FISCAL CONSOLIDATION IN TIMES OF CRISIS: IS THE SOONER REALLY THE BETTER?

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Recent evidence has renewed views on the size of fiscal multipliers. It is notably emphasized that fiscal multipliers are higher in times of crisis. Starting from this literature, we develop a simple and tractable model to deal with the fiscal strategy led by euro area countries. Constrained by fiscal rules and by speculative attacks in financial markets, euro area members have adopted restrictive fiscal policies despite strong negative output gaps. Based on the model, we present simulations to determine the path of public debt given the current expected consolidation. Our simulations suggest that despite strong austerity measures, not all countries would be able to reach the 60% debt-to-GDP. If fiscal multipliers vary along the business cycle, this would give a strong case for delaying austerity. This alternative scenario is considered. Our results show not only that delaying austerity would improve growth perspectives and would not be incompatible with public debt converging to 60% of GDP.

Keywords: public debt, fiscal multipliers, growth

Between the late 1970s and the outbreak of the global financial crisis, many economists and policymakers denied fiscal policy a role in stabilising output. After a long period of fiscal (or Keynesian) dominance in Western economies, until stagflation arose in the 1970s, monetary policy was finally considered as the most effective and flexible tool to dampen business cycle in the

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short run while achieving price stability in the medium term.[1] Except under exceptional circumstances (the case of a liquidity trap), the consensus seemed to be that fiscal multipliers were low (i.e. below unity). Some empirical papers even argued that expansionary fiscal consolidation might occur when fiscal restriction was mainly based on expenditures cuts rather than on tax increases (Alesina and Perotti, 1996, Perotti 1996 or Afonso, 2010).[2] Although these views were partly reversed in 2009 when the financial turmoil led industrial countries in the deepest recession since the Great Depression, the Keynesian revival rapidly faded away. European countries reversed their fiscal policy stance in 2010-2011 and engaged in fiscal contraction although output gaps were still strongly negative. Austerity measures were first implemented in Spain, Ireland and Greece. They followed the outbreak of the Greek crisis and were fueled by fears of a possible sovereign default. Since 2011, austerity has been generalised in most euro area countries. As shown by De Grauwe and Ji (2013), austerity programmes were partly driven and intensified by financial market pressures. Until recently, the economic models used by the European Commission relied on the Ricardian equivalence hypothesis assigning only a minor role to fiscal policy. Despite growing literature emphasizing that fiscal multipliers may not be low, the European Commission forecasts clearly illustrated the view that consolidation would not be very costly or, if it were, only temporarily.[3]

Besides, existing fiscal rules constrained the use of fiscal policy. The 3% of GDP deficit ceiling for public deficit was breached in 2009 under what was deemed to be exceptional circumstances. But in 2010, almost all euro area economies started to recover and the European Commission decided to launch excessive deficit procedures. Consolidation was then endorsed by the European Commission and approved by the Council. Although early fears of

1. See Allsopp and Vines (2005) or Angeriz and Arestis (2009) for a detailed description and criticism of this "consensus".
2. This view was however debated notably by, e.g., Creel *et al.* (2005).
3. Resorting to a narrative approach, IMF (2010) challenged the view that fiscal consolidation might be expansionary and found multipliers significantly above unity. De Cos and Moral-Benito (2013) argue that estimates of the real effects of *pure* fiscal contractions, when endogeneity issues have been rigorously corrected for, point to negative figures. Finally, Christodoulakis (2013) reviews the real costs of fiscal contraction in Greece and pledges for a slowdown in fiscal retrenchment.

a possible double-dip were expressed (e.g. OFCE, 2011), the strategy of synchronized front-loading austerity was amplified in 2012 and 2013.

The efficiency of such a strategy was debated. It regained momentum with new views on the size of fiscal multipliers and was reinforced by disappointing performance of the euro area. The literature which has re-emerged since 2009 reached two main conclusions:

1. The multiplier is higher in "times of crisis" (in the short term or as long as the crisis lasts).[4] "Times of crisis" mean periods of high unemployment and/or wide output gap. Another symptom may be a situation where safe long-term interest rates are very low (i.e. negative in real terms), suggesting a flight to safety (radical uncertainty) or a liquidity trap (expectations of deflation). Two theoretical interpretations are consistent with these manifestations of the crisis. Firstly, price expectations are moving toward deflation, or radical uncertainty makes it impossible to form an expectation, which is consistent with very low safe interest rates and leads to the paralysis of monetary policy. Or secondly, more economic agents (households, firms) are subject to short-term liquidity constraints, perpetuating the recessionary spiral and preventing monetary policy from functioning. In one case or another, fiscal multipliers are higher than in normal times because the expansionary fiscal policy (resp. restrictive) forces the economic agents to take on debt (resp. shed debt) collectively instead of individually.

2. The multiplier is higher for expenditures than for taxes. The argument in normal times is that higher taxes act as a disincentive whereas spending cuts act as an incentive on labour supply. In a small open economy, when monetary policy also induces real currency depreciation, fiscal contraction can increase activity, a result advocated by supporters of fiscal discipline. But in times of crisis, in addition to the fact that multipliers are high, the logic applicable in normal circumstances is reversed. The reluctant use of taxes, because of disincentive effects, and the preferred spending cuts do not produce the expected effects in an economy with

4. Parker (2011) recalls that this view dates back, at least, to Keynes "General theory" and he calls it the "(old) Keynesian view".

involuntary unemployment or overcapacity. It is in fact the expectations of a recession or of deflation that act as disincentives, which is another factor behind high multipliers.

Starting from this literature, it clearly appears that front-loaded austerity can be an ill-designed strategy. The economic and social costs can indeed be very high. It logically calls for an alternative strategy where it would be optimal to delay consolidation until economic growth has resumed. Implementing austerity measures when the output gap is close to zero may reduce consolidation costs and may also mitigate the requirements for a negative fiscal stance since all or part of the deficit would be already reduced thanks to automatic stabilizers.

The aim of this paper is first to assess the impact of fiscal consolidation on European economies. To this end, we present the results from simulations based on a simple reduced-form model representing 11 euro area countries (Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal and Spain). The model takes into account the most recent evidence on the size of fiscal multipliers. We adopt a flexible approach where the fiscal multiplier varies according to the business cycle. By doing so, we do not only highlight the costs of implementing austerity when the output gap is negative but we also seek for alternative and less costly strategies to reduce public debt. We define a simple algorithm to search the optimal dynamic fiscal stance in order to minimise the cost of austerity while seeking to reach a 60% debt-to-GDP ratio in 2032, in accordance with existing fiscal rules in the euro area.

The rest of the paper is organised as follows. In the first section, we review the literature on the fiscal multiplier. The main features of the model, which is used for simulations, are presented in the second section. The third section analyses the actual path of consolidation and shows that it is ill-designed. Finally, the fifth section analyses and discusses the consequences of delaying fiscal contraction.

1. Fiscal multiplier in times of crisis: a short overview

During the Great Recession, most industrial countries have implemented fiscal stimulus packages aiming at stabilising the

business cycle. But the fiscal stance was then rapidly reversed with most EMU countries rapidly engaging in a fiscal consolidation strategy. Therefore, the instrument of fiscal policy has been used intensively since the onset of the crisis. This naturally raises the issue of the efficiency of fiscal policy; hence, it questions the value of fiscal multipliers which lay at the heart of the assessment of the output costs or benefits of consolidation.

An abundant literature has recently discussed not only the value but also the stability of fiscal multipliers.[5] Economists from the IMF (IMF, 2012; Blanchard and Leigh, 2013) recognized that their hypothesis on the value of fiscal multipliers were certainly underestimated, which explained why the economic forecasts during the 2008 crisis often turned wrong. Their reassessment showed that fiscal multipliers have ranged from 0.9 to 1.7 since the Great Recession. Having values above unity indicates clearly that fiscal consolidation is costly. As a consequence, a gradual and smooth fiscal consolidation process is certainly preferable to a strategy of fast and sharp reduction of public imbalances. The size of the fiscal multiplier appears a crucial issue in the current context. Moreover, a recent literature has highlighted that this size is path-dependent, as well as instrument-dependent (see Parker, 2011, for a survey of measurement issues and Michaillat, 2012, for a theoretical rationale).

