Fiscal Consolidation under the Stability and Growth Pact: Some Illustrative Simulations

DEREK ANDERSON, MARIALUZ MORENO BADIA, ESTHER PEREZ RUIZ, STEPHEN SNUDDEN, AND FRANCIS VITEK

The Stability and Growth Pact (SGP) continues to be at the core of European Union (EU) fiscal governance (Figure 7.1). The SGP was put in place to avoid excessive deficits and debt levels. However, fiscal slippages during the first decade of the Economic and Monetary Union (EMU) led to high vulnerabilities during the global economic and financial crisis (Pérez Ruiz 2011). To remedy past flaws, EU fiscal governance is being upgraded around a number of reforms focusing on intertwined objectives. These reforms include tighter national enforcement of EU fiscal rules (implementation of the Directive on National Fiscal Frameworks under the Six-Pack and automatic correction mechanisms under the Fiscal Compact); expanded surveillance over internal and external imbalances (through the Excessive Imbalances Procedure introduced under the Six-Pack); and enhanced EU oversight of national budgetary processes (under the Two-Pack). Underpinned by these complementary processes, the SGP occupies a central role in the EU fiscal framework.

Both the scale and speed of consolidation in EMU countries are influenced by SGP rules. Bringing debt ratios down to safer levels will require a sustained period of adjustment. The key question is whether the pace of consolidation driven by the SGP is appropriate in the face of a weak outlook.

This chapter quantifies the output effects from fiscal consolidation as required by the SGP. To this aim, it proposes a conceptual framework in three steps. First, the analysis takes the April 2012 *World Economic Outlook* (WEO) as the baseline for fiscal consolidation.[1] Second, the gap between fiscal plans under this baseline and the SGP targets (in structural terms) is quantified, keeping GDP at WEO levels (that is, no multiplier effects are at play). Third, using the IMF's dynamic stochastic general equilibrium model—the Global Integrated Monetary and Fiscal model (GIMF)—the output effects of that fiscal shock are simulated. In short,

*Step 1*: The April 2012 WEO is used as the baseline scenario.

Step 2: The fiscal shock is quantified as

$$\alpha_t = \frac{Sb_{t,SGP}}{GDP_{t,WEO}} - \frac{Sb_{t,WEO}}{GDP_{t,WEO}}, \tag{7.1}$$

[1]The shock and simulation results presented in this chapter take into account the fiscal plans adopted or specified in sufficient detail at the time of the elaboration of the April 2012 WEO forecasts. Since then, some countries have announced additional measures.
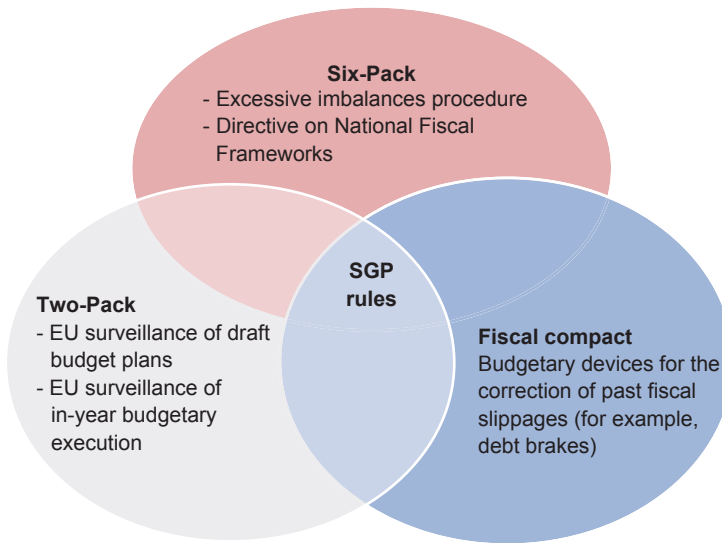
Note: EU = European Union; SGP = Stability and Growth Pact.

Figure 7.1 Recent European Union Fiscal Governance Reforms

in which, α_t represents the change in the structural-balance (Sb)-to-GDP ratio relative to the fiscal consolidation path projected in the WEO, for a given GDP (at WEO values).

