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Fiscal multipliers and beyond

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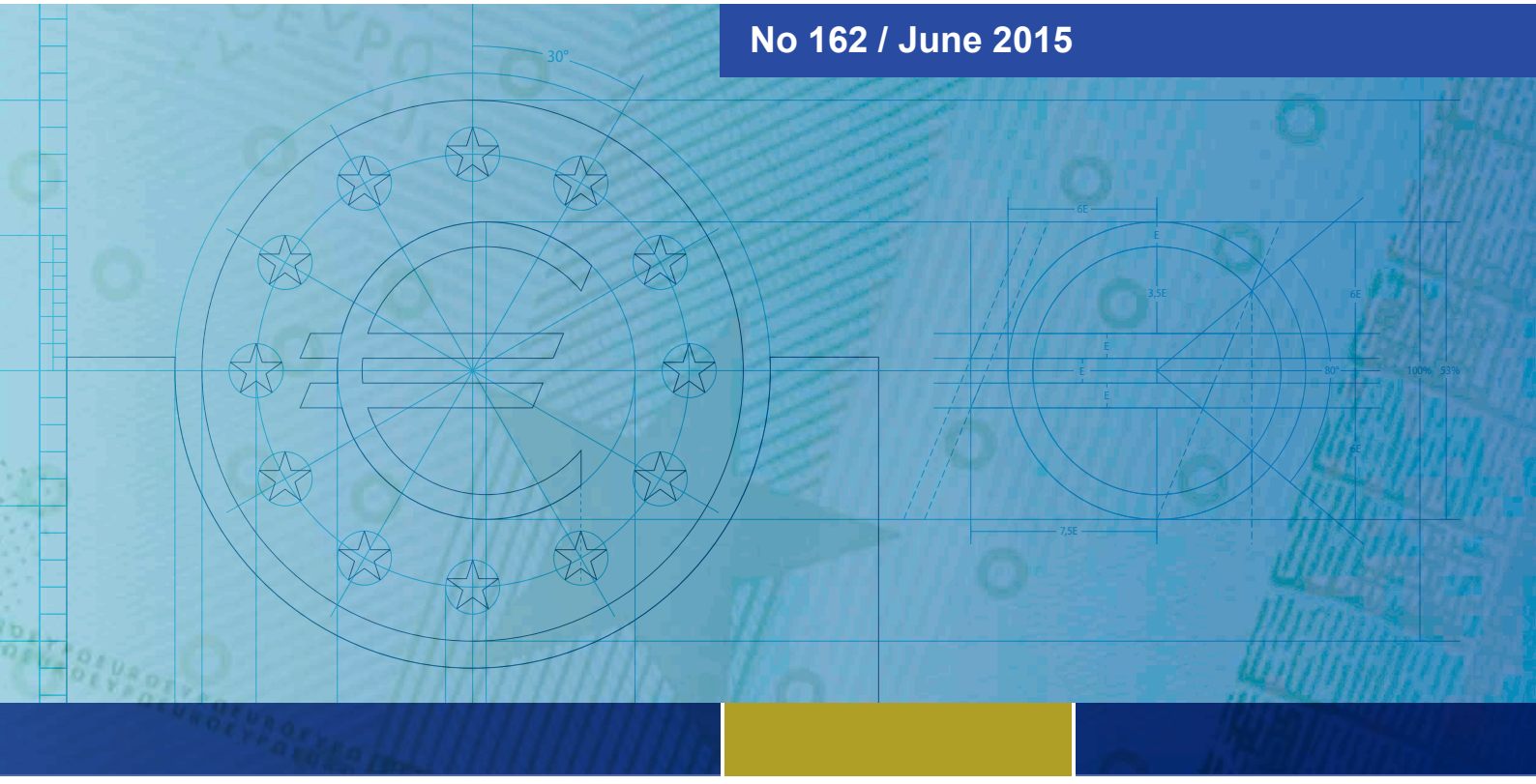

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Abstract

This paper seeks to link the debate surrounding short-term fiscal multipliers with the medium and longer-term impact of fiscal consolidation on public debt sustainability. A literature review and empirical findings for state-dependent multipliers confirm that there is considerable uncertainty surrounding the size of the short-term multiplier. Notably, multipliers may be larger in deep recessions or financial crises, but the negative impact of fiscal consolidation is mitigated when public finances are weak. Using a stylised framework and a range of plausible values for the fiscal multiplier, simulations suggest that an increase in the debt ratio following episodes of fiscal consolidation is likely to be short-lived. Even in a macroeconomic context in which multipliers are high, a frontloaded fiscal consolidation reduces the total consolidation effort and implies a faster stabilisation of the debt ratio. In general, backloading is subject to higher implementation risks, most notably in the light of political economy considerations. Overall, when determining the fiscal adjustment path, both the short-term costs and the longer-term benefits need to be taken into account. Particular attention should be paid to the composition of consolidation packages, with well-designed adjustments likely to imply a faster stabilisation of the debt ratio.

JEL codes: H30, H6, E6

Keywords: Fiscal policies, Government debt, Sustainability, Macroeconomic Aspects of Public Finance

Non-technical summary

The primary objective of this paper is twofold: first, to present a critical assessment of the most recent findings of the literature on state-dependent short-term fiscal multipliers and, second, to go beyond the multiplier discussion and address the topic of potentially self-defeating fiscal consolidation from the perspective of debt sustainability.

The literature review reconfirms that there is considerable uncertainty surrounding the size of fiscal multipliers. As such, there is no "single" short-term fiscal multiplier: multipliers may be larger in times of deep recession or financial crises, but they tend to be smaller when fiscal positions are precarious.

Against this background, the paper presents a stylised analysis of the impact of fiscal consolidation on the public debt-to-GDP ratio for a selected sample of individual euro area countries and the euro area aggregate. In a first step, the paper estimates threshold multipliers that would lead to self-defeating consolidation, in the sense of driving the public debt-to-GDP ratio up, to the point where it is unsustainable. The paper shows that fiscal multipliers must be significantly above 1 to lead to a self-defeating scenario after five years and must be very large (close to or over 3) to lead to a self-defeating scenario after ten years. Hence, the results suggest that, if the fiscal multiplier falls within the range normally considered as plausible for a balanced-composition package, fiscal consolidation has initially an adverse effect on the debt ratio, which is reversed within a few years. In a second step, the paper presents a comparison of the effects of front versus backloaded consolidation. Assuming a value of the fiscal multiplier within the "reasonable" range (e.g. 0.8 to 1.3 for a balanced-composition fiscal package), fiscal consolidation brings the debt-to-GDP ratio in all cases on a lower path over the medium run. Independent of the size of the sovereign risk premia, frontloading fiscal consolidation reduces the cumulative consolidation effort. Only in the event higher multipliers were to be short-lived, frontloaded consolidation would imply by construction larger output losses, which could be amplified through hysteresis effects.

When determining the fiscal adjustment path, both the short-term costs and the longer-term benefits need to be taken into account. It is also advisable to conduct a specific analysis of the macroeconomic situation of the country under scrutiny. In many cases, avoiding the short-term costs of fiscal consolidations is not a viable option. Countries that are under fiscal stress are forced to frontload fiscal consolidation in order to meet financing needs and rapidly restore fiscal soundness to avoid abruptly negative market reactions. This could be particularly relevant at the start of the consolidation process or at any moment where credibility is lost or at risk. A more gradual consolidation could then only be considered after credibility has been fully restored. In addition, when defining the path for fiscal consolidation, implementation risks add to the potential costs associated with backloading. Such risks, related inter alia to political economy considerations, can materialise when measures are postponed to the end of or to a different electoral cycle or in the case of "reform fatigue", when public tolerance for a gradual implementation of "more"

measures is weakened. Backloading also involves higher uncertainty about the path of future policy, when governments cannot credibly commit to later action.

Finally, in designing the fiscal adjustment path, particular attention should also be paid to the composition of consolidation packages. Well-designed adjustments, such as cuts targeting unproductive spending and revenue-enhancing measures that make tax systems more efficient, fair and less distortionary, are better suited to supporting the goal of fiscal sustainability.

1 Introduction

The medium to longer-term benefits of well-designed fiscal consolidation are typically accompanied by short-term costs in the form of output losses. However, since sound government finances are a prerequisite for price and macroeconomic stability and, consequently, for strengthening the conditions for sustainable growth, the long-term benefits of achieving such goals outweigh the short-term costs.

The recent debate among academics and policy-makers has tended to focus on the short-term output costs of consolidation. This is captured through the size of fiscal multipliers. In general, fiscal multipliers measure the effect that fiscal shocks (whether positive or negative) have on output and are usually defined as the percentage change in real GDP that follows a fiscal shock totalling 1% of GDP. Given that multipliers may be higher during crisis times, the question of whether fiscal consolidation might even be self-defeating, in the sense of putting the public debt ratio on an unfavourable path, has become central to the debate. Critics of fiscal austerity have argued that consolidation suppresses demand further and thus leads to an even deeper recession. If the negative impact on short-term economic growth is sufficiently large, frontloading fiscal consolidation may prove to be self-defeating and result in higher public debt-to-GDP ratios. The counterarguments typically focus on the necessity of consolidation to ensure fiscal sustainability; any self-defeating effects are seen at most as a short-term phenomenon.

