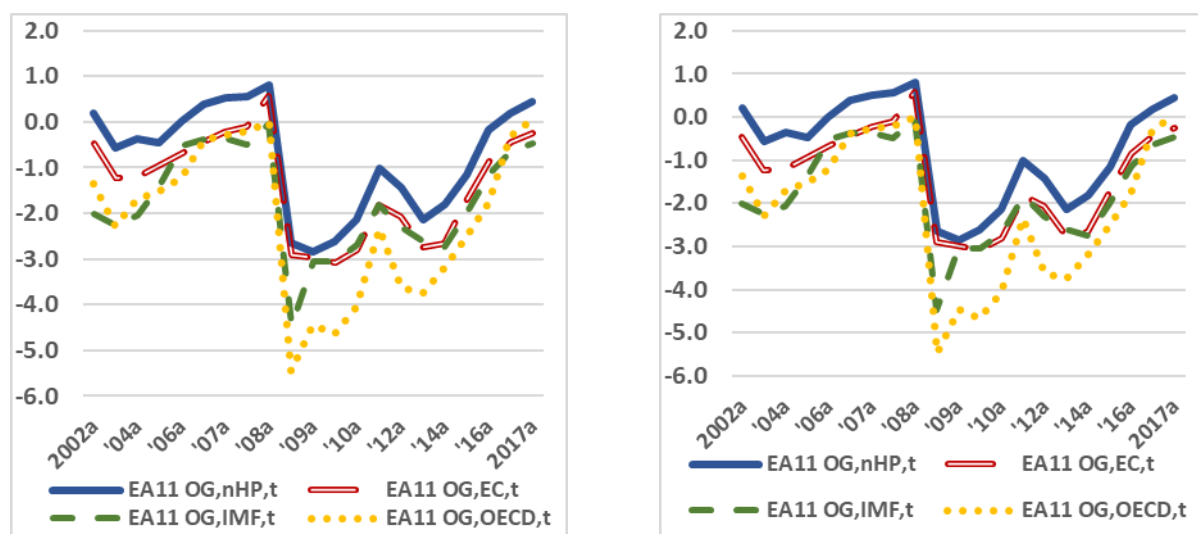
Figure 1 gives a broad picture, the real time OGs for the EA11 for the current year ( $t$ ) generated by the new HP (nHP) method and those of the EC, IMF and OECD, and the corresponding results for the following year ( $t+1$ ) in each case.

The charts show that, with one single exception, the real time OG estimates of the three institutions were clearly negative or zero throughout the whole period 2002-2016. The only exception was the estimate (+0.6 %) by the EC in autumn 2008 for 2008, and even in that case the forecast for the following year was a negative OG.

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<sup>4</sup> This coincides also with the projection by McMorrow et al. (2016, Table 1), who produce a no-policy-change medium-term projection for 2015-2024 of 1.3 % average growth for euro area GDP, based on the negative fallout from the financial crisis and the emerging drag on growth emanating from ageing populations.

**Figure 1. Output gap estimates for EA11 in real time forecasting vintages 2002-2017 for the current year (t) and for the next year (t+1).**



Legend: OG = output gap; a = autumn forecast, s = spring forecast. nHP = new HP-based estimate based on real time data from the EC including forecasts for t+1; EC = European Commission OG estimate, IMF and OECD refer to their OG estimates, respectively.

The OG estimates of the IMF and the OECD until 2009 are quite close to each other, and also the EC estimate is practically identical for 2006-2008, i.e. during the boom that was recognised only afterwards. After 2009 the estimates by the OECD are clearly the most negative ones, while those by the IMF and the EC are close to each other.

Our new HP estimates show slightly positive OGs for the boom period 2006-2008. They are consistently higher than any of the three estimates, but also their average is negative over the whole period since 2002. By construction the average of the HP estimates should be close to zero if the period is sufficiently long and the fluctuations are reasonably regular. This is not the case here as an exceptional crisis occurred (2009), followed by another fall in output (2012-13). Thus, also our new HP method produces a negative average for 2002-2016.

The Great Crunch of 2008-09 is the most interesting episode. All real time estimates recognised it in spring 2009, including our new HP-based estimate. The change from earlier estimates was dramatic, the most negative OGs being presented by the IMF and the OECD.

Comparing our new OG estimates and those by the three institutions we need to note that the differences always come both from the differences in the estimates of the potential GDP and of the forecast for the GDP itself. It turns out that the more negative OGs by the IMF and the OECD partly stemmed from their more pessimistic GDP forecasts for 2009, which were subsequently revised upwards, while the not-so-negative OG estimate by the EC for 2009 partly reflects its comparable low estimate of the potential GDP (in the middle of the crisis), which was later revised upwards.

Graphs in the TA, p. 36, show how the estimates for our new HP trend and for the potential GDP by the institutions developed over the Great Crunch, from autumn 2007 to autumn 2013 and further to autumn 2017. Additionally, we show in the TA, p. 36, our new HP-trend estimates for EA11 GDP for the current and next year in the forecasting vintages 2006-2017, together with the potential GDP estimates of the three institutions.

The most interesting observations are the following:

In spring 2009 the downward revision for the potential GDP by the EC were significantly larger than in our nHP estimates or those of the IMF and OECD. The IMF followed with a significant revision in autumn 2009 and delivered the lowest estimates of all. The OECD kept its potential GDP estimates flat in 2009 and still in autumn 2013 its projection for potential GDP was higher than those of the other institutions. Only by the projections in autumn 2017 did its view converge to those of the others.

Our nHP autumn 2017 estimate for 2017 is a good one percentage point lower than the other three, consistently with its regular pattern.

The OG estimates for the four largest euro area countries presented in Figure TA.5 in the TA, p. 34, show, in short, broadly the same patterns as for the EA11. For Germany the estimates of the institutions were mostly positive in 2007-08, but for all the other three countries almost consistently negative or zero, with the exception of the EC estimate in autumn 2008 for 2008. Their estimates for Spain were practically zero or negative throughout the boom 2005-07 while the new HP estimates are clearly positive (the issues concerning not identifying the boom in Spain in real time are not covered here).

Figure TA.4 in the TA, p. 33, presents the new HP OG estimates and those of the IMF and OECD for the US in the forecasting vintages from autumn 2002 to autumn 2017, and Figure TA.8, p. 37, gives our new HP-trend estimates for the GDP and the potential GDP estimates by the institutions for the selected years from autumn 2007 onwards.

### *Summary comparison of the real time OG estimates*

We noted above that the real time OG estimates of the three institutions have been almost always negative. There can be justified reasons for this. For example, as the OECD puts it, one of the factors behind their estimate for the unemployment gap is that the estimated equilibrium level of unemployment depends on the inflation rate (and expectations thereof). It is plausible that most of the time since 2002 unemployment has exceeded this reference level and therefore this factor tends to keep their estimate for the OG below zero. The question nevertheless arises whether an OG estimate that is almost always negative can be interpreted as depicting a cycle; in ordinary language a cycle means that a variable fluctuates around its cyclically corrected level.

If we corrected the various OG estimates for the level over the whole period on average, the picture they would give of the fluctuations would not be dramatically different. Noting this, our new HP estimates have several merits. They are simple to be composed and explained, including the meanings of the relatively small number of assumptions put on top of the GDP data, and the sensitivity of the results using alternative assumptions can be easily worked out (some such sensitivity analysis is presented in the TA, p. 37-38). This compares well with the PF estimates, which are based on numerous underlying assumptions, making them more complicated and less transparent.

The retroactive revisions of the OG estimates is a separate matter, significantly affected by developments after any given year. In several previous studies those revisions have been used for assessing the relative merits of the competing OG estimates. The adequacy and reasonability of those assessments is appropriate to be discussed in the context of the use of the OG estimates in policy design. This is where we turn next.

### **3. Using the OGs and structural balances for policy: a critical view**

#### ***Distinguishing the cyclical and structural components of government balances***

The primary use of the OGs is to identify the cyclical and structural components of government balances in each conjuncture. This is a centrepiece of fiscal policy making, originating from the work at the OECD since the early 1990s and fully rooted in the regular reports on all countries by all the three institutions (see Mourre et al., 2014, for references).

The standard procedure is to estimate the cyclical component of the government budget balance by multiplying the estimated OG by the semi-elasticity of the budget balance (defined as the effect of movements in the GDP on the budget balance as a percentage of GDP). The latest estimate for the semi-elasticity for the EU countries is 0.50 for the EU, ranging from 0.31 to 0.65 across member states (Mourre et al., 2014, 6). Removing the cyclical component gives the cyclically adjusted balance, and subtracting one-off and temporary components gives the structural balance.

#### ***Use of structural balances in euro area policy making***

The structural balances have gained a pivotal role in the fiscal policy rules for the euro area, explained in the most recent edition of the *Vade Mecum on the Stability and Growth Pact* (European Commission, 2017a, where presentation of the rules requires 224 pages).

The rules have become quite complex especially after the Great Crunch. The original SGP of 1997 focussed on the headline budget balances, but it became obvious that to be able to set sensible fiscal policy targets, the cyclical component had to be acknowledged.

As our new OG real time estimates for the period 2002-2017 are on average one percentage point higher than the ones by the three institutions, the cyclical components would be roughly 0.5 percentage points higher and the estimates for the structural balances correspondingly lower. These are the rough numbers over the whole period on average, while the corresponding figures for the differences in the OGs for the subperiods and institutions vary roughly between 0.3 and 1.8 percentage points.

Here, we do not enter into more detailed comparisons of the figures. Instead, the conceptual basis of the budget balance estimates should be clarified, questioning their usefulness and accuracy for policy design.

#### ***How to define a cyclical component in government balances?***

What should we mean by the cyclical component of the budget balance? Consider a thought experiment: assume an economy in equilibrium is hit by an exogenous factor which moves cyclically; assume then that the government pursues a fiscal policy that completely eliminates the effect on the GDP; this means that the OG remains at zero through the whole cycle; obviously, the budget balance first moves in one direction and then in the other, and at the end of the cycle the equilibrium is restored; as the OG is zero over the whole cycle, the cyclical component of the estimated budget balance according to the standard definition is zero throughout. Obviously, this does not make sense. It would be more reasonable to say that all the variation in the budget balance was cyclical as it stemmed from the specific joint effect of the exogenous cyclical factor and the countercyclical policy pursued.

This extreme example expresses a terminological conundrum. A more general concern is that the standard definitions of cyclical and structural components in government budgets ignore the effects of changes in fiscal policy on the GDP and via that to the measured OGs that are used to define and measure the cyclical components. The loop from fiscal policy to the GDP

and further to the OG is missing, even though the existence of this loop is a core part of conventional economics.

### *Ex post revisions of the OG estimates obscuring policy*

If the preceding argument were too abstract, we should recognise that the structural balance is not a reliable indicator of discrete policy actions precisely because they are regularly changed afterwards as new estimates of the OGs come in, leading to revision of the cyclical and structural components in government balances. Logically, a measure of a discrete policy action at any given time should not depend, even in retrospect, on what happened in the economy afterwards. The structural balance (or its change) does not fulfil this logic.

Anyway, as the structural balances and their retrospective revisions are used in policy and as those revisions are directly derived from the revisions of the OG estimates, we should look at them, confining ourselves to observing the revisions only in the latter.

Figure 2 shows that the revisions of all the OG estimates over the period 2002-2017 studied here were indeed significant. It presents the OG estimates for the EA11 for each year (t) in real time and ex post, the latter being the retrospective estimate from autumn 2017.

The revisions are significant and roughly of the same magnitude (though on average greatest for the OECD). The largest revisions concern the years 2006-2008 in all of them.<sup>5</sup>

Our new HP estimates have the advantage that, by their construction, the main factors behind the revisions can be relatively easily tracked to the deviation of what happened to GDP growth since 2006 compared to the underlying growth rate assumed in 2006-07 when the real time nHP estimates were calculated. The assumption on future growth in estimating our new HP trend for the EA11 was 1.5 % until 2009. As the average 10-year growth fell to 0.6 % by 2017, a significant revision of the OG estimates followed.

Tracking the sources of revisions of the PF-based OG estimates of the three institutions would require going into the details of their estimation methods and parameters, including changes in them during the period investigated (as the estimates have been modified to improve their accuracy). Like in almost all the previous literature this major task is left beyond the scope of the present paper.<sup>6</sup>

Revisions of the OG estimates for the US and the four largest euro area countries are shown in the TA, p. 39-41.

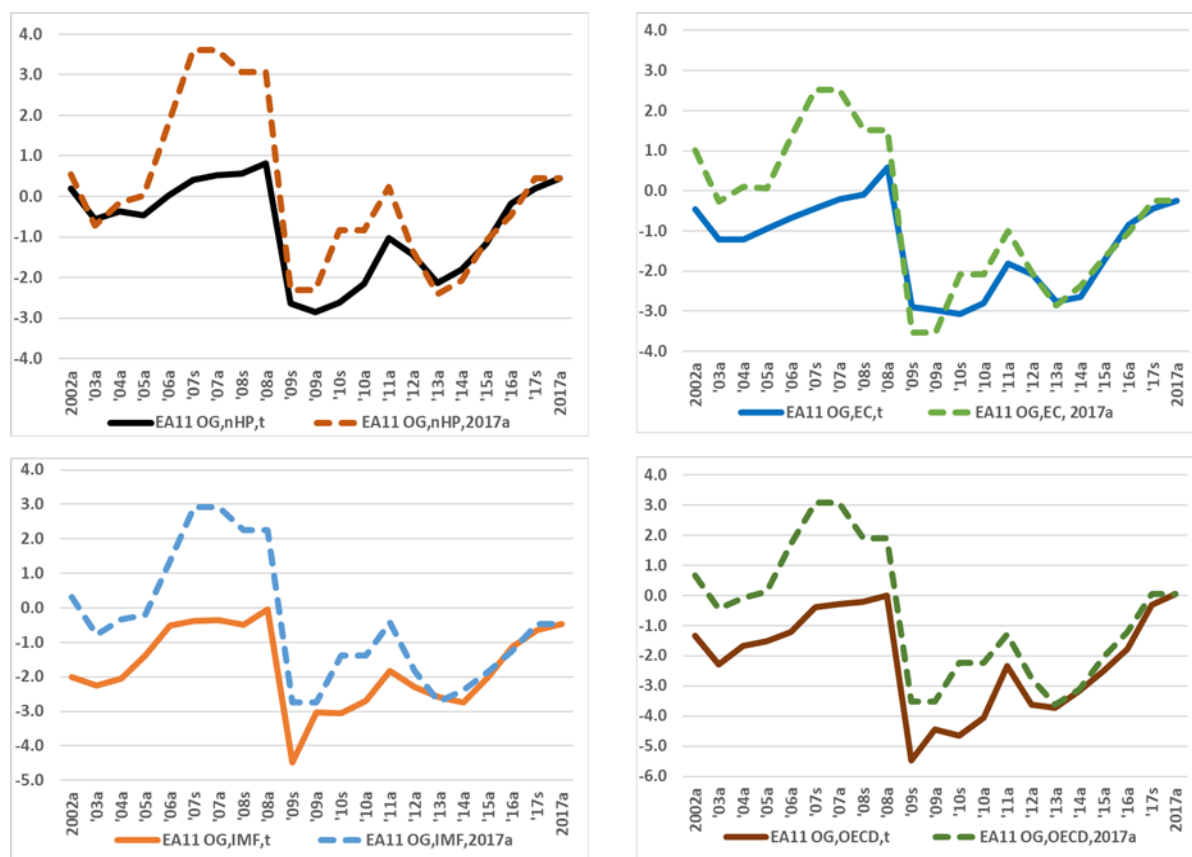
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<sup>5</sup> As we are focussing on the OG estimates for the current and next year we should remember that the revisions come partly from replacing the forecasts for the GDP by their outcomes. However, the revisions in the OG estimates mainly stem from their intrinsic nature as measures of the cyclical phase. This is not a matter of updating the data by the statistical offices but results from what happened in the economy afterwards.