Step 3: The model economy is shocked with α_t and the output decline $GDP_{t,SGP} - GDP_{t,WEO}$ is quantified when multiplier effects are at work.

The rest of this chapter is organized as follows: Building on EU legislation and discussions with the European Commission during the 2012 Article IV Consultation, the second section outlines the order of prevalence between the various SGP benchmarks and quantifies fiscal consolidation needs relative to the April 2012 WEO. The third section presents the associated output loss under different sets of assumptions. The different scenarios demonstrate that the effects of fiscal consolidation depend largely on the composition and credibility of fiscal packages, as well as on the ability of monetary policy to cushion the fiscal tightening. The chapter concludes with a number of policy recommendations.

A CHARACTERIZATION OF SGP REGIMES

Since its introduction, the SGP system has become increasingly complex (Table 7.1). Countries are required to converge to the 60 percent of GDP debt benchmark; prohibited from breaching the 3 percent of GDP deficit threshold; and mandated to improve the structural-deficit-to-GDP ratio at an average rate of 0.5 percent per year. In addition, government spending is constrained to grow in line with trend GDP. These requirements raise the question of the order of prevalence between the existing rules, complicating the task of quantifying the fiscal shock implied by the SGP.

To disentangle the order of prevalence between rules, this analysis assumes the strictest criteria apply. EU regulations and discussions with the Commission suggest that where rules overlap, countries would be subject to the strictest benchmark. This direction rules out the possibility of overdetermination and makes it possible to calculate SGP consolidation paths in an unambiguous manner.

EU Fiscal Rules from Maastricht to the Fiscal Compact				
Type	**Maastricht (SGP.1)**	**2005 Reform (SGP.2)**	**2011 "Six-Pack" Reform (SGP.3)**	**Fiscal Compact**
Debt rule	Debt/GDP is reduced to below 60 percent	→	Yearly reduction in Debt/GDP equal to 1/20th of distance between current level and target	→
Deficit rule	Deficit/GDP below 3 percent at any time	→	→	→
Structural balanced budget rule	Medium-term budget positions of "close to balance or in surplus"	Structural deficit/GDP to remain below 1 percent	→	…below 0.5 percent
Expenditure rule			Primary expenditure (excluding unemployment benefits and tax discretionary increases) grows less than medium-term GDP growth	→

Sources: IMF staff, based on the European Union treaty, Stability and Growth Pact secondary legislation, and the Fiscal Compact intergovernmental treaty.

TABLE 7.2

Excessive Deficit Procedure Deadlines	
2012	Belgium, Cyprus, Italy
2013	Austria, France, Germany, Netherlands, Portugal, Spain
2014	Greece
2015	Ireland

Source: European Commission.
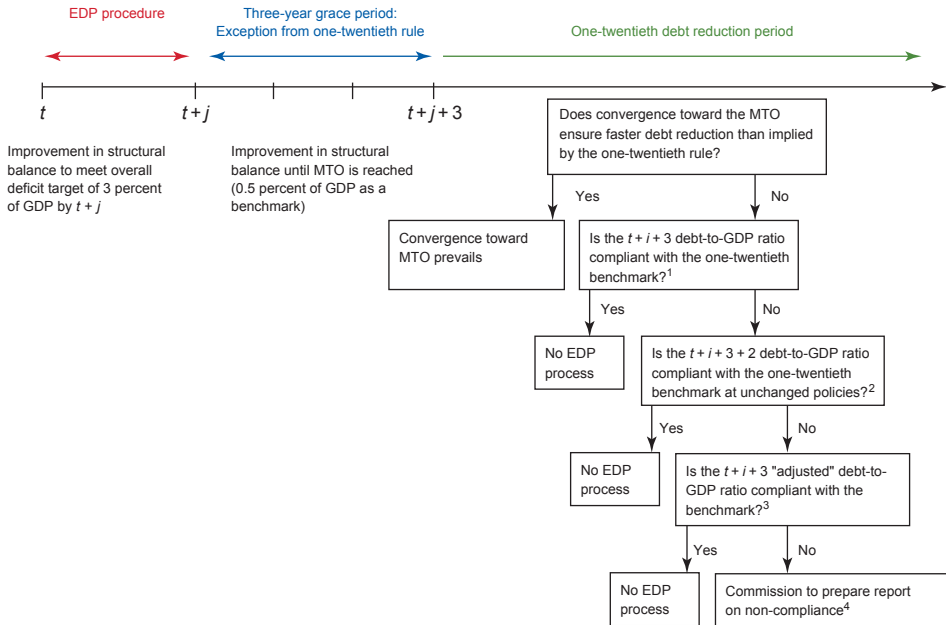Note: Excessive Deficit Procedure deadlines by April 2012.