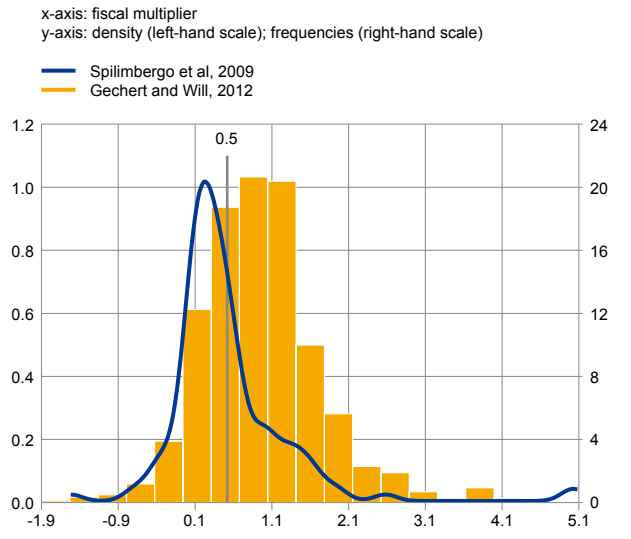
Against this backdrop, the current paper seeks to move beyond the debate about the short-term impact that fiscal consolidation has on output and discuss its medium to longer-term effects on output and debt sustainability. The structure of the paper is as follows. The first part presents a critical assessment of the most recent findings of the literature on state-dependent short-term fiscal multipliers. It first reviews the topic of conditional fiscal multipliers in DSGE models and then assesses the empirical literature, providing estimates of state-dependent multipliers for the illustrative case of Spain. The second part of the paper seeks to go beyond the multiplier discussion and addresses the topic of potentially self-defeating fiscal consolidation from the perspective of debt sustainability. In this respect, the paper presents a stylised framework to assess the impact of fiscal consolidation on the public debt-to-GDP ratio for a selected sample of euro area countries, as well as for the euro area aggregate. It first estimates threshold multipliers that would lead to self-defeating fiscal consolidation over various time horizons. Then it compares the effects of frontloading versus backloading fiscal consolidation from the perspective of total consolidation effort and the period needed to stabilise the debt ratio. Finally, the paper concludes with policy recommendations.

2 State dependent short-term fiscal multipliers: a literature review

Most of the empirical and structural models employed before the recent financial crisis to measure the output effects of fiscal policy focused on linear dynamics: vector autoregressions (VARs) and linearised (or close-to-linear) dynamic stochastic general equilibrium (DSGE) models. Several authors – see Parker (2011) for a review – point out that such models ignore the state of the economy and implicitly assume that there is a country and time-invariant fiscal multiplier. A recent strand of the empirical literature extends the analysis to allow for non-linearities or state-dependent fiscal multipliers. Such studies try to identify the economic conditions most closely related to the recent great recession and provide estimates for the output response in different regimes. While they will be the focus of this section, relevant results with DSGE models are also discussed.

Estimates of fiscal multipliers[1] are found to differ across countries, periods of analysis and methodologies employed. The range of estimates varies broadly across studies. See Chart 1 below for a distribution of the multiplier found in various studies reviewed by Spilimbergo et al. (2009) and Gechert and Will (2012). In the first study, the average multiplier is 0.5, while the most frequent values are positive but below average. In the second study (which is more recent), the average multiplier is between 0.5 and 1.0 depending on which fiscal instrument is used to achieve consolidation and the estimation method (see Andrés and Doménech (2013)).

Chart 1
Distribution of fiscal multipliers



Source: Andrés and Doménech (2013).
Notes: For details of the two datasets, see the papers referred to in the main text. The conventional negative short-term multiplier from fiscal consolidation is presented in terms of absolute value, i.e. positive values on the horizontal axis denote a positive (negative) effect on GDP following a fiscal stimulus (consolidation) shock.

In general, evidence from empirical and structural macroeconomic models suggests that the following factors can influence the size of the fiscal multiplier. First, *the composition of the fiscal shock* – owing to the more direct impact on aggregate demand, some government spending items are likely to have higher short-run multipliers than taxes. Second, the *state of public finances* – the contractionary effects of consolidation tend to be lower when public finances are weak, because the opportunity costs of no consolidation are very high when fiscal sustainability is at risk. Third, *financial frictions* – these can lead to larger multipliers as they limit the possibility of smoothing consumption over time. The contractionary effects of consolidation may be stronger during economic recessions or financial crises owing to a higher share of liquidity-

[1] The definition of fiscal multipliers varies across studies. Some studies consider the impact of fiscal shocks on the level of output while others consider the impact on output growth. This paper reviews studies that adopt both approaches.

constrained households in the economy. Fourth, the presence of *nominal or real rigidities in the economy* – nominal price and wage rigidities lead to higher multipliers as adjustments take place through output and employment. Real rigidities (e.g. investment adjustment costs) lead to a smaller multiplier as firms react slowly to changes in interest rates because of the costs they entail. Fifth, the *monetary policy reaction function* – when policy interest rates do not react or react only mildly to decreases in aggregate demand, larger fiscal multipliers could prevail owing to larger crowding out effects of private investment. This can be relevant if the consolidation takes place while the nominal interest rate is at the lower bound. Sixth, *the exchange rate regime* – under a fixed exchange rate regime the multiplier is larger if there is a need for tightening to keep the exchange rate at parity. Seventh, *the degree of openness of the economy* – a low degree of openness increases the multiplier since the scope for external leakage of the consolidation impact (especially lower imports) is limited. On the other hand, the more open an economy, the larger the potential for *country spillover effects* when consolidation takes place in many other countries simultaneously, rather than in one.

The remainder of this section reviews in more detail the recent literature on state-dependent fiscal multipliers, focusing on the economic conditions that have characterised the euro area sovereign debt crisis. It starts by summarising the results with DSGE models, which focus on the topic of *fiscal multipliers under constrained monetary policy*. It then reviews the empirical literature alongside three main areas of focus: (i) fiscal multipliers in *recessions*, (ii) in times of *financial crisis*, and (iii) in times of *weak public finances.*

2.1 Conditional fiscal multipliers in DSGE models

Studies conducted in a DSGE framework (see, inter alia, Coenen et al. (2012) for a review[2]) have investigated the factors affecting the size of fiscal multipliers, with a focus on (i) the structural features of the economy (degree of openness, the presence of nominal or real rigidities, liquidity constraints); (ii) the type of macroeconomic policy in place (degree of monetary policy accommodation and the exchange rate regime); and (iii) the composition and nature of the fiscal shock (expenditure versus taxes, temporary versus permanent, shocks under full versus imperfect credibility of fiscal policy, etc.).

Although the effects of fiscal policy are evaluated linearly[3] at the steady state, *DSGE models can also be calibrated to mimic conditions alongside the business cycle.* For instance, a recessionary environment may be reflected by a *higher share of liquidity-constrained households.* Moreover, the *situation of constrained monetary policy*

[2] This article also documents the findings of a comparative study analysing the effects of a variety of fiscal stimulus measures using seven structural policy models developed at the European Central Bank (ECB), the Federal Reserve Board, the International Monetary Fund (IMF), the European Commission, the Organisation for Economic Co-operation and Development (OECD) and the Bank of Canada.

[3] A few exceptions to linearity in a DSGE framework are represented by the modelling of the zero lower bound. See attempts to model the duration of the liquidity trap endogenously (i.e. making it dependent on the size of the fiscal shock, as in Erceg and Lindé (2010) and Gomes et al. (2010)).

(i.e. the zero lower bound, ZLB, on the policy interest rate), generally characterising deep recessions, is an important feature of some DSGE models. As pointed out in the meta analysis of DSGE studies on fiscal multipliers conducted by Leeper et al. (2011), the monetary policy regime and, to a slightly lesser extent, the fraction of liquidity-constrained households are the most important factors for the size of short-term multipliers.

As regards the ZLB, for US-calibrated models, Christiano et al. (2011), Woodford (2011) and Erceg and Lindé (2010), among others, find that the size of the government spending multiplier is substantially larger than 1[4] (between 3 and 5 in the first paper, depending on the duration of the ZLB regime) when the nominal interest rate is zero. Yet, none of these models is able to capture the effect of non-standard monetary policy actions,[5] which can provide additional accommodation even when central bank interest rates have effectively reached the lower bound. Even when the traditional channel of policy rate adjustments becomes ineffective, various forms of direct provision of liquidity can be used to anchor other relevant rates in the economy to central bank policy intentions.

Very recent DSGE models integrating the channels of *financial intermediation and sovereign default* find substantially lower fiscal multipliers. By modelling adverse sovereign-financial risk loops through the balance sheet channel, van der Kwaak and van Wijnbergen (2013) find that the effectiveness of fiscal stimuli in raising output is sizeably reduced (to the point of being negative) in an environment characterised by financial fragility, weakly capitalised banks and sovereign debt discounts, in the face of poor fiscal positions. The introduction of the sovereign default channel in such models is the main factor behind the low multipliers.

