



IMF Working Paper

Do Fiscal Spillovers Matter?

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Abstract

The paper assesses the impact of fiscal spillovers on growth in the context of a coordinated exit from crisis management policies. We find that despite potentially sizeable domestic effects from consolidation, aggregate negative spillovers to other countries are likely to be contained in 2011–2012 unless fiscal multipliers and/or imports elasticities are very large. Small and open European economies, however, will be substantially affected in any case. In contrast, the coordinated exit from fiscal stimulus will have limited direct effect on European peripheral countries since they are relatively closed, with the notable exception of Ireland.

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I. INTRODUCTION

Under normal circumstances when business cycles and fiscal policies are unsynchronized, changes in domestic fiscal stances are unlikely to have a significant global impact because the reduction in domestic demand can be partly offset by the increase in net exports, as documented, for example in IMF 2010. However, the current situation is not normal. Countries have gone through a global 2008–09 financial crisis and implemented in response synchronized fiscal stimuli, which left substantial amounts of public debt that now need to be reduced. For many governments fiscal consolidation has thus become a major objective and they have embarked on ambitious fiscal consolidation plans starting in 2011. This implies that many countries will consolidate at the same time.

Has the ongoing synchronized fiscal consolidation the potential to lead to significant spillover effects? In other words, will fiscal action of a country convey to economic activity in other countries? Some would argue that such a risk exists. Several considerations favor such a view: Exchange rates cannot adjust if many countries consolidate simultaneously. Additionally, a large number of countries undertaking consolidation are in the eurozone where the real exchange rates can adjust only slowly anyway. Hence, the offsetting effect through the adjustment in net exports may not be feasible. Moreover, empirical evidence suggests that fiscal multipliers are likely to be higher at the time of financial stress and when interest rates are close to the zero bound (Blanchard et al. 2009; Christiano et al. 2009; IMF 2010; Auerbach and Gorodnichenko 2010; Corsetti et al. 2010). Both aspects have thus the potential to magnify spillover effects from fiscal consolidation.

We use a simple analytical framework to evaluate the relevance of fiscal spillover effects through trade channels based on estimates of fiscal multipliers and import elasticities obtained in other studies. The methodology is applied to a sample of 20 countries covering more than 70 percent of world GDP.² The approach accounts for carry-over effects from previous years' fiscal positions and allows differentiating between revenue and expenditure measures. The baseline estimates of multipliers obtained in the literature are based on the premise that monetary policy is accommodative. To reflect the current environment in which exchange rate adjustments to “soften the blow” may not be feasible, we perform a series of robustness checks with higher multipliers and a range of import elasticities. We also assess how sensitive the results are to various measures of the fiscal stance.

The results do imply that the domestic contractionary effects of fiscal consolidation could be sizable. However, aggregate spillovers of these contractionary impulses to other countries are likely to be contained in 2011–2012 unless fiscal multipliers and/or imports elasticities

² The full list of countries includes Austria, Belgium, Brazil, France, Germany, Greece, Ireland, Italy, India, Netherlands, Portugal, Spain, Korea, Russia, Sweden, Switzerland, China, Japan, United Kingdom and United States.

are significantly larger than seems reasonable now. However, the effect will be different across countries. Small and open European economies, including Ireland, Belgium, Austria and the Netherlands will be substantially affected. European peripheral countries other than Ireland will face limited direct impacts because they are relatively closed. Ireland would benefit from a more relaxed pace of fiscal consolidation elsewhere, but such support would be meaningful only if it was coordinated across the major economies, including the United States and the United Kingdom. In contrast, a reduced consolidation effort by Germany alone would have a limited impact on the European periphery.

Our analysis is based on two parts. First, we estimate the impact of a uniform shock (1 percent of GDP reduction in expenditure) in 20 major economies to gauge the relative strength of the impact on growth across countries. Second, we estimate the growth impact based on the projected fiscal position in these economies in 2011–12, which also reflect the size of the expected fiscal change for each country under the current plans. In both cases, we quantify the potential effect of fiscal consolidation on output growth and the trade balance and calculate the contribution of spillovers from other countries' consolidation plans to the respective changes.

The approach only quantifies the direct demand impact and does not reflect credibility or other non-demand driven effects (to the extent that they are not embedded in the underlying multiplier estimates). Moreover, the approach focuses on a short-term impact (two years) and may not fully capture the effects of exchange rate and price adjustments on growth and the trade balance, which are also likely to reduce the spillovers in the longer-term. Hence, the results can be viewed as upper bound estimates of fiscal spillovers from consolidation, since the other effects would reduce the negative impact on growth.

The remainder of the paper is structured as follows. Section 2 briefly discusses the findings of the related literature on fiscal multipliers and spillover effects. The analytical framework is derived in Section 3. Section 4 presents the simulation results and discusses the global effects of spillovers. Finally, Section 5 provides concluding policy implications.

II. LITERATURE

The literature on economic spillovers across borders has grown in recent years. However, there are only few quantitative studies measuring the growth impact of fiscal spillovers, i.e. the impact of domestic fiscal changes on growth in other countries. This is not surprising since aggregate fiscal spillovers are negligible when the fiscal cycles of countries are independent from each other, because the sum of fiscal changes in the rest of the world are likely to be small as consolidation and expansion in different countries offset each other.

But in the event of a global downturn, fiscal spending tends to become synchronized as countries step up spending to bolster output during the recession. For example, in the

aftermath of the financial crises 2008–09, governments simultaneously implemented fiscal stimulus packages, while now there is a global tendency to reduce fiscal deficits.

Estimates of growth spillovers in the context of crises and synchronized fiscal consolidation are scarce. Thus, our understanding of the international growth impact of fiscal changes derives from studies which focus on the domestic effect of fiscal consolidation. Since the size of the domestic effect of fiscal consolidation on growth is rather important for evaluating the potential for cross-country spillover effects, we also review the literature on the domestic effects of fiscal policy. We focus on studies that investigate the difference between the effects on growth in times of crises and ‘normal’ times.

In reviewing the literature, we reach two main conclusions. First, the existing estimates of fiscal spillovers suggest that they are limited, although spillovers from the U.S. may be relevant. In most cases, however, the analysis of spillovers is based on the effect of an individual country while keeping fiscal policy in other countries unchanged. Hence, the effect of coordinated consolidation may not be fully captured. Furthermore, the estimates of growth spillovers are based on ‘normal times’ and simulation results often rely on forward looking agent models; both favoring the finding that the impact of fiscal changes on growth are low. Second, while estimates of fiscal multipliers from domestic policy action in a single country on its own growth vary widely, the evidence suggests that the multipliers are likely to be on the higher side in the current environment. In particular, with the interest rates close to the zero bound, the interest rates cannot fall much further to crowd in investment. Also the shares of the liquidity constrained households and firms are likely to be high in the aftermath of the financial crisis.

Some recent studies investigate spillover effects of fiscal policy.³ Beetsma et. al. (2006) find that the average effect of a fiscal stimulus of a 1 percent of GDP in Germany is an increase of 0.23 percent in foreign GDP for a spending increase and 0.06 percent for a net tax cut, within two years.⁴ Spillovers from France are found to be lower but still non-negligible. The authors employ a two-step procedure. In the first step, they use a standard panel VAR approach to identify fiscal shocks. In the second step, a panel bilateral trade model is estimated to obtain the effects of changes in domestic output on foreign exports. Merging the responses from the two blocks allows computing the overall effect of the fiscal impulses on bilateral exports and

³ Another study which looks at fiscal spillovers is Canova and Pappa (2007). However, the authors focus on the effect of regional expenditure and revenue shocks on the price differentials, and not growth, in monetary unions using the example of the U.S. states as well as nine EMU member countries. Since the authors run separate BVARs for each unit and construct average response from these estimates they also cannot account explicitly for spillovers across regions.

⁴ German fiscal expansion has particular strong effects on its small neighbors. An increase in public spending (a decrease in net taxes) by 1 percent of GDP in Germany leads to a more than 0.4 percent (0.1 percent) normalized increase in GDP of Austria, Belgium, Luxemburg and the Netherlands after two years.

thereby on output of other countries. Their estimates however, do not represent the full extent of the spillovers since they do not account for further feedback effects among the economies.⁵

Bénassy-Quéré and Cimadomo (2006) find positive cross-border spillovers from Germany, at least in neighboring and smaller countries. The authors find tax multipliers to be larger than spending multipliers and the effect of tax shocks on output to be more persistent.⁶ They estimate a factor augmented VAR model, appending the GDP and the real exchange rate of a country at a time to the German model. The focus is on the seven biggest EU member countries. Germany is assumed to be contemporaneously unaffected by the foreign variables while German shocks can affect the country under analysis. The estimation procedure constrains the analysis to direct effects from Germany to the respective country while not accounting for multi-country spillovers and potential feedback loops.

Some authors have employed multi-country macro-models to simulate the extent of spillovers from fiscal policies. For instance, Gros and Hobza (2001) provide an overview of results from four major macroeconomic models on cross-country spillover effects of fiscal policy, focusing on the effect of a government spending shock of 1 percent of GDP in Germany.⁷ Effects are found to be relatively small. While they are generally positive for small open economies which trade extensively with Germany, ranging around 0.02 percent of baseline GDP (Austria, Belgium and the Netherlands), they tend to be negative for the bigger countries and the small countries with few trade links with Germany, ranging around -0.05 percent of baseline GDP (France, Italy, Spain, Greece, and Portugal). Cwik and Wieland (2010) use five different empirical macroeconomic models to evaluate the impact of the fiscal stimulus in the financial crisis.⁸ Spillover effects from German expansion during the crisis are found to increase GDP in France by 0.04 percent after one year, while the effect is

⁵ The authors thus argue that the effects should be regarded as lower bounds and that further research is needed on the feedback between all countries.

⁶ The authors find German tax shocks to impact beneficially foreign GDP. However this effect seems to be limited to neighboring countries. Cross-border spillovers from fiscal spending shocks are found to be low and rarely significant, except for few countries Belgium, Austria and the Netherlands.

⁷ The impact on German GDP in the first year amounts to a change of between 0.4 to 1.2 percent. The original paper includes result from four models including MULTIMOD (IMF), NiGEM (NIESR), QUEST (EC), and Marmotte (CEPII). We excluded results from the latter for the discussion here since it is based on a multi country framework which assumes full flexibility of output prices and rational forward looking agents.

⁸ The four models based on the New-Keynesian approach do not support a text-book Keynesian multiplier effect. The reason is the forward-looking behavior of households and firms. They anticipate higher tax burdens and higher interest rates in the future and therefore reduce consumption and investment. Only the ECB's area-wide model, which largely ignores forward-looking behavior, is found to generate government spending multipliers that are significantly above one.

found to be negative for Italy with -0.001 percent. The authors explain the negative effect by the fact that the direct demand effects are overwhelmed by the indirect effect of a euro appreciation.⁹ The OECD (2009) provides some aggregate spillover results for the U.S., Japan, the Euro area, and other OECD countries. Spillovers are lowest to the U.S. and to the euro area as a whole but sizeable to other OECD countries in 2009 and even more so in 2010 mainly due to U.S. fiscal expansion. WEO 2011 demonstrates potentially large spillovers from a coordinated fiscal consolidation to a small open economy like Canada.

In the single country context, estimates of fiscal multipliers vary substantially across various studies and across countries.¹⁰ Blanchard and Perotti (2002) find that consistent with theory, an increase in government spending in the US boosts output while an increase in taxes reduces output. They do not find a significantly lower impact of taxes compared to spending in terms of cumulative multipliers but the tax shocks appear to be less persistent. Multipliers are close to one. Spending shocks tend to have a negative effect on investment while consumption tends to rise. Romer and Romer (2010), in contrast, find much stronger effects of tax changes for the U.S. The results, however, are not strictly comparable since in the latter case the shocks are not based on the standard estimation framework but derived from a narrative approach. An exogenous tax increase of one percent of GDP lowers real GDP typically by over 1.5 percent after one year and 2.5 percent after two years. Investment falls sharply in response to exogenous tax increases. Using the change in the cyclical adjusted revenues yields a smaller impact of about 0.5 percent after one year and 1.3 percent after two years. IMF 2010, which uses a similar narrative approach to construct the measure of fiscal policy in a sample of advanced countries, concludes that expansionary effects of consolidation are unusual in the short-run with the estimated average reduction in GDP by about ½ percentage points after two years from a 1 percent of GDP fiscal contraction.

Several recent studies focused on the effects of fiscal policy during the financial crisis. This literature argues that during the recent financial crisis spillover effects were prone to be particular high since conditions were relatively favorable (Blanchard et. al. 2009, IMF 2010): interest rates were very low, inflation pressure was low and investment had collapsed. With interest rates often at the zero lower bound crowding out was minimized (Christiano et al. 2009). Almunia et al (2009) employ the experience of great depression to estimate fiscal multipliers at the time when the banking system is dysfunctional and monetary policy is constrained by the zero bound. They employ a VAR technique, instrumental variables, and

⁹ It should be noted that the results are based on a G7 country model and on the assumption of no fiscal change in the other countries. Thus, positive spillovers from third country effects are likely to be underestimated (due to the country sample) and negative repercussions from the appreciation of the euro overestimated (due to the country sample and the absence of a fiscal expansion in the other countries).

¹⁰ For a summary of literature on multipliers see Schindler et al (2009).

qualitative evidence for a panel of 27 countries in the period 1925–1939 and find large fiscal multipliers, for example, for expenditure a multiplier of 2.5 on impact and 1.2 after one year.

Auerbach and Gorodnichenko (2010) find a stark contrast between multipliers in recessions and expansions.¹¹ Estimates for spending multipliers in recession are about 2–2.5 times higher than estimated multipliers when not accounting for different stages in the business cycle. Shocks appear also to be of a much more permanent nature during recessions as opposed to expansions. Tagkalakis (2008) finds that liquidity constraints can explain these asymmetric effects of fiscal policy on output over the business cycle. In recessions, liquidity constraints are binding for a wider range of firms and households, which makes the fiscal policy more effective by stimulating consumption spending either via tax cuts or government spending.

Similarly, Corsetti et al. (2010b) find for a panel of countries multipliers for government spending shocks to be much higher in times of crises causing output to increase by twofold the spending increase. The authors use a two step procedure, first identifying country specific spending shocks and then using a panel approach to regress spending shocks interacted with country characteristic. The error bounds, however, are very wide suggesting caution in interpreting these results.