<sup>6</sup> Turner et al. (2014) study the various sources of the changes in the OECD estimates for potential output.



**Figure 2. Output gap estimates for EA11 in real time for the current year (t) and corresponding estimates in autumn 2017; new HP estimates and by institutions (European Commission, IMF and OECD).**



Legend: nHP OG = new HP output gap estimate; a = autumn forecast, s = spring forecast. EC, IMF and OECD refer to their OG estimates, respectively.

#### **4. Did policies cause the further fall in GDP in 2012-13 and hence the revisions to the OG estimates?**

##### *Fiscal policy in the euro area after the Great Crunch*

As noted, the OGs for any given year, no matter how they are estimated, will always be revised retroactively. This happens irrespective of the causes of the new developments, but most importantly, they may include the policies pursued and normally do so.

For a study of fiscal indicators, notably the OGs, it is a key question as to what extent the fall in the GDP in the EA11 in 2012-13, which then came to be the major reason for the retroactive revisions of the OGs, was caused by fiscal policy itself.

The crisis in 2009 was first followed by counter-cyclical fiscal policy as a combination of automatic stabilisers and discrete actions, but from 2011 onwards policy was strongly tightened (as confirmed by several sets of data, including those on discretionary fiscal measures published by the EC and Carnot and de Castro, 2015a and b, presented and reproduced in the TA, p. 43. A number of leading economists writing in Baldwin et al. (2015,

10-11) observe that *‘[T]he Eurozone as a whole saw its 2010 primary deficit move from about minus €350 billion in 2010 to €10 billion in 2014. This was a massive contractionary shock – equal to 4 percentage points of the monetary union’s economy’*. They consider that this triggered the fall in the euro area GDP in 2012-13. Despite this, aggregate government deficits in the EA11 were cut over this period, while the US was growing at a rate of more than two per cent in 2010-15, helped by running twice as large fiscal deficits over 2011-14 (and in fact already in 2008-10).

The wide consensus that tight fiscal policy in the euro area in 2011-13 dampened growth was later adopted also by the European Commission (2016, 2), although it added that this was at least partly inevitable as *‘many Member States engaged in fiscal consolidation to preserve their access to the markets at the height of the sovereign debt crisis’*. This latter view is not the full picture. Baldwin and Giavazzi (2015, 47-48) showed that policy was strongly tightened also in countries that had access to the markets, Germany’s share of tightening being more than its relative share in the euro area. In spring 2010 Germany’s government deficit was forecast at 5.0% of GDP, and it was pressed to zero by 2012 and subsequently to a surplus.

The reasons for fiscal tightness in 2011-13 are many, but from the angle of the OG estimates the short-term GDP forecasts are most relevant. They depend on a host of factors including fiscal multipliers, i.e. the effect of fiscal policy on the GDP, perceived by the forecasters. The importance of the perceived fiscal multipliers was brought into discussion at the time by the IMF in its autumn 2012 forecasts, where it presented evidence that, early in the crisis, for the advanced economies, they were substantially underestimated. This meant that the planned fiscal consolidation led to lower growth than expected by the forecasters. This conclusion applied the most strongly to forecasts by the IMF itself and to a slightly lesser extent to those by the EC (Blanchard and Leigh, 2013; Mody, 2018, 371-3; Tooze, 2018, 429-30).

Later, Fatas and Summers (2018) contest the advisability of fiscal consolidation in the circumstances after the Great Crunch of 2008-09. According to them, consolidation was self-defeating, i.e. it did not decrease the deficits at all in most countries but caused a prolonged recession.<sup>7</sup>

### ***Role of the OGs in designing fiscal policy***

We should admit that our new HP estimates would not have revealed the strength of the boom before the Great Crash much better than the others: our new real time OGs for those years are slightly less than one percentage point above zero. It is prudent to say that the factors behind the strength of the unsustainable boom were such that no foreseeable improvements to the OG estimation methods would convincingly prevent the repetition of the same ignorance in future.

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<sup>7</sup> For assessing their result correctly, we should note that the observed decrease in deficit over the period 2011-2015 in the euro area (and elsewhere) does not disprove their conclusion. Instead, a plausible explanation is that other factors gradually turned supportive to growth and compensated for the negative effects of the fiscal consolidations (for a survey of estimating the fiscal multipliers see also Carreras et al., 2016).

Our discussion above of the underlying causes of the retroactive revisions of the OGs leads to the conclusion that the revisions do not necessarily disprove the use of the real time OG estimates for policy. However, we should not underestimate the problems with the uncertainty of their level and changes from one year to the next. This uncertainty is demonstrated by the differences between the estimates from our four different sources (our nHP-based estimates and those from the three institutions), which feeds into the uncertainty of the structural balance estimates. Broadly expressed, those estimates then often vary in the range of +/- half a percentage point (ignoring here the much larger difference in the forecasting vintages of the year 2009).

Due to this we should conclude that whatever improvements one could try and achieve, the accuracy of rules set in the *Vade Mecum on the Stability and Growth Pact* (European Commission, 2017a) is an illusion. Also Busse (2016, 30-31), based on his detailed analysis of the revisions in the EC estimates for the OGs and the implied cyclically adjusted balances, considers that the errors may lead to ill-fitting policy advice and unwarranted sanctions. He adds, nevertheless, that the SGP, thanks to its political flexibility, is faring quite well in dealing with the uncertainty and revisions.

His latter conclusion looks carefully balanced, but a critical eye on the complexity of the fiscal rules, asking whether they fit the real economic policy needs, is still warranted. After all, is it acceptable if the rule book becomes so thick and still has to be implemented with political discretion to make sense economically? Political discretion always triggers disputes and deteriorates the reputation of all the actors as well as the rules. The complexity also poses a challenge to democratic decision making as no finance minister should even try and explain them in front of their parliaments. This takes us to discussing the reform of the euro more generally.

## **5. Lessons for reforming euro area architecture**

Fiscal discipline lies at the heart of the euro. The various indicators referred to above highlight the procyclicality of fiscal policies in the euro area (with year 2009 being the only exception). The reasons behind probably go much deeper than unreliable estimates. For a successful reform of the euro, it is important to identify them.

### ***Procyclicality stems from mistrust that led to short-sighted rules***

The purpose of the fiscal rules originally stipulated in the Maastricht Treaty was to ensure smooth functioning of the single currency. The famous reference values for deficit and debt were set '*in view of identifying gross errors*' (TFEU 126) and the purpose was to give recommendations to correct them, but this would not necessarily have caused procyclicality. Instead, it was suspicion and mistrust among the prospective members in the currency union that led to the short-sighted rules set in the SGP of 1997.

The SGP became inevitable to alleviate the suspicion in Germany that the euro about to be started in 1999 was not yet sufficiently strongly anchored as fiscal discipline in all prospective member states was not assured. This suspicion goes back to the political nature of establishing a monetary union for the EU. The roots go even further back, but autumn 1989 was decisive. President Francois Mitterrand linked acceptance of German reunification to Germany's commitment to join the currency union as outlined in the Delors-report in April

1989. Chancellor Helmut Kohl accepted this in the Strasbourg European Council in December 1989. He told later that the hard negotiations were one of his darkest moments (Der Spiegel, 1998), and that joining the euro would not have won support in a referendum in Germany (The Telegraph, 2013).

The German constitutional court ruled in October 1993 that ratification of the Maastricht Treaty in Germany was acceptable provided that the currency union respects stringent fiscal and monetary policies (Tuori and Tuori, 2014, 200).

This is, in short, the historical background for the strict time schedule for correcting excessive deficits set in the SGP in 1997. The implied short-sightedness then led to the procyclicality.

Short-sightedness was most strongly demonstrated in the so-called SGP crisis in 2003. This crisis did not happen due to joint violation of the rules by Germany and France as is commonly contended. True, France did not want to obey the rules, but Germany's case was different. Gerhard Schröder's Germany made the argument that it had implemented the previously given recommendations, but new adverse factors impeded attaining the deficit target. It wanted the previous recommendations to be revised and be given more time to consolidate. However, the European Commission and some member states maintained that giving more time was illegal. This legal interpretation turned out to be erroneous as the EU Court of Justice (ECJ) later ruled that the European Commission could indeed have tabled a proposal for revising the previously given recommendations (paragraph 92 in Court of Justice of the EU, 2004). This careful reading of the ECJ ruling has been presented in the literature (Beetsma and Oksanen, 2008, 565; Heipertz and Verdun, 2010, 2, 128-162), but the other narrative that Germany, jointly with France, violated the rules is still constantly repeated as it has been a politically more suitable story to be told.<sup>8</sup>

This episode with the fiscal rules, especially as misleading interpretations still cause confusion and conflicts, exhibits weaknesses in management of the euro. On balance, a positive outcome of it was that the SGP was revised in 2005, notably making it explicit that the stages under the SGP can be repeated, the recommendations revised and deadlines for correcting excessive deficits extended if unexpected adverse economic events occur. When the Great Crunch erupted, the revision of the rules probably helped to facilitate acceptance of significant increases in deficits. This flexibility in 2009 then remained the only significant exception to procyclicality of fiscal policy in the euro (Carnot and de Castro, 2015a, Annex 2). All the new rules since the crisis have not led to fundamental improvements. Instead, the diversity of circumstances and differences among member states has led to their overkill complexity (so that also the European Commission, 2017b, 12, calls for substantial simplification, although only by 2025).

The policies in the recent past provide ample material for reconsideration. As noted above, several experts (Baldwin and Giavazzi, 2015; Bayoumi, 2017, 233, 244-245) question whether fiscal tightness during the sovereign debt crisis 2011-13 was reasonable in terms of benefits and costs, and Fatas and Summers (2018) go further and conclude that fiscal consolidation was self-defeating and rather increased the debt burden. This contrasts strongly

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<sup>8</sup> The dominating narrative of the 2003 SGP crisis constantly also appears in scholarly texts, e.g. by Tooze (2018, 94 and 101) and King (2016, 236). It seems that very few academics in addition to the 2+2 authors cited above have read and understood paragraph 92 of the ECJ ruling of 2004. Mody (2018, 199-202) covers well the conflicting arguments at the time in 2003.

with the official view that consolidation was both necessary and useful for preserving the euro.

***First lesson: focus on long-term sustainability for allowing short-term flexibility in government budgets***

Eliminating procyclical fiscal policies and maintaining the capacity to react in the event of a serious crisis, caused by common or asymmetric shocks, is a key for improving the euro. Various reform proposals certainly target this issue, but it has not been systematically raised into discussion.

Aiming at counter-cyclical fiscal policy is common wisdom. However, in the euro area, procyclicality is caused by mistrust, which leads to short-sightedness. Recognising this is indispensable. Flexibility in fiscal policy in the short term can be allowed only if mistrust is alleviated by assuring sustainability of public finances in the long term sufficiently convincingly. This holds for all member states separately (like any economy), and jointly in the monetary union. Those who suspect that some of the members are not willing and/or capable of ensuring sound public finances have reasons for their mistrust. Unfortunately, the Greek case demonstrated that at least there they had a point.

The fundamental question is what should be done to improve credibility that all members conduct sound fiscal policies in the long term. Obviously, no institutional reform can do this alone, but several parallel improvements are needed.

First, the policies that determine long-term sustainability are mostly in the competence of the member states. Confidence that the state will honour its debt depends on its capability to collect taxes. The level attainable in each situation, including a possible crisis, depends on the quality of the public institutions and the trust they have earned in each country.

Sustainability also depends on public expenditures and the foreseeable measures to keep them under a level that can be covered by revenues and a sustainable level of public debt. Also here, the most relevant policies and measures are under national competence as they must tackle the pressures of population ageing on public expenditures and require reforms of the public pension systems and health-care financing. The dilemma for managing the euro area is that the governments are not in the position to assure that population ageing-related expenditures will be contained, the reason being that the required changes in policy parameters can only be gradual, stretched over several electoral cycles. Therefore, the risk is that the policies tend to be too short-sighted or that no effective actions are taken. It is not a coincident that the international institutions (the troika) had to force though drastic pension reforms in the crisis countries where reforms were delayed for too long.

Yet, even under these dilemmas, assuring long-term sustainability of public finances has been on the agenda in the European welfare states for, say, since the late 1980s. The pressure for further reforms is called for not only for the sake of the sustainability of public finances but also for maintaining the high level of social protection as a further crisis could easily trigger disorderly cuts and reductions.

For meeting the challenges, joint work on projecting the ageing-related public expenditures in the member states has been undertaken in the EU by the Ageing Working Group of the Economic Policy Committee.

The results are currently used also for setting the medium-term objectives (MTOs) for budget balances, which should in principle be a link between the day-to-day management and long-term sustainability. Unfortunately, again for various understandable reasons, the derivation of the MTOs does not give sufficient attention to all relevant factors and policy options.

Under the rules as codified in the *Vade Mecum* (European Commission, 2017a) the MTOs are built on the expenditure projections based on current policies regarding long-term expenditures, and when the increase in taxes to cover them looks higher than politically (and economically) acceptable, the MTOs are made less demanding by making an ad hoc adjustment. In most cases it would be more reasonable to move in a few steps: as the requirements for increasing government revenue in the medium term seem too demanding, the policy parameters determining the expenditures should be reviewed and proposals to change them made, and the medium-term objectives should be derived only from the long-term expenditure projection so revised (Oksanen, 2016b, 383-387).

This sounds like common sense, but one reason why systematic monitoring along these lines has not been achieved in the EU is that the relevant policies are under national competence and the institutions and political circumstances vary greatly. Therefore, no manageable surveillance could fit them all.

Our conclusion is, therefore, that it is better to admit that fully reliable indicators for sound long-term policies are difficult to be constructed, and that, unfortunately, deficiencies in the current rules and procedures can narrow the scope of policy advice by excluding measures that could be needed or even indispensable. For example, there can be good reasons for challenging the quasi conventional wisdom that it is sufficient to increase the old age retirement age so that it would maintain the current ratio of time persons participate in working life relative to the increasing expected adult lifetime. This common advice may not be sufficient for stabilising the GDP share of ageing related expenditures, for example because health care expenditures may well increase more than proportionally. Yet, attempts to increase the old age retirement age more significantly hardly appear anywhere.