In general, the evidence from DSGE models points to lower fiscal multipliers compared with empirical models, though the treatment of fiscal shocks (transitory versus permanent) may not necessarily be similar across all studies (see European Commission (2012b) for a discussion). For the euro area aggregate, simulations conducted with the ECB's New Area-Wide Model (NAWM) largely point to short-term fiscal multipliers considerably smaller (in absolute value) than 1. For a mixed-composition fiscal consolidation package (half revenue, half expenditure), the short-term multiplier is around 0.57 in situations of imperfect credibility (which implies that markets initially disbelieve the government's commitment to fully implement the announced consolidation measures). Only when the fiscal consolidation is based purely on reductions in government investment and/or government consumption, and markets initially exhibit doubts about their implementation, the fiscal multiplier

4 Some authors (Braun et al. (2012)) have challenged the DSGE results at the ZLB for the United States on methodological grounds. More specifically, in a replication of Christiano et al. (2011), the critique refers to the use of log-linearised equations for all of the equilibrium conditions except the Taylor rule (which embeds the non-linearity created by the ZLB on the nominal interest rate). Departing from this would imply multiple equilibria. Braun et al. (2012) claim that there are two types of time-invariant ZLB equilibria that can have very different properties in terms of their implications for the response of the economy to fiscal policy (in one, the spending multiplier is much lower, below 1, and, contrary to the results of the other study, labour supply behaves intuitively, i.e. it drops following an increase in labour tax).

5 A different strand of models (with no fiscal focus) has tackled the ZLB from a financial perspective, such as analysing the central bank balance sheet, e.g. Jeanne and Svensson (2007), Auerbach and Obstfeld (2005); or fighting the ZLB through the purchase of illiquid assets, e.g. Goodfriend (2000). See Gomes et al. (2010) for a review and analysis.

rises above 1 in the simulations.[6] The fiscal multiplier increases in absolute value to 0.67 if the monetary policy is constrained at the ZLB. Considering in addition that the share of non-Ricardian (liquidity-constrained[7]) households is 50% (instead of 25% as assumed in the baseline), the multiplier increases to 0.75. On the other hand, the short-term multiplier can be much smaller in the case of full government credibility (when markets believe that the consolidation efforts will be fully implemented and lasting), or when the decline in the public debt-to-GDP ratio is associated with a reduction in the sovereign risk premium. For more detailed simulation results, see ECB (2012b) and ECB (2014).

2.2 State-dependent fiscal multipliers in empirical models

Estimates of fiscal multipliers using empirical (VAR) models have the advantage of being largely unconstrained by a theoretical framework. Moreover, they may be better suited (and are easier to estimate) than structural models to capturing non-linear behaviour, especially when the economy diverges severely from its steady state. This comes at the cost of possibly omitting important structural relationships characterising the economy.

The recent empirical literature has found that fiscal multipliers associated with consolidation tend to be state dependent. Most importantly, they are larger in recessions and in times of financial stress. On the other hand, multipliers are found to be smaller when fiscal positions are precarious, in particular, when the government debt ratio is high. Given that these three factors tend to have characterised the recent economic situation in many euro area countries, particularly the most vulnerable ones, they are discussed below in more detail, with Spain as an illustrative case. Finally, this section will focus on the spending multiplier: the empirical literature is less divided with regard to its size, while finding a much broader range for the tax multiplier depending on the identification technique used for fiscal shocks (see Caldara and Kamps (2008) for a discussion).

Fiscal multipliers in recessions

In line with the traditional Keynesian theory, given slack resources in the economy, fiscal expansions may be more effective at increasing output in recessions than during normal times. Conversely, it has been claimed that fiscal consolidation can have a deeper negative impact on output during recessions. For instance, the effect of nominal price and wage rigidities may be greater during recessions than

6 Short-run output costs of fiscal consolidation have been identified in, among others, Almeida et al. (2011) under a DSGE model of a small, open economy in a monetary union, calibrated for Portugal; in Stähler and Thomas (2012) for a two-country DSGE model calibrated for Spain and the rest of the euro area; and in Hernández de Cos and Thomas (2012) for a DSGE model calibrated for the Spanish economy.

7 The liquidity constraints considered do not rule out the intertemporal smoothing of consumption through the adjustment of households' money holdings. This might explain the relatively modest effect on the multiplier.

during boom periods, as prices and wages tend to adjust downwards more slowly on account of institutional factors, among other things. Greater nominal rigidities generally lead to larger fiscal multipliers, as adjustment to weaker demand occurs through output and employment instead. Finally, particularly after a financial crisis, the simultaneous private and public sector deleveraging could further reinforce the short-term negative impact on output. By lowering aggregate demand in the short term, fiscal consolidation can temporarily reinforce some negative feedback loops with the financial sector (e.g. increase the likelihood of non-performing loans).[8]

Several studies distinguish between fiscal multipliers in recessions and expansions using various econometric techniques, among others (i) time-varying parameter VAR models with stochastic volatility (Kirchner et al. (2010)); (ii) threshold VAR (Baum and Koester (2011) for Germany; Batini et al. (2012) for the euro area aggregate, France, Italy, the United States and Japan; and Baum et al. (2012) for the G7 economies except Italy); (iii) Markov switching (smooth transition) VAR (Auerbach and Gorodnichenko (2012a) for the United States; and Hernández de Cos and Moral-Benito (2013) for Spain); and (iv) panel regression and VAR techniques conducted on sub-groups of countries according to pre-determined thresholds (Corsetti et al. (2012) for a sample of 17 OECD economies; Ilzetzki et al. (2012) for a panel of 44 economies; and Auerbach and Gorodnichenko (2012b) for an unbalanced panel of OECD countries). Most of these studies find much larger (one-year) spending multipliers in recessions compared with expansions, but the difference between the two regimes varies widely.[9]

Such studies are subject to several drawbacks. First, as pointed out in Parker (2011), there is a "lack of data" – deep recessions are few in most studies and related non-linearities hard to measure using macroeconomic data.[10] Second, given that the non-linear models are computationally more expensive, the reduced-form VARs are generally very simple and thus prone to omitted variable bias and other estimation challenges, such as the "fiscal-foresight problem" (Leeper et al. (2008)). Most VAR studies use only (non-adjusted) fiscal shocks (total spending and net taxes) and output. By omitting the channel of government debt accumulation, for instance, such studies may find over-estimated multipliers in recessions, in particular in highly indebted countries.[11] Moreover, looking only at exogenous government spending

[8] On the other hand, fiscal consolidation can remove pressures from private sector borrowing needs and have positive effects on bank balance sheets. For instance, Cimadomo et al. (2013) find that standard capital adequacy ratios, such as the Tier 1 ratio, tend to improve following episodes of fiscal consolidation. This improvement appears to result from a portfolio re-balancing from private to public debt securities, which reduces the risk-weighted value of assets. That is particularly the case when fiscal consolidation efforts are perceived as structural policy changes that improve the sustainability of public finances and, therefore, reduce overall credit risk.

[9] The largest gap is found in Batini et al. (2012) (for the euro area aggregate: 0.4 in expansions and 2.6 in recessions; for the United States: 0.3 and 2.2), as well as in Auerbach and Gorodnichenko (2012a) (0 and 1.4 for the United States). On the other hand, Baum and Koester (2011) find only a relatively small difference for Germany. With respect to the revenue multiplier, Baum et al. (2012) claim that the results are less conclusive. Together with Batini et al. (2012), they generally find a small short-term multiplier, which remains very similar in expansions and recessions. Cugnasca and Rother (2015) find that fiscal adjustments made via cuts to transfers and subsidies, or via tax increases, are usually associated with multipliers at or below unity, even when the economy is in recession.

[10] Parker (2011) argues that the lack of statistical power in the estimation of these non-linear models can be addressed by exploiting estimates of partial equilibrium responses in disaggregated data.

[11] An exception is Caprioli and Momigliano (2013), whose specification for Italy includes both government debt and foreign demand.

in an extension of Ramey's (2011) military news series for a period covering the 20th century in the United States, Owyang et al. (2013) do not find evidence that multipliers are greater during periods of high unemployment in the United States. The estimated multipliers are also below unity. Third, results are subject to sizeable uncertainty particularly in studies using threshold VAR in which the threshold variable (e.g. potential output) is in itself subject to uncertainty and data revisions. This can add significant noise to the regime switching and complicate the already difficult task of computing non-linear impulse reaction functions after a fiscal shock.

One further dimension in this debate is that of country spillovers. Recent evidence[12] provided by Auerbach and Gorodnichenko (2012c), based on an unbalanced panel of OECD members, documents that fiscal stimuli in one country are likely to have economically and statistically significant effects on output in other countries. Such effects are shown to vary depending on the state of the economy in the recipient and source countries, with the effects being more sizeable during recessions. For an analysis of fiscal spillover effects in the euro area – pointing to relatively limited adverse GDP effects under illustrative structural model simulations[13] – see ECB (2014).

Fiscal multipliers in times of financial crisis

Many advanced economies, including euro area countries, were hit by the financial crisis that started as early as 2007. Feedback effects between the banking and the government sector propagated throughout the economy and risks shifted to government balance sheets (see Attinasi et al. (2009)), limiting their room for fiscal manoeuvre. In turn, the sovereign debt crisis has further weakened the balance sheets of banks holding large portfolios of (vulnerable) euro area government bonds and limited their capacity to provide credit to the economy. Overall, given that binding liquidity constraints are thought to reinforce the impact of a fiscal shock (see also the results with DSGE models), another potential determinant of the size of fiscal multipliers is the health of the financial system.