For the WEO horizon, this exercise assumes that compliance with the rules follows a three-stage process. All fiscal commitments are translated into deviations from the WEO for the structural-deficit-to-GDP ratio.[2] Two regime switches operate during the WEO projection period: first, from the overall to the structural deficit benchmark; and second, from the structural deficit benchmark to the debt-reduction criterion. The relevant fiscal regimes can be summarized as follows:

- *Excessive Deficit Procedure (EDP) phase*—Countries under the EDP by April 2012 are expected to deliver structural adjustments needed to meet the 3 percent of GDP deficit target by the requested deadlines (between 2012 and 2015; see Table 7.2).

- *Grace period*—An exemption from the one-twentieth debt reduction rule will apply during the three-year period following the closure of the EDP for each country. During this period, each country is expected to improve its structural balance by at least 0.5 percent of GDP each year until it reaches its medium-term objective (MTO).[3]

- *One-twentieth debt benchmark*—Beginning three years after exiting the EDP, structural balances will improve by 0.5 percent of GDP per year or more, if required by the one-twentieth debt benchmark. This benchmark ensures an annual pace of debt reduction of no less than 5 percent of the gap between the observed debt level and the 60 percent of GDP target. EU authorities will first verify compliance with the debt rule in a backward-looking manner and then in a forward-looking manner for countries breaching the first criterion (Figure 7.2).

---

[2]GDP is kept at WEO levels and Organisation for Economic Co-operation and Development budgetary semi-elasticities are used to break down the overall deficit into its structural and cyclical components.

[3]MTOs are country specific and updated every three to four years. MTOs applying to the 2012 EDP are 0.5 of debt for Belgium, Finland, and Luxembourg; 0 for Austria, Cyprus, Estonia, Greece, France, Italy, Malta, and Spain; −0.5 for Germany, Ireland, Netherlands, Portugal, and Slovak Republic; and −1 for Slovenia.

1.

2.
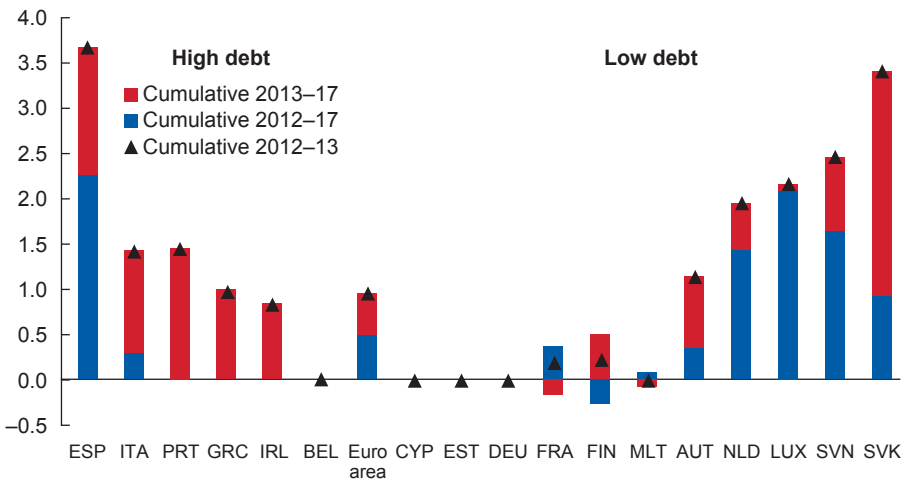
Sources: IMF, *World Economic Outlook* April 2012; Stability and Growth Pact regulations; and IMF staff calculations.
Note: EDP = Excessive Deficit Procedure; MTO = medium-term objective; SGP = Stability and Growth Pact; WEO = *World Economic Outlook*.
Data labels in the figure use International Organization for Standardization (ISO) country codes.