While the recent literature provides some results on fiscal spillovers on growth, the analysis is generally conducted in a *ceteris paribus* manner, i.e. looking at the direct effect of a single country's fiscal policy on others without taking into account indirect second round effects through trading partners, which could amplify the impact. We contribute to the literature by accounting for these second round effects. Moreover, unlike earlier studies, we study not only the potential spillover effects but also the spillovers that are implied by the announced global fiscal consolidation plans for 2011–2012. We allow Keynesian effects to operate fully, allowing thus, for the full possible effects of fiscal policy on growth spillovers.

III. FRAMEWORK

A. Fiscal Spillover Framework

The spillover framework is based on the representation of the national accounts and behavioral assumptions for government spending, taxes, consumption, investment, exports and imports. Starting from the national accounting identity we know that:

$$Y_{t,j} = C_{t,j} + I_{t,j} + G_{t,j} + X_{t,j} - M_{t,j} \quad (1.1)$$

¹¹ On the other hand the OECD (2009) argues that multipliers may be lower in the current crises, about 0.5 percent, due to the higher propensity to save of households.

Where $Y_{t,j}$ is the real output, $I_{t,j}$ is real investment, $G_{t,j}$ is the real government spending, $X_{t,j}$ is are real exports and $M_{t,j}$ are real imports of country j in time t denominated in a common currency. The single elements of output are respectively given by:¹²

$$\begin{aligned} C_{t,j} &= C_0 + c_1 (Y_{t,j} - T_{t,j}) \\ I_{t,j} &= I_0 + d_1 Y_{t,j} - d_2 r_{t,j} \end{aligned} \quad \begin{aligned} M_{t,j} &= \mu_j Y_{t,j} \\ X_{t,j} &= \sum_{\substack{i \neq j \\ i=1}}^I \omega_{ij} \mu_i Y_{t,i} \end{aligned} \quad (1.2)$$

μ_j is the marginal propensity to import of a trading partner i ,¹³ Y_i is the output of a trading partner i , and ω_{ij} is the weight of imports from country j in total imports of country i .

Government expenditures and revenues have a cyclical part and a discretionary element. We also allow past measures to have carry over effects into the current period. Substituting the definitions (1.2) in (1.1) yields

$$Y_{t,j} = ex_{t,j} + m_j G_{t,j} - m_j c_1 T_{t,j} + m_j \sum_{\substack{i \neq j \\ i=1}}^I \omega_{ij} \mu_i Y_{t,i} \quad (1.3)$$

Where $ex_{t,j} = C_0 + I_0 - d_2 r_{t,j}$ and $m_j = (1 - c_1 - d_1 + \mu_j)^{-1}$ is the expenditure multiplier, which is also the multiplier for exports. Taking the first difference and dividing by real output in $t-1$ yields the contribution of the fiscal change to output growth:

$$\frac{\Delta Y_{t,j}}{Y_{t-1,j}} = m_j \left[\frac{\Delta G_{t,j}}{Y_{t-1,j}} \right] - m_j c_1 \left[\frac{\Delta T_{t,j}}{Y_{t-1,j}} \right] + m_j \sum_{\substack{i \neq j \\ i=1}}^I \omega_{ij} \mu_i \frac{\Delta Y_i}{Y_{t-1,i}} \frac{Y_{t-1,i}}{Y_{t-1,j}} \quad (1.4)$$

¹² The model is not accounting for potential crowding out effects. Allowing consumption and investment to react to fiscal changes (beyond the output effect) potentially reduces the contractionary effect of fiscal consolidation. While this is clearly a simplifying assumption, it is not unreasonable in the current economic environment.

¹³ In the calculations the marginal propensity to import μ_j was computed as the ratio of imports to GDP multiplied by the imports elasticity for each country.

Converting expenditure and revenue ratios into nominal terms with respect to GDP we have:¹⁴

$$\tilde{y}_{j,t} = m_j \left[\frac{\Delta G_{t,j}^N P_{j,t-1}}{Y_{j,t-1}^N P_{j,t}} \right] - m_j c_1 \left[\frac{\Delta T_{t,j}^N P_{j,t-1}}{Y_{j,t-1}^N P_{j,t}} \right] + m_j \sum_{\substack{i=1 \\ i \neq j}}^I \omega_{ij} \mu_i \tilde{y}_i \frac{Y_{i,t-1}^N}{Y_{j,t-1}^N} \quad (1.5)$$

Where $P_{j,t}$ is the price level at time t , which is measured by the GDP deflator.

Consistent with empirical findings we allow the fiscal measures to incorporate a current period as well as a lagged period effect from fiscal measures implemented in the previous period:

$$m_j \left[\frac{\Delta G_{t,j}^N P_{j,t-1}}{Y_{j,t-1}^N P_{j,t}} \right] = m_j^{G,1} g_{j,t} + m_j^{G,2} g_{j,t-1} \quad m_j c_1 \left[\frac{\Delta T_{t,j}^N P_{j,t-1}}{Y_{j,t-1}^N P_{j,t}} \right] = m_j^{T,1} t_{j,t} + m_j^{T,2} t_{j,t-1} \quad (1.6)$$

Equation (1.5) is a system of I linear equations that can be written in matrix notation and solved for the change in expenditures and revenues according to:

$$\tilde{Y}_t = W \left[A_1 \bar{G}_t - A_2 \bar{T}_t \right] \quad (1.7)$$

Where $W = (I - B)^{-1}$, is a I -by- I identity matrix, B is a I -by- I matrix, \tilde{Y} is I -by-1 vector of real GDP growth rates, A_1 and A_2 are diagonal I -by- I matrices and \bar{G}_t and \bar{T}_t are I -by-1 vectors. It is possible to derive country i 's contribution to country j 's GDP growth by evaluating:

$$\tilde{y}_{t,ji} = w^{ji} \left[a_1^{ji} \bar{g}_t^i - a_2^{ji} \bar{t}_t^i \right] \quad (1.8)$$

We can use the definitions in (1.2) to derive the implicit change in the real trade balance that is caused by the change in fiscal spending. To do so we first compute the real change in exports and imports relative to real GDP in $t-1$:

¹⁴ Note that we used the following transformation: $\frac{Y_{t-1,i}}{Y_{t-1,j}} = \frac{q_{ij} Y_{t-1,i}^*}{Y_{t-1,j}} = \frac{s_{ij} P_{t-1,i}^* Y_{t-1,i}^*}{P_{t-1,j} Y_{t-1,j}} = \frac{s_{ij} Y_{t-1,i}^{N*}}{Y_{t-1,j}^N} = \frac{Y_{t-1,i}^N}{Y_{t-1,j}^N}$ where

q_{ij} and s_{ij} are respectively the real and the nominal exchange rate between country i and country j and stars denote values in foreign currency. The nominal exchange rate is assumed to be stable across the period of analysis.

$$\frac{\Delta X_{t,j}}{Y_{t-1,j}} = \sum_{\substack{i \neq j \\ i=1}}^I \omega_{ij} \mu_i \frac{\Delta Y_{t,i}}{Y_{t-1,i}} \frac{Y_{t-1,i}}{Y_{t-1,j}} \quad \frac{\Delta M_{t,j}}{Y_{t-1,j}} = \mu_j \frac{\Delta Y_{t,j}}{Y_{t-1,j}} \quad (1.9)$$

Converting into nominal terms with respect to GDP and subtracting gives the real change in the trade balance relative to GDP in t-1:

$$\frac{X_{j,t}^N (P_{j,t-1} / P_{j,t}) - X_{j,t-1}^N}{Y_{j,t-1}^N} - \frac{M_{j,t}^N (P_{j,t-1} / P_{j,t}) - M_{j,t-1}^N}{Y_{j,t-1}^N} = \sum_{\substack{i \neq j \\ i=1}}^I \omega_{ij} \mu_i \frac{Y_{i,t-1}^N}{Y_{j,t-1}^N} \tilde{y}_{t,i} - \mu_j \tilde{y}_{t,j} \quad (1.10)$$

B. Measures of Fiscal Stance

An important question in identifying growth impacts of fiscal changes is the choice of the measure of the fiscal stance. In theory, the multiplier is defined with respect to the change in real fiscal variables; in particular, it provides an answer to the question by how many units the output changes if the fiscal variable (say, expenditure) changes by one unit, keeping other things constant. In practice, however, policymakers often use the measure of fiscal policy changes in relation to GDP or potential GDP, which facilitates comparison across countries. In addition, a measure of cyclically-adjusted fiscal changes is often employed to separate the impact of discretionary fiscal policy on output. While the latter allows making a clear link between fiscal changes and growth since it can be viewed as largely exogenous to output changes, it misses an important component of automatic stabilizers, which contribute to output dynamics.

For assessing the robustness of our results we employ three different measures of fiscal stance:

- Changes in cyclically-adjusted revenues/expenditures in percent of GDP using Girouard and André, 2005 estimates of elasticities and EC approach for calculating cyclical adjustment;¹⁵
- Changes in headline revenue/expenditure in percent of GDP;
- Changes in headline revenue/expenditure in real terms.

All three measures have their advantages and disadvantages and capture different aspects of fiscal policy. Cyclically-adjusted measures attempt to capture discretionary fiscal action.

¹⁵ We compared the estimates of fiscal changes based on cyclically-adjusted revenue/expenditure in percent of GDP with those in percent of potential GDP and found the differences to be small. We chose to report the results for the measure scaled by GDP to facilitate comparison with the headline measure.

However, it may not provide an accurate picture in case historical elasticities of revenues/expenditures do not correctly capture automatic stabilizers, for example, in countries where asset prices play an important role (e.g. U.K.) or where there might have been structural changes (e.g. the German labor market, where the developments have recently decoupled from the developments in the output gap). Estimation of potential output is also inherently difficult.

The measure of fiscal balance based on revenue/expenditure in percent of GDP is a commonly used indicator, which captures not only discretionary policy but also automatic stabilizers. While it does not require additional assumptions on the output gap and elasticities it is endogenous in a sense that it is itself affected by the developments in the GDP. Resolving the issue of endogeneity, however, is rather difficult and is beyond the scope of this paper.

Moreover, the fact that the denominator—be it actual GDP or potential GDP—is changing implies that any measure in ratios is bound to reflect those changes, which may be distortive in terms of measuring fiscal contribution to growth. The following example demonstrates this for government spending: The change in expenditure in real terms, which is relevant for computing fiscal contribution to growth (see formula (1.4)), can be written as

$$\Delta G^{real} = \frac{G_t^r - G_{t-1}^r}{Y_{t-1}^r}$$

Where G_t^r is real fiscal spending at time t and Y_{t-1}^r is real output at time t-1. Then the change in expenditure in ratios to GDP or potential GDP can be written as

$$\Delta G^{ratios} = \frac{G_t^r P_t}{Y_t^r P_t} - \frac{G_{t-1}^r P_{t-1}}{Y_{t-1}^r P_{t-1}} = \Delta G^{real} - \frac{G_t^r}{Y_t^r} g_{Y_t^r}$$

Where $g_{Y_t^r}$ is a real GDP or potential GDP growth at time t. Hence, provided the growth in GDP or potential GDP is non-zero, the differences can be substantial for revenue/expenditure subcomponents as the ratio of expenditure/revenue to GDP is typically large. The differences for the overall balance, however, will be small as the differences for revenue and expenditure largely offset each other.

While the theoretical definition of multiplier is based on a concept of real change in revenue/expenditure, the empirical estimates of fiscal multipliers are sometimes geared towards the measure based on ratios to GDP or potential GDP. Hence, none of the measures mentioned above is perfect and the three measures capture different aspects of fiscal policy, hence, all three can be useful in assessing the impact on growth.

IV. SIMULATION RESULTS

For practical reasons we limit our discussion to 20 countries with a focus on European countries but a fair representation of major international actors. More precisely our exercise includes all nations with a ratio of domestic to world output of above 2 percent. Given our particular interest in the euro area countries we include additionally a range of euro area members and their relevant trading partners in the sample. The final sample includes the following 20 countries:¹⁶ Austria, Belgium, Brazil[†], China^{†‡}, France, Germany, Greece, Ireland, India[†], Italy, Japan[†], Korea[†], Netherlands, Portugal, Russia[†], Spain, Sweden, Switzerland[‡], United Kingdom^{†‡}, and the United States^{†‡}

The sample represents more than 70 percent of world GDP and covers on average 2/3 of a country's imports and of a country's exports. For the euro area members in the sample the values are roughly 3/4 for imports and exports.

The OECD (2009) reports revenue and spending multipliers for current periods and lagged effects for subcomponents of revenues and expenditures for a wide sample of countries. We draw on these multipliers for specific tax and revenue policies to compute the respective values for the current period revenue ($m_j^{T,1}$) and expenditure ($m_j^{G,1}$) as well as the lagged effect revenue ($m_j^{T,2}$) and expenditure ($m_j^{G,2}$) multiplier.¹⁷ We use each country's share of specific revenue components to compute an overall revenue multiplier and similarly an overall spending multiplier. In some cases the resulting average multipliers are adjusted in line with country-specific estimates provided by IMF country desks.

Import elasticities are taken from Kee et al. (2008). The marginal propensity to import (μ) is then computed by multiplying the elasticity with the respective imports to GDP ratio in 2009. An overview of the multipliers and the import elasticities are provided in the Appendix Table 1.

¹⁶ Countries marked by † account for more than 2 percent of world output, and countries marked with ‡ are major trading partners for one or more of the euro member countries. We did exclude Canada and Mexico in favor of several smaller euro zone members. Both Mexico and Canada have negligible effects on the European countries but are very much subject to US shocks.

¹⁷ More precisely we employ the country specific multipliers labeled “high multipliers” by the OECD (2009). The term “high” in this context refers to the fact that the OECD's “reference” multiplier employed in their study is “judgmentally scaled down, by more for tax cuts than for government spending”, since the current economic circumstances are “more likely to reduce multipliers”. Thus we use effectively the original series.