The second conclusion is that the short-sighted fiscal rules stemming from mistrust are built on inadequate fiscal indicators, starting from the deficit ceiling and gross public debt, extending to estimates of structural balances and the targets to reduce them and to setting the MTOs. The key indicators underlying all these indicators obviously suffer from the failure of not making the distinction between government investment and consumption, and regarding the latter, expenditure on education is recorded as consumption although it should be counted as investment in human capital.

Furthermore, the fiscal indicators fail to treat reasonably the fully funded second pillar pension systems. As they are classified as part of the private sector in the national accounts even if being mandatory, their treatment disturbs the current fiscal indicators (Beetsma and Oksanen 2008, 568-9). Under these accounting rules, reversals of pension reforms have taken place in some countries for improving the government balances, especially when the deficit targets became hard to attain (Bielawska, Chłoń-Domińczak and Stańko 2015, 9, 85-91). This effect is a collateral damage of the simplistic fiscal rules.

All these various flaws in the current fiscal indicators and rules lead to losing the sight on long-term health of the economy, and the objective of sound public finances becomes blurred. It is the mistrust between the member states, which led to simplistic and short-

sighted rules. The cost is high, and removing it will not be easy, but recognising that it needs to be tackled is indispensable for successful reforms of the euro.

### ***Two key criteria for assessing the reform proposals***

The Great Crunch triggered a wave of proposals to reform the euro. We shall discuss some of them with reference to two main criteria: (1) do they alleviate mistrust between the members in the euro, and (2) can they be implemented under the current EU Treaty.

The validity of the first should be clear: mistrust has led to short-sighted fiscal policy, but it also appears in resisting proposals for smoothing asymmetric shocks as they are suspected to lead to permanent redistributive transfers across the member states.

The second criterion is of utmost importance. An attempt to push through reforms that require changes to the EU Treaty would probably fail as they require referenda in some countries and would cause serious political quarrels also in others. Centrifugal forces would gain strength in the euro area and the EU as a whole.

The present paper is written under the hypothesis that the euro can be made viable and serve well the European economies by implementing reforms that are feasible under the current Treaty.

### ***Key role of the central bank***

A useful third criterion for the reform proposals is that they need to address a real issue and that they are based on a solid analysis of what already works well in the euro system.

Here we come to the functions of the European Central Bank (ECB), or more accurately, of the European System of Central Banks (ESCB). A decisive turning point was the statement of ECB Governor Mario Draghi in London on 26 July 2012 that ‘Within our mandate, the ECB is ready to do whatever it takes to preserve the euro – and believe me, it will be enough’. It was at least partly improvised by him, provoked by the euro sceptic remarks of the Bank of England Governor Mervyn King, who was chairing the meeting with hedge fund managers and other people from the world of finance. Draghi’s statement immediately calmed the markets, and in September it was followed by formalising the new role of the ECB as a conditional lender of last resort in provisions titled ‘Outright Monetary Transactions’, OMT (Tooze, 2018, 437-441, King, 2016, 227-8).<sup>9</sup>

In addition, the ESCB has an important role in distributing liquidity in the euro area (partly also beyond it) though its Target2 mechanism of claims and liabilities of euro area national central banks vis-à-vis the ECB (European Central Bank, 2017).

When private financing was withdrawn from the troubled euro area periphery, Target2 gained utmost importance. As private financing flowed back to the North seeking safe havens, the excessive liquidity surged to the central banks and the ECB then channelled it via Target2 to its southern members, allowing them to provide liquidity and financing to their financial

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<sup>9</sup> The legality of the OMT was cleared in 2015 by the Court of Justice of the EU (2015a and b). Interestingly, the OMT has not been activated so far as its sheer existence has been sufficient for restoring ‘the monetary policy transmission mechanism’ by providing confidence in the stability of the euro.

institutions and via them to their governments (Minenna, 2017).<sup>10</sup> Importantly for the broad and correct picture, the Target2 flows are far greater than financing via the special arrangements and the newly created special institution, European Stability Mechanism (ESM).

Complemented by various other new measures, the ECB has performed its responsibilities in providing liquidity for the euro area as a whole, and distributing it through Target2 to places where it is needed. The balance sheet of the ESCB is currently about 40% of the GDP in the euro area while for the US Federal Reserve it is just over 20% of the US GDP. The relatively larger volume obviously reflects the fragmentation of the financial system in the euro area, which necessitates a large role for the ESCB. Overcoming the crisis has been slower in the euro area than in the US, but it would have been even slower without the extension of the operations of the ECB. Without the ESCB/ECB undertaking these tasks, OMT as a potential tool, quantitative easing (QE) as put into action and Target2, the euro would probably have already collapsed.

### ***Proposals to improve financial infrastructure***

A group of 14 French and German economists (Bénassy-Quéré et al., 2018) makes several proposals for improving financial and fiscal stability for complementing the ongoing work for the banking and capital markets union (European Commission, 2017b, 11-12). One of them includes provisions for economic, legal and institutional underpinnings for orderly sovereign-debt restructuring. The purpose is to make the no-bail out rule credible again, after the leeway that had to be improvised as a consequence of the Great Crunch (Bénassy-Quéré et al., 2018, 12-13).

They also make a proposal to create a synthetic euro area safe asset backed by a standardised diversified portfolio of sovereign bonds with seniority status (Bénassy-Quéré et al., 2018, 7-8, 17-18). They consider that carefully constructed this could contribute to financial stability by providing a ‘safe asset’ for monetary policy operations and other purposes, and help breaking the ‘doom loop’ between the banks and sovereigns by removing the bias of the banks for holding bonds issued by their own governments. Progress is currently underway (European Systemic Risk Board, 2018; Lane and Langfeld, 2018; and European Commission, 2018, 34).

De Grauwe and Ji (2018) are sceptical and warn that ‘financial engineering’ proposed by the group may create a false sense of stability despite being far from sufficient. They consider that creating a joint liability of the euro governments is necessary for the stability of the euro, while they also judge that this is completely excluded politically.

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<sup>10</sup> At the end of 2012, as a result of the first peak of Target2 balances, the positive balance of Germany was 24% of its GDP, relatively even more for Finland (35%) and highest for Luxembourg as a banking centre (240%). The negative balance for Spain was -32% of its GDP and relatively more for the smaller troubled members (Ireland, Portugal and Greece). After some decline, the numbers are again in 2018 in the same order of magnitude (except for Ireland that has done away with its negative balance; data is available at Statistical Data Warehouse/ecb.europa.eu). These stocks have been large, and they have fluctuated so that, noting the largest provider, the Bundesbank increased its balance by 5-7% of German GDP in 2010-12, then reduced it by 5% in 2013, and has increased it again since 2014. The negative balance of Spain reflects these movements.



The proposals for joint liability bonds nourish mistrust as they entail a risk of potentially large transfers between the governments. They are also considered to fuel moral hazard by reducing the pressure to follow a sound fiscal policy. For these reasons they are politically excluded.

On the contrary, the twin proposals by the Group of 14 fare well under our criteria. Notably, a foreseeable mechanism of partial default of sovereign debt keeps pressure on both governments and their creditors to focus on long-term sustainability, reducing mistrust. A synthetic ‘safe’ asset would serve as a safe investment for funds currently deposited in the ECBS and channelled further via Target2. Correspondingly, the diversified pool of senior bonds would provide financing for all governments up to the amount eligible for senior status.

The two proposals can obviously be implemented under the current EU Treaty.

### ***Proposal for an expenditure rule for improving fiscal policy***

The group of 14 (Bénassy-Quéré et al., 2018, 9-11) presents also a proposal to eliminate procyclicality of the fiscal rules by replacing the focus on the (structural) deficit by a simple expenditure rule guided by a long-term debt reduction target. According to the authors, such a rule would help stabilise economic cycles, since cyclical changes in revenues would not need to be offset by changes in expenditures.

Although this proposal at first sight seems well-founded, it encounters difficulties. Monitoring the total public expenditures confronts the same issues we discussed above regarding the current fiscal rules on deficits. The various exceptions and detailed corrections needed to make an expenditure rule economically reasonable would again lead to serious complexities. As this would extend to implementing possible sanctions on non-compliance, mistrust would only be augmented.

### ***Proposals for smoothing asymmetric shocks***

One of the key issues for a monetary union is the challenge of asymmetric shocks when the exchange rate is no longer a tool of the national authorities. In preparing for the euro competing views were revolving around the size of the common budget and possible specific arrangements for smoothing such shocks. The US was always used as the reference with an eye on different mechanisms dampening the asymmetric developments across the US states (Oksanen, 2016a). Recent papers by Alcidi, D’Imperio and Thirion (2017) and Alcidi and Thirion (2017) summarise the studies, benefitting from the recent data covering the changes in the dynamics after 2008.

One key finding is that in the US smoothing is larger than in the euro area mainly due to capital market integration, especially cross-ownership of capital across the states. The other is that in the euro area smoothing effect via the government budgets is normally larger than inter-state fiscal transfers in the US federal budget (noting, in addition, that the state budgets in the US do not contribute to it due to the common balanced budget requirement).

Thus, the importance of flexibility of government budgets in the euro area under both common and asymmetric shocks appears again here. However, smoothing works in the euro area in normal circumstance, while all smoothing practically ceased since 2010 in the

periphery (Alcidi and Thirion, 2017, 15) due to fiscal austerity (whether it was necessary and optimal or excessive).

The above picture is otherwise quite comprehensive, but Target2 in the ESCB/ECB system is an important element to be added. The flows and stocks in Target2 are as important as any other items in the balance of payments and they are so large that they should not be ignored. They compensate for the lower degree of financial and capital market integration in the euro area than in the US. Including them in the analysis would shed new light on the relative importance of the parallel mechanisms.

Proposals for smoothing mechanisms remained subdued for the first decade of the euro, but came back as the Great Crunch and its consequences revealed significant asymmetries.

Creating a stabilisation function under the next multiannual financial framework to deal with large asymmetric shocks is listed in the roadmap of the European Commission (2017b, 8, 12). Also Bénassy-Quéré et al. (2018, 14-16) propose a fund providing payouts mainly based on unemployment indicators, the system being financed by the member states according to their economic size. Also Andor et al. (2018) propose an unemployment insurance scheme for the euro area to complement the national systems.

These proposals face several problems: tackling only large asymmetric shocks limits their effectiveness; unemployment is a lagged indicator of exogenous shocks; conditionality to compliance with other schemes and rules (which can be controversial) easily leads to disputes; even though it is declared that they should not lead to permanent redistribution, this is far from being assured. Additionally, instead of the contributions to be paid to the scheme being proportional to GDP, they could be disproportional in order to dampen also the asymmetric booms. All in all, the proposed systems would not be effective for smoothing but aggravate mistrust and disputes, thus failing to meet our first criterion.

Oksanen (2016a) proposes an alternative scheme where payments in and paybacks depend on the relative OGs of the member states, being, for example, proportional to half of the percentage deviation of each member state's OG from the euro area average. Importantly, his proposal contains a rule that after an agreed period, say seven years, the net balances are recorded and netted out in constant instalments over the subsequent seven-year period. This would make sure that permanent redistribution would not emerge.

Oksanen (2016a) illustrated his proposal with historical data based on OG estimates by the EC. He considered that improving the real time OG estimates would be advisable, though not indispensable for starting it as the details could be improved afterwards. In the TA, p. 43-44, we show that using the nHP OG estimates seems encouraging as for the two opposite countries, Germany and Spain, they would have worked better than the EC estimates before the crisis.

It is an advantage of the proposed mechanism that it only requires a light administration. It would dampen the asymmetric shocks to an extent comparable to the US federal budget. Being non-distributive, it leaves redistribution to policy areas that are specifically devised for it. Thereby, it avoids disputes that nourish mistrust. This proposal also helps to reveal whether other proposals tacitly aim at permanent redistribution. Also, it would remove this issue from the agenda of pending reforms and release energy for other important tasks.

### ***A large budget for the euro?***

A limited and practical smoothing mechanism could also take heat from the view that without a large common budget a monetary union would not survive. In the EU this view goes back to the MacDougall Report in 1977, where it was argued that it is needed both for permanent redistribution and smoothing short-term asymmetries (Oksanen, 2016a, 332, 336-337). This view did not prevail in Maastricht in December 1991, but proposals for a significantly larger budget have come up again, triggered by the crisis, for example by Andor et al. (2018).

The main institutional difference between the euro area (and EU) and the US is that in the euro area national governments run 98% of the public budgets (2 % at the EU level), while in the US the share of the federal budget of general government is 60%. The studies referred to above show that there are several parallel mechanisms working in each, and adding the specific limited mechanisms proposed here would increase short-term smoothing in the euro area to a degree comparable with the US. This weakens the arguments for increasing the common EU/euro area budget.

In addition, multiplying the size of the EU/euro area budget is politically unrealistic. The proposals to multiply the permanent redistribution from the level agreed and reconfirmed on several occasions in the past, including in Maastricht in 1991, only augment mistrust and cause discontent as they will fail.

### ***Illustration of the OGs if growth falls significantly***

An advantage of our new HP application is that the assumption of future growth can be freely varied. As an illustration imagine that currently, based on the forecast in autumn 2017, it is perceived that the economic growth will soon go persistently to zero. The relevance of this vision could be argued on several grounds, which are listed in the TA, p. 44-45, together with the graphical illustration of the result for the OG estimates in the EA11.

According to the result, assuming zero for the underlying growth in the EA11 from 2018 onwards implies that for 2018 the nHP OG estimate is +3.3%, considerably higher than the baseline result +1.2% (which is based on 1.3% growth) and the OG estimate +0.3% of the EC in autumn 2017. And it is almost exactly equal to the retroactive estimate for 2007, the peak of the overheated boom before the Great Crunch.

The high OG for 2018 produced by this thought experiment does not imply that fiscal policy should be immediately tightened. However, the new dramatic result could serve as a wake-up call for thinking seriously about long-term challenges. More modestly, it is an illustration of a possible use of the new HP method for easily charting a broad spectrum of risks to economic development.

## 6. Summary and conclusions

We have presented here new output gap (OG) estimates based on a simple statistical method, the Hodrick-Prescott (HP) filter, to distinguish the cycle from a possible change in the trend of the GDP.

We showed that the HP-based estimates have been often criticised on inadequate grounds. Using the method carefully can distinguish the cycle from changes in the trend in a way that compares well with the results from other methods. A clear advantage of the HP method is that it is simple, based only on one single time series, the GDP. As the method is simple the results and their limitations can be easily understood also by non-experts

The contribution here is to present a new application of the HP filter, where we insert an explicit link to the view about underlying growth of the economy in future. This does not complicate the method unduly, but it is useful in two ways. First, it makes explicit the question of what might be happening with respect to long-term growth prospects, allowing alternative assumptions on it; this question is encountered continually, especially when a major shock hits the economy. Second, it is obvious under all OG estimation methods that the phase of the cycle always depends not only on the current situation (supplemented by the short-term forecast) and the past, but also on the changes further on in the future. Our new method makes this explicit. This helps us to understand that the results are uncertain, and that they should be treated with care and caution.