Corsetti, Meier and Müller (2012) explain that in "times of crisis" more and more economic agents (households, firms) are subject to very short-term liquidity constraints, thus maintaining the recessionary spiral and preventing monetary policy from functioning. The value of the multiplier may reach 2 in times of crisis whereas it is supposed to be closer to 0.5 in normal times. Auerbach and Gorodnichenko (2012), corroborate the idea that the multipliers are higher in recessions than in periods of expansion. These authors argue that the impact of a shock on public expenditure would be 4 times higher when implemented during an economic downturn (2.5) than in an upturn (0.6). This result has been confirmed for the US data by Fazzari *et al.* (2012) and by Mittnik and Semmler (2012), but Owyang *et al.* (2013) do not find such evidence with a dataset encompassing the entire 20th

5. Some parts of this literature review draw on Heyer (2012).

century.[6] This non-linearity was also found with German data by Baum and Koester (2011) and conceptualized by Creel, Heyer and Plane (2011) in a simulated model drawing on French data. Karras (2013), studying a panel of 61 countries, both developed and developing, between 1952 and 2007, concludes that the fiscal multiplier is twice as large during downswings than expansions.

The stance of monetary policy also matters. Hall (2009) concludes that the size of the multiplier doubles and is around 1.7 when the real interest rate is close to zero (zero lower bound), which is characteristic of an economy undergoing a downturn, as is the case today in many developed countries. This view is shared by a number of other researchers, including DeLong and Summers (2012), Erceg and Lindé (2012), OECD (2009), and Boussard *et al.* (2012). It was also highlighted in some recent theoretical work, notably by Carrillo and Poilly (2013), Christiano *et al.* (2011), Woodford (2011). When nominal interest rates are blocked at the zero lower bound, anticipated real interest rates rise. Monetary policy can no longer offset budgetary restrictions and can even become restrictive, especially when price expectations are anchored on deflation.

Coenen *et al.* (2012) analyse the instrument-dependence of the effectiveness of fiscal policy. On the basis of 8 different macroeconometric models (mainly DSGE models) for the United States, and 4 models for the euro area, they show that the size of many multipliers is large, particularly if public expenditures and targeted transfers are used. The multiplier effects exceed unity if the strategy focuses on public consumption or transfers targeted to specific agents and are larger than 1.5 for public investment. For the other instruments, the effects are still positive but range from 0.2 for corporation tax to 0.7 for consumer taxes. This finding is also shared by the European Commission (2012), which indicates that the fiscal multiplier is larger if fiscal consolidation is based on public expenditure, and in particular on public investment. These results confirm those published about fiscal stimulus by the OECD (2009), Creel *et al.* (2009), Burriel *et al.* (2010), and Baum and Koester (2011). Without invalidating this result, a study by Fazzari *et al.* (2012) nevertheless introduced a nuance: according to

6. Owyang *et al.* (2013) find some above-unity fiscal multipliers only for Canada.

their work, the multiplier associated with public spending is much higher than that observed for taxes only when the economy is at the bottom of the cycle. This result would be reversed if the economy were closer to full-employment.

Furthermore, in their specific assessment of the US economy, Ilzetzki *et al.* (2013), highlight a high value for the fiscal multiplier for public investment (1.7), i.e. higher than for public consumption.[7] This is similar to the results of Freedman *et al.* (2009).

In the recent literature, only a few papers seem to break the consensus among economists on the size of fiscal multipliers. For instance, after examining 107 fiscal consolidation plans, conducted in 21 OECD countries over 1970-2007, Alesina and Ardagna (2010) and Alesina *et al.* (2012) conclude, first, that the multipliers can be negative and, second, that fiscal consolidations based on expenditure are associated with minor, short-lived recessions, while consolidations based on taxation are associated with deeper, more protracted recessions. These findings raise two critiques. First, Alesina *et al.* (2012) usually emphasize rather substantially the experiences of fiscal restraint of some Scandinavian countries or Canada which are highly specific (planned entry into the European monetary system and financial liberalisation in Scandinavian countries, unexpected increases in oil and gas receipts for Canada) and cannot be easily generalized. By the way, when these experiences are included within a larger dataset including all experiences of fiscal restriction (or expansion), no strong results emerge. Second, the empirical work of Alesina *et al.* (2012) suffers from an endogeneity problem in the measurement of fiscal restraint. Once De Cos and Moral-Benito (2013) correct for this problem, fiscal contractions give… contractionary effects. The notion of a narrative record of fiscal impulse also helps to avoid this endogeneity. For example, in the case of a real estate bubble (and more generally in cases of large capital gains), the additional tax revenues from real estate transactions result in a reduction in the structural deficit, as these revenues are not cyclically-based (the elasticity of revenues to GDP becomes much higher than 1). So

7. Ilzetzki *et al.* (2013) also show, using VAR estimates performed with a dataset of 44 countries, that the effectiveness of fiscal policy depends on the exchange rate regime, quite consistently with the properties derived from Mundell-Fleming models.

these revenues are associated with an expansion (in conjunction with the housing bubble) and with a reduction in the structural deficit: thus, it strengthens artificially the argument that reducing the public deficit may lead to an increase in activity, whereas the causality is actually the reverse.

Beyond Alesina *et al.*'s contributions, Corsetti *et al.* (2013a, 2013b) have studied the incidence of public debt growth (and possible sovereign defaults) on the fiscal multiplier. Through the "sovereign risk channel", fiscal multipliers would tend to be smaller when sovereign risk (or public debt) is high than otherwise.[8] Müller (2013) draws on this argument to oppose the self-defeating approach that Gros and Maurer (2012) and Holland and Portes (2012) attributed to current European fiscal austerity. Denes *et al.* (2013) and Bi *et al.* (2013) rather oppose Corsetti *et al.*'s conclusions. The former attribute the effectiveness of fiscal policy to a clear management of public finances in the short, medium and long run: the success of a fiscal stimulus is dependent on the policy regime and on the confidence by the public that a change in the policy regime would lead the fiscal stance to change as well. The latter share a similar view, although they broaden the determinants of a successful fiscal consolidation to the public debt level, to fiscal consolidation duration, likelihood and composition.

Apart from the contributions by Alesina, Corsetti and their colleagues, a relatively broad consensus has emerged: a policy of fiscal restraint is preferable in periods of expansion, but is ineffective and even pernicious when the economy is at a standstill; if such a policy were to be enacted during a downturn, then tax increases would be less harmful to activity than public spending cuts.

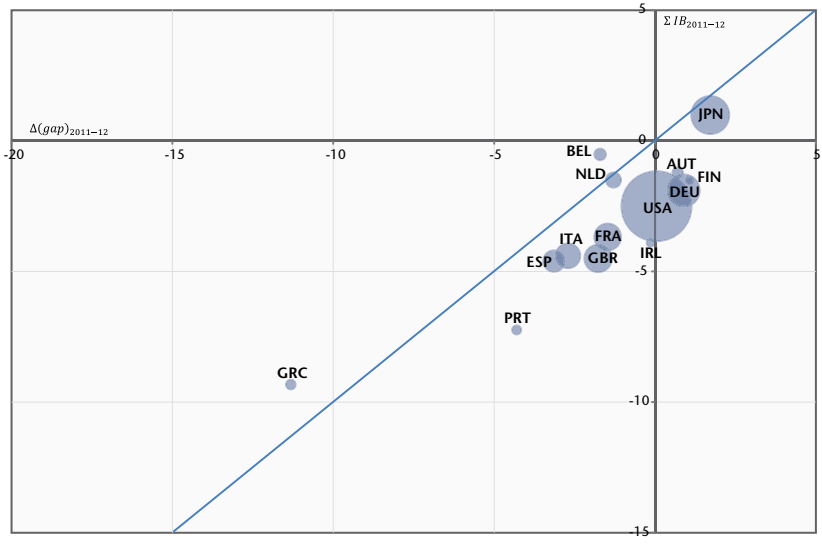
Taking these views into consideration is crucial to assess fiscal consolidation episodes: The higher the value of the multiplier, the costlier is fiscal consolidation. Such an assessment should rely on a careful analysis of the economic, financial and monetary context. Looking at the situation of euro area economies in 2012 certainly gives credit to the hypothesis of a high multiplier. Monetary policy rates have indeed rapidly decreased to the zero lower bound. The unemployment rate has reached record levels in the euro area. For

8. Using a dataset of EU-26 countries, Vranceanu and Besancenot (2013) find empirical results in line with Corsetti *et al*'s analysis.

all countries but Germany, it stands well above estimated NAIRUs. It is not always easy to disentangle between countries resorting to consolidation based on expenditures cuts or tax increases. Finally, the synchronization of fiscal consolidation across countries may also certainly tend to raise the value of the multiplier.