The fiscal measures are based on the IMF's April 2011 WEO data. The simulation framework implies that the differences in the impact of fiscal consolidation is a combination of the following elements

- 1) The country specific revenue and expenditure multipliers
- 2) The composition of the consolidation (revenue versus expenditure measures)
- 3) The trade links between countries (and thus these countries' characteristics for sub-points 1 to 2) and their propensity to import when income changes

We will refer to variations in the above in the respective robustness checks.

A. Uniform Fiscal Shock

A1. Baseline multipliers and import elasticities

We first demonstrate an impact of a 1 percent of GDP shock to expenditures to gauge the relative size of spillovers between countries under the baseline assumption on multipliers and import elasticities. The baseline multipliers average at 0.5 for revenue and 0.8 for expenditure after two years across the sample of 20 countries. Hence, the baseline multipliers are relatively high. The import elasticities average at 1.15, Table 1 reports detailed assumptions on multipliers and import elasticities.

To clarify the mechanics and the intuition behind the reported results we present the calculation of the first-round spillover effects from a 1 percent decline in government spending in Germany to the peripheral European countries after one year in the table below.

The first-round effect of the fiscal consolidation in Germany on growth in Portugal can be approximated as follows. German imports from Portugal comprise only 0.7 percent of total German imports¹⁸ while Germany's marginal propensity to import out of income is 0.5 (imports share in GDP times imports elasticity). Hence, out of every additional euro of income Germany will import only 0.35 cents from Portugal and the opposite is true for income reduction. Since fiscal spending in Germany has a multiplier of only about 0.4 after one year, a one percent of GDP decline in fiscal spending in Germany will reduce German GDP due to domestic consolidation by only about 0.4 percent after one year, which would result in a decline of about 10 bln euros. As a result, Germany will import 0.03 bln euros less from Portugal, and Portuguese exports will decline by this amount. However, this does not translate in the equivalent amount of income loss for Portugal since, for example, some of this reduction will be compensated by lower imports. Since exports have the same multiplier

¹⁸ In fact, the share is even smaller; the results in the table were rescaled by the total over the sample of 20 countries to sum up to 1.

as expenditures (see equation (1.3)), which is about 0.5 for Portugal, the actual income loss for Portugal would only be about 0.015 bln euro, which corresponds to about 0.009 percent reduction in Portuguese GDP in the first year (German GDP is 15 times bigger than Portuguese GDP).

This calculation, however, does not incorporate second round effects since a reduction in German GDP will result in lower growth in other common trading partners of Germany and Portugal. Taking into account these second round effects will result in a slightly higher reduction in GDP growth in Portugal, namely, 0.011 percent. The impact is somewhat bigger on Ireland but almost negligible on Greece.¹⁹

Hence, the impact of Germany's fiscal policy on the peripheral countries is likely to be rather small. As we demonstrate below even very high multipliers result in only a moderate impact from Germany alone.

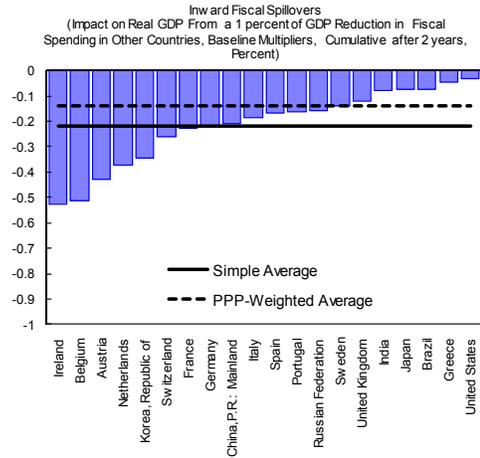
The matrix of results of a coordinated 1 percent decline in fiscal spending across all 20 countries is reported in Table 2 in the Appendix. The table reports the growth impact (percent deviation from the baseline of no fiscal change) after two years. Countries where the fiscal shock originates are reported in columns while recipient countries of the growth impact are in rows. Hence, the diagonal elements of this matrix show the growth impact of the country's domestic fiscal policy while the off-diagonal elements show the spillovers—the impact on country's growth due to the fiscal changes in other countries. The total at the end of the row, therefore, is the total growth impact on a particular country reported in this row from the coordinated fiscal consolidation. The PPP-weighted average at the bottom of the table can be interpreted as an individual country's impact on the whole group of 20 countries—a proxy of the impact on world growth. The PPP-weighted average, however, includes both the impact on global growth from the changes in domestic growth of a country and through the spillovers from this country to other countries weighted by the PPP GDP of each country.

The results indicate that the overall impact of a 1 percent of GDP coordinated fiscal consolidation is sizeable, reducing growth in the 20 countries on average by about 0.9 percent after two years (PPP-weighted basis) largely due to the impact on growth from domestic consolidation with only about 15 percent being accounted for by spillovers from one country to another. The largest contributions to the PPP-weighted average growth decline come from the United States and China (close to 0.2 percent) reflecting their large

¹⁹ It should be noted that the calculation results are based on the pattern of trade in goods. Greece, however, has a substantial share of trade in services, hence, the estimates are biased downward. Nonetheless, the impact is likely to be very small; even assuming that trade in services is about 50 percent of total trade in Greece and, hence, by roughly doubling the results would yield very small spillovers from Germany.

weight in the world economy, followed by Japan and India (close to 0.1 percent) with Germany, France, Brazil, Italy and Russia contributing close to 0.05 percent while United Kingdom, Spain, and Korea contributing about 0.03 percent each.

Total inward fiscal spillovers to most countries are limited, not exceeding 0.3 percentage points over two years and averaging at 0.1 on PPP-weighted basis and 0.2 on simple average basis. However, spillovers to Ireland, Belgium, Austria, the Netherlands and Korea are more substantial, close to ½ percentage points over two years. In the case of Ireland the largest single-country contribution comes from the United States (Appendix Table 2). For Austria and the Netherlands spillovers from Germany are particularly pronounced, while for Belgium spillovers from Germany and France are equally important. In Korea spillovers from China play an important role. However, individual country spillovers to other individual countries are rather small, not exceeding 0.16 percentage points over two years.



An example of the calculation of the first-round effect of the reduction in fiscal spending in Germany by 1 percent of GDP on growth in the European periphery.

Peripheral Country	First-Round Effect on German GDP			First-Round Effect on Peripheral Exports						First-Round Effect on Peripheral GDP		Total spillover effect on growth after one year
	Expenditure Shock in Germany	Expenditure multiplier in Germany	First-Round Effect on German GDP	Share of Country's Imports in Total German Imports	German Imports elasticity	German Imports share in GDP	German Marginal Propensity to Import	Ratio of German Output to Country's Output	First-Round Effect on Peripheral Exports	Export Multiplier of the Peripheral Country	First round spillover effect on growth after one year (percent)	The solution given by (1.8), reflects indirect effects through other countries (percent)
	$\frac{\Delta G_{i,t}^N}{Y_{i,t-1}^N} \frac{P_{i,t-1}}{P_{i,t}}$	m_i	$\tilde{y}_i = m_i \left[\frac{\Delta G_{i,t}^N}{Y_{i,t-1}^N} \frac{P_{i,t-1}}{P_{i,t}} \right]$	ω_{ij}	\mathcal{E}_i	$\frac{M_{t-1,j}}{Y_{t-1,j}}$	$\mu_i = \mathcal{E}_i \frac{M_{t-1,j}}{Y_{t-1,j}}$	$\frac{Y_{i,t-1}^N}{Y_{j,t-1}^N}$	$\frac{\Delta X_{t,j}}{Y_{t-1,j}} = \omega_{ij} \mu_i \tilde{y}_i \frac{Y_{i,t-1}^N}{Y_{j,t-1}^N}$	m_j	$m_j \frac{\Delta X_{t,j}}{Y_{t-1,j}}$	$\tilde{y}_{t,ji}$
Greece	-1.000	0.410	-0.410	0.004	1.140	0.422	0.481	10.975	-0.008	0.555	-0.004	-0.005
Ireland	-1.000	0.410	-0.410	0.013	1.140	0.422	0.481	16.124	-0.042	0.395	-0.017	-0.024
Portugal	-1.000	0.410	-0.410	0.007	1.140	0.422	0.481	14.604	-0.021	0.453	-0.009	-0.011

A2. Higher multipliers and import elasticities

There are several arguments why multipliers in the current economic environment are likely to be higher than under the usual circumstances (see Corsetti et al. (2010b), Auerbach and Gorodnichenko (2010), and IMF (2010)). To reflect such a possibility, we analyze to which extent a multiplier level of one standard deviation above the respective baseline value for expenditure multiplier changes the growth impact and, in particular, spillovers. This implies that expenditure multipliers are about 25 percent above their baseline values and the resulting multiplier close to 1. In principle, higher multipliers could be caused by a higher propensity to consume or a lower propensity to import (see explanation to equation 1.3 above). If multipliers are higher due to higher marginal propensity to consume with unchanged marginal propensity to import then spillovers would be higher since they raise the impact on domestic demand. The impact on spillovers from higher multipliers due to lower propensity to import is ambiguous since lower propensity to import would contribute to lowering spillovers while higher multipliers would tend to increase them. We analyze the impact of higher multipliers under the assumption that it is a result of higher propensity to consumer to give spillovers a higher chance to play out. It should be noted that the resulting average high multiplier (close to 1 after two years) is consistent with the estimates obtained under constrained monetary policy in IMF 2010.

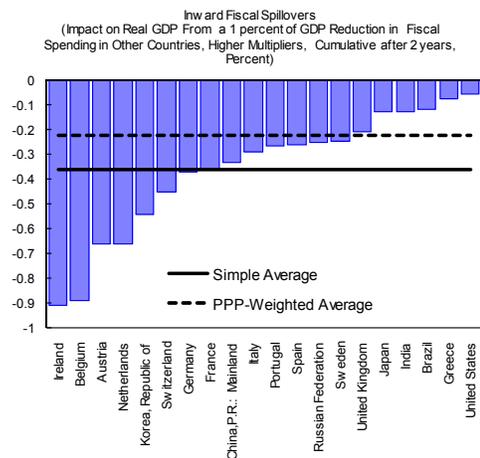
There is also evidence that import elasticities vary over the cycle with higher elasticities during the downturn (e.g. Leibovici and Waugh, 2011). We, therefore, also perform a robustness check with higher import elasticities while unchanged baseline assumption on expenditure multipliers. Hence, we assume that in this scenario higher import elasticities were combined with higher marginal propensities to consume such that the opposing effects of these changes lead to unchanged expenditure multipliers. Higher import elasticities are calculated as baseline elasticities plus five standard deviations resulting in an average elasticity of 1.64 i.e. about 40 percent higher than the baseline elasticities.

Impact of a 1 Percent of GDP Reduction in Fiscal Spending on Growth After Two Years (percent)

From:	Baseline multipliers and imports elasticities 1/			Higher multipliers and baseline imports elasticities 1/			Baseline expenditure multipliers and higher imports elasticities 1/		
	Total	Domestic	Inward Spillovers	Total	Domestic	Inward Spillovers	Total	Domestic	Inward Spillovers
To:									
Austria	-1.5	-1.1	-0.4	-2.0	-1.3	-0.7	-1.8	-1.1	-0.7
Belgium	-1.3	-0.7	-0.5	-1.8	-0.9	-0.9	-1.6	-0.8	-0.8
Brazil	-0.9	-0.8	-0.1	-1.1	-1.0	-0.1	-0.9	-0.8	-0.1
France	-1.3	-1.1	-0.2	-1.7	-1.3	-0.4	-1.5	-1.1	-0.4
Germany	-1.0	-0.8	-0.2	-1.4	-1.0	-0.4	-1.2	-0.8	-0.3
Greece	-0.9	-0.8	0.0	-1.1	-1.0	-0.1	-0.9	-0.8	-0.1
Ireland	-1.3	-0.8	-0.5	-1.9	-1.0	-0.9	-1.6	-0.8	-0.8
Italy	-1.2	-1.0	-0.2	-1.4	-1.2	-0.3	-1.3	-1.0	-0.3
India	-0.9	-0.8	-0.1	-1.1	-1.0	-0.1	-0.9	-0.8	-0.1
Netherlands	-1.1	-0.8	-0.4	-1.6	-1.0	-0.7	-1.4	-0.8	-0.6
Portugal	-1.0	-0.8	-0.2	-1.3	-1.0	-0.3	-1.1	-0.8	-0.3
Spain	-1.2	-1.0	-0.2	-1.5	-1.2	-0.3	-1.3	-1.0	-0.3
Korea, Republic of	-1.2	-0.8	-0.3	-1.6	-1.0	-0.5	-1.3	-0.8	-0.5
Russian Federation	-1.0	-0.8	-0.2	-1.3	-1.0	-0.3	-1.1	-0.8	-0.2
Sweden	-0.9	-0.7	-0.1	-1.2	-0.9	-0.2	-1.0	-0.7	-0.2
Switzerland	-1.0	-0.7	-0.3	-1.4	-0.9	-0.5	-1.1	-0.7	-0.4
China,P.R.: Mainland	-1.0	-0.8	-0.2	-1.4	-1.0	-0.3	-1.1	-0.8	-0.3
Japan	-0.9	-0.8	-0.1	-1.1	-1.0	-0.1	-0.9	-0.8	-0.1
United Kingdom	-0.8	-0.7	-0.1	-1.1	-0.8	-0.2	-0.8	-0.7	-0.2
United States	-0.6	-0.6	0.0	-0.8	-0.8	-0.1	-0.7	-0.6	-0.1
PPP-weighted average	-0.9	-0.8	-0.1	-1.2	-1.0	-0.2	-1.0	-0.8	-0.2
Simple Average	-1.0	-0.8	-0.2	-1.4	-1.0	-0.4	-1.2	-0.8	-0.3

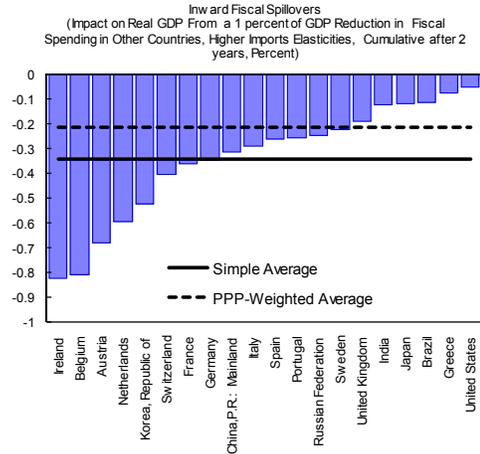
1/ See Table 1 for the assumptions on multipliers and imports elasticities under the baseline and using higher values. In the case when imports elasticities were increased, expenditure multipliers were assumed to remain unchanged from the baseline as marginal propensity to consume is assumed to compensate the decline in multipliers due to higher imports elasticity.