The same warning is valid also for the OG estimates regularly produced and published by the three main institutions, the European Commission (EC), IMF and OECD.

The OGs are an important input for designing policies, primarily but not only fiscal policy. They are of pivotal importance in the rule book of the euro area (and the EU as a whole) and underlie important procedures in the joint decision making.

The problem with the OGs produced in all the three institutions, the EC, IMF and OECD, is that their estimation methods are complex and liable to criticism on several grounds. Some of the criticism is well-founded, like pointing out that the real time OGs have been negative almost without exception. This has triggered a doubt that this might have caused a bias towards increased public debt. Not taking a definite position on this possible causality, we consider that there is at least a terminological problem as in ordinary language a cycle refers to fluctuations on both sides of a specified benchmark for which the average over a long enough period is a natural first choice. As no perfect estimates are available, a prudent conclusion is that estimates produced with parallel methods are useful as they measure slightly different aspects of the economies. An OG estimate that is consistently negative may indicate in a useful way that the economy produces persistently less than its potential, but inferring as to how the whole potential could be exploited requires much more policy analysis than the OG estimates and the derived structural balances in the government budgets.

As the retrospective revisions in the OG estimates have been widely used as a criterion of their reliability, we emphasise that the revisions do not necessarily indicate weaknesses in their construction. The recent history before and after the Great Crunch of 2008-09 is a case in point. The revisions of all the OG estimates, extending backwards to 2002, were the consequence of the fall in the EA11 GDP not only in 2009 but also in 2012-13.

This observation triggers not only questions about fiscal (and other) policies in 2010-13, but more generally about procyclicality of fiscal policies in the euro area. With the exception of the year 2009, when the significant fall in GDP struck, there is overwhelming evidence that fiscal policy has been persistently procyclical. As the OGs are in essence produced precisely for guiding towards counter-cyclical policies, the factors behind short-sightedness and procyclicality stand out. Our narrative for these phenomena is based on mistrust between the member states: they do not trust that all members are willing and capable of conducting fiscal policy so that they would credibly meet their public debt obligations in all foreseeable circumstances. As there are no easy ways to commit governments to sound policies in the long term sufficiently convincingly, the mistrust led to short-sighted fiscal rules.

The first round of the rules in the Stability and Growth Pact of 1997 became so simple that they did not work as they were not economically reasonable. This then led to new rules, especially after the Great Crunch, which became so complex that there is now wide agreement that simplification is needed, but how to do this is a major open question.

This leads us to assessing the various proposals to reform the euro. Our main conclusion of analysing fiscal policies in the light of the OG estimates is that a successful reform agenda must contain flexibility for counter-cyclical policy so that the national budgets work as stabilisers for both common and asymmetric shocks. But then, equally importantly, it follows that flexibility in fiscal policy in the short term can be allowed only if the sustainability of public finances in all member states is assured sufficiently firmly.

Sustainability has been seriously tackled in the work of the experts, but the results have been based on limited analyses that do not duly cover all relevant policy areas in the member states. The reasons are partly understandable as many of them are under national competence. Examples of this are pension systems and public financing and management of health care. The various proposals so far for increasing the old age retirement age have possibly been too complacent and in practice hindered serious discussion on significantly larger increases.

In the present paper we use two key criteria for assessing the reform proposals. Reducing mistrust across the members is one of the criteria, and implementation without changes to the EU Treaty is the other. Our focus on assuring long-term sustainability meets them both. Shifting focus from short-sighted fiscal rules to long-term sustainability is not only compatible with the current EU Treaty as agreed in Maastricht in December 1991, but even required by it. According to the Treaty the purpose of the excessive deficit procedure is to identify ‘gross errors’, and it says that government investment and all other relevant factors shall also be taken into account. Reasserting these principles, simplifying the rules significantly and enhancing reforms that strengthen the role and responsibility of the member states in assuring sound public finances can give a firm basis for preserving the euro as a currency that serves well the European economies and the rest of the world. Ambitious reform proposals that require changes to the Treaty only provoke mistrust and easily backfire.

Two proposals that usefully meet our criteria are made by a group of French and German economists (Bénassy-Quéré et al., 2018, 7-18). One aims at creating the necessary rules for orderly sovereign-debt restructuring in case of insolvency. This would eliminate governments and their creditors seeking bail-outs and thereby strengthen their responsibility and incentives to behave prudently. This would enhance long-term sustainability of public debts. Another is

a proposal to create a synthetic euro area safe asset backed by a standardised diversified portfolio of sovereign bonds with seniority status. They consider that it would help streamline monetary policy operations and break the excessive interdependence of banks and governments.

Several reform proposals include a stabilisation fund for smoothing asymmetric shocks. They encounter several problems. They are not effective for smoothing and, most seriously, they fuel suspicion that they would lead to large permanent transfers, and thereby nourish mistrust and disputes. A quasi-automatic transfer mechanism based on relative OGs proposed here could be more efficient and help smoothing both large and small asymmetric shocks. The proposal contains a provision for reviewing the net transfers periodically so that no permanent transfers would take place. Illustrated with past data using our new OG estimates in the proposed system seems to work somewhat better than those produced by the EC.

The complex fiscal rules only aggravate mistrust. Euro area architecture would benefit from avoiding new rules and procedures that provoke disputes. Simplification of the rules should instead be high on the agenda. More leeway for conducting counter-cyclical policies can be created by focusing on long-term sustainability of public finances in all member states, particularly by reforming the public pension systems and health-care financing. Long-term sustainability is of key importance for ensuring the viability of the euro, although progress in other fields is also needed. All reform proposals should be assessed under the two criteria here: do they diminish mistrust, and can they be implemented under the current EU Treaty.

(end)

## Technical appendix

### to paper ‘New Output Gap Estimates for Assessing Fiscal Policy with Lessons for Euro Area Reform’

This Technical appendix (TA) provides additional analysis and data referred to in the main text.

Most of the data on the EA11, the US and the four largest euro area countries comes from public sources on the internet made available by the three institutions (EC, IMF and OECD), most of the EA11 data being downloaded from the website of the FIRSTRUN project, <http://www.firstrun.eu/>.

The titles and subtitles (bold) correspond to those in the main paper.

#### **TA.1 Introduction**

##### *Illustration with long series*

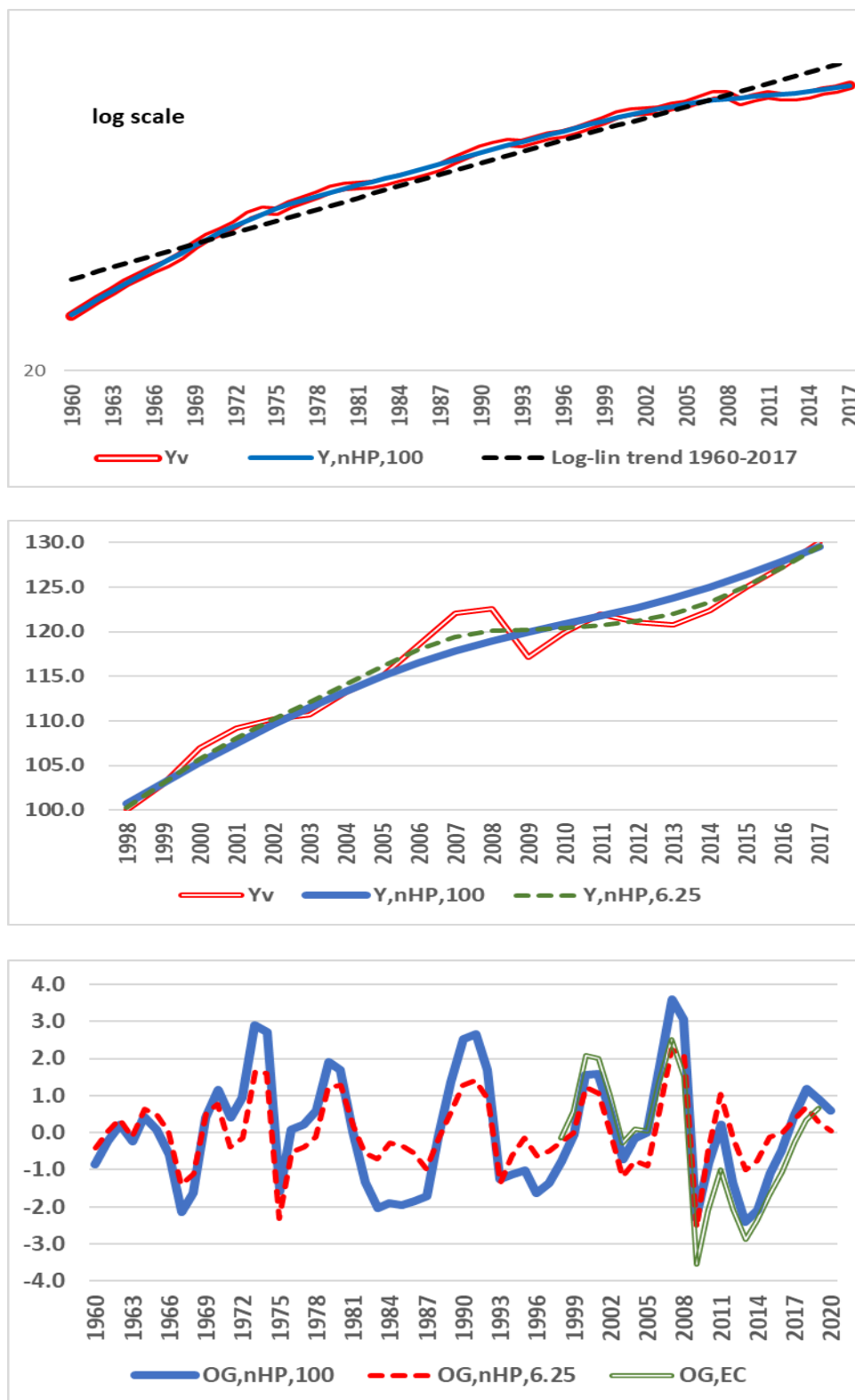
Figures TA.1 illustrate the usefulness of the HP filter. In the first graph we have the EA11 GDP data 1960-2017, its log-linear trend and the HP-filtered series using the smoothing parameter 100 conventionally applied for annual series (and for the results in this paper). The log-linear trend obviously fails to depict the cyclical movements as it produces a trend with average rate of growth over the whole period without adjusting to its long-term decline (from 5% per annum in the 1960s to 2% by 2008).

The HP filter is developed to respond to such movements in the long-term trend so that the medium-term business cycles are identified, though without imposing the cycles by assumption but letting them appear from the data as results of the HP method. The cycles are defined as deviations of the observed (or forecast) data series from the HP-filtered series (normally called the ‘HP trend’). The conventionally used smoothing parameter 100 assumes an underlying long-term fluctuation extending over 19.8 years on average (Casey, 2018, 19).

The second graph covers the years 1998-2017 and shows the observed EA11 GDP and the HP estimates using alternatively a smoothing parameter of 100 or 6.25, the latter being preferred by the Deutsche Bundesbank (2014). The latter assumes an underlying long-term cycle of 10 years (Casey, 2018, 19). The result of the latter is that the HP ‘trend’ follows the movements in the original series so that part of the (obvious) cyclical movements remain unidentified.

Complementing the comparison, the third graph shows that for 1960-2017 the amplitude of the OGs based on smoothing parameter 6.25 is about half of what it is with value 100. Also the OG by the EC from the autumn 2017 forecast (for 1998-2017) is shown, indicating that its amplitude is roughly the same as for the HP estimate with smoothing parameter 100.

**Figure TA.1. Performance of the HP method with different parameters for smoothing applied to EA11 GDP.**



Legend: Yv = GDP for EA11; Y,nHP,100 = HP-trend estimate using smoothing parameter 100; OG = output gap; OG,nHP,100 and OG,nHP,6.25 = OG estimate using smoothing parameter 100 or 6.25, respectively. Data: EC/AMECO autumn 2017.



*The OG estimates are important and need to be assessed carefully*

As explained in the main text, McMorrow et al. (2015) discredit the HP method referring especially to its poor performance in the estimates of the EC for the HP trend of the GDP in spring and autumn 2009, presenting a graph where the HP-based OG for the euro area estimated by the EC in spring 2009 was zero for both in 2009 and 2010, while all other estimates gave a significant negative value (which became the dominant view and has not been challenged since then). Six months later, in autumn 2009 forecasts the HP estimates by the EC were significantly revised, including a negative value for the OG from the HP filter (McMorrow et al. (2015, 12). This swing in the HP estimates by the EC then led to the denouncement of the HP method in general.

For the source of their conclusion Figure TA.2 shows a swing in the HP-trend GDP estimates by the EC for Germany and the Netherlands published in autumn 2008, and in spring and autumn 2009, and the corresponding projections derived here from the country-wise EC estimates for EA11.

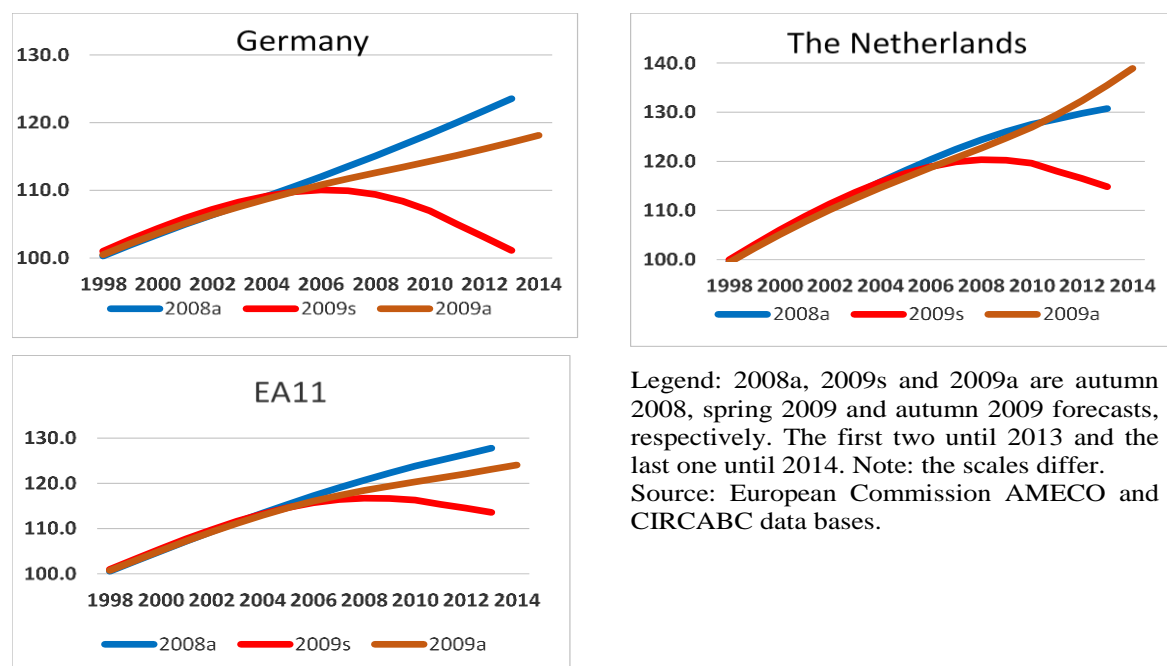
In spring 2009 the HP-trend projections by the EC were revised drastically downwards from autumn 2008 to a persistent and continuous decline in 2009-2013, especially dramatically for Germany: its trend level would have declined almost to the 1998 level by 2013. An absolute decline was projected for several countries, including the Netherlands, so that the similar pattern appears for the EA11.