In this respect, Corsetti et al. (2012) find that short-term spending multipliers are higher (broadly in the order of 2) in OECD countries suffering from a financial crisis (as defined in Reinhart and Rogoff (2008) and in Reinhart (2010)). Afonso et al. (2011) also provide evidence consistent with higher multipliers during periods of financial stress in a threshold-VAR framework for Germany, Italy, the United States and the United Kingdom. In this study, however, the multipliers in the high-stress

[12] In a previous study, Bénassy-Quéré and Cimadomo (2006) analysed cross-border fiscal spillovers from Germany to the seven largest European economies. Expansionary fiscal policies in Germany were not generally found to have "beggar-thy-neighbour" effects on other European countries.

[13] In an empirical analysis for the euro area countries, Hondroyiannis and Papaoikonomou (2014) verify the presence of negative effects on real GDP growth from coordinated fiscal tightening, proxied by the share of Member States recording an improvement in the structural primary balance. After controlling for the state of the economy, the level of unemployment, economic sentiment, availability of credit, stock market conditions and fiscal spillover effects, multipliers in the euro area as a whole are found to be rather moderate, ranging from 0.2 during upswings to 0.4 during downturns. Greece is noted as an exception, as the fiscal multiplier is reported to have increased since 2010, exceeding unity in 2011. This is argued to be related to the features of the eventually implemented policy mix and the country-specific aspects related to tax evasion.

regime remain well below 1 (e.g. 0.4 versus 0.2 in Germany, and 0.7 versus 0.3 in Italy). Finally, Hernández de Cos and Moral-Benito (2013) conclude that the spending multiplier is slightly larger in Spain during times of banking crisis.

Fiscal multipliers in bad fiscal times

There is a general consensus that the short-term costs of fiscal consolidation are lower where the starting fiscal positions are precarious and/or the consolidation measures are implemented during periods of stress when the budget balance is rapidly deteriorating and public debt levels are high and unsustainable. In line with Blanchard (1990) and Sutherland (1997), the expectation channel may even induce non-Keynesian effects of fiscal consolidation at high levels of government indebtedness.[14]

Moreover, lower multipliers can be the result of confidence effects, which materialise via reduced sovereign spreads[15]. Determined action by governments can restore fiscal sustainability and thus contribute to price and macroeconomic stability and a recovery in output. The credibility of government announcements can also influence the size of fiscal multipliers through direct supply-side effects. For instance, fiscal consolidation is generally associated with smaller short-term multipliers if markets are convinced that the measures announced will be implemented in full and remain in place. In the presence of full credibility, the markets' anticipation of tax cuts in the longer term following consolidation measures today may result in favourable supply-side effects, including an increase in labour supply even in the short term.[16] On the other hand, when several countries facing fiscal problems consolidate simultaneously, the overall negative impact on the domestic economy may be compounded.

Several recent studies find evidence that short-term multipliers are lower the higher the public debt ratio (Kirchner et al. (2010) for the euro area aggregate) or even turn negative at high debt ratios (Nickel and Tudyka (2013) for 17 European countries; Corsetti et al. (2012) for a public debt ratio above 100% of GDP and/or government net borrowing above 6% of GDP in their panel of OECD economies; Ilzetzki et al. (2012)[17] and Hernández de Cos and Moral-Benito (2013) for regimes in which the public debt ratio is above 60% of GDP).

For an illustration of the results of state-dependent fiscal multipliers in the case of Spain, see Box 1 below.

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14 If fiscal consolidation appears to the public as a credible attempt to reduce public sector borrowing requirements, consumers with finite horizons would expect an increase in their permanent income, leading to an increase in private consumption today. Furthermore, if the government raises (decreases) taxes today it will have to cut (increase) them even more tomorrow to compensate for the saved (accrued) interest payments.

15 In an analysis of the impact of fiscal consolidation on economic growth in the European Union countries between 2004 and 2013, Cugnasca and Rother (2015) find evidence of confidence effects when consolidation is made under stressed credit markets. In a small number of episodes, involving open economies benefitting from confidence effects, the paper finds some evidence for expansionary fiscal consolidation.

16 See ECB (2012b).

17 This paper found the fiscal multiplier to be negative (and statistically significant) in the long run, while on impact the multiplier was found not statistically different from zero during episodes where the outstanding debt of the central government was assessed as high (exceeding 60% of GDP).

Box 1
State-dependent multipliers: the case of Spain

This box briefly outlines selected methodological aspects and results of state-dependent fiscal multipliers for Spain in Hernández de Cos and Moral-Benito (2013). In order to allow the fiscal multiplier to vary across three dimensions considered specific to the situation in Spain – recession, weak public finances and financial stress – the paper considers a smooth transition vector autoregression model (STVAR), as proposed in Auerbach and Gorodnichenko (2012a). This is based on a VAR with two regimes and different parameters governing the contemporaneous and dynamic behaviour of fiscal policy and output in each regime.

The indicators used for the state of the economy (in quarter t, normalised to have zero mean and unit variance) are as follows: (i) for the expansion/recession dichotomy: the seven-quarter moving average of output growth, the output gap and the change in the unemployment rate, with the model calibrated to match the recessions as identified by the Economic Cycle Research Institute (ECRI); (ii) for the good/bad fiscal times: the normalised public debt-to-GDP ratio, deficit-to-GDP ratio and the change in gross debt, with the model calibrated to match the fiscal stress periods broadly following the criteria in Corsetti et al. (2012), i.e. periods in which public debt is above 60% and/or government net borrowing exceeds 6% of GDP; and (iii) for the banking crisis times: large increases in the share of non-performing loans (as an indicator of a banking crisis in line with Reinhart and Rogoff (2010)), as well as the volume of credit to households over disposable income (as proxy for difficulties in access to credit).

The VAR contains the logarithms of real government purchases, taxes net of transfers, and real GDP observed at a quarterly frequency for the period from Q1 1986 to Q4 2012. Given the challenges in properly identifying tax shocks, the paper focuses on spending shocks only. The identification of these shocks is based on Blanchard and Perotti (2002), i.e. Cholesky ordering with spending ordered first (before net taxes and output).

The results of the paper indicate that the Spanish spending multiplier might be larger during recessions (between 1.26 and 1.75 over the first year) than in expansions (between 0.17 and 0.65). On the other hand, the weak situation of public finances in Spain might cause the spending multiplier to be close to zero or even negative. Finally, the amplification channel of liquidity constraints might also increase the size of the spending multiplier during the financial crisis in Spain. Combining these three dimensions into a single global turmoil indicator via principal component analysis (PCA), the estimated multipliers are 1.4 and 0.6 for turmoil and tranquil times respectively. The detailed results of the study are presented in the table below.

Finally, to illustrate the importance of fiscal multiplier heterogeneity across countries and not only over time, fiscal VARs with two regimes are estimated for two additional countries, Italy and Germany. In particular, the paper considers two different dichotomies in the state of the economy, expansion/recession, defined using GDP growth, as well as good/bad fiscal times defined according to the level of public debt. Overall, the results for Italy and Germany are similar to those obtained for Spain. In particular, the resulting spending multiplier estimates are larger during recessions (1.39 and 1.55 over the first and second years respectively in the case of Italy;

Table

Government spending multipliers for Spain: A STVAR approach

Indicator Variable	Regime	One year	Two years
GDP growth	Expansion	0.17*	-0.01
GDP growth	Recession	1.26*	1.25*
Output gap	Expansion	0.65*	0.72*
Output gap	Recession	1.30*	1.32*
Unemployment rate	Expansion	0.55*	0.56*
Unemployment rate	Recession	1.75*	1.57*
Deficit-to-GDP	Good fiscal times	1.84*	1.76*
Deficit-to-GDP	Bad fiscal times	-0.21*	-0.29*
Change in gross debt	Good fiscal times	1.22*	1.01*
Change in gross debt	Bad fiscal times	-0.07	0.22
Debt-to-GDP	Good fiscal times	1.99*	2.38*
Debt-to-GDP	Bad fiscal times	-0.31*	-0.92*
Change non-performing loans	No banking crisis	0.43*	-0.26*
Change non-performing loans	Banking crisis	0.77*	0.88*
Private credit flow	No banking crisis	0.70*	-0.67*
Private credit flow	Banking crisis	1.40*	1.76*
PCA index	Tranquil times	0.64*	0.60*
PCA index	Global turmoil	1.48*	1.30*

* Denotes statistical significance at the 5% level. Cumulative multiplier estimates based on the regime switching VAR (STVAR) discussed in Auerbach and Gorodnichenko (2012a). Identification of government shocks follows Blanchard and Perotti (2002), i.e. Cholesky ordering with G ordered first, T second, and GDP third. Sample period is Q1 1986 to Q4 2012.

and 0.71 and 0.47 for the first and second years in the case of Germany) than in expansions. By contrast, the multipliers in expansions are statistically indistinguishable from zero in both countries. Turning to the dichotomy of good and bad fiscal times, multipliers are smaller (basically zero) during periods of fiscal stress (high level of debt), again in both countries, while the estimated multipliers in good fiscal times (low level of debt) reach 1.84 in the first year in the case of Italy and 1.27 in Germany.

In conclusion, there is considerable uncertainty regarding the size of fiscal multipliers especially in the presence of large systemic risks when financial stability and the ability of governments to honour their debt obligations are threatened. Such risks cannot be properly captured by current models and the consequences of counterfactuals to actual policy are extremely difficult to gauge. Several recent institutional developments in the euro area aimed at strengthening the fiscal and macroeconomic governance framework can contribute to reducing the potential for imbalances in the future and may help to enhance the credibility of fiscal consolidation, thereby reducing its short-term costs. The euro area crisis management framework and the strengthening of financial backstops, as well as the progress towards a banking union intended to break the nexus between sovereigns and the financial sector, have the potential to mitigate the uncertainty and the short-term risks of fiscal consolidation in the future. In addition, in situations where fiscal consolidation is necessary to avoid a large systemic sovereign debt crisis, one should be cautious in drawing conclusions on the costs of fiscal consolidation based on estimated short-term fiscal multipliers. In such situations, the costs of not undertaking fiscal consolidation are likely to be significantly higher than those of bringing fiscal policy back on a sustainable path.