Results reported in the table above suggest that the average growth impact increases with higher multipliers. However, what is more striking is the non-linearity in which this affects the impact via spillovers. While multipliers are increased by only about 25 percent, the overall impact of fiscal consolidation on output growth increased by more than 30 percent. This is primarily due to a more than 60 percent increase of spillovers from other countries' consolidation efforts, while the domestic effect increased proportionally to the average increase in multipliers. On PPP-average terms, the increase implies a reduction of GDP growth due to spillovers by only 0.2 percentage points while a simple average is now close to 0.4 percentage points. However, for some countries,

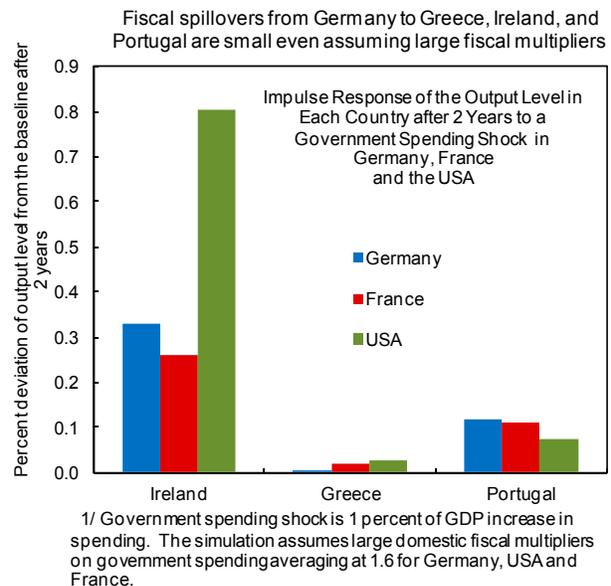


spillovers now account for a sizable fraction of growth reduction with the largest spillovers close to 1 percentage point for Ireland and Belgium.

Import elasticities also have a magnifying effect on spillovers though the effect is less pronounced. Import elasticities higher on average by 40 percent lead to an increase in spillovers by over 50 percent while the domestic impact remains virtually unchanged. As a result, the overall growth impact increases by about 10 percent compared to the baseline as the share of spillovers remains relatively small (just over 20 percent on the PPP-average basis of the overall growth impact). The average spillovers on PPP basis are close to 0.2 and on simple average basis are over 0.3 percentage points after two years. The list of countries substantially affected by spillovers remains unchanged.



These results suggest that on average the size of spillovers remains limited under alternative assumptions on multipliers and import elasticities with the exception of small open economies where the effects can be substantial. However, even for those countries where spillovers can be substantial the impact of fiscal changes in a single trading partner remains contained, not exceeding $\frac{1}{4}$ percentage points over two years. German fiscal policy, in particular, has limited implications for growth in the European periphery. Very high multipliers would have to operate for Germany to exhibit a relatively modest impact on these countries. For example, with expenditure multipliers equal to the baseline plus four standard deviations (an average expenditure multiplier of 1.6 after two years), a one percent of GDP fiscal expenditure stimulus in Germany would raise the GDP growth in Ireland by only 0.3 percentage points after two years, in Portugal by 0.1 percentage points and have virtually no effect on growth in Greece. Similarly, fiscal policy changes in Germany alone have only a small impact on trade balance of the peripheral countries and are thus unlikely to contribute to the reduction in the peripheral countries' imbalances.



B. Actual Consolidation Plans

We now turn to the growth impact of the actual fiscal plans in the years 2011 and 2012. To assess the robustness of our conclusions, we employ all three measures discussed in Section IIIB.

B1. Cyclically-Adjusted Fiscal Measure (Percent of Potential GDP)

Fiscal consolidation has started in 2011 and is forecasted to intensify in 2012. The average adjustment to the cyclically-adjusted balance is 0.3 percent of GDP in 2011 and 1.4 in 2012. The average adjustment is biased toward expenditure reductions.

Country	Fiscal measure = cyclically-adjusted revenue/expenditure								
	fiscal change in percent of GDP								
	2010			2011			2012		
	Revenue	Expenditure	Overall balance	Revenue	Expenditure	Overall balance	Revenue	Expenditure	Overall balance
Austria	-1.1	0.1	-1.2	0.1	-0.7	0.8	0.0	-0.3	0.2
Belgium	-0.1	-1.0	0.9	0.5	-0.2	0.7	-0.4	0.0	-0.4
Brazil	1.3	1.8	-0.6	-1.8	-1.2	-0.6	0.1	0.0	0.0
France	0.3	0.7	-0.4	0.7	-0.8	1.5	0.0	-0.8	0.9
Germany	-3.0	-1.1	-1.9	-0.5	-1.0	0.5	-0.4	-1.0	0.6
Greece	3.5	-3.8	7.4	3.8	0.3	3.5	-0.1	-0.9	0.8
Ireland	0.8	0.3	0.5	0.6	-0.6	1.2	0.4	-0.9	1.3
Italy	-0.8	-0.6	-0.2	-0.6	-1.2	0.6	-0.5	-1.0	0.5
India	-0.4	-0.6	0.3	0.2	-0.3	0.6	1.1	0.2	0.9
Netherlands	-1.3	-0.9	-0.4	0.5	-0.9	1.4	0.3	-0.3	0.7
Portugal	2.2	0.5	1.6	0.7	-1.8	2.6	1.1	-0.1	1.2
Spain	2.0	-0.2	2.2	0.4	-2.2	2.6	-0.2	-0.4	0.2
Korea, Republic of	-1.2	-2.4	1.2	-0.3	-0.6	0.3	0.3	-0.1	0.4
Russian Federation	-1.3	-1.5	0.3	0.1	-0.1	0.1	-0.5	-1.0	0.5
Sweden	-2.3	1.0	-3.3	-0.6	0.0	-0.6	0.2	-0.7	1.0
Switzerland	-1.4	0.0	-1.3	0.4	-0.1	0.5	0.1	-0.7	0.8
China, P.R.: Mainland	0.0	0.0	0.0	0.6	-0.5	1.1	0.8	0.1	0.7
Japan	-0.7	-0.2	-0.6	0.3	0.3	0.0	0.5	-0.2	0.7
United Kingdom	-0.9	-0.2	-0.7	0.6	-1.6	2.2	0.3	-1.7	2.0
United States	-0.6	0.1	-0.7	-0.3	0.4	-0.8	1.4	-1.9	3.3
PPP weighted average	-0.5	-0.2	-0.3	0.0	-0.3	0.3	0.6	-0.8	1.4
Simple average	-0.3	-0.4	0.2	0.3	-0.6	0.9	0.2	-0.6	0.8

Source: April 2011 WEO and IMF staff estimates.

1/ Financial sector support recorded above-the-line was excluded for the calculation of growth impact for Ireland (2.5 percent of GDP in 2009 and 5.3 percent of GDP in 2010) and the US (2.4 percent of GDP in 2009, 0.2 percent of GDP in 2010 and 2011, and 0.1 percent of GDP in 2012). Financial sector support is not expected to have a significant impact on demand. For Russia only non-oil revenues are assumed to have an impact on growth.

The overall growth impact of fiscal consolidation is moderate in 2011 (0.2 percentage points) but more notable in 2012 (0.7 percentage points). This reflects not only the fact that the fiscal plans include a larger degree of consolidation in 2012, in particular in the U.S., but also the fact that the impact in 2011 is somewhat cushioned by a lagged effect from 2010 where the fiscal stance was still expansionary on average. The cross-country variation in the growth impact reflects the respective country's extent of consolidation and the varying size of the spillovers from other countries. There are hardly any aggregate spillovers from consolidation in 2011 and small aggregate spillovers in 2012 largely reflect spillovers to small open economies. Of the cumulative average decline in GDP in 2011 and 2012 by about 1 percent

on PPP-weighted basis, only about 15 percent may be attributable to spillovers from one country to another, the latter comprising only about 0.1 percentage points decline in GDP. The spillovers are somewhat bigger on simple average basis (0.2 percentage points), reflecting the fact that spillovers to larger countries tend to be smaller.

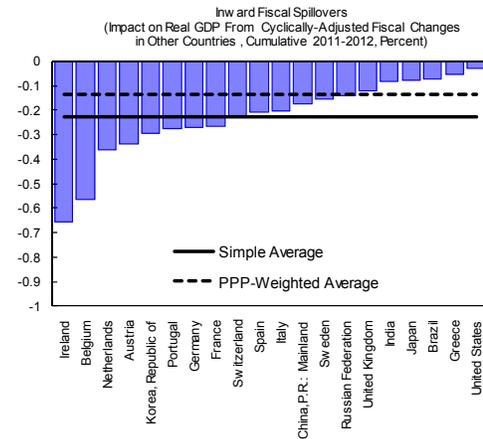
Country 1/	Fiscal Contribution to Growth								
	Fiscal measure = cyclically-adjusted revenue/expenditure fiscal change in percent of GDP								
	(In percentage points)								
	2010			2011			2012		
Of which:									
Total growth impact	domestic effect	spillover effect	Total growth impact	domestic effect	spillover effect	Total growth impact	domestic effect	spillover effect	
Austria	0.9	0.5	0.3	0.0	0.0	0.0	-0.8	-0.5	-0.3
Belgium	1.3	0.8	0.5	-0.6	-0.5	-0.1	-0.6	-0.2	-0.5
Brazil	0.9	0.8	0.1	-0.1	-0.1	0.0	0.0	0.0	-0.1
France	1.7	1.5	0.2	-0.5	-0.4	-0.1	-1.2	-1.0	-0.2
Germany	0.9	0.7	0.2	0.4	0.5	-0.1	-0.6	-0.5	-0.2
Greece	-1.7	-1.7	0.0	-2.4	-2.4	0.0	-1.2	-1.2	0.0
Ireland	1.6	1.1	0.5	-0.5	-0.4	-0.1	-1.4	-0.8	-0.6
Italy	0.7	0.6	0.2	-0.8	-0.7	0.0	-1.0	-0.8	-0.2
India	0.3	0.2	0.1	-0.3	-0.3	0.0	-0.3	-0.3	-0.1
Netherlands	1.9	1.6	0.3	-0.5	-0.5	-0.1	-0.9	-0.6	-0.3
Portugal	1.8	1.7	0.2	-1.5	-1.4	-0.1	-1.3	-1.2	-0.2
Spain	1.4	1.3	0.1	-2.0	-1.9	-0.1	-1.3	-1.1	-0.2
Korea, Republic of	-0.5	-0.8	0.3	-0.7	-0.7	-0.1	-0.5	-0.2	-0.2
Russian Federation	0.8	0.6	0.2	-0.2	-0.2	0.0	-0.6	-0.5	-0.1
Sweden	1.0	0.8	0.1	1.1	1.2	0.0	-0.2	-0.1	-0.1
Switzerland	0.7	0.5	0.2	0.2	0.3	0.0	-0.6	-0.4	-0.2
China,P.R.: Mainland	0.9	0.7	0.2	-0.4	-0.4	0.0	-0.6	-0.4	-0.2
Japan	1.8	1.7	0.0	0.2	0.2	0.0	-0.3	-0.3	-0.1
United Kingdom	1.2	1.1	0.1	-0.7	-0.7	0.0	-1.3	-1.2	-0.1
United States	0.7	0.7	0.0	0.3	0.3	0.0	-0.9	-0.9	0.0
PPP weighted average	0.9	0.8	0.1	-0.2	-0.1	0.0	-0.7	-0.6	-0.1
Simple average	0.9	0.7	0.2	-0.4	-0.4	0.0	-0.8	-0.6	-0.2

Source: April 2011 WEO and IMF staff estimates.

1/ Financial sector support recorded above-the-line was excluded for the calculation of growth impact for Ireland (2.5 percent of GDP in 2009 and 5.3 percent of GDP in 2010)and the US (2.4 percent of GDP in 2009, 0.2 percent of GDP in 2010 and 2011, and 0.1 percent of GDP in 2012). Financial sector support is not expected to have a significant impact on demand. For Russia only non-oil revenues are assumed to have an impact on growth.

While aggregate fiscal spillovers are limited, for small open economies such as Ireland, Belgium, Netherlands and Austria, spillovers can be substantial, largely in 2012. Ireland, in particular, could substantially benefit from a coordinated fiscal relaxation, although this would require contributions from the major economies, including the United States and the United Kingdom (Table 4)—both countries where such relaxation is not on the cards.

The decomposition of spillovers by country (Appendix Table 3) reveals the relatively large impact on PPP-weighted average from the U.S. and China followed by the United Kingdom, Spain, France and Italy. This reflects both the size of the country and the actual amount of consolidation. For instance, while a uniform fiscal shock would result in a larger impact from Germany than the U.K. (Appendix Table 2), Germany's consolidation plans are much more moderate than the U.K.'s consolidation plans, resulting in a relatively larger impact from the U.K. under the actual consolidation plans.



For some countries the overall growth effect masks the various forces that are at work. This is evident once the effect is decomposed into the effects from current period consolidation and the carry-over effects from last period's fiscal change. For instance, in the case of the Netherlands and Belgium the spillovers in 2011 are negative from the current period consolidation but there are also small positive spillovers from the previous year's mostly expansionary fiscal change in relevant trading partner countries, reducing the overall negative effect from spillovers in 2011. However, for the countries which are large and not very open (e.g. the U.S.) spillovers tend to be negligible in both periods.