This projection by the EC was then turned around half a year later in autumn 2009. The negative trends had disappeared (except for Ireland and Greece, the latter being not included in our EA11), and the HP projection for the EA11 GDP in 2013 had become eight per cent higher than estimated in spring 2009.

These swings were obviously caused by the mechanically produced extensions of the GDP forecasts that were composed to avoid the end-of-the-sample bias of the HP estimates. These extensions then turned out to be unstable and obviously caused the instability of the HP-trend based estimates for the OGs by the EC. The problems with these projections probably remained unnoticed at the time as the HP results were produced only for reference, as aftermaths of the compromises when shifting to the PF method in 2002. They were not properly verified and remained unnoticed also later by McMorrow et al. (2015).

The only reason why the swinging HP estimates by the EC in 2009 are referred to here is that those estimates led McMorrow et al. (2015) to discredit the HP method in general as ‘unstable’ and ‘liable to revisions’. This conclusion is unwarranted as those swings were obviously caused by specific problems in setting the data and not stemming from the HP method in general.

**Figure TA.2. HP-trend estimates for GDP by the European Commission (EC) for Germany, Netherlands and EA11 in autumn 2008, spring 2009 and autumn 2009 forecasts.**



## TA.2. New OG estimates generated by the HP method

### *Graphical illustration of the method*

We refer here to the change from 2008 to 2009 using highly stylised numbers which resemble the data and perceptions at the time for the EA11.

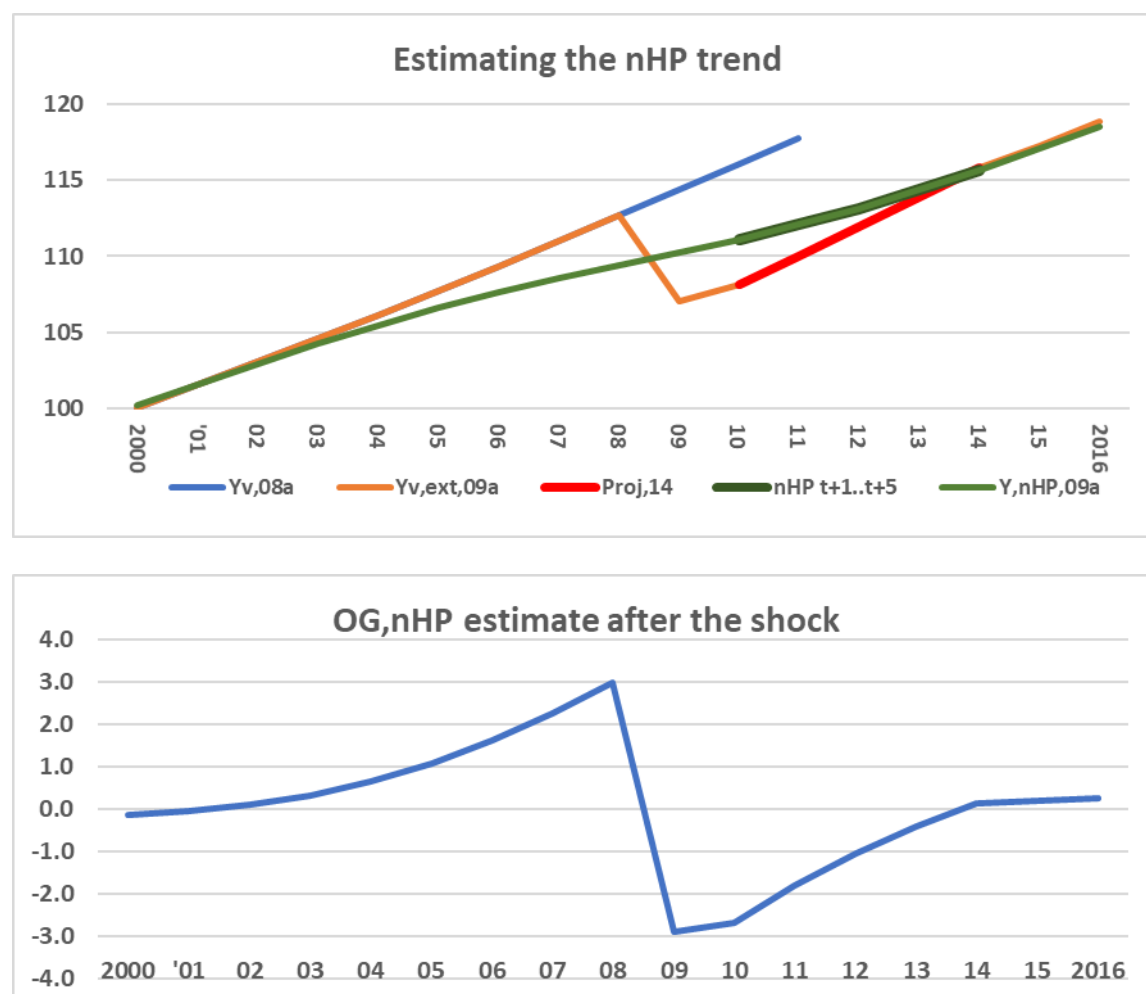
In Figure TA.3 GDP has been growing 1.5% pa. until 2008 and is expected to continue. In this steady state the trend (or potential) of the GDP is identical with the data, and thereby the OG is equal to zero throughout. Then, suddenly, in 2009 GDP falls by 5% and is expected to grow by 1% in 2010 (in the official forecasts almost without exceptions GDP is forecast to grow in year  $t+1$ , and, for that matter, also in  $t+2$  when made available).

The GDP series is extended beyond  $t+1$  based on an assumption the constant underlying rate of GDP growth declines to 1.3%, and that in years from  $t+2$  to  $t+5$  it additionally grows by one quarter of the OG in year  $t+1$ . This latter variable is estimated by our application. From  $t+6$  onwards the GDP is assumed to grow by the newly assumed underlying rate 1.3%.

A freely available HP-filter device available at Federal Reserve Bank St. Louis Economic Research website <https://dge.repec.org/cgi-bin/hpfilter.cgi> is used.

The HP filter is applied in logs and with a smoothing parameter 100 on the extended GDP series explained above (as throughout this paper). In this stylised example the data starts from the year 1980 and extends to 2040.

**Figure TA.3. Stylised illustration of the new HP (nHP) method**



Legend: Yv,08a = GDP and its forecast in ‘autumn 2008’; Yv,ext,09a = GDP and its forecast after the shock (‘autumn 2009’); Proj,14 = GDP projection until 2014; nHP t+1..t+5 = the resulting nHP estimate for those years; Y,nHP,09a = the nHP estimate for the entire data series. nHP OG = estimate for the output gap after the shock.

As the OG is defined as the relative difference of the GDP and the estimated nHP trend and the OG for year t+1 also enters in the formula for the extended series and thereby affects the estimated nHP trend itself, an iterative procedure is needed for the solution: a value for OG in t+1 is first set, the nHP trend is calculated and the result for OG in t+1 noted. This is repeated a few times to arrive at a result where the value set for OG,t+1 and the result from the nHP estimate coincide.

The result then gives the time series for the nHP trend and OG backward and forward. Our stylised example in Figure TA.3 shows how the perceived OGs for the period until 2008 (a constant zero) change when the shock hits the economy. This has important implications for using the OG for estimating the cyclical and structural balances in the government budgets. Not only do the OGs in the past change but also changes in the current and next year take place regardless of possible changes in fiscal policy parameters. Also, it should be noted that

in the newly estimated series the OG falls from +3.0% in 2008 to -2.9% in 2009, i.e. 5.9 percentage points, while the GDP is falling by 5%.

The basically same feature that new developments affect the whole history of the OGs apply also to the OG estimates of the three institutions based on their more complex production function methods.

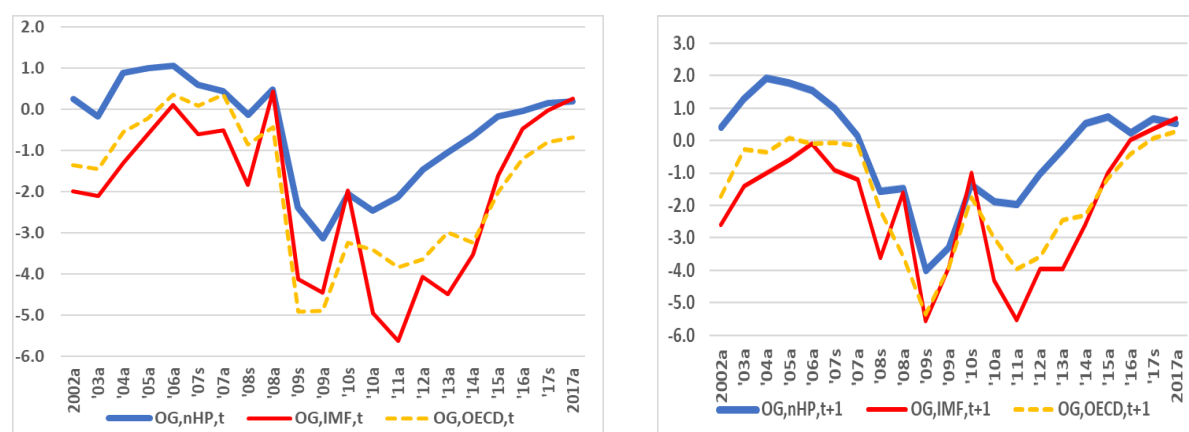
### ***Real time OG estimates for EA11 and others***

#### ***Real time estimates for the US***

Complementing the real time OG estimates for the EA11 Figure TA.4 gives the new HP OG estimates and those of the IMF and OECD for the US in the forecasting vintages from autumn 2002 to autumn 2017, for the current year (t) and for the following year (t+1).

The nHP estimates are based on the IMF data and forecasts for the current and following year. The assumption on the underlying GDP growth rates is set at a round number 2 % throughout, i.e. higher than for the EA11. This is based roughly on the differences in the projected rate of population growth in the long term.

**Figure TA.4. Output gap estimates for the US in real time forecasting vintages 2002-2017. For the current year (t) and for the next year (t+1).**

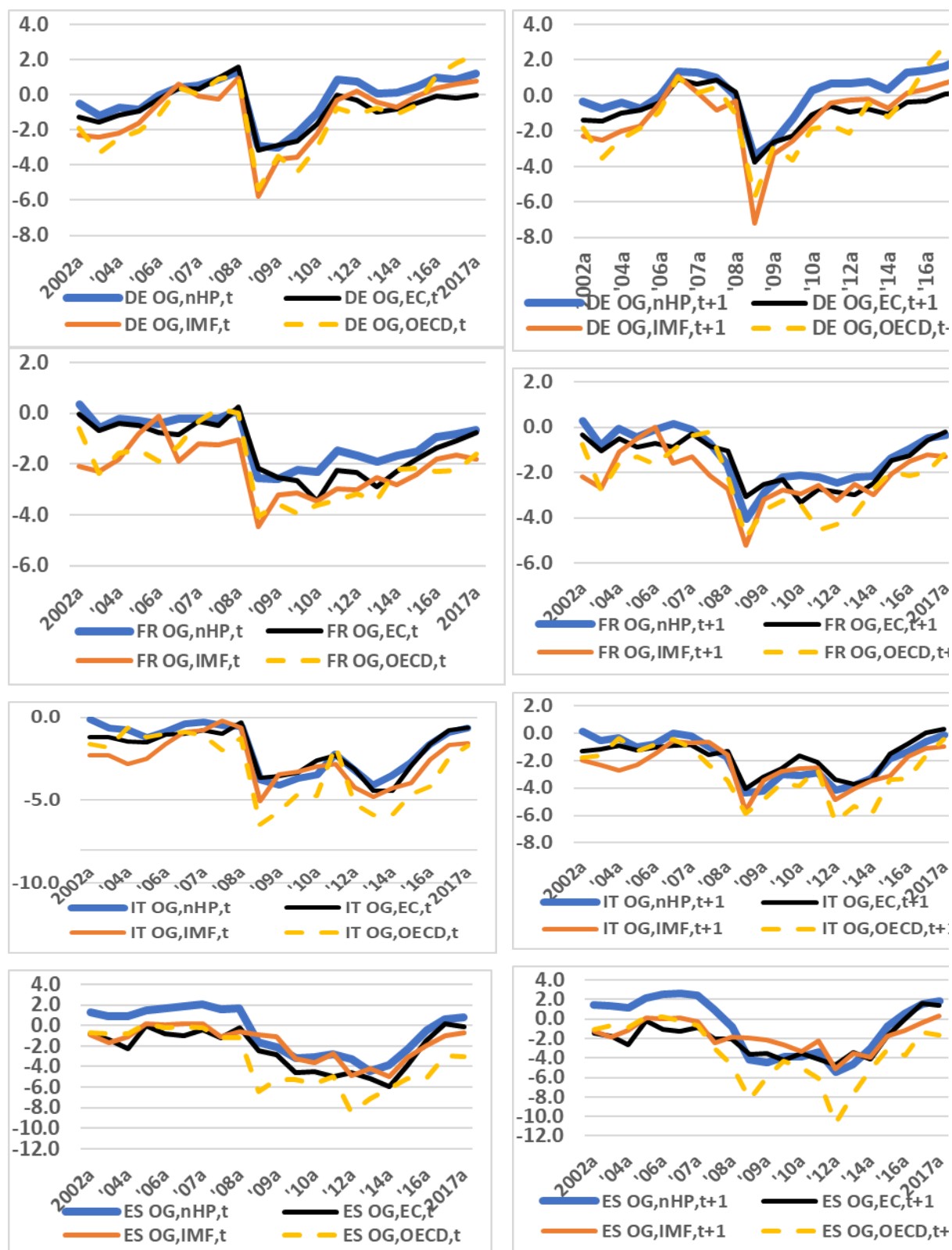


Legend: OG = output gap; a = autumn forecast, s = spring forecast. nHP = new HP-based estimate based on real time data from the IMF, including forecasts for t+1.

Like for the EA11 above our nHP estimates for the OG are consistently higher than the other two. In this case the OECD estimates are slightly positive in 2006-07, while the IMF estimates just hit zero in autumn 2006 and 2008 forecasts. The averages over 2002-2015 reveal a negative tendency in both IMF and OECD estimates, while it is just over half a percentage point (pp.) in the nHP. Apart from this, the fall in the estimates from autumn 2007 to autumn 2009 is interesting. The largest decline is in the OECD estimate, while it is 4 pp. for the IMF and 3.5 pp. for the nHP.