3 Relevance of fiscal multipliers for public debt dynamics and the pace of consolidation

As indicated above, several academic papers have recently suggested that fiscal multipliers may be larger in crisis situations than they are in normal times. Some commentators have used this evidence to argue that frontloaded consolidation should be avoided in countries that do not face an imminent risk of losing access to market financing.[18] At the extreme end of the spectrum, some have argued that fiscal austerity during a crisis may be self-defeating in the sense that it could drive the public debt-to-GDP ratio up, to the point where it is unsustainable. Another argument feeding this view is that frontloaded consolidation could exacerbate hysteresis effects in the economy.[19] This concerns situations where cyclical downturns in economic activity have the capacity to permanently damage the long-term productive potential of the economy. These hysteresis effects may be more pronounced during deep recessions, when high unemployment rates and long periods of unemployment increase the risk of a permanent loss of skills for some workers and when low levels of investment threaten a permanent decline in the stock of productive capital. Those against this view typically focus on the need for consolidation to ensure fiscal sustainability. They see debt-increasing effects as a short-term phenomenon at most.[20]

Discussions about self-defeating consolidation usually focus on the short-term dynamics. The positive long-term effects of fiscal consolidation are usually forgotten. This section presents a stylised framework to analyse the impact of fiscal consolidation on debt dynamics. It first estimates threshold multipliers that would lead to self-defeating consolidation and then presents a comparison of effects of front versus backloaded consolidation. Our contribution to this debate is threefold. First, we account for hysteresis effects in the sense that a certain part of consolidation-induced GDP losses is permanently lost in potential GDP. Second, we focus on a relatively long time horizon of 20 years, which allows us to distinguish between the short and long-term effects of fiscal consolidation measures. Lastly, we extend the analysis of the underlying interest rate dynamics and endogenise the risk premium with regard to both the debt-to-GDP and deficit-to-GDP ratios.

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18 This argument is summarised in Blanchard and Cottarelli (2010), Blanchard and Leigh (2013), and De Grauwe and Ji (2013a and b).

19 See DeLong and Summers (2012).

20 Contributions to the debate comprise, among others, Boussard et al. (2012), Buti and Pench (2012), Gros (2011), and Padoan et al. (2012). Gros (2011) provides for a theoretical sketch arguing that the self-defeating effects of fiscal consolidation are entirely restricted to the short run. Boussard et al. (2012) focus on a time horizon of six years and distinguish between short and medium-term consolidation effects. In line with Weymes (2012), the findings show that fiscal consolidation can be self-defeating, but that such effects are largely restricted to a time horizon of two to three years. However, factors such as the size of fiscal multipliers and risk premia may play a crucial role in this context. In a similar vein, the results of Padoan et al. (2012) suggest that fiscal condition is a precondition for stronger growth in the medium run. Importantly, the authors find no case in which consolidation pushes a country into a bad equilibrium in which the fiscal position, economic growth, risk premia and confidence interact adversely. Lastly, Buti and Pench (2012) highlight the importance of the initial fiscal and economic conditions. They argue that frontloaded consolidations are superior to gradual ones if the initial value of the debt-to-GDP ratio is very large or if the consolidation effort follows a financial crisis.

3.1 Stylised framework to assess the impact of consolidation on public debt dynamics

This section uses a stylised framework to analyse the effects of fiscal consolidation on the public debt-to-GDP ratio for the euro area aggregate, the four largest euro area economies (Germany, France, Italy and Spain), and the four countries, which applied for financial assistance under EU-IMF programmes (Greece, Ireland, Portugal and Cyprus). The framework incorporates the actual debt ratios as a starting point, as they matter significantly for debt sustainability. The technical aspects of this stylised modelling framework are summarised in Box 2.

Box 2
Stylised modelling framework

The dynamics of public debt are modelled using the standard debt accumulation equation

$$\Delta d_t = \underbrace{\frac{i-g}{1+g}}_{\textit{snowball effect}} d_{t-1} - pb_t + dda_t$$

where *d* is the debt-to-GDP ratio, *i* the effective interest rate, *g* the (nominal) GDP growth rate, *pb* the primary balance-to-GDP ratio, and *dda* the deficit-debt adjustment. As can be seen, debt accumulation depends on the relative size of the interest-growth differential *i - g* and the primary balance *pb*. Assuming that *dda* is zero, a decrease in the growth rate requires an increase in the primary balance to stabilise the path of the debt-to-GDP ratio.

The framework models nominal GDP growth endogenously as a weighted average between its own lag and the potential GDP growth rate. The model introduces a cyclical closure of the output gap and incorporates the impact of the interest rate. Fiscal consolidation is introduced as an exogenous parameter (fiscal multiplier) in the growth equation.

$$y_t = C_1 y_{t-1} + (1 - C_1)\, y_{pt} + C_2\, (-Consolidation_t) + C_3\, (-Output\ gap_{t-1}) + C4\, (\Delta\, i_{marg,t})$$

where *y* is nominal GDP growth; *yp* is potential output growth; C1 is the weight of the lagged endogenous variable (in the basic set-up at 0.5[21]); C2 is the contemporaneous fiscal multiplier (further negative effects from fiscal consolidation are taken into account indirectly through the inclusion of the lagged endogenous variable); C3 is the elasticity with regard to the output gap (set at 0.2, i.e. 20% of the output gap is ceteris paribus closed in each period); and C4 is the elasticity with regard to the change in the marginal interest rate (set at -0.1).

The path of the potential GDP growth *yp* is based on the European Commission's 2012 Ageing Report (European Commission (2012a)). In addition, the framework allows for the incorporation of hysteresis effects, that is, a certain proportion of the GDP effect of fiscal consolidation is

[21] This parameter value has been used in other studies, see for example Baum et al. (2012).

permanently lost in the level of potential GDP. The share of permanent losses is set in the basic framework to 0.25, which is broadly in line with the literature.[22]

Finally, the effective interest rate path, needed to trace debt dynamics, is modelled as a weighted average between its own lag and the marginal interest rate (weight indicated by w):

$$i_t = (1 - w)\, i_{t-1} + w \underbrace{(i_{marg,\, t-1} + v_1 \Delta rp_{(deficit),\, t} + v_2 \Delta rp_{(debt),\, t} + \Delta rp_{ex,t})}_{marginal\ interest\ rate}$$

The marginal interest rate is modelled as the sum of the lagged marginal interest rate as well as changes in two endogenous risk premia (Δrp) with regard to the deviation of the deficit-to-GDP ratio from the 3% benchmark (a response reaction (v_1) set at 0.25) or of the debt-to-GDP ratio from the 60% benchmark (a response reaction (v_2) set at 0.04), broadly in line with the literature[23] – and one exogenous component (set to 100 basis points in the baseline). The coefficient of the pass-through effects from the marginal interest rate to the effective interest rate (w) is set at 0.2, broadly reflecting the maturity structure of euro area marketable public debt (government securities with a residual maturity of up to one year accounted for 20% of total debt securities outstanding in the euro area in 2013).

The fiscal variables in this stylised set-up follow standard accounting identities. The framework includes a cyclical budgetary effect which, in the basic framework, is set at 0.5, i.e. for every 1% gap between output and its estimated potential, the corresponding cyclical component of the budget balance is 0.5. This is in line with the overall budget semi-elasticities used by the European Commission in the 2013 EU fiscal surveillance.[24] Therefore, the adverse impact of consolidation on GDP affects the debt-to-GDP ratio through the primary balance, as well as through the denominator effect. The table below summarises the basic cross-country parameters used in the analysis.

Table

Parameter values

C1	C3	C4	v_1	v_2	w	Hysteresis	Elasticity of CAB w.r.t. GDP
0.5	0.2	-0.1	0.25	0.04	0.2	0.25	0.5

A sensitivity analysis with regard to these parameter values is outlined in Box 3.

[22] For example, in a framework of a deeply demand-constrained economy, DeLong and Summers (2012) report an estimate for the hysteresis parameter of 0.241.

[23] The two parameters v1 and v2 are set at the values found in Laubach (2009).

[24] The budgetary semi-elasticities averages out to 0.54 for the euro area and ranges from 0.48 in Spain to 0.56 in Germany and 0.57 in the Netherlands. See Mourre et al. (2013) for more details on the update of the cyclically adjusted budget balance (CAB) methodology used in the EU fiscal framework. As explained in more detail in ECB (2012a), the overall budget sensitivity is usually estimated as being close to the share of cyclical revenue and spending in GDP, which for the euro area is close to 0.5. In order to better assess the effects of the composition of fiscal policy measures (in terms of expenditure and revenue), in addition to their size, in its winter 2013 forecast, the European Commission switched from overall budgetary sensitivity (elasticity) to semi-elasticities to measure the CAB. It found that the shift had only second-order effects on the conventional CAB estimates, while it affected substantially the estimates of the cyclical components of revenue and expenditure separately.