	Fiscal Contribution to Growth (In percentage points) ¹							
	2011				2012			
	Change in the fiscal balance	Total growth impact	Of which:		Change in the fiscal balance	Total growth impact	Of which:	
		domestic effect	spillover effect			domestic effect	spillover effect	
Germany	0.5	0.4	0.5	-0.1	0.6	-0.6	-0.5	-0.2
of which:								
- current year		-0.3	-0.2	-0.1		-0.4	-0.2	-0.1
- carry over prev. year		0.7	0.7	0.0		-0.3	-0.2	-0.1
Netherlands	1.4	-0.5	-0.5	-0.1	0.7	-0.9	-0.6	-0.3
of which:								
- current year		-0.5	-0.4	-0.2		-0.3	-0.1	-0.2
- carry over prev. year		0.0	-0.1	0.1		-0.6	-0.5	-0.1
Belgium	0.7	-0.6	-0.5	-0.1	-0.4	-0.6	-0.2	-0.5
of which:								
- current year		-0.4	-0.2	-0.2		-0.2	0.1	-0.3
- carry over prev. year		-0.2	-0.4	0.1		-0.4	-0.2	-0.2
Portugal	2.6	-1.5	-1.4	-0.1	1.2	-1.3	-1.2	-0.2
of which:								
- current year		-1.1	-1.0	-0.1		-0.4	-0.3	-0.1
- carry over prev. year		-0.3	-0.3	0.0		-1.0	-0.9	-0.1
PPP weighted average	0.3	-0.2	-0.1	-0.1	1.4	-0.7	-0.6	-0.1
Simple average	0.9	-0.4	-0.3	-0.1	0.8	-0.8	-0.6	-0.2

Source: IMF staff estimates.

1/ Financial sector support recorded above-the-line was excluded for the calculation of growth impact for Ireland (2.5 percent of GDP in 2009 and 5.3 percent of GDP in 2010) and the US (2.4 percent of GDP in 2009, 0.2 percent of GDP in 2010 and 2011, and 0.1 percent of GDP in 2012). Financial sector support is not expected to have a significant impact on demand. For Russia only non-oil revenues are assumed to have an impact on growth.

B2. Headline Fiscal Measure (Percent of GDP)

We now turn to a headline measure of fiscal changes that incorporates not only the impact of discretionary fiscal policy but also that of automatic stabilizers. While this measure is likely to overstate the impact on fiscal changes due to the feedback effect to automatic stabilizers from changes in the GDP, it could be viewed as an upper bound, which together with the impact estimated based on the cyclically-adjusted balance provides an estimate of the possible range of fiscal changes on growth.

The change in the overall balance in percent of GDP is higher than that measured by the cyclically-adjusted balance (0.6 percent of GDP in 2011 and 1.6 percent of GDP in 2012) largely due to the contribution from automatic stabilizers as the output gaps are closing. Automatic stabilizers also explain the differences for 2010. This is particularly the case for Germany, where the estimated impact on growth in 2010 using the headline measure almost doubled.

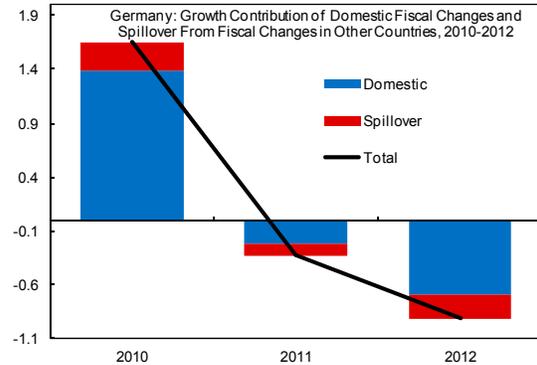
Country	Fiscal measure = headline revenue/expenditure								
	fiscal change in percent of GDP								
	2010			2011			2012		
	Revenue	Expenditure	Overall balance	Revenue	Expenditure	Overall balance	Revenue	Expenditure	Overall balance
Austria	-0.9	0.1	-1.0	0.3	-0.7	1.0	0.1	-0.3	0.4
Belgium	0.2	-1.0	1.3	0.6	-0.2	0.8	-0.2	0.0	-0.1
Brazil	2.4	1.8	0.5	-1.8	-1.2	-0.6	0.0	0.0	-0.1
France	0.5	0.7	-0.2	0.9	-0.8	1.7	0.3	-0.8	1.1
Germany	-1.9	-1.4	-0.5	-0.2	-1.0	0.9	-0.2	-1.0	0.8
Greece	2.0	-3.8	5.8	2.6	0.4	2.3	0.0	-0.9	0.9
Ireland	0.6	0.3	0.3	0.7	-0.6	1.4	0.7	-0.9	1.7
Italy	-0.5	-0.7	0.2	-0.4	-1.2	0.8	-0.2	-1.0	0.8
India	-0.2	-0.6	0.4	0.3	-0.3	0.6	1.1	0.2	0.9
Netherlands	-0.9	-0.4	-0.6	0.8	-0.9	1.7	0.5	-0.3	0.8
Portugal	2.4	0.5	1.9	-0.1	-1.8	1.7	0.6	0.0	0.6
Spain	1.7	-0.2	1.9	0.5	-2.2	2.7	0.1	-0.4	0.5
Korea, Republic of	-0.6	-2.4	1.9	-0.1	-0.6	0.5	0.2	-0.1	0.3
Russian Federation	-0.7	-1.5	0.8	0.6	-0.1	0.7	-0.2	-1.0	0.8
Sweden	-0.7	0.7	-1.4	0.5	-0.2	0.7	0.8	-0.8	1.6
Switzerland	-1.1	-0.1	-1.0	0.3	-0.1	0.5	0.1	-0.7	0.8
China,P.R.: Mainland	0.0	0.0	0.0	0.5	-0.5	1.0	0.7	0.1	0.6
Japan	0.5	-0.2	0.7	0.6	0.2	0.3	0.8	-0.3	1.1
United Kingdom	-0.4	-0.3	-0.2	0.7	-1.6	2.3	0.4	-1.7	2.1
United States	-0.1	0.0	-0.2	0.2	0.4	-0.2	1.6	-1.9	3.6
PPP weighted average	0.0	-0.2	0.2	0.3	-0.4	0.6	0.8	-0.8	1.6
Simple average	0.1	-0.4	0.5	0.4	-0.7	1.0	0.4	-0.6	1.0

Source: April 2011 WEO and IMF staff estimates.

1/ Financial sector support recorded above-the-line was excluded for the calculation of growth impact for Ireland (2.5 percent of GDP in 2009 and 5.3 percent of GDP in 2010) and the US (2.4 percent of GDP in 2009, 0.2 percent of GDP in 2010 and 2011, and 0.1 percent of GDP in 2012). Financial sector support is not expected to have a significant impact on demand. For Russia only non-oil revenues are assumed to have an impact on growth.

These fiscal changes can be expected to reduce the GDP growth in 2011 and 2012 cumulatively by about 1¼ percentage points. Again, the domestic effect of consolidation dominates, contributing 80 percent to the growth contraction, with spillovers from one country to another contributing the remaining 20 percent. A large variation across countries remains. The domestic effect from fiscal changes will be substantial in Greece, Spain,

Portugal and the United Kingdom, exceeding 2 percentage points over the two years. The domestic impact of fiscal changes on growth in Sweden, Switzerland, and Brazil can be expected to be rather small, less than $\frac{1}{2}$ percentage points. The German domestic drag on growth over these two years will be noticeable—expected to reach 1 percentage point with another $\frac{1}{4}$ percentage points subtracted from growth due to the spillovers from abroad.²⁰ Most of this effect will be felt in 2012 as in 2011 the lagged effect of the fiscal stimulus from 2010 is still lingering, since the impact on the 2011 growth is muted due to the strong positive carry-over effects from last period’s expansion. This observation is true for the countries on average—consolidation will have a stronger “bite” in 2012—though for some countries (e.g. the U.S.) it also reflects, a larger fiscal adjustment in 2012.



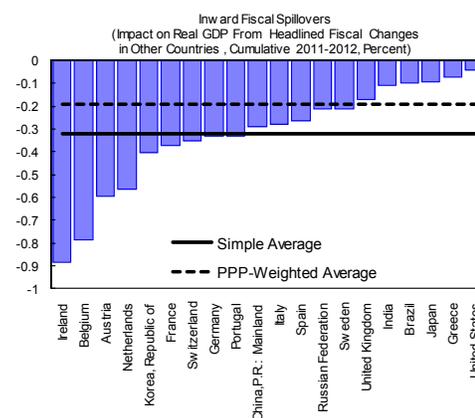
²⁰ Given the recent divergence in the developments in the labor market in Germany and the output gap, possibly, reflecting structural changes in the labor market, the commonly used cyclically-adjusted measure with elasticities estimated from historical data and the output gap is likely to understate the true degree of discretionary policy intervention. While for comparability we used a common cyclical adjustment method for all countries, we believe that for Germany headline measure better captures changes in the underlying fiscal position.

Country 1/	Fiscal Contribution to Growth								
	Fiscal measure = headline revenue/expenditure fiscal change in percent of GDP (In percentage points)								
	2010			2011			2012		
	Of which:			Of which:			Of which:		
Total growth impact	domestic effect	spillover effect	Total growth impact	domestic effect	spillover effect	Total growth impact	domestic effect	spillover effect	
Austria	1.9	1.4	0.5	-0.4	-0.2	-0.2	-1.0	-0.6	-0.4
Belgium	2.0	1.3	0.7	-0.9	-0.7	-0.3	-0.8	-0.3	-0.5
Brazil	1.0	0.9	0.1	-0.3	-0.3	0.0	0.0	0.1	-0.1
France	2.0	1.7	0.3	-0.7	-0.5	-0.1	-1.3	-1.1	-0.2
Germany	1.7	1.4	0.3	-0.3	-0.2	-0.1	-0.9	-0.7	-0.2
Greece	-1.1	-1.1	0.1	-1.8	-1.8	0.0	-1.0	-0.9	-0.1
Ireland	2.5	1.9	0.6	-0.6	-0.4	-0.2	-1.6	-0.9	-0.6
Italy	1.0	0.8	0.2	-0.9	-0.8	-0.1	-1.1	-0.9	-0.2
India	0.4	0.3	0.1	-0.4	-0.4	0.0	-0.3	-0.3	-0.1
Netherlands	2.7	2.2	0.5	-0.6	-0.4	-0.2	-1.1	-0.7	-0.4
Portugal	2.2	1.9	0.2	-1.4	-1.2	-0.1	-1.0	-0.8	-0.2
Spain	2.1	1.9	0.2	-2.0	-1.9	-0.1	-1.4	-1.3	-0.2
Korea, Republic of	-0.4	-0.8	0.4	-1.0	-0.8	-0.1	-0.5	-0.2	-0.3
Russian Federation	1.3	1.0	0.2	-0.5	-0.4	-0.1	-0.8	-0.6	-0.1
Sweden	1.8	1.6	0.2	0.2	0.3	-0.1	-0.8	-0.7	-0.1
Switzerland	1.2	0.8	0.3	0.1	0.2	-0.1	-0.7	-0.4	-0.2
China,P.R.: Mainland	1.0	0.7	0.3	-0.5	-0.4	-0.1	-0.6	-0.4	-0.2
Japan	2.2	2.2	0.1	-0.4	-0.4	0.0	-0.6	-0.5	-0.1
United Kingdom	1.4	1.3	0.2	-0.9	-0.8	0.0	-1.4	-1.3	-0.1
United States	0.8	0.8	0.0	0.1	0.1	0.0	-1.1	-1.0	0.0
PPP weighted average	1.2	1.0	0.2	-0.4	-0.3	-0.1	-0.8	-0.7	-0.1
Simple average	1.4	1.1	0.3	-0.7	-0.5	-0.1	-0.9	-0.7	-0.2

Source: April 2011 WEO and IMF staff estimates.

1/ Financial sector support recorded above-the-line was excluded for the calculation of growth impact for Ireland (2.5 percent of GDP in 2009 and 5.3 percent of GDP in 2010) and the US (2.4 percent of GDP in 2009, 0.2 percent of GDP in 2010 and 2011, and 0.1 percent of GDP in 2012). Financial sector support is not expected to have a significant impact on demand. For Russia only non-oil revenues are assumed to have an impact on growth.

For most countries, spillovers to growth from fiscal policy in other countries remain limited when using headline balance as a fiscal measure (below $\frac{1}{2}$ percentage points over the next two years, Appendix Table 4) though the average has slightly increased. As with the cyclically-adjusted measure, Ireland, Belgium, Austria, and the Netherlands are standing out. As in the case of the cyclically-adjusted measure, German influence is primarily with respect to its direct neighbors: Austria, Belgium, the Netherlands and Switzerland. The U.S. is generally exerting a higher influence on other countries and the U.S. and China provide the largest contribution to the average.



To summarize, using the change in the headline ratio rather than the change in the cyclical adjusted ratio does not substantially alter the main conclusions. While the growth impact is larger in this case the cross-border spillovers remain limited in 2011 and 2012 with the exception of small and open European economies.

B3. Real Fiscal Changes

The last measure of fiscal stance that we are employing is the change in the real revenues and expenditures. As discussed above this is the measure that is most consistent with the theoretical concept of the fiscal multiplier but is not commonly employed by the policymakers and, more importantly, the estimates of fiscal multipliers obtained in the literature are often not based on this definition. Hence, while we present the estimates based on the real fiscal changes comparison the results should be interpreted with caution.

First, note that as explained in Section IIIB, as long as real GDP growth between the two periods is non-zero the two measures of fiscal stance will differ and since revenue/expenditure-to-GDP ratios are rather large numbers (e.g. expenditure is close to 40 percent on average in the sample of 20 countries) with even a moderate real GDP growth of 2.5 percent (simple average in the sample for 2011) the difference can be as large as 1 percent of GDP for revenue/expenditure measures. For the overall balance, however, the differences are likely to be small since the overall balance is a relatively smaller number.

With that in mind the results presented below are not surprising. The changes in the overall balance using the real measure based on the CPI²¹ are rather close to those obtained by using the ratios to GDP. The composition of changes, however, is quite different. In particular, while the measure in ratios suggests that consolidation in 2011 and 2012 on average includes both revenue and expenditure contributions, the measures based on real changes suggests that in real terms expenditures, in fact, are projected to increase, hence, consolidation is mainly revenue-based.

²¹ We use CPI rather than GDP deflator because the majority of fiscal changes work through either private consumption decisions or government consumption. The results are not substantially different if we employ the GDP deflator.