[1]The benchmark is given by $B_t / Y_t = 60 + (0.95/3) \times (B_{t-1} / Y_{t-1} - 60) + ((0.95^2)/3) \times (B_{t-2} / Y_{t-2} - 60) + ((0.95^3)/3) \times (B_{t-3} / Y_{t-3} - 60)$.

[2]The formula specified in footnote 1 is applied to projected debt-to-GDP ratio up to $t + i + 3 + 2$.

[3]The "adjusted debt measure" is given by $B_t / Y_t = B_t + \sum_0^2 C_{t-j} / Y_{t-3} \prod_0^2 (1 + Y^*_{t-j})$, with C the cyclical budget and Y^* the growth rate of nominal potential GDP.

[4]To place a country under EDP, the report assesses risk factors such as the structure of debt, implicit liabilities related to aging, or private indebtedness.

[5]The High Debt group comprises Belgium, Greece, Ireland, Italy, Portugal, and Spain. The Low Debt group includes the rest of euro area countries.

Figure 7.2 Translating Stability and Growth Pact into a Fiscal Shock

Overall, planned fiscal efforts in the euro area fall significantly short of SGP requirements. For the euro area as a whole, the additional consolidation amounts to 1 percent of GDP during 2012–17, nearly half of which would be front-loaded during 2012–13 (Figure 7.2). For the analysis in this chapter, the euro area countries are split into two blocs: those countries with acute fiscal sustainability issues (high-debt[4] or HD), comprising Belgium, Greece, Ireland, Italy, Portugal, and Spain, and those countries with less acute fiscal sustainability issues (low-debt or LD), comprising the rest of the euro area. Additional consolidation needs in the HD bloc (at about 2.2 percent of GDP for the WEO horizon) are five times as large as in the LD bloc (at 0.4 percent of GDP for 2012–17). Across countries, the additional fiscal effort is highest in Spain, mainly as a result of requirements under the EDP. In contrast, Belgium, Cyprus, Estonia, and Germany have no additional adjustment because the WEO path is consistently more demanding than requirements under the SGP. Among the larger euro area countries, additional consolidation is particularly front-loaded in the Netherlands and Spain.

THE OUTPUT EFFECTS FROM FISCAL CONSOLIDATION UNDER THE SGP

The output effects from fiscal consolidation requirements under the SGP vary depending on key assumptions such as the composition of the fiscal adjustment, the monetary policy stance, and the credibility of fiscal policy. To illustrate this, a number of scenarios are conducted and simulation results are inspected based on the GIMF model (country groupings) and the G35 model (country specific results).

Assumptions

The impact of fiscal tightening on economic activity will depend on the underlying simulation assumptions. First, the composition of the fiscal adjustment makes a big difference, with multipliers typically being larger for spending-based consolidations. Second, the monetary policy reaction function is an important factor because multipliers are higher when interest rates are constrained by the zero lower bound. Finally, the credibility of fiscal packages also affects multipliers through anticipation of the future benefits of consolidation. This last effect may be substantial in some cases.

In practice, however, considerable uncertainty surrounds these assumptions. Information on the composition of the adjustment on a country basis is not readily available, and predicting the time horizon over which monetary policy in the euro area will be constrained by the zero lower bound is difficult. Also, governments' credibility in delivering fiscal commitments is at stake, and risk-premium effects are inherently difficult to quantify when spreads are volatile and an increasing number of countries face punitive yields.

In the face of these uncertainties, a number of illustrative simulations are carried out. These alternatives are intended to illustrate the possible response of the economy under three different scenarios rather than aiming to accurately represent the economic reality (Table 7.3):

- *Scenario 1: Myopia and growth-friendly consolidation*—Under this scenario, the consolidation package is tilted toward measures that have strong effects on households' current disposable income, but little negative impact on factor supply and potential output. It is further assumed that fiscal plans are not credible per se, but rather that credibility needs to be established by action. In particular, agents do not perceive the government's commitment

---

[4]For the purposes of the simulation, the HD group includes countries with debt projected to be greater than 85 percent of GDP by 2017.