This hypothesis is confirmed when taking together 2011 and 2012, years of very strong fiscal impulses. Figure 1 compares, on the one hand, changes in the output gap from end 2010 to 2012 (on the x-axis) and, on the other hand, the cumulative fiscal impulse for 2011 and 2012 (y-axis), based on OECD *Economic Outlook* data. We obtain the short-term impact of fiscal consolidation. Figure 1 depicts this relationship, showing a close link between fiscal restraint and economic slowdown.

Figure 1. Fiscal impulses 2011-2012 and changes in the output gaps



Source: OECD, *Economic Outlook* 91, June 2012. The year 2012 is a projection (OFCE forecast October 2012). The area of the bubbles is proportional to real GDP in 2011 ($ PPP).

For most countries, the "apparent" multiplier is less than 1 (the lines connecting each of the bubbles are below the bisector, the "apparent" multiplier is the inverse of the slope of these lines). Figure 2 refines the assessment. The changes in the output gap are corrected for the "autonomous" dynamic of the closing of the output gap (if there had been no impulse, there would have been a

closing of the output gap, which is estimated as taking place at the same rate as in the past) and for the impact of each country's budget cutbacks on the other partners through the channel of foreign trade. The bubbles in this chart therefore replace the bubbles in Figure 1, integrating these two opposing effects, which are evaluated here while seeking to minimize the value of the multipliers. In particular, because the output gaps had never been so large, it may be the case that they are closing faster than in the past 30 or 40 years, which would justify a more dynamic counterfactual and therefore higher fiscal multipliers.

Austria and Germany are exceptions. As these two countries enjoy a more favourable economic situation (lower unemployment, better business conditions), it is not surprising that the multiplier is low there. Despite this, the "corrected apparent" multiplier is negative. This follows either from the paradoxical effects of the incentives, or more likely from the fact that monetary policy is more effective and that these two countries have escaped the liquidity trap. But the correction provided here does not take into account any stimulus from monetary policy.

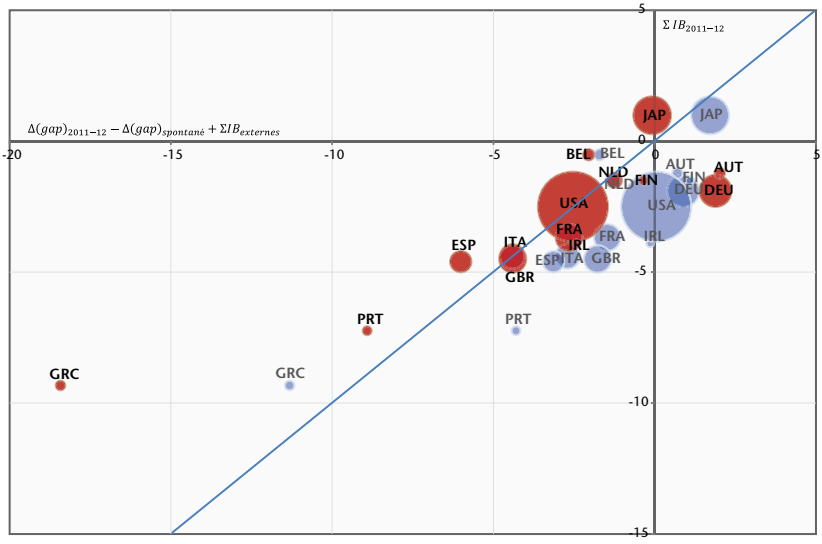
In the United States, the "2011-2012 corrected apparent" multiplier reaches 1. This "corrected apparent" multiplier is very high in Greece (~ 1.5), Spain (~ 1.3) and Portugal (~ 1.2). This suggests that if the economic situation deteriorates further, the value of the multiplier may increase, exacerbating the vicious circle of austerity.

For the euro area as a whole, the "corrected apparent" multiplier results from the aggregation of "small open economies". It is thus higher than the multiplier in each country, because it relates the impact of fiscal policy in each country to the whole area and not only to the country concerned. The aggregate multiplier for the euro area also depends on the composition of the austerity packages, and more especially on the countries where the measures are being implemented. However, the biggest negative fiscal impulses take place in areas where the multipliers are highest or in the countries in deepest crisis. The result is that the aggregate multiplier for the euro area is 1.3, significantly higher than the multiplier derived for the US.

A comparison of the fiscal plans for 2011 and 2012 with the economic cycle in those years yields a high estimate for the fiscal

multipliers. This confirms the dependence of the multiplier on the cycle and is a serious argument against the austerity approach.

Figure 2. Fiscal impulse 2011-2012 and adjusted changes in the output gap



Source: OECD, *Economic Outlook* 91, June 2012. The year 2012 is a projection (OFCE forecast October 2012). The area of the bubbles is proportional to real GDP in 2011 ($ PPP).

2. Short description of the model and calibration

The simulations are done with a macroeconomic model that combines structural and reduced-form non-linear equations. An exhaustive presentation of the model and its calibration is available in the appendix of iAGS 2013 Report.[9] It is a simple reduced-form equation model to analyse complex supply and demand mechanisms that can be heterogeneous across countries. In contrast with DSGE models which are linearised around a single equilibrium, our model notably allows for variable fiscal multipliers over the business cycle. Indeed, the value of the fiscal multiplier is endogenous and determined according to the size of the output gap. The parameters of the model are calibrated to allow the analyses of various scenarios. It is far more tractable than DSGE models and given the current context, it may better capture the

9. http://www.iags-project.org/documents/iags_appendix2013.pdf.

effect of fiscal policy on the output gap. It does not rest on structural hypotheses regarding agents' behaviour (representative rational agent), hypotheses which are today largely debated.[10] By the way, it may be more consistent with recent empirical developments regarding the size of fiscal multipliers. It enables to reflect more accurately the current economic situation which may be better described by a Keynesian environment. Yet, the model is also sufficiently tractable to allow for alternative hypotheses. It is easy to modify the parameters defining the fiscal multiplier and to account for New Classical hypotheses where fiscal policy has only a limited impact on output. Hence, this kind of model is helpful to shed some lights on the effects of various economic policy shocks according to a given set of transparent hypotheses.

The key features of the model are the following:

— It allows for an explicit representation of the main euro area countries: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal and Spain. An aggregated euro area is also computed.

— On the demand side, an open economy aggregate demand function is represented, with fiscal and monetary policy, external demand (a channel for intra EU interdependencies) as well as exogenous shocks on the output gap (the gap between actual and potential GDP). The equation is written as an error-correction model. It may also take into account possible long run effects of macroeconomic policies such as long term fiscal policy, debt-related threshold effects and hysteresis on potential output. The stabilization of the economy stems from adjustments in the long-term interest rates and competitiveness, which have feedback effects on the output gap. The stabilisation may then hinge on private demand (through interest rates adjustment and monetary policy) and on external demand (through the decrease in relative prices). The calibration allows to simulate standard hypotheses as well as alternatives, checking the dependence of results on different sets of hypotheses. Furthermore, the size of fiscal multipliers is allowed to vary along the business

10. These issues are notably discussed by Fagiolo and Roventini (2012).

cycle. The ineffectiveness of monetary policy is made possible when the economy hits the zero lower bound (ZLB).