Country	Fiscal measure = headline revenue/expenditure								
	fiscal change in real terms								
	2010			2011			2012		
	Revenue	Expenditure	Overall balance	Revenue	Expenditure	Overall balance	Revenue	Expenditure	Overall balance
Austria	0.1	1.1	-1.1	1.1	0.1	1.0	0.9	0.6	0.3
Belgium	1.1	-0.1	1.2	1.1	0.3	0.8	0.8	1.0	-0.2
Brazil	6.0	5.7	0.3	-0.3	0.4	-0.7	1.4	1.6	-0.2
France	0.8	1.0	-0.2	1.5	-0.1	1.6	1.2	0.1	1.1
Germany	-0.1	0.5	-0.6	0.7	-0.2	0.8	0.5	-0.2	0.8
Greece	-0.3	-6.6	6.4	1.0	-1.6	2.6	0.4	-0.5	0.9
Ireland	0.5	0.1	0.4	1.3	0.1	1.2	1.5	0.0	1.5
Italy	-0.1	-0.3	0.2	-0.1	-0.8	0.7	0.3	-0.4	0.7
India	0.7	0.8	-0.1	1.8	1.9	-0.1	2.6	2.4	0.2
Netherlands	0.1	0.8	-0.7	1.2	-0.4	1.7	1.0	0.2	0.8
Portugal	3.0	1.2	1.8	-1.2	-3.1	1.9	0.4	-0.2	0.6
Spain	1.3	-0.7	2.0	0.3	-2.4	2.7	0.7	0.2	0.4
Korea, Republic of	0.9	-1.1	2.0	0.9	0.3	0.6	1.3	0.9	0.5
Russian Federation	1.6	1.9	-0.4	2.6	2.9	-0.3	1.1	0.9	0.2
Sweden	1.8	3.3	-1.5	2.5	1.8	0.7	2.6	1.0	1.6
Switzerland	-0.3	0.7	-1.0	1.1	0.6	0.5	0.7	-0.1	0.8
China, P.R.: Mainland	2.3	2.7	-0.4	2.6	1.8	0.8	2.8	2.3	0.5
Japan	1.3	0.9	0.5	0.8	0.5	0.3	1.2	0.2	1.0
United Kingdom	0.0	0.3	-0.3	1.2	-0.9	2.1	1.5	-0.4	2.0
United States	0.5	0.9	-0.4	1.0	1.4	-0.5	2.5	-0.9	3.4
PPP weighted average	1.2	1.3	-0.1	1.3	1.0	0.4	1.9	0.6	1.4
Simple average	1.1	0.7	0.4	1.1	0.1	0.9	1.3	0.4	0.8

Source: April 2011 WEO and IMF staff estimates.

1/ Financial sector support recorded above-the-line was excluded for the calculation of growth impact for Ireland (2.5 percent of GDP in 2009 and 5.3 percent of GDP in 2010) and the US (2.4 percent of GDP in 2009, 0.2 percent of GDP in 2010 and 2011, and 0.1 percent of GDP in 2012). Financial sector support is not expected to have a significant impact on demand. For Russia only non-oil revenues are assumed to have an impact on growth.

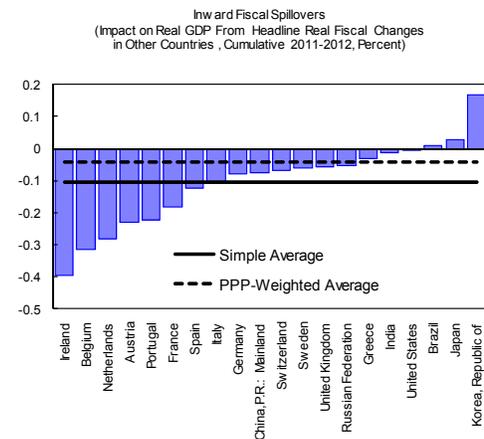
Since the multiplier on revenue is lower than that on expenditure this leads to a substantially smaller estimated negative impact on growth with the contribution to growth remaining positive on average in 2011, in part, due to the lagged effect from 2010. For some countries (e.g. Greece) where growth is projected to remain in the negative territory in 2011, however, fiscal impulse measured by the real change implies a larger consolidation on expenditure side, hence, the growth impact is more negative compared to the measure in ratio to GDP (see Appendix Table 5 for detailed country-by-country estimates).

Country 1/	Fiscal Contribution to Growth								
	Fiscal measure = headline revenue/expenditure fiscal change in real terms (In percentage points)								
	2010			2011			2012		
	Of which:			Of which:			Of which:		
Total growth impact	domestic effect	spillover effect	Total growth impact	domestic effect	spillover effect	Total growth impact	domestic effect	spillover effect	
Austria	2.5	2.0	0.5	0.3	0.3	0.0	-0.4	-0.2	-0.2
Belgium	2.1	1.5	0.7	-0.5	-0.4	0.0	-0.3	0.0	-0.3
Brazil	2.4	2.3	0.1	0.6	0.6	0.0	0.7	0.7	0.0
France	1.9	1.6	0.3	-0.1	0.0	0.0	-0.5	-0.3	-0.1
Germany	1.8	1.5	0.3	-0.1	-0.1	0.0	-0.7	-0.6	-0.1
Greece	-2.3	-2.3	0.1	-2.8	-2.8	0.0	-1.0	-1.0	0.0
Ireland	1.4	0.7	0.7	-0.3	-0.3	0.0	-0.9	-0.5	-0.4
Italy	0.8	0.5	0.2	-0.6	-0.5	0.0	-0.7	-0.6	-0.1
India	0.9	0.7	0.1	0.7	0.7	0.0	0.8	0.9	0.0
Netherlands	2.4	1.9	0.5	0.0	0.1	-0.1	-0.6	-0.4	-0.2
Portugal	2.3	2.0	0.2	-1.5	-1.4	-0.1	-1.2	-1.1	-0.1
Spain	1.6	1.4	0.2	-2.1	-2.1	0.0	-1.1	-1.1	-0.1
Korea, Republic of	0.2	-0.4	0.6	-0.3	-0.5	0.2	0.1	0.1	0.0
Russian Federation	2.0	1.7	0.3	1.2	1.2	0.0	0.4	0.5	-0.1
Sweden	2.1	1.9	0.2	0.9	0.9	0.0	-0.2	-0.2	-0.1
Switzerland	1.3	1.0	0.4	0.4	0.4	0.0	-0.3	-0.2	-0.1
China,P.R.: Mainland	2.2	1.8	0.3	0.7	0.7	0.0	0.5	0.6	-0.1
Japan	2.3	2.2	0.1	-0.2	-0.2	0.0	-0.4	-0.4	0.0
United Kingdom	1.2	1.1	0.2	-0.6	-0.6	0.0	-1.0	-1.0	-0.1
United States	1.0	0.9	0.0	0.5	0.5	0.0	-0.7	-0.7	0.0
PPP weighted average	1.6	1.4	0.2	0.3	0.3	0.0	-0.2	-0.1	-0.1
Simple average	1.5	1.2	0.3	-0.2	-0.2	0.0	-0.4	-0.3	-0.1

Source: April 2011 WEO and IMF staff estimates.

1/ Financial sector support recorded above-the-line was excluded for the calculation of growth impact for Ireland (2.5 percent of GDP in 2009 and 5.3 percent of GDP in 2010) and the US (2.4 percent of GDP in 2009, 0.2 percent of GDP in 2010 and 2011, and 0.1 percent of GDP in 2012). Financial sector support is not expected to have a significant impact on demand. For Russia only non-oil revenues are assumed to have an impact on growth.

The spillovers are correspondingly also much smaller on average than in the case of the fiscal measure in ratios. While the list of top countries affected by the spillovers (Ireland, Belgium, Netherlands and Austria) is unchanged, the magnitude of spillovers in 2011–2012 has declined substantially and for Korea spillovers have turned positive. The milder negative impact on growth, however, should be interpreted with caution as the empirical estimates of multipliers obtained from the literature may not correspond to this fiscal measure and the effects may be underestimated.



To summarize, using real changes rather than the change in the ratio of the fiscal position implies that the growth contribution of consolidation is generally less negative due to the fact that consolidation is not anymore dominated by expenditure reductions but rather revenue increases. While the net change in the fiscal balance is mostly unaffected the combination of

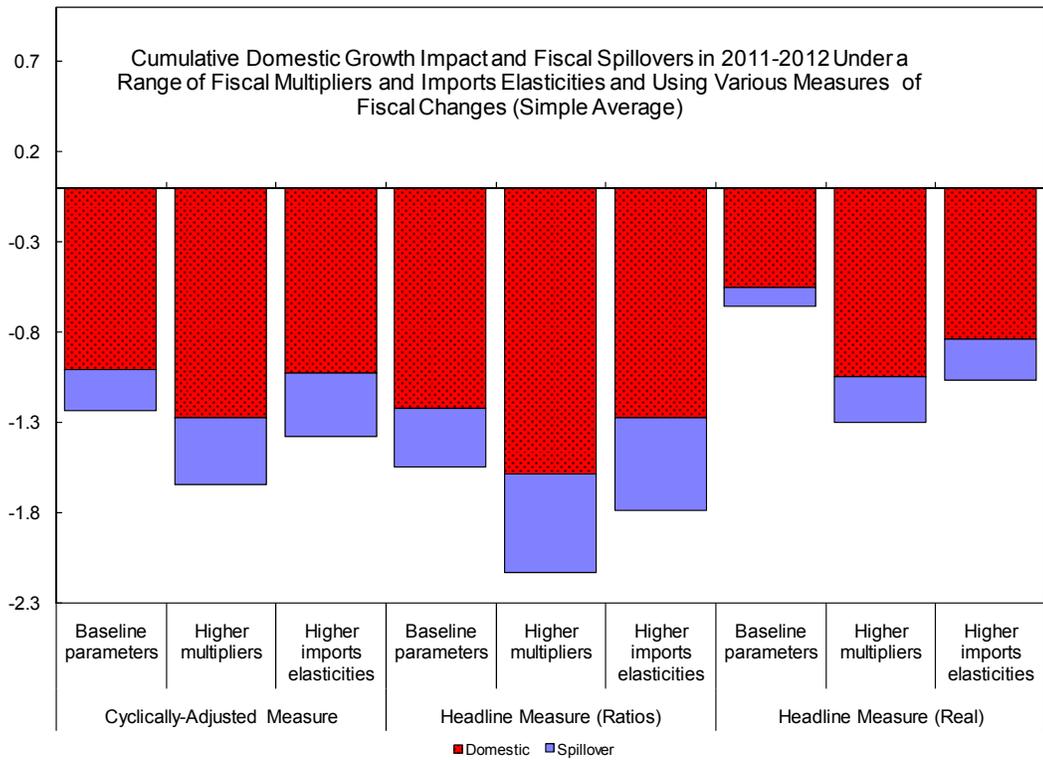
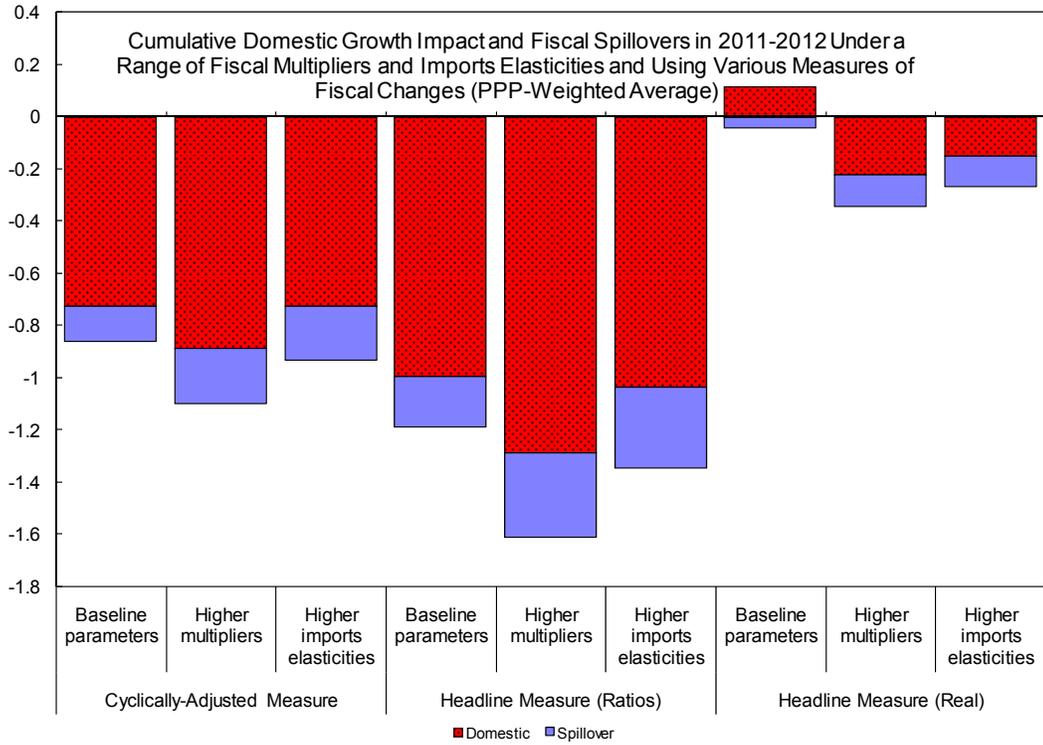
higher revenue adjustment and lower multipliers for revenue causes the contribution of fiscal changes to GDP growth to fall. Hence, using the real fiscal change as the relevant fiscal measure leads to an even less important role of cross-country spillovers.

B4. Higher Multipliers and Higher Import Elasticities

To evaluate robustness of our results we calculate growth impact under higher multipliers and higher import elasticities. Higher revenue and expenditure multipliers with unchanged imports elasticity were calculated by assuming that higher multipliers are a result of the higher marginal propensity to consume. This is consistent with the proposition that higher multipliers after financial crisis may reflect a higher share of liquidity-constrained households and firms. It, however, implies a steeper rise in revenue multipliers, which are more sensitive to the changes in the marginal propensity to consume. Correspondingly, we raised revenue multipliers by 1.5 times the standard deviation of revenue multipliers across the sample of 20 countries, while expenditure multipliers were raised by one standard deviation of expenditure multipliers across the sample. This resulted in an average revenue multiplier of about 0.7 (almost 50 percent higher than in the baseline) and expenditure multipliers of about 1 (about 25 percent higher than in the baseline).