TABLE 7.3

Assumptions Underlying Stability and Growth Pact Simulations						
Assumptions	*Explanation*	**Scenario 1: Myopia and Growth-Friendly Consolidation**	**Scenario 1A: Scenario 1 plus ZIF**	**Scenario 1B: Scenario 1 plus Joint Consolidation**	**Scenario 2: Credibility and Growth-Friendly Consolidation**	**Scenario 3: Credibility and Growth-Unfriendly Consolidation**
Composition of adjustment						
1. Growth-friendly consolidation	1/4 transfers, 1/3 government consumption, 1/4 labor income tax, 1/6 consumption tax	X	X	X	X	
2. Growth-unfriendly consolidation	1/4 targeted transfers, 1/3 government investment, 1/4 labor income, 1/6 corporate tax					X
Spillovers						
3. Joint consolidation	High Debt and Low Debt groups jointly consolidate			X	X	X
4. Individual consolidation	Only one of the blocs consolidates (euro area calculated by simple addition disregarding spillovers)	X	X			
Monetary policy reaction						
5. Interest rates unconstrained by zero interest floor (ZIF)	Unconstrained reaction of nominal interest rates		X	X	X	X
6. Interest rates constrained by ZIF	Nominal interest rates unchanged over first 5 years	X				
Credibility of fiscal plans						
7. Myopia	Agents do not perceive as permanent the government's commitment toward consolidation; they only change their beliefs ex post, once they verify past fiscal measures remain in place	X	X	X		
8. Partial Ricardian behavior	Changes in the structural balance are perceived as permanent as of the year of implementation				X	X

Source: IMF staff.
Note: ZIF = zero interest rate floor.

to consolidation to be permanent but rather expect measures to revert back to baseline levels in each period. However, they change their beliefs once they verify past fiscal measures remain in place. This version is meant to portray an economy in which, because of a general lack of confidence in the future, agents base their decisions on short-term considerations. With regard to monetary policy, the zero interest floor is assumed to bind during the 2012–17 period. To gauge the magnitude of spillovers, two variants of this scenario are run featuring joint and stand-alone consolidation (that is, undertaken separately by the HD and LD groups).

• *Scenario 2: Credibility and growth-friendly consolidation*—The assumptions mimic scenario 1 except that agents are not myopic, that is, changes in the structural balance are perceived

to be permanent as of the year of implementation. As a result, agents incorporate the long-term benefits of the consolidation already undertaken (lower real interest rates and future debt-service costs) into their expectations. However, fiscal changes are not anticipated and do not affect behavior until they actually occur (absence of full Ricardian equivalence).

- *Scenario 3: Credibility and growth-unfriendly consolidation*—A variant of scenario 2, this scenario is intended to illustrate the sensitivity of the results to the composition of the fiscal consolidation, with a package biased toward high-multiplier measures. In particular, fiscal efforts are switched (1) from consumption to corporate taxes, (2) from government consumption to public investment, and (3) from general transfers to transfers targeted to households with high marginal propensities to consume. As empirical evidence shows (for example, OECD 2010 and the references therein), corporate taxes have the highest distortionary effects among revenue measures. Government investment shrinks potential output, and cuts in targeted transfers reduce the income of households whose marginal propensity to consume is equal to one.