— External demand is modelled using a bilateral trade matrix representing interdependencies between countries. The trade matrix is also used as a basis for imbalances analysis.

— We model prices by a generalized Phillips curve relating current and expected inflation to the output gap, imported inflation and other exogenous shocks. Expectations can be modelled as adaptive (backward-looking) or rational (forward-looking).

— A Taylor rule sums up monetary policy, except under the zero lower bound.

— Changes in the short term monetary policy rate are then passed through the long-term interest rates. Hence, according to the expectations theory, the long-term interest rate for German public bonds is set equal to the expected sum of future short term interest rates (Shiller, 1979), with short-term interest rates set by the (European) central bank. The long-term public rate for Germany is considered risk free, and long-term public rates for other countries include a risk premium that is set exogenously. We also temporarily set exogenously the long-term rate for countries that entered the EFSF to account for a lower interest rate on debt refinancing. Finally, for each country the long-term interest rate on private bonds is equal to the public one plus a risk premium that is set exogenously.

— The stance of monetary policy remains expansionary as long as the euro area aggregate output gap is negative and if inflation is below the 2% target. In case of a negative idiosyncratic demand shock, the convergence to the potential growth rate hinges partly on the effect of common expansionary monetary and on a competitiveness effect. Due to hysteresis effect, the output level may be permanently affected by a negative demand shock. But trend growth will always converge to an exogenously set path. The hypothesis regarding long run growth rates are presented in table A1 in the appendix.

— We call $\tilde{y}_c$, the gap between the log of real GDP Y of country c, and a baseline trajectory for the output growing at a constant growth rate. A distinction is then made between

potential GDP and this baseline. This gap is noted y^*_c. Then, y_c is the output gap of country c, i.e. the difference between $\tilde{y}_c$ and y^*_c. The real GDP growth rate is given by potential GDP growth and the output gap.

— The public balance separates interest payments, cyclically-adjusted balance and cyclical components, in order to properly assess the fiscal stance, *i.e.* the part of fiscal policy which is under the direct control (discretion) of current governments. We then derive public debt projections for euro area countries.

The structural primary surplus evolves according to the fiscal impulse (which is set exogenously, at levels given by Stability programmes, except otherwise stated) and to changes in taxes due to variations in the gap between potential output and the baseline. A permanent downward shift in potential output relative to the baseline entails a permanent fall in taxes, hence a permanent fall in the structural primary surplus. The average interest rate on debt varies according to the long-term nominal interest rate on newly issued public bonds. The average maturity of public debt is assumed to be constant. The inverse of average maturity gives the share of debt refinanced every year. Public debt (in % of nominal GDP) varies according to its usual law of motion.

We introduce a state-dependent fiscal multiplier, in accordance with the consensus mentioned in the former section of the paper. The fiscal multiplier μ_t is modelled as follows:

$$If\ y_{t-1} < y_{min}\ then\ \ \mu_t = \mu_{max}$$

$$if\ y_{t-1} > y_{max}\ then\ \mu_t = \mu_{min}$$

$$if\ y_{inf} \leq y_{t-1} \leq y_{sup}\ then\ \mu_t = \mu_0$$

$$if\ y_{min} \leq y_{t-1} \leq y_{inf}\ then\ \mu_t = \mu_{max} + (\mu_0 - \mu_{max})/(y_{inf} - y_{min}) * (y_{t-1} - y_{min})$$

$$if\ y_{sup} \leq y_{t-1} \leq y_{max}\ then\ \mu_t = \mu_0 + (\mu_{min} - \mu_0)/(y_{max} - y_{sup}) * (y_{t-1} - y_{sup})$$

The value of the multiplier is maximal in very bad times, whereas it is minimal in very good times (see Figure 3). We define normal times as economic states in which the output gap stands between -1.5% and 1.5%. In that case, we set the *ex ante* instantaneous fiscal multiplier to 0.5 for large countries (Germany, France, Italy and Spain), and to 0.3 for other countries, accounting for the fact that fiscal multipliers are generally smaller for small open

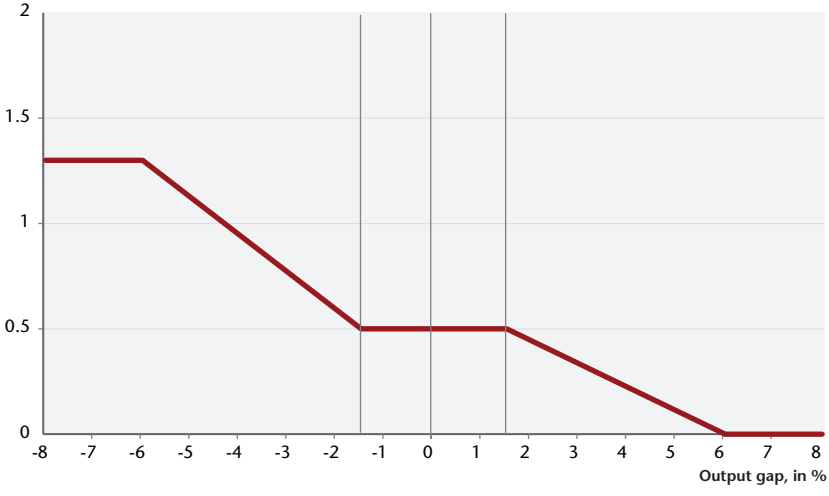
economies than for large countries (Ilzetsky *et al.*, 2013). When the output gap is larger than 1.5%, the *ex ante* instantaneous fiscal multiplier linearly decreases down to 0 when the output gap reaches 6%. In bad times, the *ex ante* instantaneous fiscal multiplier increases as the output gap deteriorates. We set its maximum value between 1 and 1.3 when the output gap reaches -6% (Table 1).

Table 1. Fiscal multipliers

	DEU	FRA	ITA	ESP	NLD	BEL	GRC	PRT	IRL	AUT	FIN
Fiscal multiplier μ_0	0.4	0.5	0.5	0.5	0.5	0.3	0.5	0.5	0.3	0.6	0.5
Maximum multiplier μ_{max}	1.0	1.3	1.2	1.3	1.3	1.3	1.5	1.3	1.0	1.0	1.0

Source: Authors' estimates.

Figure 3. Example of the value of the multiplier according to the output gap



Note: μ_{max} = 1.3, μ_0 = 0.5, μ_{min} = 0, y_{min} = -6%, y_{inf} = -1.5%, y_{sup} = 1.5% and y_{max} = 6%. Values are illustrative and may vary across countries.
Source: Authors' estimates.

Drawing on exogenous fiscal impulses, we compute an effective fiscal impulse, representing the *ex ante*[11] cumulative real effect of current and past fiscal impulses at time *t*. We retain 7 lags to account for the possibility of long lasting effects of fiscal impulses

11. It is an *ex ante* multiplier in the sense that it does not take into account monetary policy effects and external trade feedback effects on GDP following a fiscal impulse.