Raising import elasticities is a more complex experiment since higher import elasticities would reduce marginal propensities to import and, therefore, would reduce the size of fiscal multipliers. To evaluate the maximum impact on spillovers, we have assumed that expenditure multipliers remain unchanged compared to the baseline, which implies that the marginal propensity to consume has increased enough to compensate for the reduction in expenditure multipliers due to higher import elasticities. However, given the more elastic response of revenue multipliers to changes in the marginal propensity to consume they would have to increase compared to the baseline. Hence, we raised revenue multipliers by 0.5 times standard deviation of revenue multipliers in the sample, which resulted in an average revenue multiplier of about 0.5 (about 15 percent higher than in the baseline).

The results of these robustness checks for all three measures of fiscal position are summarized on the two charts below. They suggest that our main conclusions on spillovers hold under the alternative assumptions. In particular, while fiscal consolidation across the world may have substantial impact on domestic growth, fiscal spillovers from one country to another will play a limited role in absolute terms—the aggregate spillovers not exceeding 0.3 percentage points over the two years (2011–2012) on PPP average basis and 0.5 percentage points on simple average basis – as well as in relation to the impact on domestic growth. However, small open economies such as Ireland, Belgium, Austria and the Netherlands can be substantially affected. The effect of domestic fiscal policy on growth, however, varies substantially depending on the choice of fiscal measure, the size of fiscal multipliers and imports elasticities but in most cases a substantial reduction in growth would be in the cards.



It is also worth mentioning that while we simulated the impact under relatively large import elasticities, the assumption here is that the process of normalization of the world trade after the collapse during the 2008–2009 financial crisis will continue in 2011–2012. Hence, the import elasticities assumed are not as high as those observed during the collapse of world trade in the course of the recent financial crisis. Extreme import elasticities could lead to larger fiscal spillovers if combined with an increase in the marginal propensity to consume. Hence, if the downward spiral in world trade were to reoccur the rationale for a coordinated fiscal relaxation would strengthen.

C. Alternative Scenarios

C1. The Growth Impact of More Consolidation

Continued market pressure and rising concerns about debt levels could imply that governments may seek to consolidate beyond the currently announced level in the forthcoming two years. We thus simulate the results for a scenario in which some countries in the euro zone (Eur I) reduce spending by additional 0.5 percent of GDP in 2011 and 2012 or alternatively manage to increase structural revenues by an additional 0.5 percent of GDP in the two years.

Under the baseline multiplier scenario, spillovers are hardly affected, in particular in the case of increases in tax revenues in selected European countries. But even in the case of additional expenditure cuts, spillovers are limited, not exceeding an additional growth reduction of 0.1 percentage points.

Assuming higher multiplier values causes the effect to be slightly magnified, in particular for the small open economies. However, also in this case, growth spillovers in none of the exercises increase by more than an additional 0.2 percentage points. Thus, more consolidation in countries with no fiscal space (Eur II) appears to have limited growth spillovers beyond their border though are likely to put an additional drag on growth in those countries themselves.

Total growth spillovers from fiscal consolidation in 2012¹⁾²⁾

	Baseline multiplier					High multiplier						
	Baseline	More consolidation		Less consolidation		Baseline	More consolidation		Less consolidation			
		Eur I cntry		German	Eur II cntry		Eur I cntry		German	Eur II cntry		
		(G)	(T)	stimulus			(G)	(T)	stimulus			
Austria	-0.3	-0.4	-0.4	-0.3	-0.2	-0.5	-0.6	-0.6	-0.4	-0.4		
Belgium	-0.5	-0.6	-0.5	-0.4	-0.4	-0.8	-1.0	-0.9	-0.7	-0.7		
Brazil	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1		
France	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	-0.4	-0.3	-0.3	-0.3		
Germany	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	-0.4	-0.4	-0.3	-0.3		
Greece	0.0	-0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1		
Ireland	-0.6	-0.6	-0.6	-0.5	-0.5	-1.0	-1.1	-1.0	-0.9	-0.9		
Italy	-0.2	-0.2	-0.2	-0.1	-0.1	-0.3	-0.3	-0.3	-0.2	-0.2		
India	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1		
Netherlands	-0.3	-0.4	-0.3	-0.2	-0.2	-0.6	-0.7	-0.6	-0.5	-0.4		
Portugal	-0.2	-0.2	-0.2	-0.1	-0.1	-0.3	-0.3	-0.3	-0.2	-0.2		
Spain	-0.2	-0.2	-0.2	-0.1	-0.1	-0.2	-0.3	-0.3	-0.2	-0.2		
Korea, Republic of	-0.2	-0.3	-0.2	-0.2	-0.2	-0.4	-0.4	-0.4	-0.4	-0.4		
Russian Federation	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2		
Sweden	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2		
Switzerland	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	-0.4	-0.4	-0.3	-0.3		
China,P.R.: Mainland	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3		
Japan	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1		
United Kingdom	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2		
United States	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
PPP weighted average	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2		
Simple average	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	-0.4	-0.3	-0.3	-0.3		

Source: IMF staff estimates.

1) Fiscal measure = cyclical adjusted revenue/expenditure, change in percent of GDP

2) Less consolidation is an increase in expenditures by 0.5 percent of GDP in 2011 and 2012, while more consolidation is either a reduction in expenditures (G) or an increase in revenues (T) by 0.5 percent of GDP in 2011 and 2012. "Eur I" includes Belgium, France, Italy, Ireland, Greece, and Portugal. "Eur II" includes Austria, Germany, Netherlands, and Switzerland.

C2. The Growth Impact of Coordinated Fiscal Relaxation

If spillovers were sufficiently large a coordinated fiscal effort could alleviate the negative impact of strong fiscal consolidation on GDP growth through positive spillovers. To simulate the effect of such a policy, we compare the baseline specification to a specification in which (i) Germany reduces its expenditures by 0.5 percent of GDP less in 2011 and 2012; or (ii) an extended set of European countries (Austria, Germany, Netherlands, and Switzerland) increase spending by 0.5 percent of GDP more in 2011 and 2012.

In the baseline multiplier case under the scenario that Germany slows the reduction in spending by 0.5 percent of GDP, GDP growth in other countries is hardly affected in 2012 via lowered negative spillover. In the high multiplier scenario, the spillover are also little affected; they are limited to an additional 0.1 percentage point higher growth rate in selected economies. Left alone to Germany, it would require an increase in fiscal spending of about 2.5 percent of GDP in 2011 and 2012 to move the growth rate in Ireland by 0.5 percentage points. Such a scenario, however, does not take into account a possible negative credibility effect of the German fiscal leadership in Europe as well as a narrower space left for ECB interest policy maneuver.

In a scenario, in which also Austria, the Netherlands, and Switzerland increase fiscal spending by 0.5 percent of GDP, effects change little under the baseline assumption for the multipliers. Also, once the higher set of multipliers is applied, effects are contained to an increase by 0.1 percentage points with the exception of the Netherlands which grows an additional 0.2 percentage points more due to the lower consolidation in Austria, Germany, and Switzerland. Only under significantly higher multipliers or imports elasticities the effect from less consolidation will translate into visible growth effects in other countries.

D. The Impact on Trade Balances

We can also use the framework to evaluate to which extent trade imbalances (measured by the change in the real trade balance relative to the GDP in the previous period) can be addressed by a coordination of demand management. More precisely we can determine by how much Germany's trade balance deteriorates in comparison with the baseline if Germany were to consolidate by 0.5 percent less and to which extent this alters the trade balance of other countries. We provide an additional simulation in which surplus countries (defined by countries which had a current account surplus in the years 2008–2010) increase their spending by 0.5 percent of GDP in comparison with the baseline.

If consolidation proceeds as predicted according to the WEO estimates, the cumulative effect on the trade balance in 2012 is broadly contributing to a rebalancing. Several surplus countries, including Germany, Belgium, Sweden, Switzerland, Russia, Korea, China and Japan are likely to experience a deterioration of the trade balance due to the fiscal changes, while deficit countries including, Greece, Portugal, Spain, the U.K., and the U.S. are likely to experience an improvement in the trade balance. However, Ireland for instance is likely to experience no strong change in the trade balance. Overall, the magnitudes are moderate and trade balances of relatively closed economies such as Greece, Portugal and Spain are primarily driven by domestic consolidation rather than spillovers, while the contrary is true for open economies such as Belgium.

It turns out that the cumulative change in the trade balance on the peripheral countries, implied by the scenario under which only Germany consolidates less, is with the exception of Ireland indifferent from zero. Even when we simulate a wider policy coordination effort encompassing other surplus countries, the impact on the periphery countries remains contained to an improvement of 0.1–0.2 percentage points. Only Belgium is likely to experience an improvement in the trade balance by close to ½ percentage points.

The reason for the low impact is the fact that most of the correction in the trade balance is brought about by domestic policies since none of the peripheral countries is highly interlinked in trade terms with the core countries which have surpluses. Additionally, the absence of an impetus from the United States or the U.K. in this scenario explains the low impact on Ireland.

Change in the real trade balance 2010-2012 (in percent of previous year GDP)[§]

	Change trade balance	of which:	
		own effect	spill-overs
Austria	0.0	0.3	-0.3
Belgium	-0.6	0.6	-1.1
Brazil	-0.1	0.0	-0.1
France	0.2	0.5	-0.3
Germany	-0.6	0.0	-0.6
Greece	1.1	1.2	-0.1
Ireland	0.0	1.0	-1.1
Italy	0.2	0.5	-0.3
India	0.1	0.2	-0.1
Netherlands	0.0	0.8	-0.8
Portugal	0.6	1.1	-0.5
Spain	0.7	1.0	-0.3
Korea, Republic of	0.1	0.5	-0.4
Russian Federation	0.0	0.2	-0.2
Sweden	-0.9	-0.5	-0.4
Switzerland	-0.5	0.1	-0.5
China,P.R.: Mainland	-0.1	0.2	-0.3
Japan	-0.2	0.0	-0.2
United Kingdom	0.5	0.7	-0.2
United States	0.1	0.1	-0.1

Source: IMF staff calculations

[§] Fiscal measure = cyclical adjusted revenue/expenditure, change in percent of GDP

Change in the real trade balance 2010-2012 due to fiscal consolidation ¹⁾²⁾

	Baseline multiplier			High multiplier		
	Baseline	Difference to baseline		Baseline	Difference to baseline	
		German	Selected		German	Selected
	stimulus	surplus cntry		stimulus	surplus cntry	
Austria	0.0	0.1	-0.3	0.0	0.1	-0.4
Belgium	-0.6	0.2	0.3	-0.5	0.2	0.4
Brazil	-0.1	0.0	0.1	-0.2	0.0	0.1
France	0.2	0.0	0.1	0.3	0.0	0.1
Germany	-0.6	-0.3	-0.1	-0.7	-0.4	-0.2
Greece	1.1	0.0	0.0	1.6	0.0	0.0
Ireland	0.0	0.1	0.2	0.3	0.1	0.2
Italy	0.2	0.0	0.1	0.2	0.0	0.1
India	0.1	0.0	0.0	0.1	0.0	0.1
Netherlands	0.0	0.2	-0.1	0.1	0.2	-0.2
Portugal	0.6	0.0	0.1	0.8	0.0	0.1
Spain	0.7	0.0	0.1	0.9	0.0	0.1
Korea, Republic of	0.1	0.0	-0.2	0.1	0.0	-0.2
Russian Federation	0.0	0.0	-0.1	0.0	0.0	-0.1
Sweden	-0.9	0.0	-0.1	-1.1	0.1	-0.2
Switzerland	-0.5	0.1	0.0	-0.6	0.1	-0.1
China,P.R.: Mainland	-0.1	0.0	-0.1	-0.1	0.0	-0.1
Japan	-0.2	0.0	0.0	-0.2	0.0	-0.1
United Kingdom	0.5	0.0	0.1	0.6	0.0	0.1
United States	0.1	0.0	0.0	0.1	0.0	0.0
PPP weighted average	0.0	0.0	0.0	0.0	0.0	0.0
Simple average	0.0	0.0	0.0	0.1	0.0	0.0

Source: IMF staff estimates.

1) Fiscal measure = cyclical adjusted revenue/expenditure, change in percent of GDP

2) The assumption for the scenarios is an increase in government spending by 0.5 percent in 2011 and 2012. The sample of surplus countries is given by Austria, China, Korea, Japan, Germany, Netherlands, Russia, Sweden, and Switzerland

V. CONCLUSION

In a world of unsynchronized fiscal spending patterns across countries and normal interest rate levels, spillovers from fiscal policies across countries are likely to be limited. However, since 2009 fiscal patterns across most developed countries have been synchronized to a large extent. While the magnitude varies, in most countries the fiscal expansion of 2009 and 2010 is set to be followed by fiscal consolidation in 2011, 2012, and beyond. At the same time, the interest rates remain low while the output gaps have not closed yet in many advanced economies. In such an economic environment, fiscal multipliers are likely to be above the usual levels and a synchronized and significant swing in fiscal policy from expansion to consolidation is likely to magnify the role of spillovers from fiscal policy across countries.

We find that, even in this setting, aggregate negative spillovers to other countries are likely to be contained in 2011–2012. Despite potentially sizeable domestic effects from consolidation, we find that the cumulative impact on GDP over the two years (2011–2012) is likely not to exceed 0.3 percentage points on PPP-weighted basis and $\frac{1}{2}$ percentage points on simple average basis under the various assumptions on fiscal multipliers and import elasticities. While the absolute size of spillovers varies depending on the measure of fiscal stance, size of multipliers and imports elasticities, average spillovers are invariably small compared to the size of the impact of the domestic fiscal policy.

The average, however, masks differences across countries. For small and open European economies such as Belgium, Netherlands, and Austria spillovers are important. In contrast, the coordinated exit from fiscal stimulus will have limited direct effect on European peripheral countries since they are relatively closed, with the notable exception of Ireland. While the latter could benefit from external support, such support would require contributions from the major economies, including the United States and the United Kingdom—both countries where fiscal relaxation at the moment is not on the cards. Changes in the German fiscal plan alone would have a very limited impact on the European periphery.

Under the baseline scenario, projected fiscal change for 2011 and 2012 will help reduce external imbalances. However, the effects over these two years are likely to be relatively small. While a stronger fiscal expansion in surplus countries could reduce the respective countries' surpluses, the "leakages" tend not to go to the peripheral countries. Thus, most of the correction in the peripheral countries' trade balances will have to be brought about by the domestic consolidation in these countries.