Simulation Tools and Output Effects from Additional Fiscal Consolidation

The simulations are conducted for the two euro area country groupings using the GIMF model.[5] The analysis uses a general equilibrium framework applying a six-region version of the GIMF, with the euro area split into the HD and LD blocs, the United States, Japan, emerging Asia, and a bloc encompassing the rest of the world. The GIMF models both liquidity-constrained and finite-planning-horizon households. This setup provides nonneutrality in both spending- and revenue-based measures, which makes the model particularly appropriate for analyzing the stabilization role of fiscal policy in the short term.
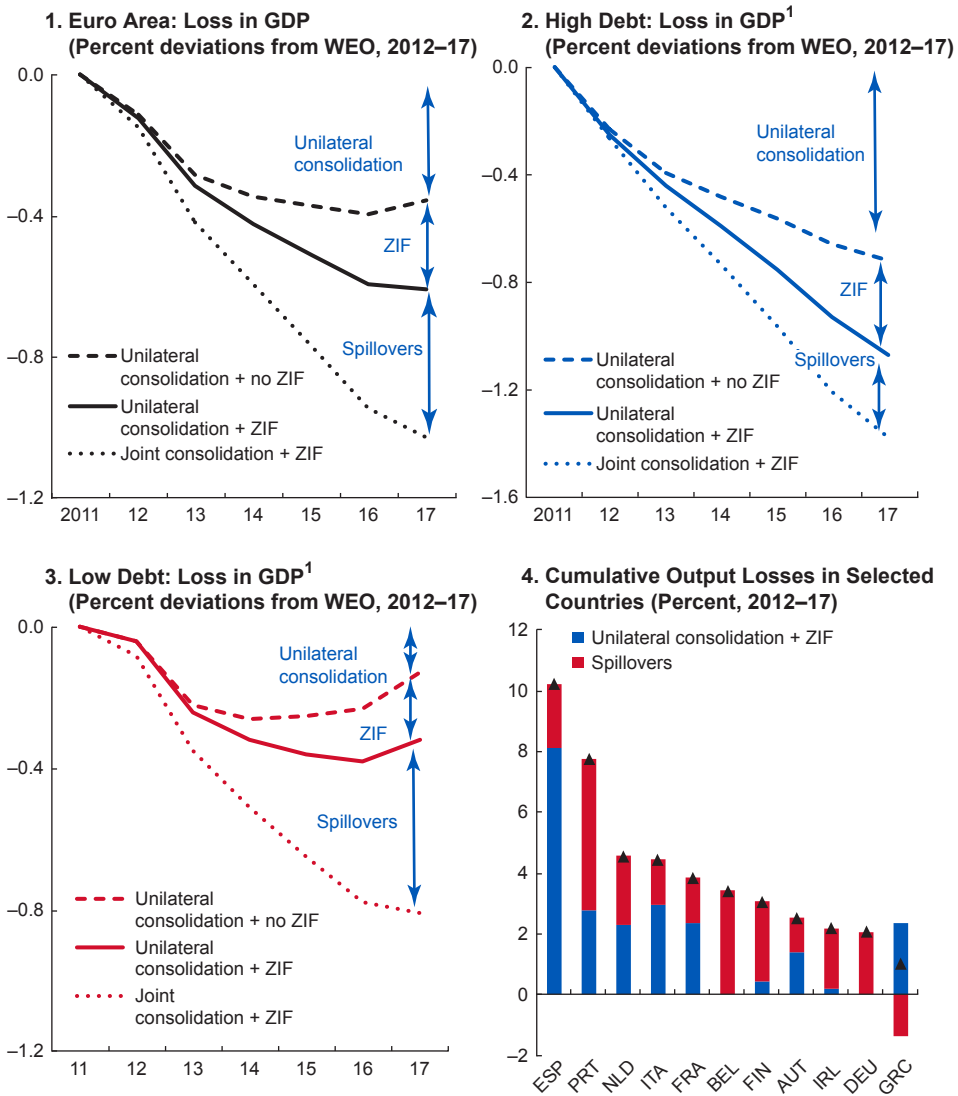
Country-specific effects are examined using the G35 model.[6] The G35 model is an estimated structural macroeconometric model of the world economy, disaggregated into 35 national economies, including 11 euro area countries.[7] Within this framework, each economy is represented by interconnected real, external, monetary, fiscal, and financial sectors. Spillovers are transmitted across economies via trade, financial, and commodity price linkages.

Even with a growth-friendly consolidation package, the output effects are sizable (Figure 7.3). Under scenario 1, output in the euro area is 1 percent lower than baseline by 2017 (Figure 7.3, panel 1). This result implies a cumulative output loss of 3½ percent between 2012 and 2017. The fairly large multiplier stems from negative spillovers (about 40 percent of the loss) and the inability of monetary authorities to ease the policy rate (20 percent of the loss). As expected, the HD bloc experiences the largest losses (Figure 7.3, panel 2)—1.4 percent of GDP by 2017 (cumulatively 5 percent during 2012–17)—mainly reflecting the scale of the additional fiscal adjustment required. Losses among the LD bloc of 0.8 percent by 2017 (cumulatively 3 percent during 2012–17) are largely caused by spillovers from the HD bloc (given their relatively high propensity to import from the LD countries) (Figure 7.3, panel 3). The aggregate results conceal considerable cross-country heterogeneity (Figure 7.3, panel 4). Because of contractions in domestic demand, cumulative output losses are highest in Spain (at about 10 percent), closely followed by Portugal (at almost 8 percent), largely caused by substantial spillovers from fiscal tightening in its neighboring country. Negative spillovers are also sizable in small open economies like Belgium, Finland, and Ireland. Somewhat surprisingly, Greece experiences positive spillovers from fiscal adjustment in other euro area countries. This occurs because a joint consolidation in the euro area reduces world demand for commodities and improves Greece's terms of trade. Because Greece is