Figure TA.5 supplements the picture with the OG estimates for the four largest euro area countries.

**Figure TA.5. Output gap estimates in real time for DE, FR, IT and ES, forecasting vintages 2002-2017, for the current year (t) and for the next year (t+1).**



Legend: OG = output gap; a = autumn forecast, s = spring forecast. nHP = new HP filter estimate based on real time data from the EC, including forecasts for t+1. DE = Germany, FR = France, IT = Italy, ES = Spain. EC, IMF and OECD refer to their OG estimates, respectively.

### *Changes over 2007-2013 in the the nHP trend and potential output estimates for EA11*

Supplementing the real time OG estimates for the EA11 presented in the main text (Figure 1), Figure TA.6. shows how the estimates for our new HP trend and for the potential GDP by the institutions developed over the Great Crunch, from autumn 2007 to autumn 2013 and further to autumn 2017.

The first panel shows how the Great Crunch 2008-09 led to revised estimates for the HP trend. Our method automatically generates the HP projection for the GDP so that the levels projected at each forecasting vintage can be easily compared at any chosen future year.

The results for EA11 from selected vintages are shown: before the Great Crunch (autumn 2007), when it had been recognised (autumn 2009), when a revival of growth was projected (autumn 2011) though failed to happen, when the negative growth 2012-2013 was about to be over (autumn 2013), and for hindsight, the estimates in autumn 2017 and the ex post GDP data (black line).

The nHP-trend estimate in autumn 2009 for 2009 was 2.9% lower than projected in autumn 2007, and due to deceleration of the projected growth rate (the slope of the projection decreasing) the relative difference was increasing. After a marginal revision in the autumn 2011 vintage, the second recession in 2012-13 led to a further decrease in the nHP-trend estimate: the estimate in the autumn 2013 vintage for 2013 was 1.9% lower than projected in autumn 2011. The revival of growth to what was assumed in autumn 2013 then maintained the projected level in the autumn 2017 vintage (with a marginal shift upwards); the projected level in autumn 2017 for 2017 is 7% lower than projected 10 years earlier (not shown in the graph).

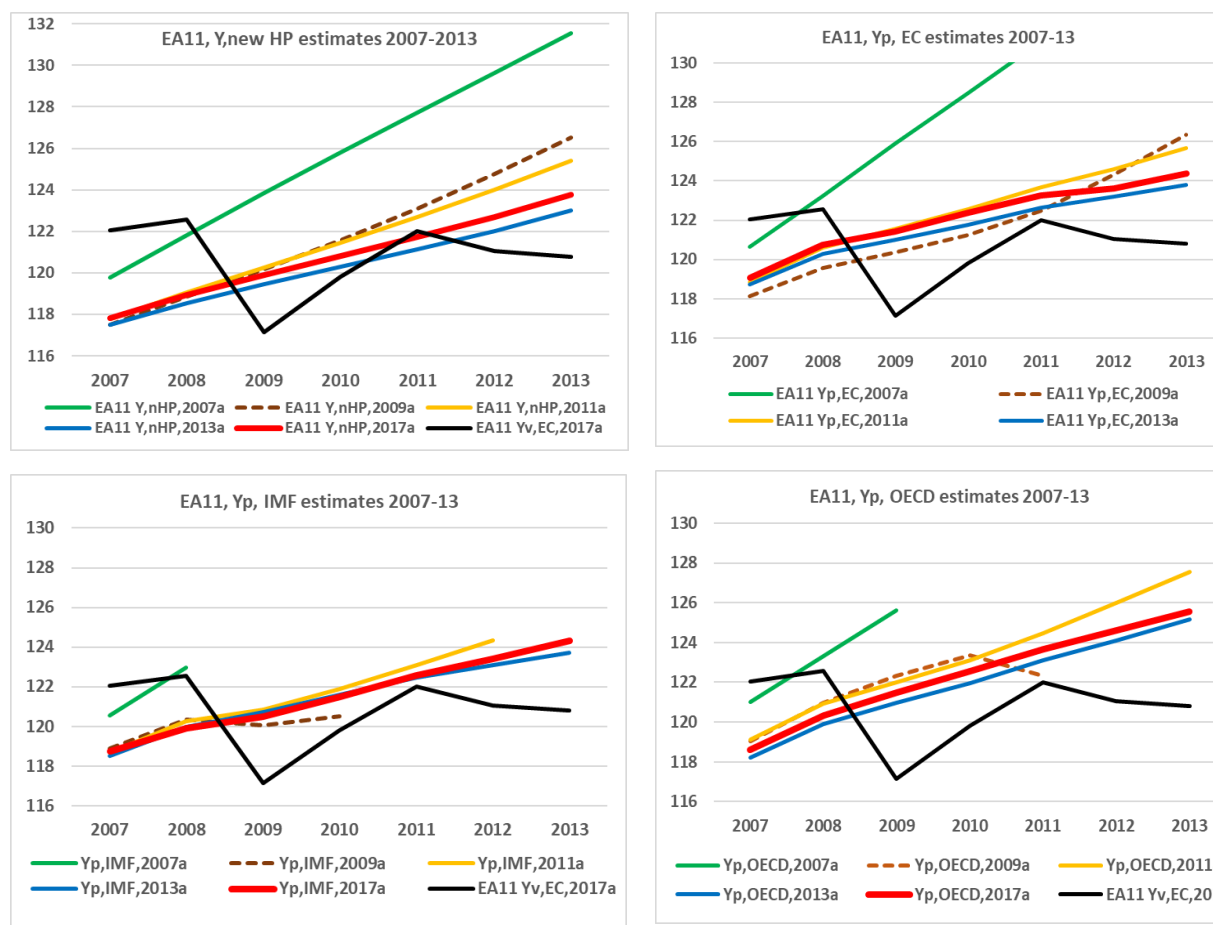
The other panels in Figure TA.6 show the corresponding projections for potential GDP for the EA11 by the three institutions (their time spans vary and impede straightforward comparisons). All institutions revised their projections significantly downwards, although the charts also show some interesting differences.

### *Estimates of nHP-trend and potential GDP of the three institutions for EA11 for $t$ and $t+1$*

Additionally, Figure TA.7 shows our new HP-trend estimates for EA11 GDP in all forecasting vintages recorded in the present paper, together with the potential GDP estimates of the three institutions (presented separately for the current year  $t$ , and the next,  $t+1$ ).

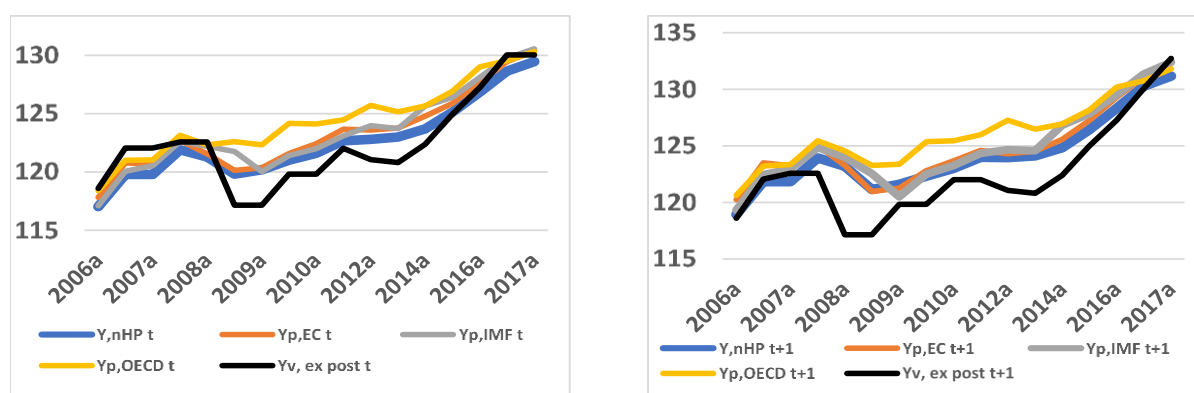
The graphs show, for example, that in spring 2009 the EC revised the potential GDP estimates downwards quite drastically, more than what happens in our nHP estimate (as the latter comes down from a lower level), while the IMF made this revision half a year later and the OECD maintained it at a flat level in 2009 and kept it higher than the others throughout until 2016. These features are the main sources for the differences in the OG estimates noted above. However, also the forecasts for the current year and the next diverged in the forecasts of the institutions affecting their OG estimates. A full record and analysis of all this data is left here for further research.

**Figure TA.6. New HP estimates for EA11 GDP in 2007-13 and potential GDP estimates by the three institutions; selected forecasting vintages 2007-13.**



Legend: all series ind 1998=100; Y,nHP = new HP estimate for the trend of GDP; Yp = potential GDP, a = autumn forecasting vintage of the year; estimates in autumn 2017 and Yv,EC,2017a = ex post GDP data (EC/AMECO) are added for reference; for other details see the text.

**Figure TA.7. New HP-trend and potential GDP estimates of the three institutions for EA11 for t and t+1 in successive forecasting vintages 2006-2017.**

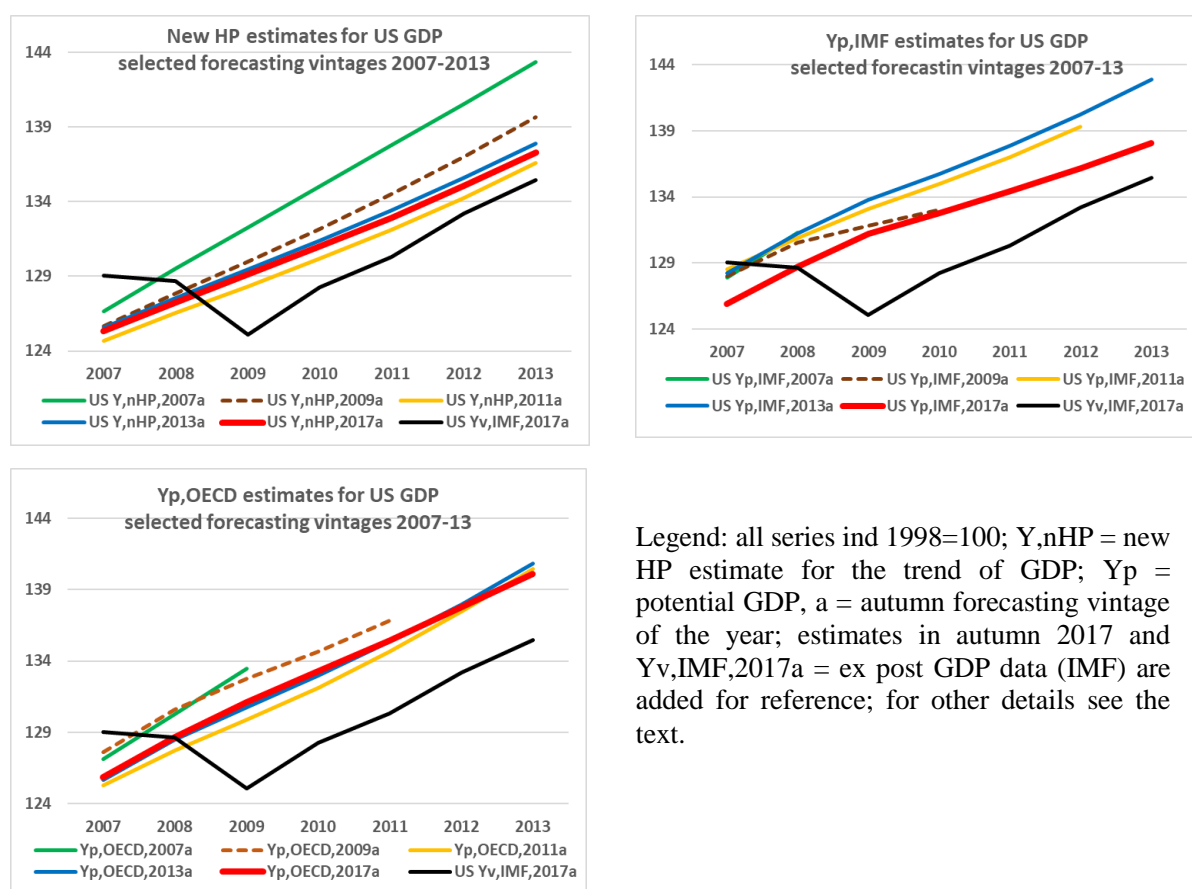


Legend: Y,nHP = new HP estimates for GDP; Yp = potential GDP estimates by EC, IMF and OECD; a = autumn forecast, s = spring forecast. Yv ex post for t and t+1 = GDP from EC/AMECO data in autumn 2017.

## Estimates for the US

Figure TA.8 gives the nHP-trend estimates for the US since autumn 2007, and the corresponding estimates for the potential GDP by the IMF and the OECD. Interestingly, in addition to the negative correction in autumn 2009 our new HP-trend estimate produces a relatively large reduction also in autumn 2011, being revised only slightly upwards since 2013. The estimate by the IMF comes down to the lower level only later, as shown in its retrospective estimate in autumn 2017. The graphs also show the GDP path ex post depicting that in the US GDP was growing steadily, unlike the second recession occurring in the EA11.

**Figure TA.8. New HP estimates for the US GDP in 2007-2013 and potential GDP estimates by the IMF and OECD; selected forecasting vintages 2007-2013.**



## Summary comparison of the real time OG estimates

*Sensitivity analysis:* As mentioned in the main text some tests for showing the sensitivity of the new HP-filter results to alternative assumptions can be easily worked out.

The assumption on the underlying GDP growth rate is most important. Testing it, the result for the EA11 OG estimate in 2009, when we have the largest deviations from zero, is that if the assumed underlying growth rate was already in autumn 2009 lowered to 1.3% instead of 1.5% in the base line, the OG would be 0.2 pp. higher (-2.65 instead of -2.84 in autumn 2009).



for 2009). Thus, limited variation of this assumption hardly affects the result at all. In section TA.5 below we present a more dramatic test by assuming zero growth from 2018 onwards.

Our nHP method also offers the possibility to make tests the other way round: we could ask which assumption for the underlying long-term growth rate is required in each situation to attain the OG estimates of the three institutions. The result for the EA11 is that growth rates should have even accelerated from the well above 2% rate prevailing in 2006-2007.