One way to assess the risk of self-defeating consolidation is to estimate the minimum size of fiscal multiplier that would entail an increase in the debt-to-GDP ratio at various time horizons. Another possibility is to look at the effects on the debt ratio of frontloading versus backloading the fiscal consolidation. These two aspects are discussed below.

3.2 Threshold multipliers that would lead to self-defeating consolidation

In the first step, the aim is to analyse what minimum size of fiscal multiplier (for a balanced-composition consolidation package) would lead to a self-defeating scenario (debt-to-GDP ratio higher than in the no-consolidation baseline) for time horizons of one, three, five and ten years.

The illustrative simulations in Table 1 show that the initial debt-to-GDP ratio plays an important role in this respect. The higher the level of debt, the more difficult it is to stabilise it and put it on a declining path (generally given a higher interest rate-growth differential and the need to generate a larger primary surplus to stabilise the debt ratio). For instance, for a high-debt country such as Greece (with an initial debt-to-GDP ratio of 157% in 2012), a multiplier of 0.9 is enough to lead to a self-defeating scenario for three years. Conversely, for Germany (with an initial debt-to-GDP ratio of 81%), the multiplier must be at least 1.1 in this context. This finding is in line with European Commission (2012b), which also concludes that self-defeating effects are rather short term for reasonable values of the fiscal multiplier.

Other factors also influence this relationship. For instance, hysteresis effects,[25] the impact of output gap closure,[26] and the dependence of interest rate risk premia on

Table 1

Threshold size of fiscal multiplier at which fiscal consolidation has an adverse impact on the debt-to-GDP ratio in period T

(percentages)

Country	Initial debt-to-GDP	T=1	T=3	T=5	T=10
Germany	81.0	0.8	1.1	1.6	3.5
Spain	86.0	0.8	1.1	1.6	3.5
Cyprus	86.6	0.8	1.1	1.6	3.3
France	90.2	0.8	1.1	1.6	3.5
Ireland	117.4	0.6	1.0	1.5	3.5
Portugal	124.1	0.6	0.9	1.4	3.1
Italy	127.0	0.6	0.9	1.4	2.9
Greece	156.9	0.5	0.9	1.4	3.3
Euro area	**92.7**	**0.8**	**1.1**	**1.6**	**3.2**

Sources: European Commission forecast (autumn 2013) and ECB staff calculations.
Notes: Figures assume a permanent consolidation totalling 3% of GDP in the period T=1. Initial values refer to the year 2012. The positive multiplier values denote an adverse GDP impact.

[25] For example, the framework incorporates a negative hysteresis effect on potential GDP when the output gap becomes more negative, but does not include a positive hysteresis effect when the output gap becomes less negative.

[26] The size of the output gap (which determines future growth rates and, in turn, depends non-linearly on the size of consolidation) is also a relevant factor. The larger the initial output gap, the more favourable the potential for future nominal growth rates and debt dynamics. At the same time, the uncertainty surrounding the estimates of the output gap translates into simulation uncertainty for the current stylised framework. Yet, this caveat is significantly mitigated as the framework analyses the deviations from the baseline of no-consolidation.

the deficit (debt) thresholds introduce non-linearities in the effects of consolidation. As a result, the initial debt-to-GDP ratio is not the only determinant of the threshold multiplier in this framework.

Furthermore, Table 1 shows that fiscal multipliers must be significantly above 1 to lead to a self-defeating scenario after five years and must be very large (close to or over 3) to lead to a self-defeating scenario after ten years. Hence, the results suggest that, if the fiscal multiplier falls within the range normally considered as plausible for a balanced-composition package, fiscal consolidation has initially an adverse effect on the debt ratio, which is reversed within a few years. This means that fiscal consolidation brings the debt ratio in all cases on a more favourable trajectory relative to a no-consolidation baseline.

A sensitivity analysis with respect to the basic parameter values – presented in Box 3 below – shows that the overall conclusions of the basic analysis above remain valid.

Box 3

Sensitivity analysis with regard to the stylised framework's parameters

Compared with the basic parameter values used in the simulations and outlined in Box 2, the following alternative values have been considered: (i) for C1: 0.3 and 0.7 (respectively, lower and higher growth persistency effects); (ii) for C3: 0.15 and 0.25 (respectively, a slower and faster pace of output gap closure); (iii) the sovereign spread fiscal reaction parameters *v1* and *v2* switched off (no positive risk spread effects from consolidation); (iv) for *w*: 0.15 and 0.30 (respectively, lower and higher pass-through from changes in the marginal interest rate to the effective sovereign interest rate); (v) for hysteresis effects: switched off or double (no or larger loss in potential output from consolidation); and (vi) for the budgetary elasticity with regard to the output gap: 0.6 and 0.7 (higher cyclical budget reaction to the output gap).

In terms of the threshold multiplier, the parameters that most affect the size of the multiplier – in particular by lowering the threshold for the self-defeating consolidation scenario – are the pace of closure of the output gap and budgetary elasticity with regard to the output gap. A slower pace of closure of the output gap (in approximately seven versus five years) – which in turn depends on the starting position of the output gap size and the hysteresis effects of the additional consolidation – would induce lower growth dynamics and, in interactions with other factors, would exacerbate the effects of consolidation on the debt ratio. Similarly, a higher budgetary elasticity with regard to the output gap results in weaker improvements in debt ratios from the additional consolidation and thus lowers the size of the threshold multiplier. See the results in the table below.

Further robustness checks confirm these findings. Overall, neither the size of the consolidation effort (5% of GDP) nor a more backloaded consolidation (1% of GDP in the first three years as opposed to 3% in the first year only) is crucial for the overall conclusions. The sensitivity analysis thus supports the conclusion of the basic framework analysis that, over the medium term, fiscal consolidation can be considered self-defeating only for implausibly high and persistent fiscal multipliers.

Table

Sensitivity analysis of the threshold size of fiscal multipliers with regard to various parameters (euro area aggregate)

Parameters	T=1	T=3	T=5	T=10
current settings	0.8	1.1	1.6	3.2
Growth persistence effects (C1, default 0.5)				
0,3	0.7	1.2	1.8	3.3
0,7	0.7	1.0	1.3	3.2
Pace of closure output gap (C3, default 0.2)				
0,15	0.7	1.0	1.4	2.6
0,25	0.7	1.1	1.8	3.9
Sovereign spread fiscal reaction parameters				
switched off	0.7	1.0	1.5	3.0
Pass-through changes in marginal interest rates (w, default 0.2)				
0,15	0.7	1.0	1.5	3.3
0,30	0.7	1.1	1.5	3.1
Hysteresis effects (default 0.25)				
switched off	0.7	1.1	1.7	3.5
double reaction	0.7	1.0	1.5	3.0
Budgetary elasticity with respect to output gap (default 0.5)				
0,6	0.7	1.0	1.4	2.7
0,7	0.7	0.9	1.4	2.5

Sources: European Commission forecast (autumn 2013) and ECB staff calculations.
Notes: Figures assume a permanent consolidation totalling 3% of GDP in the period T=1. Initial values refer to the year 2012. The positive multiplier values denote an adverse GDP impact. The basic parameters are described in Box 2.

Caveats of the analysis

This analysis is subject to a number of caveats. In particular, it is only a simplified, partial equilibrium framework, albeit modelling underlying endogenous relationships in more detail than previous studies. Further, the framework takes into account only indirectly (e.g. through the sovereign risk channel or the pace of output gap closure) several macroeconomic and structural features of the economy (including imbalances), which may be relevant for debt sustainability. Finally, it does not provide for a detailed analysis of the structure of public debt, government contingent liabilities and financial assets, which matter for both debt sustainability and sovereign liquidity risks (see Hartwig Lojsch et al. (2011) and van Riet (ed., 2010) for analytical discussions on the importance of these factors). One could argue that the higher the risks associated with these factors, the more pressing the need for frontloading the consolidation. More generally, the non-linearities associated with crisis scenarios cannot be captured by such a stylised analysis. At the same time, it may arguably be preferable to use a stylised and traceable framework given that estimated empirical relationships may be subject to structural breaks in the severe circumstances observed during the crisis.

Overall, the results suggest that if the fiscal multiplier falls within the range normally regarded as plausible for a consolidation package with a balanced composition, fiscal consolidation initially has an adverse effect on the debt ratio, which is reversed within a few years. Thus, in all cases, fiscal consolidation results in a more favourable trajectory for the debt ratio.

3.3 Comparison of effects of front versus backloaded consolidation

The analysis above considered fiscal consolidation as a one-shot game. In a second step, the differences between the effects of front and backloaded consolidation paths are assessed. Here, frontloading means that fiscal consolidation takes place in the first three years, while backloading means that consolidation is delayed by two years before being implemented over a three-year period. In the interest of comparability, it is important that both paths eventually achieve the same consolidation effect. To this end, the public debt-to-GDP ratio is assumed to reach a target of 60% after 20 years.