---

[5] For further details on this model, see Kumhof and others (2010).
[6] For further details, see Vitek (2012).
[7] Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, and Spain.

1. Euro Area: Loss in GDP
(Percent deviations from WEO, 2012–17)

2. High Debt: Loss in GDP[1]
(Percent deviations from WEO, 2012–17)

3. Low Debt: Loss in GDP[1]
(Percent deviations from WEO, 2012–17)

4. Cumulative Output Losses in Selected
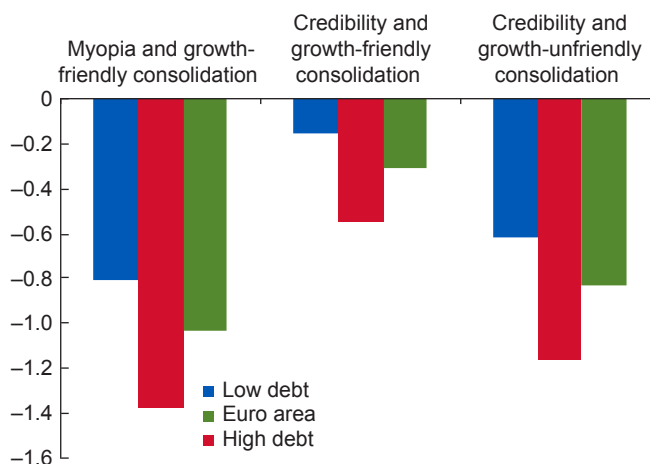**Countries (Percent, 2012–17)**

Sources: IMF, April 2012 *World Economic Outlook*; and IMF staff simulations carried out using the Global Integrated Monetary and Fiscal model (panels 1–3) and the G35 model (panel 4).

Note: SGP = Stability and Growth Pact; WEO = *World Economic Outlook*; ZIF = Zero interest floor. Data labels in the figure use International Organization for Standardization (ISO) country codes.

[1]The High Debt bloc comprises Belgium, Greece, Ireland, Italy, Portugal, and Spain. The Low Debt bloc includes the rest of euro area countries.

Figure 7.3 Output Effects from SGP Rules: Myopia and Growth-Friendly Consolidation

a relatively closed economy, this improvement in the terms of trade outweighs the reduction in its external demand, yielding a positive net spillover.

Multiplier effects dramatically change with credibility and fiscal composition assumptions (Figure 7.4). With myopia (scenario 1), private households and firms are so concerned with the short-term impact of fiscal retrenchment that they neglect the positive income effects arising from future lower tax liabilities when making their consumption, employment, and investment choices. For a given composition of adjustment and the zero lower bound constraint, the 2017 GDP loss in the euro area is considerably reduced if fiscal plans are credible (scenario 2), falling

Sources: IMF, April 2012 *World Economic Outlook* (WEO); and IMF staff simulations carried out using the Global Integrated Monetary and Fiscal model.
Note: High debt comprises Belgium, Greece, Ireland, Italy, Portugal, and Spain. Low debt comprises the remainder of the euro area.

Figure 7.4 Comparing Output Losses across Scenarios *(Percent deviations from WEO, 2017)*

from 1 percent to 0.3 percent of GDP. However, the multiplier effect is more than doubled when consolidation remains credible but becomes growth unfriendly (scenario 3). In this case, the 2017 GDP loss in the euro area relative to the WEO amounts to 0.8 percent, compared with 0.3 under credible but growth-friendly consolidation. Cumulative losses in the euro area throughout 2012–17 amount to 1.5 percent under scenario 2 and 3.1 percent under scenario 3.