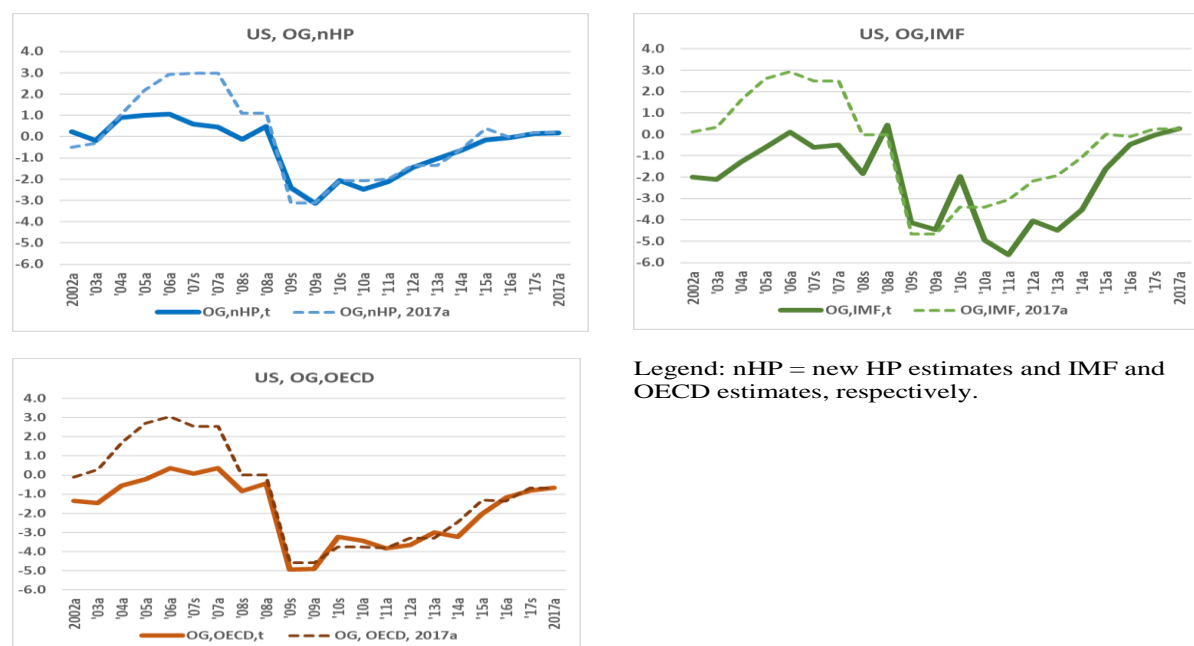
Another assumption to be tested is the speed of adjustment of the GDP from  $t+1$  to the trend level. In the base line we used the conventional assumption that the gap is closed by year  $t+5$ . There is hardly any serious question about the reasonability in normal fluctuations, but for the extreme situations a longer adjustment path should be tested. The result is that if we allow three more years in the autumn 2009 estimate for 2010, the nHP OG estimate is -2.9% instead of -3.3% in the base case. Thus, reasonable variation in this assumption does not affect the results significantly, but noting that there is no definitely correct result is a valuable reminder that all we can achieve by any method is a range of useful estimates.

Our new HP application could be modified in the respect of which forecast is used as the basis. For each real time estimate we used the forecast of the respective institution (EC for the EA11 and IMF for the US) for the following year ( $t+1$ ) and allowed our application to produce the projection from then onwards. The method would easily allow us to use also the existing forecast for year  $t+2$  (regularly available in the autumn forecasts) and apply our method from there onwards. However, looking quickly at our results and the EC forecasts for  $t+2$  it seems that such an alternative computation would give almost the same results as here.

### TA.3. Using the OGs and structural balances for policy: a critical view

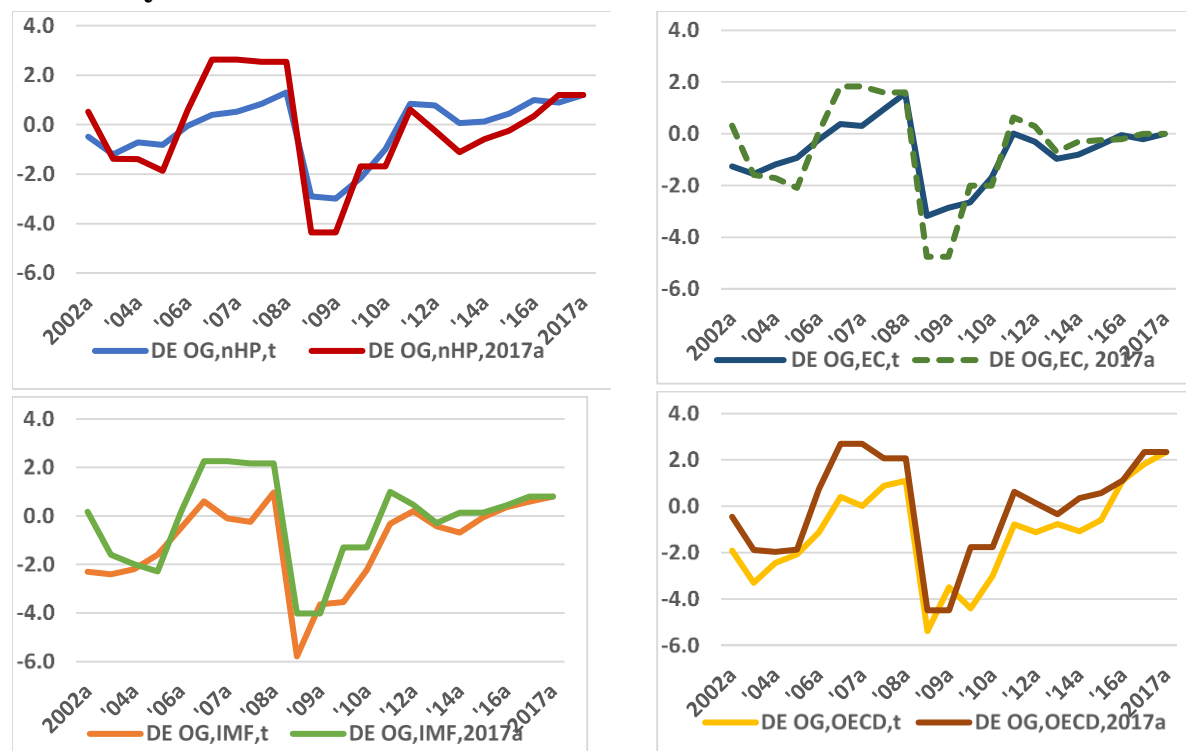
Complementing the retroactive revisions of OG estimates for the EA11 in Figure 2 in the main text, Figure TA.9 shows the similar data for the US and Figure TA.10 for the four largest euro area countries.

**Figure TA.9. Output gap estimates for the US in real time for the current year (t) and corresponding estimates in autumn 2017.**

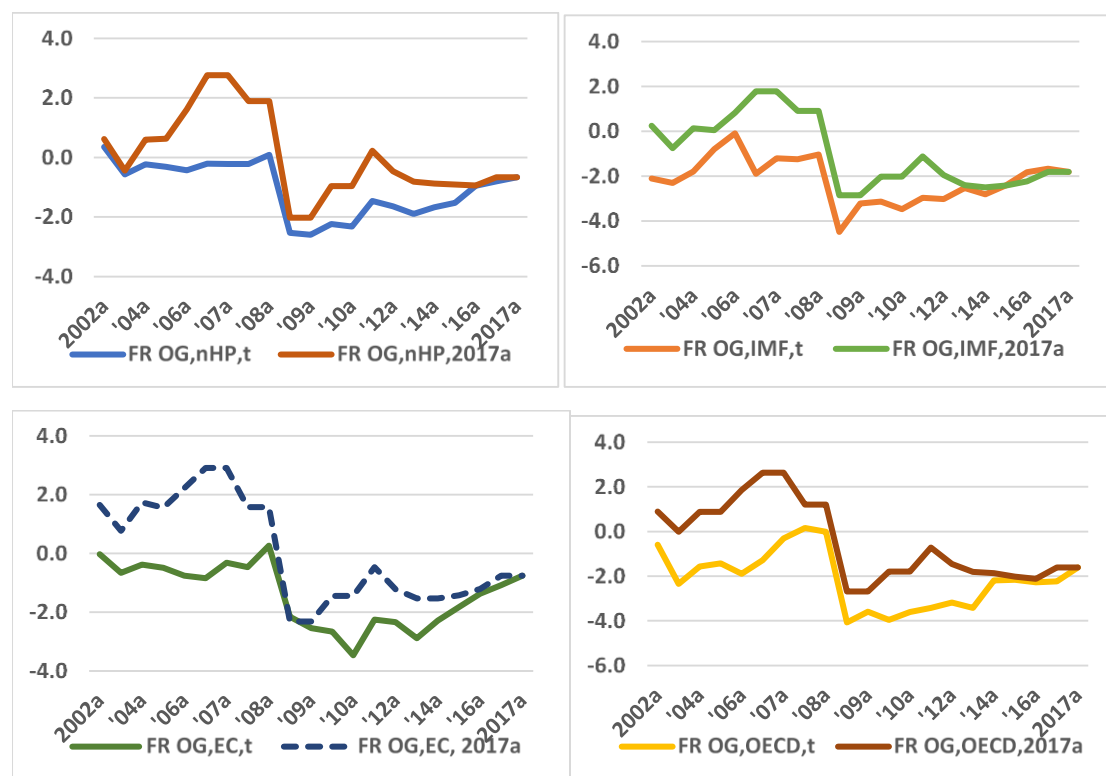


**Figure TA.10. Output gap estimates for the four largest euro area counties in real time for the current year (t) and corresponding estimates in autumn 2017; new HP estimates and by EC, IMF and OECD.**

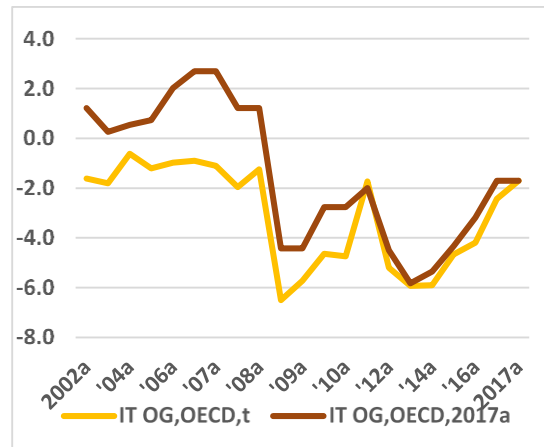
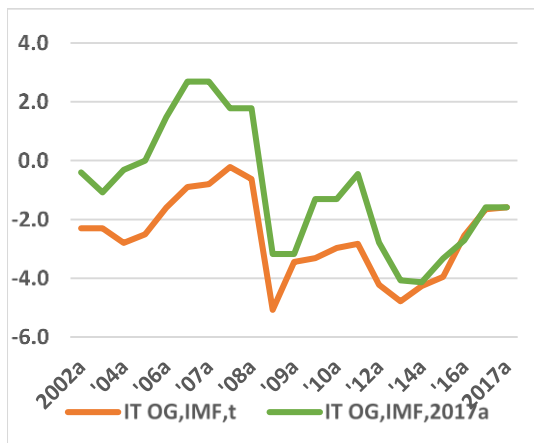
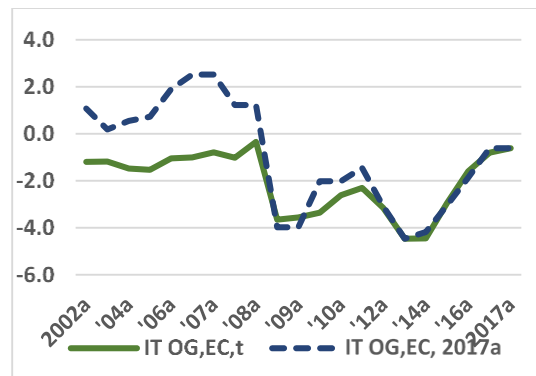
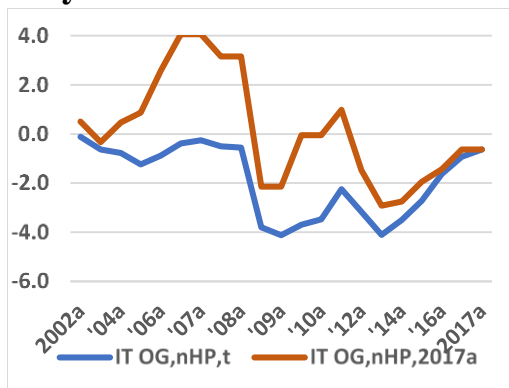
## Germany



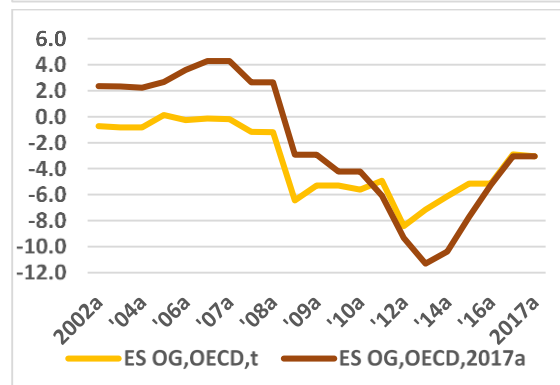
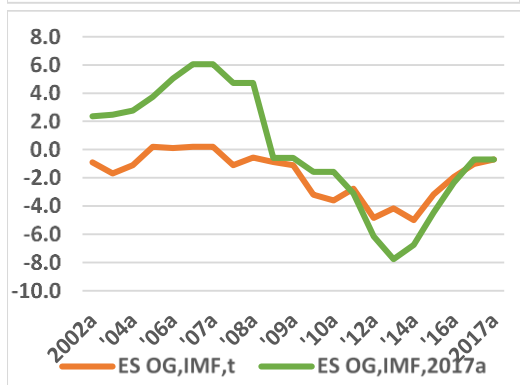
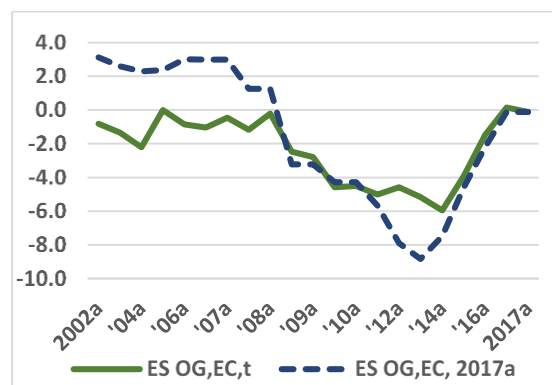
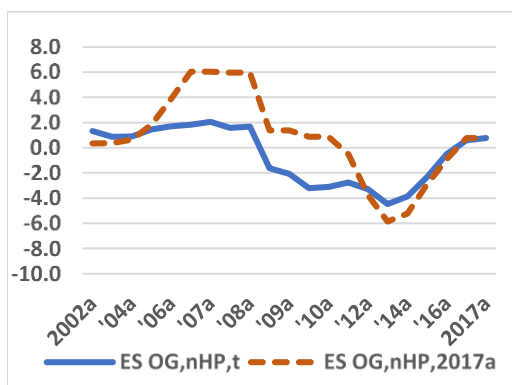
## France



## Italy



## Spain



#### **TA.4. Did policies cause the further fall in GDP in 2012-13 and hence the revisions to the OG estimates?**

##### ***Fiscal policy in the euro area after the Great Crunch***

###### *Other indicators for discretionary policy measures supplementing the structural balances*

Although the structural balances are given a central place in the euro area (and EU) fiscal rules (*Vade Mecum on the Stability and Growth Pact*, European Commission, 2017a), there is considerable uncertainty about them both in real time and retrospectively. This has given rise to development of complementary indicators of the fiscal stance before and after the Great Crunch.