The literature review has highlighted the significant uncertainties that surround the size of fiscal multipliers. To capture these uncertainties, the analysis presented in Table 2 assesses front and backloaded consolidation paths using different assumptions on the size and time profile of fiscal multipliers for the euro area. The base case assumes a time-invariant fiscal multiplier of 0.8. A value of 0.8 for the multiplier appears reasonable when assessed against the distribution of multiplier estimates summarised in Chart 1, where the median size of the multiplier is 0.5. It is also in line with the multipliers for a balanced-composition consolidation package estimated with the NAWM under more restrictive parameter settings. The base case is then compared with two alternatives which seek to mimic a situation of temporarily higher multipliers that characterise the recent times of recession. In the first alternative, the fiscal multiplier is assumed to be initially higher at 1.3 in the first two years, and then to fall to 0.8 in year three. The second one assumes that the fiscal multiplier remains high for an even longer period of time (longer recession) entailing a multiplier of 1.3 in the first four years and 0.8 in the fifth. These two scenarios imply by construction a stronger negative effect on growth if consolidation is frontloaded compared with a situation of backloading.

Table 2 below shows that frontloading consolidation reduces the cumulative consolidation effort that is required to meet the 60% debt-to-GDP target after 20 years in all countries[27] and the euro area aggregate.

Table 2
Cumulative consolidation effort: comparison between front and backloaded consolidation

(percentage of GDP)

Country	Constant multipliers (a)		Multipliers fall in year 3 (b)		Multipliers fall in year 5 (c)	
	Frontloading	Backloading	Frontloading	Backloading	Frontloading	Backloading
Spain	4.0	4.6	4.3	4.6	4.4	4.9
Cyprus	7.6	9.0	8.2	9.0	8.6	9.8
France	1.6	1.8	1.7	1.8	1.7	1.9
Ireland	5.5	6.2	5.8	6.2	6.0	6.6
Portugal	4.4	5.1	4.7	5.1	4.9	5.5
Italy	0.9	1.0	0.9	1.0	0.9	1.0
Euro area	**2.6**	**3.0**	**2.7**	**3.0**	**2.8**	**3.2**

Sources: European Commission forecast (autumn 2013) and ECB calculations.
Notes: In scenario (a), the multiplier is 0.8 in all five years. In scenario (b), the multiplier is 1.3 in the first two years and 0.8 as of the third year. In (c), the multiplier is 1.3 in the first four years and 0.8 in the fifth. In the frontloading scenario, consolidation with equal yearly amounts takes place in the first three years. In the backloading scenario, consolidation with equal yearly amounts takes place in the third, fourth and fifth years. A target for the debt-to-GDP ratio of 60% is achieved after 20 years.

[27] Greece is not shown in this table, as the country had already implemented a large frontloaded fiscal adjustment. Germany is also excluded as simulations suggest that additional consolidation is unnecessary for the debt-to-GDP ratio to meet the 60% target over 20 years.

Frontloading consolidation reduces the compounding effect of growth-adjusted interest payments on the debt-to-GDP ratio (the "snowball effect") compared with backloading, and so requires a lower long-run primary balance to achieve a given debt-to-GDP ratio. This result applies for all three scenarios for the size and time profile of the fiscal multiplier.

The larger the size of the multiplier and the longer the period a higher multiplier prevails, the larger the amount of consolidation required – in both the frontloading and backloading scenarios – to bring the debt ratio down to 60% of GDP after 20 years. Compared with the base case with time-invariant multipliers, the scenario where multipliers fall in year three narrows the difference in consolidation effort between front and backloading (from 0.4 percentage point of GDP for the euro area aggregate and 0.6 on average across the six countries in scenario (a) to 0.2 and, respectively, 0.3 in scenario (b) as shown in Table 2). However, the results suggest that the adverse effect of any misjudgement about the evolution of the fiscal multiplier is stronger if consolidation is backloaded. For a situation in which the decrease in the fiscal multiplier takes place not in the third, but in the fifth year, while the cumulative consolidation effort required to reach a debt-to-GDP ratio of 60% after 20 years increases under both consolidation paths, this increase is about 0.3 percentage point of GDP in the case of a backloaded consolidation strategy at the euro area aggregate level, compared with only 0.1 in the frontloaded scenario (and, correspondingly, 0.4 compared with 0.1 for the simple average of the six countries considered).

In terms of the impact on output, with a higher short-term fiscal multiplier in the frontloading scenario (see scenario (b) in Table 3 below and, to a lesser extent, scenario (c)), it is by construction that frontloading affects GDP growth more adversely than backloading consolidation.[28] Cumulative nominal GDP growth over the simulation period for the euro area aggregate is 0.6 percentage point lower in the case of frontloading compared with backloading (0.8 for the simple average of the six countries considered). Where the multipliers remain larger for longer periods, the cumulative short-term negative effects on output increase in both scenarios,

Table 3

Cumulative nominal GDP: difference between front and backloaded consolidation impact (no positive long-term impact from consolidation considered)

(percentages)

Country	Constant multipliers (a)	Multipliers fall in year 3 (b)	Multipliers fall in year 5 (c)
Spain	-0.2	-0.9	-0.5
Cyprus	0.2	-1.2	-0.2
France	0.0	-0.3	-0.2
Ireland	0.1	-0.8	-0.2
Portugal	-0.2	-1.1	-0.6
Italy	0.0	-0.2	-0.2
Euro area	**-0.1**	**-0.6**	**-0.2**

Sources: European Commission forecast (autumn 2013) and ECB calculations.
Note: In scenario (a), the multiplier is 0.8 in all five years. In scenario (b), the multiplier is 1.3 in the first two years and 0.8 as of the third year. In (c), the multiplier is 1.3 in the first four years and 0.8 in the fifth. In the frontloading scenario, consolidation with equal yearly amounts takes place in the first three years. In the backloading scenario, consolidation with equal yearly amounts takes place in the third, fourth and fifth years. A target for the debt-to-GDP ratio of 60% is achieved after 20 years. The percentage difference is relative to the cumulative nominal GDP in the backloaded scenario.

[28] In the constant multiplier scenario (a), the difference in cumulative nominal GDP is close to zero, i.e. somewhat below -0.1% for the euro area aggregate and zero for the simple average of the six countries considered.

but the difference between front and backloading scenarios is reduced (to 0.2 for the euro area aggregate and 0.3 for the average across the six countries). One must emphasise that these simulations do not take into account the likely positive impact of consolidation on growth over the long term, except the relatively limited impact considered in the model of a reduction in sovereign risk spreads.

Overall, as shown in Table 4 below, frontloaded consolidation achieves faster stabilisation of the debt-to-GDP ratio for all variants of the multiplier (by one year on average). Consolidation will always deliver lower debt-to-GDP ratios in the medium term for plausible values of the multiplier. However, more rapid debt stabilisation can help to lower sovereign borrowing costs and retain market access in situations where financial markets focus on short-run debt dynamics to assess a sovereign's solvency. The faster stabilisation of the debt-to-GDP ratio with frontloading reflects the direct impact of reducing the fiscal deficit more quickly, as well as smaller "snowball effects".

A closer examination of the simulations shows how the debt dynamics differ between the frontloaded and backloaded consolidation paths in the case where the multiplier declines from 1.3 to 0.8 in year 3 (Chart 2). With frontloaded consolidation, the cyclically adjusted primary balance reaches its steady-state level of 3.6% of GDP in T+3 (2015), while the impact of the economic cycle on the primary balance vanishes by around T+8 (2020). By T+4 (2016), the primary surplus is larger than the "snowball effect" from the interest/growth rate differential and the debt-to-GDP ratio starts to decline, reaching 60% in 20 years (by 2032). In the backloaded case, the cyclically adjusted primary balance does not reach its higher steady-state level of 3.9% of GDP until T+5 (2017). The primary balance does not exceed the "snowball effect" to put the debt-to-GDP on a downward trajectory until T+5 (2017).

The stylised simulations above do not take account of the positive medium to longer-term effect that consolidation is likely to have on the supply side of the economy. In the longer term, well-designed fiscal consolidation programmes have sizeable benefits, not only in terms of fiscal sustainability, but also in terms of GDP. In general, the literature[29] finds that the longer-term benefits of fiscal consolidation in terms of

Table 4

Number of years to stabilise the debt-to-GDP ratio: comparison of front and backloaded consolidation