The output decline might be higher than implied by these simulations because of the state of the economy during the crisis. Empirical work suggests that fiscal multipliers are larger when there is excess capacity (for example, Batini, Callegari, and Melina 2012; and Baum, Poplawski-Ribeiro, and Weber 2012). This situation could arise from tighter credit constraints, the need to repair balance sheets, and higher precautionary savings.

POLICY PERSPECTIVES: HOW CAN THE OUTPUT LOSS FROM ADDITIONAL FISCAL CONSOLIDATION BE MITIGATED?

The SGP rules should be applied flexibly to accommodate unexpected events. The appropriate pace of consolidation should depend on the state of public finances and growth, and the monetary policy stance. Given uncertainties surrounding these developments, consolidation strategies that adjust for new information can be welfare improving. Thus, the shift of focus toward structural targets under the SGP during the crisis is appropriate.

Where financing conditions permit, the pace of fiscal consolidation should take into account adverse economic conditions. With limited scope for monetary policy to mitigate output losses from fiscal tightening, negative output gaps, and joint consolidation efforts, multipliers are likely to be larger than normal. Furthermore, multipliers might increase with the size of consolidation (Stehn and others 2011; Erceg and Lindé 2010). Therefore, to the extent that market financing remains available at reasonable rates, adjustment should occur at a steady pace defined in cyclically adjusted terms and should avoid heavy front-loading.

The composition of fiscal adjustment should be tilted toward growth-friendly measures. Where adjustment needs are very large, countries will have to act on both the revenue and the

spending sides. However, given the high spending levels prevailing in many European countries, consolidation should focus on the spending side, targeting in particular those areas in which multipliers are low or spending is most inefficient.

Reforms that underpin credibility are essential to limiting output losses from fiscal tightening. The findings in this chapter suggest that by raising agents' expectations about the positive future income effects of consolidation, credible policies can reduce multipliers in the short term and act as a substitute for heavy front-loading. Anchoring adjustment in well-specified medium-term plans is crucial. Responsible implementation of automatic correction mechanisms under the Fiscal Compact will be important to safeguarding durable fiscal efforts.

Finally, monetary policy should accommodate the consolidation. The simulations suggest significant output losses if monetary policy does not provide support. When the zero bound is binding or if conventional interest rate cuts are less effective than normal, unconventional monetary policy stimulus may be needed.

REFERENCES

Batini, N., G. Callegari, and G. Melina. 2012. "Successful Austerity in the United States, Europe and Japan." Working Paper No. 12/190, International Monetary Fund, Washington, DC.

Baum, A., M. Poplawski-Ribeiro, and A. Weber. 2012. "Fiscal Multipliers and the State of the Economy." Working Paper No. 12/286, International Monetary Fund, Washington, DC.

Erceg, Christopher J., and J. Lindé. 2010. "Asymmetric Shocks in a Currency Union with Monetary and Fiscal Handcuffs." In *NBER International Seminar on Macroeconomics 2010*, ed. by R. Clarida and F. Giavazzi, 95–135. Chicago, Illinois: University of Chicago Press.

Kumhof, Michael, D. Laxton, D. Muir, and S. Mursula. 2010. "The Global Integrated Monetary and Fiscal Model (GIMF)—Theoretical Structure." Working Paper No. 10/34, International Monetary Fund, Washington, DC.

Organisation for Economic Co-operation and Development (OECD). 2010. "Tax Policy Reform and Economic Growth." Tax Policy Study No. 20, Paris.

Pérez Ruiz, Esther. 2011. "Strengthening Governance in the Euro Area." In "Euro Area Policies: 2011 Article IV Consultation: Lessons from the European Financial Stability Framework Exercise, and Selected Issues Paper." Country Report No. 11/186, International Monetary Fund, Washington, DC.

Stehn, S. J., J. Hatzius, D. Wilson, and S. Carlson. 2011. "The Speed Limit of Fiscal Consolidation." Global Economics Paper No. 207, Goldman Sachs, New York.

Vitek, Francis. 2012. "Policy Analysis and Forecasting in the World Economy: A Panel Unobserved Components Approach." Working Paper No. 12/149, International Monetary Fund, Washington, DC.