Carnot and de Castro (2015a and b) present a new indicator named discretionary fiscal effort (DFE) that combines data on changes in policy on public revenues and refinements to measuring changes in policy on the expenditure side. The latter, defining discretionary measures on public expenditures, is never clear-cut. For example, unchanged policies combined with moving underlying factors may lead to an increase in expenditures as a percentage of GDP (or other scale factors). This happens in welfare states as population ageing-related public expenditures tend to increase if deliberate policy changes are not made. Despite this, for practical purposes, it is common to define a constant share of GDP as the no-policy-change scenario.

The same applies on the revenue side as taxes are not strictly proportional but a constant share of GDP is only an approximation of neutral policy. Such compromises in defining the concepts are unavoidable and acceptable as there is no way to make a complete matrix of the policy parameters and their effects on public revenues and expenditures, not to mention covering all the EU countries. Yet, the national experts working for their ministers of finance regularly need to make estimates of how the proposed changes in various policy parameters affect public finances.

Carnot and de Castro (2015a and b) compare their DFE indicator to *changes* in structural primary balances based on the OG estimates of the EC. Comparing to the primary balance is justified as it removes the effect of changes in the interest rate. Focussing on *changes* in structural balances is appropriate as the issue pertains to *changes* in policy; focussing on changes also eliminates the possible bias in their levels (due to the obvious negative bias in the underlying OGs). They cover all EU member states over the period 2004-2015.

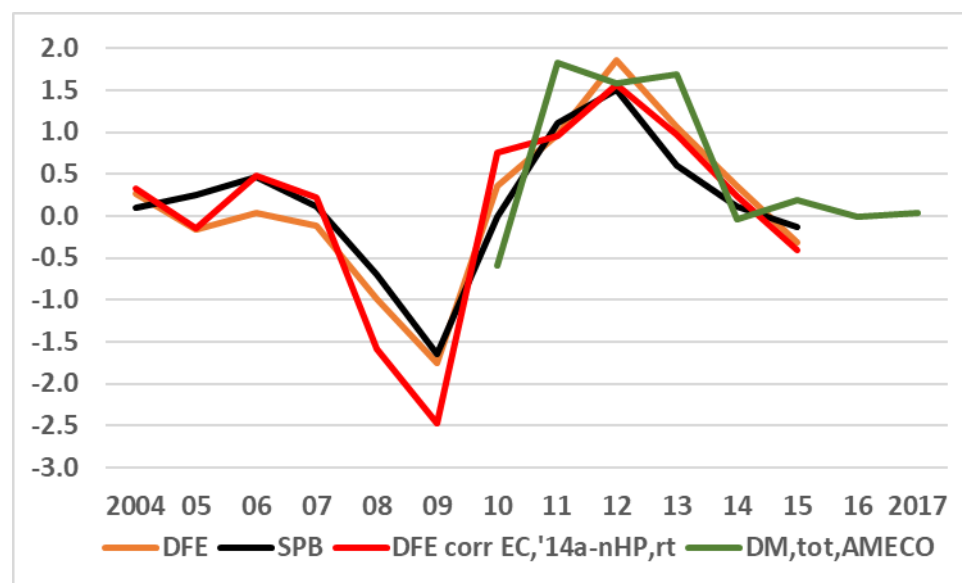
In addition, since spring 2014 the EC has made available (in AMECO) a parallel set of four discretionary fiscal measures: general government current expenditure, current revenue, capital expenditure and capital transfers received. This data represents the effects of changes to these variables stemming from changes in policy parameters. It starts from 2010 and is published twice a year in connection with the regular forecasts.

Figure TA.11 shows a comparison of these data for the EA11. The two variables presented by Carnot and de Castro are there, but as they use retroactive data from the spring 2014 forecasting round we also show the DFE corrected by using our new OG real time estimates. In addition, discretionary fiscal measures, the total of the four components, retroactive data from the AMECO are shown.

Differences between these variables occur, notably regarding the AMECO data for 2010-11 and 2013. We confine ourselves here to noting that fiscal policy was procyclical almost always during 2004-2015 and for most of the euro area counties (and in the EU more generally) with one exception, the year 2009 (Carnot and de Castro, 2015a, Annex 2, shows

this pattern by country). Specifically, the contractionary procyclicality in 2011-2013 is confirmed by the new discretionary measures data in AMECO, showing a tightened fiscal policy, which was then followed by the renewed negative growth in EA11.

**Figure TA.11. Discretionary fiscal effort estimates for EA11 2004-15 with comparisons.**



Legend: DFE estimates by Carnot and de Castro (2014), SPB = change in primary structural balance by them, EA11 calculated by the author from their data by member states; DFE corr EC, '14a-nHP,rt = DFE corrected by the difference between EC autumn 2014 forecasting vintage data and the new OG real time estimates by the author, using semi-elasticity of 0.5; DM,tot,AMECO = Discretionary measures data from AMECO, total of the four series for the EA11; the latter covers 2010-2017; its source is the EC autumn 2017 forecast in AMECO .

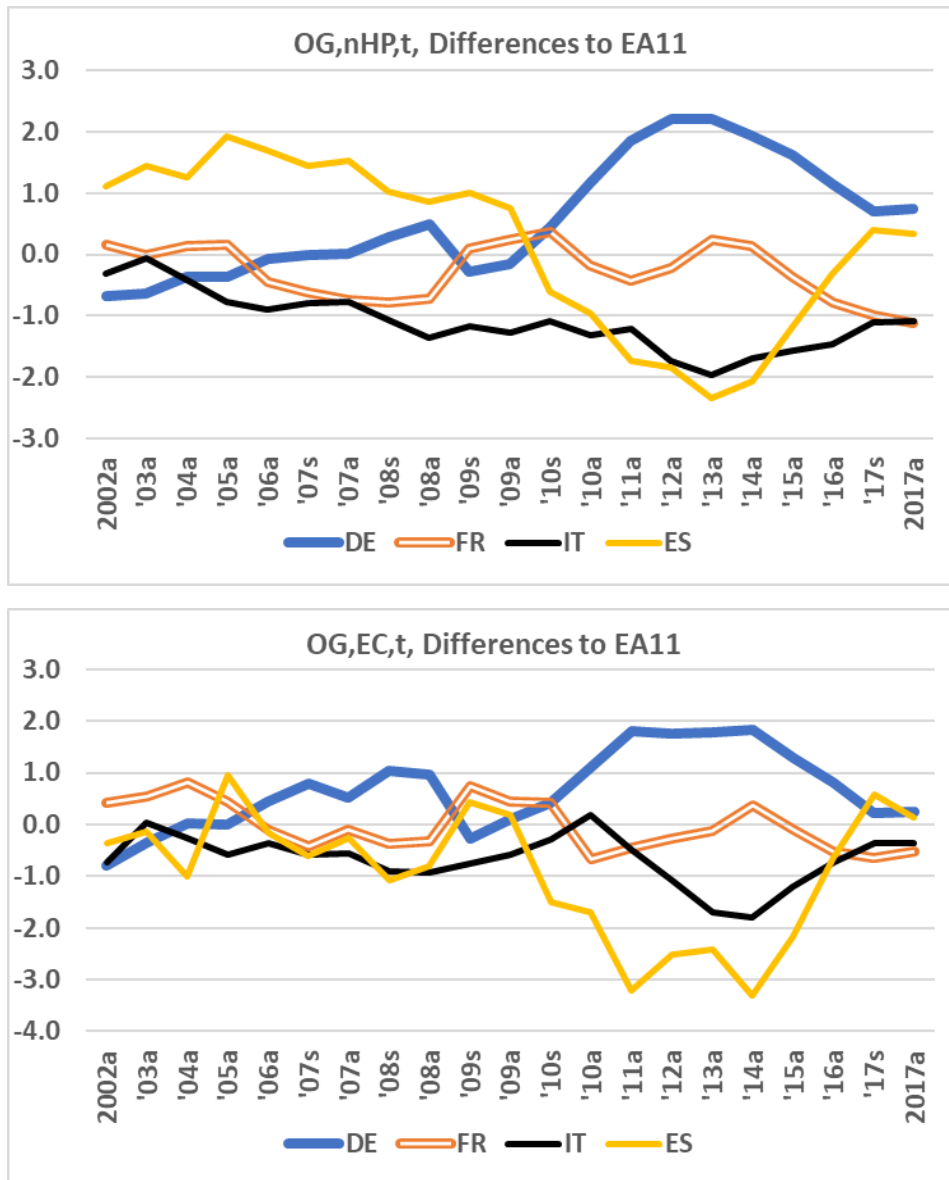
## TA.5. Lessons for reforming euro area architecture

### *Proposals for smoothing asymmetric shocks*

Oksanen (2016a) proposed a mechanism for smoothing asymmetric shocks based on the relative OGs of the member states. For assessing how the nHP real time OG estimates would have worked for it Figure TA.12 shows the differences between the OGs for each of the four largest euro area countries to the EA11 average. The estimates for the current year are presented, while similar graphs of the forecasts for the next year could be added (and those for the previous year if deemed interesting). The parallel data based on the OGs by the EC are shown for comparison.

This first glance at the use of the nHP OG estimates is encouraging. It shows that for the two opposite countries, Germany and Spain, the new OG estimates would have worked better than the EC estimates before the crisis. The relative figure for Spain is close to two pp. in 2005-07, while in the EC estimates it was positive (below one) only in the autumn 2005 forecast, and otherwise negative. Not identifying the unsustainability of the boom in Spain was one flaw that had to be recognised the hard way.

**Figure TA.12. Output gap estimates, real time, differences to EA11, four largest EA11 member states 2002-2017; new HP and European Commission estimates.**



Legend: OG,nHP,t = new HP OG estimates in real time estimates for the current year in each forecasting vintage; OG,EC,t = the corresponding European Commission real time estimates; DE = Germany, FR = France, IT = Italy, ES = Spain.

### *Illustration of the OGs if growth falls significantly*

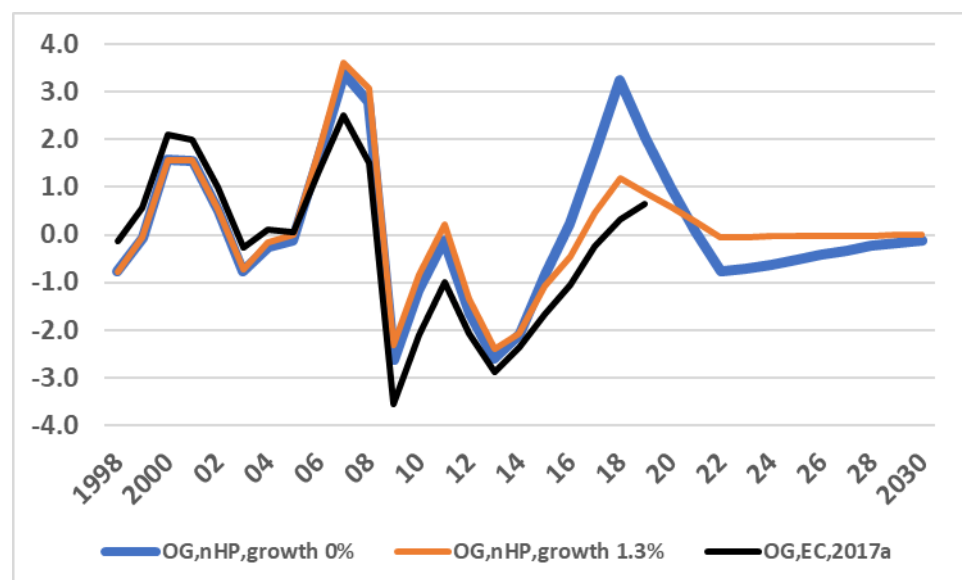
As discussed in the main text it is an advantage of our new HP application is that the assumption of future growth can be freely varied. For an illustration we assume that currently, based on the latest forecast in autumn 2017, economic growth will soon go persistently to zero. This could be a relevant scenario on several grounds: even if technological progress may continue, more resources are required for repairing the environment and containing climate change and a smaller share is available for private and public consumption, so that the GDP measures the material resources available for

consumption and well-being less accurately than hitherto; for a long time the income level of large segments of the population has not grown in the US, the leading major economy, as the richest are taking an increasing share; and globalisation in general shifts production outside Europe. Not taking a view of these arguments, the result of the new HP method for the EA11 is shown in Figure TA.13 together with the baseline result assuming 1.3% growth and the OG estimate of the EC in autumn 2017.

The interesting result is that for 2018 the nHP OG estimate is +3.3%, almost exactly equal to the retroactive estimate for 2007, the peak of the overheated boom (this estimate does not change much with the reduced growth assumption from 2018 onwards).

As mentioned in the main text the high OG for 2018 should not lead to the conclusion that fiscal policy should be immediately tightened – the policy advice should be based on much broader analysis. Anyway, this illustration is an example of a possible use of the new HP method.

**Figure TA.13. New OG estimate for EA11 assuming zero growth from 2018 onwards.**



Legend: nHP OG estimates in real time based on EC autumn 2017 forecast; gr 0% = zero underlying GDP growth assumed from 2018 onwards; gr 1.3% = the base line growth assumption; OG,EC,2007a = EC OG estimate in autumn 2017.

(end)



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Figure 1. Output gap estimates for EA11 in real time forecasting vintages 2002-2017 for the current year ( $t$ ) and for the next year ( $t+1$ ).

Figure 2. Output gap estimates for EA11 in real time for the current year ( $t$ ) and corresponding estimates in autumn 2017; new HP estimates and by institutions (European Commission, IMF and OECD).

### Technical appendix

Figure TA.1. Performance of the HP method with different parameters for smoothing applied to EA11 GDP.

Figure TA.2. HP-trend estimates for GDP by the European Commission (EC) for Germany, Netherlands and EA11 in autumn 2008, spring 2009 and autumn 2009 forecasts.

Figure TA.3. Stylised illustration of the new HP (nHP) method.

Figure TA.4. Output gap estimates for the US in real time forecasting vintages 2002-2017. For the current year ( $t$ ) and for the next year ( $t+1$ ).

Figure TA.5. Output gap estimates in real time for DE, FR, IT and ES, forecasting vintages 2002-2017, for the current year ( $t$ ) and for the next year ( $t+1$ ).

Figure TA.6. New HP estimates for EA11 GDP in 2007-2013 and potential GDP estimates by the three institutions; selected forecasting vintages 2007-2013.

Figure TA.7. New HP-trend and potential GDP estimates of the three institutions for EA11 for  $t$  and  $t+1$  in successive forecasting vintages 2006-2017.

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Figure TA.11. Discretionary fiscal effort estimates for EA11 2004-15 with comparisons.

Figure TA.12. Output gap estimates, real time, differences to EA11, four largest EA11 member states 2002-2017; new HP and European Commission estimates.

Figure TA.13. New OG estimate for EA11 assuming zero growth from 2018 onwards.

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