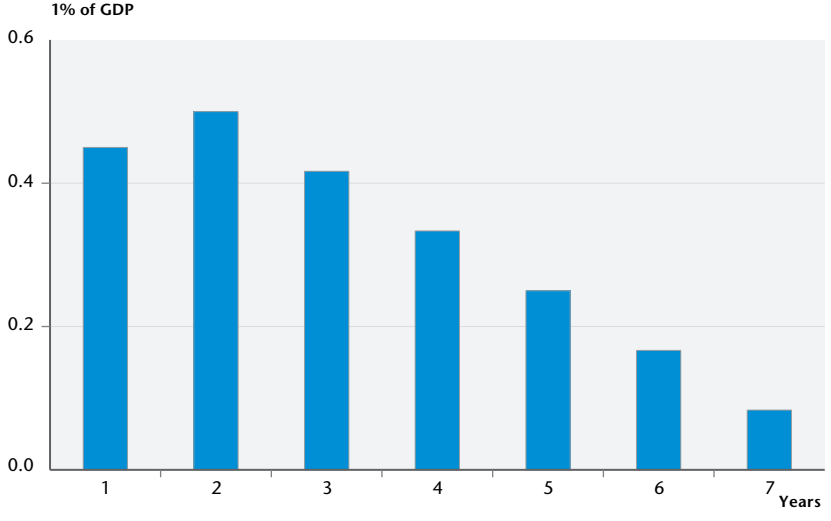
(Figure 4). With $\psi_k.\mu_{t-k}$, the fiscal multiplier at time t of a fiscal impulse that occurred k years ago, we can write:

(1) $$\Delta EFI_t = \psi_0.\mu_t.FI_t + \psi_1.\mu_{t-1}.FI_{t-1} + \psi_2.\mu_{t-2}.FI_{t-2} + \psi_3.\mu_{t-3}.FI_{t-3} + \psi_4.\mu_{t-4}.FI_{t-4} + \psi_5.\mu_{t-5}.FI_{t-5} + \psi_6.\mu_{t-6}.FI_{t-6} + \psi_7.\mu_{t-7}.FI_{t-7}$$

(2) $$\Sigma FI_t = \Sigma FI_{t-1} + \mu_t.FI_t$$

Equation (1) ensures that the fiscal impulse impact depends on the fiscal multiplier which prevailed when the fiscal impulse occurred. We also assume that *EFI* can take into account long run effects of fiscal policy. It is the case if $\psi_\alpha = \Sigma_{k=0}^{7} \psi_k \neq 0$, since in that case *EFI* is not necessarily null in the long run. The long run impact of a sequence of fiscal impulses is then computed using the accumulation of fiscal impulses times the multiplier (Equation (2)); the long run impact on potential GDP is: $\mu_\alpha.\Sigma FI_t$.

Figure 4. Effective fiscal impulse in normal times with $\mu_t = 0.5$ following a positive fiscal impulse



Source: Authors' estimates.

3. The costs of fiscal consolidation

We use our model to simulate the path of output gap and public debt according to the consolidation plans. The aim is twofold. First, we assess the cost of consolidation, in terms of the

output gap. The maximum negative value for the output gap as well as the time needed for output gaps to get back to zero provide insights on the consequences of austerity. Second, as the aim of implemented consolidation measures is to bring back the debt-to-GDP ratio to 60% by 2032, which is the horizon of the 1/20th debt rule incorporated in the revised SGP and in the Fiscal Compact, we pay attention to the ability of member states to reach this target, and to comply with existing fiscal rules. A full discussion on the rationale of this objective goes beyond the scope of this paper. It is indeed not clear that there is a need for some or most euro area countries to consolidate. A significant part of the deficit may be cyclical. Besides, it must be stressed that it does not match any theoretical definition of fiscal sustainability[12] nor does it correspond to the equilibrium value for public debt. This may only be seen as an institutional objective that euro area members have to comply with.

The first six columns of Table 2 report the public debt and the structural balance respectively in 2012, 2017 (5-year horizon) and 2032 (20-year horizon). The cumulated fiscal impulse for 2013-2015 sums up the short-term fiscal stance in the euro area as it cumulates forecast variations in structural primary government spending and taxes.[13] We report the average annual growth rate of real GDP for 2013-2017 and 2018-2032, and the sovereign interest rate spread vis-à-vis Germany in 2013-2015. A description of the main underlying hypotheses is given in the Appendix.

Table 2 reports how tough austerity will be all over the euro area: between 2013 and 2015, all member states except Germany and Finland will improve their cyclically-adjusted primary public deficit by at least 2% of GDP. Spain, Portugal, Ireland and Greece will make even stronger efforts. This highly contractionary fiscal stance will make it ever harder to achieve an output gap at or above

12. The issue of public debt sustainability is theoretically and empirically unsettled, between promoters of investigating the statistical properties of public finances' variables on the one hand, and, on the other hand, promoters of investigating the macroeconomic incidence of public finances (Bohn, 2007, calls it "a return to economic thinking"). Stated briefly, sustainability refers to the ability of the general government to pay back the domestic public debt. This ability depends on the future available scope for spending cuts and tax hikes, but also on future economic growth.

13. Government spending is net of interest payments and spending and taxes are adjusted for cyclical variations.

zero in our simulations: countries will not fully recover from the crisis until 2019 (Austria, Finland), 2020 (Germany, France, Italy, Spain, Portugal) or 2021. Meanwhile, the aggregate euro area output gap will reach -4.8%. Hence, the cumulated fiscal impulse, starting already from negative output gaps and associated large fiscal multiplier effects, will lead to gloomy growth prospects for the euro area. Germany and Austria will be exceptions, since they will face almost no further real cost with their forecast fiscal strategy thanks to milder consolidation plans.

Table 2. Baseline scenario

	Public debt (% of GDP)			Structural balance (% of GDP)			Cumulated fiscal impulse (% of GDP)	Average annual growth		Maximum negative output gap reached	Sovereign rate spread to Germany
	2012	2017	2032	2012	2017	2032	2013-2015	2013-2017	2018-2032	2013-2032	2013-2015
Germany	82	67	26	0.3	0.9	1.8	-0.3	1.4	1.3	-0.7	0.0
France	90	91	52	-1.4	-0,2	0,2	-2.9	1,9	2.2	-6.8	0.0
Italy	127	109	18	0.3	2.4	5.5	-2.1	1.6	1.4	-6.5	0.7
Spain	86	101	83	-3.7	-2.1	-2.2	-4.3	1.7	2.3	-9.7	0.8
Netherlands	69	68	48	-2.9	-0.8	-0.8	-2.9	2.0	2.1	-2.8	0.0
Belgium	100	91	38	-0.9	0.6	1.8	-2.2	2.1	2.1	-4.3	0.2
Portugal	119	133	79	-2.8	-0.8	0.7	-4.7	0.9	1.8	-10.1	1.2
Ireland	118	140	105	-5.0	-2.4	-2.3	-5.7	1.0	2.6	-10.9	1.0
Greece	177	199	93	-0.6	1.3	3.0	-7.5	0.2	2.5	-17.1	1.1
Finland	53	45	8	0.2	0.1	1.9	-1.3	2.4	2.2	-1.9	0.0
Austria	75	68	40	-2.5	-0.3	0.3	-1.9	1.7	1.6	-0.9	0.0
Euro area	94	88	43	-1.0	0.3	1.2	-2.2	1.6	1.8	-4.8	0.3

Sources: Eurostat, iAGS model.

Regarding public debt-to-GDP ratios in 2032, the simulations suggest that even though some countries (Spain, Portugal, Ireland and Greece) do not reach the 60% threshold, debt ratios are substantially lowered. For instance, Greece would halve its debt ratio and Ireland's debt would decrease by 35 percentage points of GDP between 2017 and 2032. Nevertheless, the social costs as well

as the cost in terms of fiscal balance could make this adjustment unrealistic. Christodoulakis (2013) shows that fiscal austerity in Greece has been self-defeating. For Greece, Italy, Portugal and Belgium, austerity measures planned would indeed require structural primary surpluses above 3% of GDP for many years, which has rarely been achieved in history of fiscal consolidation.

Besides, our simulations show that the long-run debt-to-GDP ratio in many euro area countries is astonishingly low: 26% in Germany, 18% in Italy, even 8% in Finland. There is no reason to consider that this figure is consistent with preferences in these countries notably because public bonds are highly demanded on financial markets, especially "risk-free" bonds like German *Bunds*. Consequently, this outcome questions the relevance of fiscal austerity in these countries. The baseline scenario may then go too far in terms of fiscal sustainability. To sum up, this scenario considers fiscal restrictions that go beyond the requirements of fiscal sustainability. Debt sustainability is a relative concept which should not be assessed regardless of the cost of achieving it. Consolidation also goes beyond the requirements of EU fiscal rules – for a country under an excessive deficit procedure, the minimum improvement in public finances per year is an increase of 0.5% in the cyclically-adjusted balance – and, undoubtedly, beyond the social resilience of European citizens.