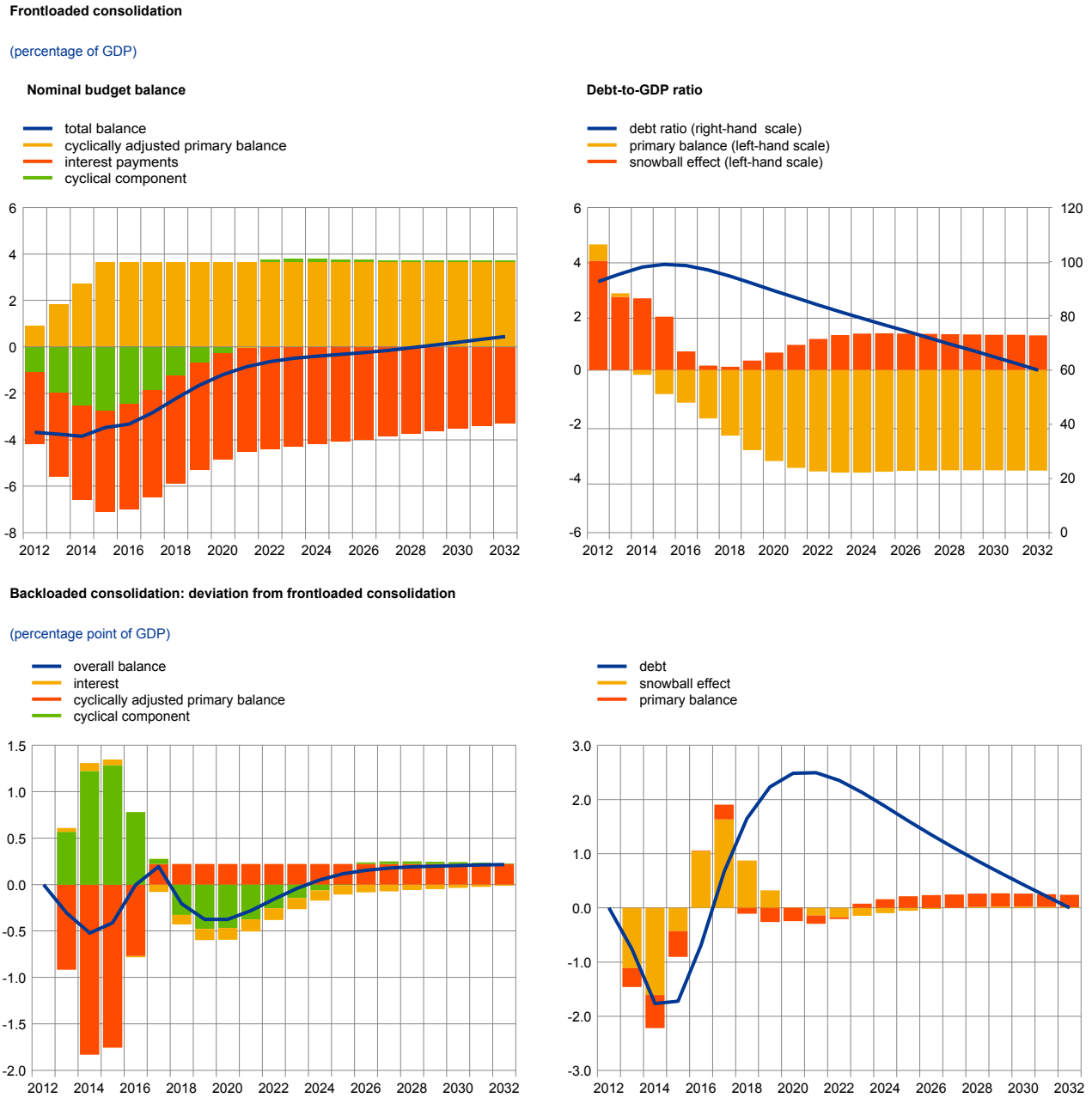
Country	Constant multipliers (a)		Multipliers fall in year 3 (b)		Multipliers fall in year 5 (c)	
	Frontloading	Backloading	Frontloading	Backloading	Frontloading	Backloading
Spain	4	5	4	5	4	5
Cyprus	4	6	4	6	5	6
France	3	3	3	3	3	4
Ireland	4	5	4	5	4	5
Portugal	3	5	3	5	4	5
Italy	2	2	2	2	2	2
Euro area	**3**	**3**	**3**	**4**	**3**	**5**

Sources: European Commission forecast (autumn 2013) and ECB calculations.
Note: In scenario (a), the multiplier is 0.8 in all five years. In scenario (b), the multiplier is 1.3 in the first two years and 0.8 as of the third year. In (c), the multiplier is 1.3 in the first four years and 0.8 in the fifth. In the frontloading scenario, consolidation with equal yearly amounts takes place in the first three years. In the backloading scenario, consolidation with equal yearly amounts takes place in the third, fourth and fifth years. A target for the debt-to-GDP ratio of 60% is achieved after 20 years.

[29] Theoretical literature is divided on whether fiscal policy has an impact on the level or growth rate of GDP per capita. Exogenous (neo-classical) growth models allow only for an impact on levels, not for long-term effects on growth stemming from changes in fiscal policy variables, while endogenous growth models predict effects on the growth rate, at least along the transition path to the steady state.

Chart 2

Decomposition of simulated debt dynamics in the euro area



Sources: European Commission forecast (autumn 2013) and ECB calculations.

output are likely to be larger when (i) fiscal consolidation is mostly implemented on the expenditure side, but avoids cuts in productive government spending, (ii) the government sector is already large, and (iii) the debt-to-GDP ratio is high and the sustainability of public finances is at risk. On the other hand, this study does not consider the feasibility of governments maintaining large primary surpluses over such a long period of time. Yet, given that we focus on relative differences between front and backloading, the main point of our results is that governments would have to maintain even larger primary surpluses in the case of backloading fiscal consolidation.

4 Conclusions

The review of relevant literature presented in this article indicates that there is no single short-term multiplier associated with fiscal consolidation. Multipliers are country, time and episode-specific. Generally, fiscal consolidation can be expected to have a negative impact on output in the short term. This impact is larger, not only during recessions and/or periods of financial stress, but also when monetary policy is constrained. At the same time, the fiscal multiplier is found to be smaller in the presence of weak public finances, particularly when the sustainability of government debt is at risk. The multiplier also differs depending on the fiscal instrument used. Thus, to the extent possible, it is advisable to conduct a wide range of case-specific analyses for the particular fiscal policy under scrutiny.

It is, however, important to move beyond this narrow short-term focus. There is a broad consensus that well-designed fiscal consolidations have positive medium to longer-term effects. Consolidation implies a permanent improvement in the structural budget balance, while the deterioration in growth is only temporary. Even in the presence of a large fiscal multiplier, fiscal consolidation could initially lead to a higher debt ratio, but this effect will typically be reversed within a few years. For countries with high public debt levels, while the adverse short-term effect on the debt ratio may be more prolonged even at a more moderate fiscal multiplier, fiscal consolidation eventually returns debt to a more sustainable path.

Simulations using plausible assumptions suggest that frontloading consolidation reduces the total consolidation effort and stabilises the debt ratio more quickly, although it does imply larger short-term reductions in output, which could be amplified through hysteresis effects. Overall, it is advisable to conduct a specific analysis of the macroeconomic situation of the country under scrutiny. In particular, in many cases, avoiding such short-term costs is not a viable option. Countries that are under fiscal stress are forced to frontload fiscal consolidation in order to meet financing needs and rapidly restore fiscal soundness to avoid abruptly negative market reactions. This could be particularly relevant at the start of the consolidation process or at any moment where credibility is lost or at risk. A more gradual consolidation could then only be considered after credibility has been fully restored.

Even in the absence of market pressures, there may be merits to frontloaded adjustment. Taking early action to correct fiscal imbalances allows a country to achieve a primary surplus more quickly, so it delivers a larger reduction in the public debt-to-GDP ratio over a given period of time. Gradual consolidation also carries political risks of derailing consolidation if it is spread over a long period of time. Governments may find it more difficult to implement unpopular reforms towards the end of their mandates when seeking re-election. Moreover, gradual consolidation postpones the day when the public is able to observe the benefits of adjustment in terms of lower public debt, lower private sector borrowing costs and sustained economic growth. In the interim, the perception may take hold that reforms are not delivering the expected results and should therefore be abandoned. Moreover, when fiscal institutions are weak and medium-term budgetary frameworks are not binding,

it may be more difficult for governments to convince the markets or the public that the fiscal consolidation which is approved today will actually be implemented in the future. Finally, postponing decisive measures involves higher uncertainty about the path of future policy, especially when governments cannot credibly commit to later action.

Backloading fiscal consolidation is often defended on the basis of lower multipliers expected in the future. However, there is great uncertainty about the size of the fiscal multiplier today, let alone its future value. The expectation of a lower fiscal multiplier "tomorrow" is linked to an expected recovery from the crisis and a correction of the output gap. But it is widely argued that recoveries from crises that are associated with over-leveraged balance sheets are slow and require a gain in competitiveness in some countries. The expected recovery also seems unlikely in cases where a postponement of fiscal consolidation implies a further deterioration in fiscal positions. If, as a result, the expected recovery does not materialise, then there might also be no scope for a lower multiplier tomorrow. Backloading will then require much higher cumulative consolidation efforts. Overall, in designing the fiscal adjustment path, the above arguments in favour of a frontloaded adjustment need to be weighed carefully against the costs of short-term output losses, depending on country-specific circumstances.

In all cases, the credibility of the fiscal consolidation process, which seems crucial to reducing its short-term costs, should be enhanced by well-designed medium-term plans based on detailed and permanent measures. To be credible and to avoid creating even more economic uncertainty, consolidation programmes should be lasting and avoid frequent changes in objectives, accounting gimmicks and sector-discriminating measures. In terms of its composition, although not treated in detail in this paper, the literature[30] also suggests that fiscal consolidation based on cuts to non-productive government expenditure is most beneficial for medium-term growth and has more permanent effects on the deficit. In addition, the expenditure-based consolidation most favourable to growth is consolidation that has been accompanied by supply-side reforms, including goods and labour market deregulation, by wage moderation and a strengthening of bank balance sheets in the aftermath of a financial crisis.

[30] For instance, Tsibouris et al. (2006) find that durable fiscal adjustments relied primarily on expenditure reductions. There were also cases of durable fiscal adjustment based on revenue enhancement, but mainly in countries with low initial revenue-to-GDP ratios where the pace of consolidation was more gradual. Case studies confirmed that political support was a key element in sustained fiscal adjustments. Moreover, they also highlighted the importance of fiscal structural reforms, such as greater transparency, improved monitoring of the fiscal stance, and more advanced expenditure management systems. The authors also conclude that among the large adjustments, a more gradual pace of implementation seems to have led to more favourable macroeconomic outcomes.

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