We introduce a first variant where we consider a strict implementation of current fiscal rules, and we compute a sequence of fiscal impulses over 2015-2032 that allows to reach the 60% target in each member state, assuming that fiscal impulses for the years 2013 to 2015 remain unchanged. Thus, we aim at gauging if all countries can reach the public debt target in 2032. For countries which already achieved this threshold, we implement *positive* fiscal impulses after 2015 so that debt-to-GDP is equal to 60% in 2032. For simplicity, we set fiscal impulses at -0.5 or +0.5 depending on the gap *vis-à-vis* the target: the fiscal impulse is negative (resp. positive) if actual debt is above (resp. below) the target. The cumulated fiscal impulse is larger than in the baseline scenario for countries which cannot achieve 60% in this scenario, whereas it is lower for the other countries. Comparisons between the baseline scenario and this variant, based on structural balances and average annual growth rates, indicate the costs or gains of sticking to the debt

target at 20-year horizon in all countries. The question of fiscal sustainability is crucial for Greece, Ireland, Portugal and Spain since they do not reach this targeted debt level in the baseline scenario, whereas the question of the costs of fiscal retrenchment is crucial for countries which go beyond EU fiscal legislation requirements in the baseline scenario.

Results are reported in Table 3. Striking results are threefold. First, two countries – Ireland and Greece – are still unable to achieve the debt-to-GDP target. It does not preclude fiscal sustainability *per se*, but it entails further social unsustainability of public finances: the fiscal stance over 2013-2032 produces a cumulative fiscal impulse which is highly negative and twice as high (in absolute values) as in the baseline scenario. Such a fiscal stance is entirely unrealistic and inefficient: economic growth in the medium-run would be lowered substantially, and the maximum negative output gap would be even larger. This outcome ensues from the high value of the fiscal multiplier when the output gap is strongly negative, from inertial processes in economic growth once hysteresis is introduced, and from the relatively insufficient decrease in real interest rates, since these two countries suffer from low or negative inflation rates until 2020.

Second, Spain and Portugal achieve the debt target in 2032, but under substantially more restrictive fiscal stances. Fiscal adjustment under such conditions seems unrealistic and unreasonable: between 2013 and 2017, both countries would experience slower economic growth than in the baseline, hence postponing until 2025 (Portugal) and 2027 (Spain) the return to a zero output gap.

Third, countries with public debt levels below the debt target in 2032 have fiscal leeway and then implement expansionary fiscal policies:[14] indeed, the cumulated fiscal impulse improves by 2.7 percentage points in Germany, 1 in France, 4.2 in Italy, 5.7 in Finland and 1.4 in Austria in this variant compared to the baseline scenario. Despite fiscal leeway and relatively high fiscal multipliers in the short run, the net gain in terms of economic growth is however very small. The reason lies in trade interactions within the

14. An alternative scenario would have been to suppose that these countries pursue a neutral fiscal policy. But the difference with the scenario where they adopt expansionary fiscal policy to reach the 60% in 2032 would have been very small.

euro area: the margins for manoeuvre for some countries are offset by the large real difficulties resulting from the implementation of a more restrictive fiscal stance in Southern countries and Ireland. Besides, countries that implement expansionary fiscal policies have a small output gap. The fiscal multiplier is then lower.

Table 3. Can the 60% target be reached in 2032 and what are the costs in terms of growth?

	Public debt (% of GDP)			Structural balance (% of GDP)			Cumulated fiscal impulse (% of GDP)	Average annual growth		Maximum negative output gap reached
	2012	2017	2032	2012	2017	2032	2013-2032	2013-2017	2018-2032	2013-2032
Germany	82	68	60	0.3	-0.1	-1.8	2.4	1.5	1.3	-0.7
France	90	89	60	-1.4	-1.1	-0.8	-1.9	2.3	2.1	-6.8
Italy	127	109	60	0.3	1.4	0.4	2.1	1.8	1.4	-6.5
Spain	86	104	60	-3.7	-1.3	1.3	-8.2	1.3	2.2	-9.8
Netherlands	69	68	60	-2.9	-1.6	-1.9	-2.0	2.1	2.0	-2.8
Belgium	100	91	60	-0.9	-0.3	-0.6	-0.3	2.3	2.1	-4.3
Portugal	119	137	60	-2.8	-0.1	3.7	-8.2	0.4	1.8	-10.2
Ireland	118	144	71	-5.0	-1.7	5.2	-13.7	0.5	2.5	-11.0
Greece	177	206	84	-0.6	1.9	8.9	-15.5	-0.4	2.3	-17.3
Finland	53	46	60	0.2	0.1	-4.3	3.4	2.5	2.2	-1.9
Austria	75	69	60	-2.5	-1.2	-1.7	-0.5	1.8	1.6	-0.9
Euro area	94	89	61	-1.0	-0.3	-0.5	-1.0	1.7	1.8	-4.9

Sources: Eurostat, iAGS model.

4. No pain, more gain: the case for delaying consolidation

The previous results show unambiguously that fiscal consolidation is costly. The output gap is strongly reduced by austerity and in some countries it would reach record low levels. Besides, for all euro area countries, it will take time to recover from the crisis since the output gap would not close until 2020. This is the consequence of past, current and future consolidation measures. But even countries that would reach the 60% debt ratio without additional fiscal

effort will be negatively affected by austerity implemented in other countries.

The most negative consequences are borne by Spain, Portugal, Greece and Ireland. These countries are those where the fiscal multiplier is the highest. The cost of austerity is then amplified and the effectiveness of consolidation, i.e. the ability to stick to the objectives settled in the European fiscal rules, is reduced. There is clearly a trade-off in the short term between economic growth and debt and this trade-off strongly hinges on the value of the fiscal multiplier. The higher the multiplier, the costlier consolidation and the smaller the public debt decreases. This trade-off raises the following question: is there an optimal situation where the same objective for public debt ratios may be reached while reducing output losses? If countries had the opportunity to delay austerity measures, they would benefit from higher growth, but what would be the consequences on debt? It is likely that the output gap would close more rapidly, hence implying lower values for the fiscal multiplier. By taking advantage of this time-varying feature of multipliers, it would be possible to optimize the effectiveness of fiscal consolidation. In order to compute such a variant, we seek for each country separately the date at which it would be optimal to start consolidation. This date may be different across countries as it depends on the initial conditions. It must be stressed that for each country, the simulations are done everything else equal and notably given the fiscal impulses in the other countries. Optimization is then partial as there may be feedback effects, which are ignored here. Besides, we keep interest rates spreads constant relative to the baseline scenario. This is clearly a strong hypothesis as part of the rise in sovereign yields spreads may be explained by fear of default. Then, frontloading austerity was perceived as the only way to convince financial markets that countries care about fiscal sustainability. Yet, we advocate that delaying fiscal austerity should go along with institutional arrangements ensuring that due measures will be taken in the future. The case for constant spreads may for example be warranted by the central bank playing the role of lender of last resort for sovereigns.

We consider a (small, permanent and negative) fiscal impulse at a certain year (and no fiscal impulse for any other year), and then we run the model and calculate the decrease in the public debt-to-

GDP ratio in 2032. This simulation is done at each date between 2013 and 2032 and for each country. The algorithm is simple: given the assumption of a homogeneous initial debt-to-GDP ratio across countries, given the timeframe for reducing debt to 60% of GDP (20 years), and given a maximum fiscal impulse of Imax=±0.5, it is possible to select the timing of the first fiscal impulse based on the maximum efficiency of fiscal impulse. Figure 5 suggests that when the fiscal multiplier is *constant*, austerity is more efficient (in terms of debt reduction) when the negative fiscal impulse is done in the first period (frontloading strategy). Implementing a 1 percentage point fiscal impulse in 2013 would lead to decrease by nearly 20 percentage points the public debt-to-GDP ratio in 2032. When the fiscal impulse is implemented in 2021, the debt ratio is only 11 percentage points lower in 2032 than in 2012. Since the fiscal impulse is small, this is an approximation of the first derivative of debt to GDP ratio 20 years from now relative to impulse in any year from now. If the model is linear (no hysteresis and constant fiscal multiplier), then, debt reduction is independent of initial conditions and derivatives are independent of the size of the impulse.

Things get more complicated when we consider time-varying multipliers, hysteresis effects and *different* initial conditions. Figure 6 is based on a business cycle-dependent multiplier and includes negative output gaps described above as initial conditions to the system. In such a model and for given initial conditions, multipliers are higher than a given critical value for which it is equivalent to implement fiscal restriction now or one year later, for a given amount of debt reduction. Thus postponing the negative fiscal impulse by one year or more may be more efficient for debt reduction (backloading strategy). For Germany where the output gap was close to zero in 2012, there is no gain in postponing fiscal consolidation. The maximum impact of consolidation is given when consolidation starts in 2013. However, for Greece, starting consolidation in 2013 gives poor results in terms of public debt reduction. The output gap is indeed strongly negative and the value of the fiscal multiplier is high. A fiscal impulse implemented in 2013 would thus have a strong negative impact on output. The negative feedback effect on the cyclical public deficit would mitigate the decrease in public debt. For Greece, a 1 percentage point fiscal consolidation would decrease public debt in 2032 by less

than 3 percentage points. The best year to start consolidation would be 2017 as the fall in the public debt ratio would reach nearly 13 percentage points in 2032. Using this algorithm for each euro area country, we obtain the year when it is optimal to start fiscal consolidation.

Figure 5. Debt reduction in 2032 for a 1.0 fiscal impulse on a given year

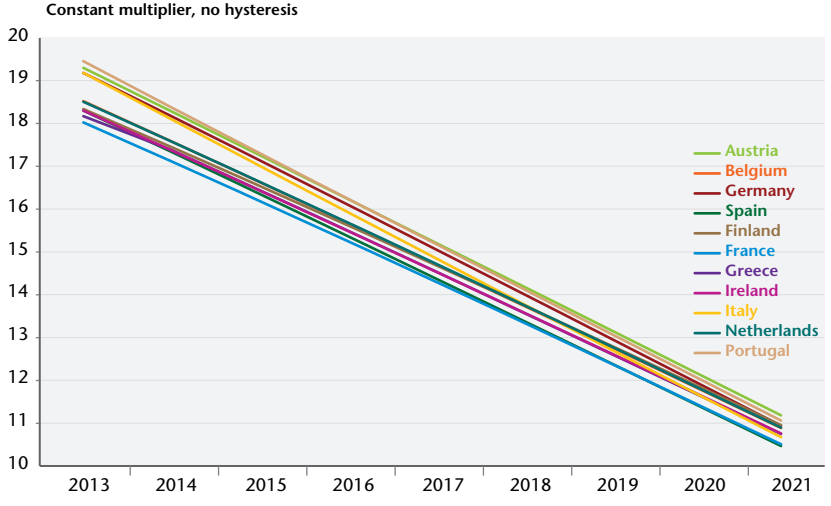
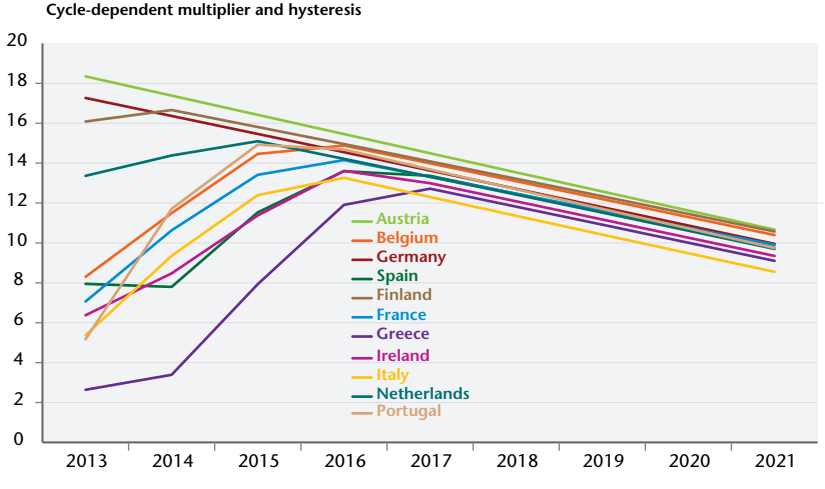


Figure 6. Debt reduction in 2032 for a 1.0 fiscal impulse on a given year, non linear model



Following the dynamics shown on Figure 6, the aforementioned algorithm states that fiscal impulses should not start in 2013 in most countries. The necessary sequence for debt reduction would thus follow a pattern of no impulse before the inflexion date and an impulse equal to Imax after the inflexion date, as long as necessary to reduce debt to 60% of GDP in 2032. Table 4 indicates the optimal date to start fiscal consolidation.

It may happen – as we describe below – that the debt target cannot be reached through this process. In this case, we compute the Imax which would allow reaching the 60% debt-to-GDP ratio.

We show that in the case of a large negative output gap, postponement is more effective to reduce public debt, because of the high current value of the fiscal multiplier. Accordingly, we find that there are 6 countries where it would be better to delay consolidation (Table 4). The effectiveness of consolidation would be increased in so far as time would be given for growth to recover. Such a strategy implicitly boils down to a 2-step approach. It stresses that it is first needed to let the cyclically-adjusted deficit be reduced in line with the closing of the output gap. Once the output gap is closed, it becomes more effective to undertake fiscal consolidation *per se*, i.e. the requested reduction of the structural deficit. Thus, for Greece, it would be more effective to start consolidation in 2017. For France, Spain and Ireland, it would be better to implement a neutral fiscal policy until 2016. Finally, for the Netherlands and Portugal, debt reduction would be optimized if consolidation started in 2015.

Comparing Table 4 to Table 2, we show that delaying fiscal consolidation leads to a higher average growth in 2013-2017 in concerned countries, and also for the euro area as a whole (2.4% for 2013-2017, against 1.7% without delaying the adjustment). Greece is again the country which would benefit the most from delaying fiscal consolidation. Yearly average growth would be 4.5 percentage points higher between 2013 and 2017. Then, as the output gap would close more rapidly, the average growth would be slightly lower from 2018 to 2032. It must be stressed again that postponing consolidation in these simulations would lead to achieve the same debt target, relatively to the situation where consolidation is only spread over time, with a cumulated fiscal impulse that would be only half as large. This is extensively

explained by the cycle-dependent multiplier, which makes austerity less painful since it is postponed until the multiplier reaches a lower value. Considering this argument, we may also argue that forward looking financial markets would also consider that it is more efficient to consolidate later. Then, if they worry about fiscal sustainability and public debt default, it is not clear whether interest rate spreads would necessarily increase. Furthermore, it may be needed to enforce the credibility of postponed austerity by appropriate institutional arrangements. The ECB should notably play a crucial role. As reminded by De Grauwe (2012), countries in monetary union are more prone to speculative attacks, which strengthens the argument for central banks in monetary union being lender of last resort for sovereigns. Similarly, Portugal, Spain, and Ireland combine a gain of 0.5 to 0.6 percentage point of growth on average over the same period

Table 4. Is it more appropriate to postpone the start of fiscal adjustment?

	Public debt (% of GDP)			Structural balance (% of GDP)			Cumulated fiscal impulse (% of GDP)	Average annual growth		Maximum negative output gap reached	Starting date of fiscal impulses (sign of FI)
	2012	2017	2032	2012	2017	2032	2013-2032	2013-2017	2018-2032	2013-2032	
Germany	82	74	60	0.3	-1.3	-1.1	1.6	1.6	1.3	-0.7	2013 (+)
France	90	86	60	-1.4	-1.2	-0.8	-1.1	2.8	2.1	-4.0	2016 (-)
Italy	127	107	60	0.3	-0.7	1.3	1.9	2.4	1.3	-3.0	2013 (+)
Spain	86	95	60	-3.7	-4.0	2.4	-7.3	3.1	1.9	-5.7	2016 (-)
Nether-lands	69	72	60	-2.9	-2.1	-1.6	-2.1	2.3	2.0	-2.1	2015 (-)
Belgium	100	90	60	-0.9	-1.3	-0.5	0.1	2.7	2.0	-3.2	2013 (+)
Portugal	119	116	60	-2.8	-1.7	1.9	-3.3	2.4	1.6	-3.3	2015 (-)
Ireland	118	123	78	-5.0	-5.1	2.7	-8.0	3.2	2.2	-4.7	2016 (-)
Greece	177	141	60	-0.6	-0.3	2.8	-1.5	4.1	1.9	-7.1	2017 (-)
Finland	53	56	60	0.2	-2.3	-2.8	1.8	2.6	2.2	-1.3	2013 (+)
Austria	75	72	60	-2.5	-1.6	-1.4	-0.9	1.7	1.6	-0.9	2013 (-)
Euro area	94	88	60	-1.0	-1.6	-0.1	-0.7	2.4	1.7	-2.9	

Sources : Eurostat, iAGS model.

when they delay fiscal consolidation and implement a bigger cut in their structural deficit. For France, average growth would be 0.2 percentage point higher compared to the situation where consolidation is spread over time. This improvement would stem from the better prospects of trade partners within the euro area. It remains to be said that this mild improvement would give a net gain of 0.5 percentage point in comparison with the baseline situation where the French government sticks to its current fiscal commitments.

For Austria and Germany, the second variant would not entail significantly less consolidation. On the one hand, those countries would benefit from a stronger growth in the rest of the euro area. But, on the other hand, interest rates would be higher as a result of a relative tightening of monetary policy, through the Taylor rule. For Germany, real interest rates would on average amount to 1.7% when consolidation is delayed in all other euro area countries against 1% in the scenario where current commitments are fulfilled.

5. Conclusion

Drawing on a reduced-form model of most euro area member states, we assess the costs of the frontloaded strategy endorsed by governments, under the auspices of the European Commission, in terms of economic growth and also in terms of fiscal sustainability. Beyond clarifying the failure of this strategy, we discuss an alternative scenario built upon simulations based on the same reduced-form model. We suggest that keeping a debt ratio target of 60% by 2032 and postponing fiscal consolidation would be almost optimal. As a matter of fact, in most countries, long-term sustainability of public finances would be fulfilled while in the short run, economic growth would be higher.

The reduced-form model, though it departs from optimal control modelling, includes major features of the so-called New Consensus (New Classical) school: (partly) forward-looking expectations by consumers, firms and financial markets, a Taylor rule to describe monetary policy setting, the introduction of risk premia on public or private bonds, reliance on the disputable concept of "output gap" and a zero-lower-bound to describe non-linear mone-

tary policy. Despite the similarity of our model with some models used in large international institutions like the European Commission, we achieve new results as regards the appropriate pace of fiscal consolidation in the euro area. Two assumptions are important: fiscal multipliers vary along the business cycle, in accordance with an abundant literature which we review, and hysteresis effects maintain the real GDP fall vis-à-vis its potential. The introduction of a delayed consolidation in the euro area certainly goes beyond the letter of the European treaties; nevertheless, this backloading strategy would significantly alleviate the social consequences of the crisis as it would reduce unemployment. For this strategy to be fully effective, a strong commitment by governments to reduce debt-to-GDP ratios in the future is a necessity: debt reduction must be planned, but only once the output gap has substantially decreased, therefore limiting the costs of consolidation. Governments should pay attention to the size of fiscal multipliers and to the level of the output gap or the unemployment rate before implementing restrictive fiscal policies.

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Appendix : Main hypotheses for the baseline simulations

Simulations begin in 2013. To do so, we need to set some starting point values in 2012 for a set of determinant variables. Output gaps for 2012 come from ECLM-IMK-OFCE forecasts. Potential growth for the baseline potential GDP is based on Johansson *et al.* (2012) projections (see Table A1). Concerning fiscal policy and budget variables, the main hypotheses are as follows:

— The public debt in 2012 comes from the European Commission's autumn 2012 forecast;

— We use the ECLM-IMK-OFCE forecasts for fiscal balances in 2012;

— We use the European Commission's autumn 2012 forecast of interest expenditures for 2012; combined with ECLM-IMK-OFCE forecasts of output gaps in 2012, and model estimates of the cyclical part of the fiscal balance, it gives the structural primary balance for 2012;

— Fiscal impulses come from ECLM-IMK-OFCE forecasts for 2013 (Table A2). For 2014-2015, we use fiscal impulses implied by the Stability and Growth Pact reported in the "Assessment of the 2012 national reform programme and stability programme" for each country.

— Sovereign spreads come from ECLM-IMK-OFCE forecasts for 2013-2015 (see Table A3). We made the hypothesis that the ECB programme of unlimited debt buying on the secondary market (Outright Monetary Transactions) is effective and achieves its goal to bring down interest rates for Italy and Spain. Regarding countries relying on the ESM for debt financing, we assume that Ireland will get direct access to financial markets as of 2014, Portugal as of 2015 and Greece as of 2016.

Table A1. Main hypotheses for 2012

In %

	Public debt	Fiscal balance	Structural primary balance	Interest expenditures	Output gap	Potential growth
Source	European Commission	ECLM-IMK-OFCE	ECLM-IMK-OFCE	European Commission	ECLM-IMK-OFCE	ECLM-IMK-OFCE
Germany	81.7	-0.2	2.7	2.4	-1.0	1.3
France	90.0	-4.4	1.2	2.6	-6.2	2.0
Italy	126.5	-2.5	5.8	5.5	-5.5	1.3
Spain	86.1	-7.4	-0.7	3.0	-8.5	2.0
Netherlands	68.8	-4.4	-0.9	2.0	-2.8	2.0
Belgium	99.9	-3.5	2.6	3.5	-4.8	2.0
Portugal	119.1	-5.5	1.7	4.5	-6.1	1.5
Ireland	117.6	-8.0	-1.0	4.0	-7.4	2.2
Greece	176.7	-6.7	4.8	5.4	-14.1	1.9
Finland	53.1	-0.9	1.3	1.1	-2.1	2.2
Austria	74.6	-3.0	0.1	2.6	-1.1	1.6

Sources: European Commission, ECLM-IMK-OFCE forecasts.

Table A2. Fiscal impulses

In % of GDP

	2013	2014	2015
Germany	0.0	-0.3	0.0
France	-1.8	-0.6	-0.5
Italy	-2.1	0.0	0.0
Spain	-2.5	-1.2	-0.6
Netherlands	-1.2	-1.2	-0.5
Belgium	-0.8	-0.6	-0.8
Portugal	-2.9	-0.6	-0.2
Ireland	-1.8	-2.1	-1.8
Greece	-3.9	-2.7	-0.9
Finland	-1.3	0.0	0.0
Austria	-0.9	-0.3	-0.6

Sources: ECLM-IMK-OFCE forecasts.

Table A3. Sovereign spreads relative to German interest rate on public debt

In %

	2013	2014	2015
Germany	0.0	0.0	0.0
France	0.1	0.0	0.0
Italy	1.3	0.8	0.0
Spain	1.5	0.8	0.0
Netherlands	0.1	0.0	0.0
Belgium	0.5	0.1	0.0
Portugal	1.4	1.2	1.0
Ireland	1.4	1.5	0.0
Greece	1.4	1.2	0.9
Finland	0.0	0.0	0.0
Austria	0.0	0.0	0.0

Sources: ECLM-IMK-OFCE forecasts.