Hence, the bad news is that the countries in need cannot rely much on other countries' fiscal policies to stimulate their growth in the short run. The good news is, however, that ambitious consolidation plans in the European peripheral countries will have limited repercussions for much of the rest of the world.

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Appendix

Table 1. Assumptions on multipliers and elasticities by country (higher values in brackets)

	Revenue multiplier		Expenditure multiplier		Import elasticity	Elasticities	
	First year	Second year	First year	Second year		Revenue	Expenditure
Austria	0.2 (0.29)	0.6 (0.82)	0.7 (0.82)	1.1 (1.29)	1.08 (1.57)	0.90	-0.07
Belgium	0.18 (0.27)	0.48 (0.7)	0.35 (0.47)	0.74 (0.93)	1.05 (1.05)	0.99	-0.13
Brazil	0.22 (0.31)	0.42 (0.64)	0.56 (0.68)	0.82 (1.01)	1.34 (1.34)	0.77	-0.16
France	0.2 (0.29)	0.3 (0.52)	0.7 (0.82)	1.1 (1.29)	1.14 (1.14)	0.88	-0.10
Germany	0.35 (0.44)	0.74 (0.96)	0.4 (0.52)	0.8 (0.99)	1.14 (1.14)	0.94	-0.24
Greece	0.22 (0.31)	0.42 (0.64)	0.56 (0.68)	0.82 (1.01)	1.12 (1.12)	0.77	-0.16
Ireland	0.2 (0.29)	0.4 (0.62)	0.4 (0.52)	0.8 (0.99)	1.07 (1.07)	0.90	-0.10
Italy	0.16 (0.25)	0.32 (0.54)	0.58 (0.7)	0.96 (1.15)	1.14 (1.14)	0.89	-0.23
India	0.22 (0.31)	0.42 (0.64)	0.56 (0.68)	0.82 (1.01)	1.33 (1.33)	1.14	-0.03
Netherlands	0.1 (0.19)	0.28 (0.5)	0.34 (0.46)	0.76 (0.95)	1.07 (1.07)	1.16	-0.03
Portugal	0.23 (0.32)	0.49 (0.71)	0.45 (0.57)	0.84 (1.03)	1.09 (1.09)	1.15	-0.04
Spain	0.23 (0.32)	0.45 (0.67)	0.6 (0.72)	1 (1.19)	1.14 (1.14)	1.06	-0.07
Korea, Republic of	0.22 (0.31)	0.42 (0.64)	0.56 (0.68)	0.82 (1.01)	1.1 (1.1)	0.99	-0.13
Russian Federation	0.22 (0.31)	0.42 (0.64)	0.56 (0.68)	0.82 (1.01)	1.12 (1.12)	1.00	0.00
Sweden	0.18 (0.27)	0.48 (0.7)	0.35 (0.47)	0.74 (0.93)	1.11 (1.11)	0.94	-0.19
Switzerland	0.18 (0.27)	0.48 (0.7)	0.35 (0.47)	0.74 (0.93)	1.1 (1.1)	0.99	-0.13
China,P.R.: Mainland	0.22 (0.31)	0.42 (0.64)	0.56 (0.68)	0.82 (1.01)	1.13 (1.13)	1.00	0.00
Japan	0.35 (0.44)	0.74 (0.96)	0.4 (0.52)	0.8 (0.99)	1.37 (1.37)	1.00	-0.05
United Kingdom	0.25 (0.34)	0.4 (0.62)	0.4 (0.52)	0.65 (0.84)	1.13 (1.13)	1.10	-0.05
United States	0.2 (0.29)	0.3 (0.52)	0.4 (0.52)	0.6 (0.79)	1.3 (1.3)	1.10	-0.09
Average	0.22 (0.3)	0.45 (0.66)	0.49 (0.6)	0.83 (1.02)	1.15 (1.64)	0.98	-0.10

Source: OECD (2009), Kee, Nicita and Olarreaga (2008), IMF staff calculations

Table 2. Growth Impact of a Coordinated 1 Percent of GDP Decline in Fiscal Spending Under the Baseline Assumptions on Multipliers and Imports Elasticities

		Impact of a 1 Percent of GDP Reduction in Fiscal Spending on Growth After Two Years (percent)																					
From:	Austria	Belgium	Brazil	France	Germany	Greece	Ireland	Italy	India	Netherlands	Portugal	Spain	Korea, Republic	Russian Federation	Sweden	Switzerland	China,P.R.: Mainland	Japan	United Kingdom	United States	Total	Inward Spillovers	
To:																							
Austria	-1.10	-0.01	-0.01	-0.03	-0.16	0.00	0.00	-0.05	-0.01	-0.01	0.00	-0.01	-0.01	-0.01	-0.01	-0.02	-0.02	-0.01	-0.02	-0.04	-1.53	-0.43	
Belgium	-0.01	-0.75	0.00	-0.116	-0.117	0.00	0.00	-0.04	-0.02	-0.04	0.00	-0.02	0.00	-0.01	-0.01	-0.01	-0.02	-0.01	-0.03	-0.04	-1.26	-0.51	
Brazil	0.00	0.00	-0.82	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02	-0.01	0.00	-0.02	-0.89	-0.07	
France	0.00	-0.01	0.00	-1.11	-0.05	0.00	0.00	-0.03	-0.01	-0.01	0.00	-0.02	0.00	-0.01	0.00	-0.01	-0.01	-0.01	-0.02	-0.03	-1.34	-0.23	
Germany	-0.02	-0.01	0.00	-0.03	-0.81	0.00	0.00	-0.02	-0.01	-0.01	0.00	-0.01	-0.01	-0.01	-0.01	-0.01	-0.02	-0.01	-0.01	-0.03	-1.04	-0.22	
Greece	0.00	0.00	0.00	0.00	-0.01	-0.82	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.86	-0.05	
Ireland	0.00	-0.04	-0.01	-0.04	-0.05	0.00	-0.81	-0.03	-0.01	-0.02	0.00	-0.03	-0.01	-0.01	-0.01	-0.01	-0.02	-0.04	-0.06	-0.14	-1.33	-0.52	
Italy	-0.01	0.00	0.00	-0.03	-0.03	0.00	0.00	-0.97	-0.01	-0.01	0.00	-0.01	0.00	-0.01	0.00	-0.01	-0.01	-0.01	-0.01	-0.02	-1.15	-0.18	
India	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	-0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.01	0.00	-0.02	-0.90	-0.08	
Netherlands	-0.01	-0.03	0.00	-0.05	-0.11	0.00	-0.01	-0.03	-0.01	-0.76	0.00	-0.02	0.00	-0.01	-0.01	-0.01	-0.01	-0.01	-0.03	-0.03	-1.13	-0.37	
Portugal	0.00	0.00	0.00	-0.03	-0.02	0.00	0.00	-0.01	0.00	-0.01	-0.84	-0.05	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.01	-1.01	-0.16	
Spain	0.00	0.00	0.00	-0.04	-0.03	0.00	0.00	-0.02	0.00	-0.01	-0.01	-1.00	0.00	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.01	-1.17	-0.17	
Korea, Republic of	0.00	0.00	-0.01	-0.01	-0.01	0.00	0.00	-0.01	-0.02	0.00	0.00	0.00	-0.82	-0.01	0.00	0.00	-0.14	-0.05	-0.01	-0.07	-1.17	-0.34	
Russian Federation	0.00	0.00	0.00	-0.01	-0.03	0.00	0.00	-0.02	-0.01	-0.01	0.00	-0.01	-0.01	-0.82	0.00	0.00	-0.02	-0.01	-0.01	-0.02	-0.98	-0.16	
Sweden	0.00	-0.01	0.00	-0.01	-0.03	0.00	0.00	-0.01	-0.01	-0.01	0.00	-0.01	0.00	-0.01	-0.74	0.00	-0.01	-0.01	-0.01	-0.02	-0.88	-0.14	
Switzerland	-0.01	0.00	-0.01	-0.03	-0.06	0.00	0.00	-0.02	-0.03	0.00	0.00	-0.01	0.00	-0.01	0.00	-0.74	-0.02	-0.02	-0.01	-0.03	-1.00	-0.26	
China,P.R.: Mainland	0.00	0.00	-0.01	-0.01	-0.01	0.00	0.00	-0.01	-0.01	-0.01	0.00	0.00	-0.01	-0.01	0.00	0.00	-0.82	-0.04	-0.01	-0.07	-1.03	-0.21	
Japan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	-0.02	-0.81	0.00	-0.02	-0.88	-0.08	
United Kingdom	0.00	0.00	0.00	-0.01	-0.02	0.00	-0.01	-0.01	0.00	-0.01	0.00	-0.01	0.00	0.00	0.00	0.00	-0.01	-0.01	-0.65	-0.02	-0.77	-0.12	
United States	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.01	0.00	-0.60	-0.63	-0.03	
PPP-weighted average	-0.01	-0.01	-0.04	-0.05	-0.06	0.00	0.00	-0.04	-0.07	-0.02	0.00	-0.031	-0.029	-0.04	-0.01	-0.01	-0.18	-0.08	-0.033	-0.20	-0.91	-0.14	

Table 3. Single Country Cumulative Growth Impact of the Actual Fiscal Changes in 2011-2012, Baseline multipliers, Cyclically-Adjusted Fiscal Measure

Cumulative Growth Impact of Actual Consolidation in 2011-2012, Cyclically-Adjusted Fiscal Measure (percent)																					Inward	
From:	Austria	Belgium	Brazil	France	Germany	Greece	Ireland	Italy	India	Netherlands	Portugal	Spain	Korea, Republic	Russian Federation	Sweden	Switzerland	China,P.R.: Mainland	Japan	United Kingdom	United States	Total	Spillovers
To:																						
Austria	-0.52	-0.01	0.00	-0.04	0.00	-0.02	0.00	-0.08	-0.01	-0.01	-0.01	-0.04	-0.01	-0.01	0.01	0.00	-0.02	0.00	-0.05	-0.04	-0.85	-0.34
Belgium	0.00	-0.69	0.00	-0.15	0.00	-0.02	-0.01	-0.06	-0.01	-0.06	-0.01	-0.07	0.00	-0.01	0.01	0.00	-0.02	0.00	-0.11	-0.04	-1.25	-0.57
Brazil	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	-0.02	0.00	-0.01	-0.02	-0.09	-0.07
France	0.00	-0.01	0.00	-1.41	0.00	-0.01	0.00	-0.04	0.00	-0.01	-0.01	-0.07	0.00	-0.01	0.01	0.00	-0.01	0.00	-0.05	-0.03	-1.67	-0.27
Germany	-0.01	-0.01	0.00	-0.04	0.03	-0.01	0.00	-0.04	0.00	-0.02	-0.01	-0.04	-0.01	-0.01	0.01	0.00	-0.02	0.00	-0.04	-0.03	-0.24	-0.27
Greece	0.00	0.00	0.00	-0.01	0.00	-3.54	0.00	-0.02	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.01	-3.59	-0.05
Ireland	0.00	-0.04	0.00	-0.06	0.00	-0.01	-1.20	-0.04	0.00	-0.03	-0.01	-0.09	-0.01	-0.01	0.01	0.00	-0.02	0.00	-0.20	-0.15	-1.85	-0.66
Italy	0.00	0.00	0.00	-0.04	0.00	-0.02	0.00	-1.56	0.00	-0.01	-0.01	-0.04	0.00	-0.01	0.00	0.00	-0.01	0.00	-0.03	-0.02	-1.76	-0.20
India	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.58	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	-0.01	0.00	-0.01	-0.02	-0.66	-0.08
Netherlands	0.00	-0.03	0.00	-0.06	0.00	-0.02	-0.01	-0.05	0.00	-1.10	-0.01	-0.06	0.00	-0.01	0.01	0.00	-0.01	0.00	-0.09	-0.03	-1.46	-0.36
Portugal	0.00	0.00	0.00	-0.03	0.00	0.00	0.00	-0.02	0.00	-0.01	-2.53	-0.16	0.00	0.00	0.00	0.00	0.00	0.00	-0.03	-0.01	-2.81	-0.27
Spain	0.00	0.00	0.00	-0.05	0.00	-0.01	0.00	-0.03	0.00	-0.01	-0.04	-3.09	0.00	0.00	0.00	0.00	-0.01	0.00	-0.04	-0.01	-3.30	-0.21
Korea, Republic of	0.00	0.00	0.00	-0.01	0.00	-0.02	0.00	-0.01	-0.01	-0.01	0.00	-0.01	-0.87	-0.01	0.00	0.00	-0.13	0.00	-0.02	-0.07	-1.16	-0.30
Russian Federation	0.00	0.00	0.00	-0.02	0.00	0.00	0.00	-0.02	0.00	-0.02	0.00	-0.02	-0.01	-0.66	0.01	0.00	-0.02	0.00	-0.02	-0.02	-0.80	-0.14
Sweden	0.00	0.00	0.00	-0.02	0.00	0.00	0.00	-0.01	0.00	-0.01	0.00	-0.02	0.00	0.00	1.05	0.00	-0.01	0.00	-0.04	-0.02	0.90	-0.15
Switzerland	-0.01	0.00	0.00	-0.03	0.00	-0.01	0.00	-0.04	-0.02	-0.01	0.00	-0.03	0.00	0.00	0.00	-0.15	-0.01	0.00	-0.03	-0.03	-0.38	-0.23
China,P.R.: Mainland	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	-0.01	-0.01	-0.01	0.00	-0.01	-0.02	-0.01	0.00	0.00	-0.79	0.00	-0.02	-0.07	-0.97	-0.18
Japan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	-0.02	-0.02	-0.01	-0.02	-0.10	-0.08
United Kingdom	0.00	0.00	0.00	-0.02	0.00	0.00	-0.02	-0.01	0.00	-0.01	0.00	-0.02	0.00	0.00	0.00	0.00	-0.01	0.00	-1.95	-0.02	-2.07	-0.12
United States	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	-0.01	-0.59	-0.62	-0.03
PPP-weighted average	0.00	-0.01	0.00	-0.07	0.00	0.00	-0.01	-0.06	-0.05	-0.02	-0.01	-0.09	-0.03	-0.03	0.01	0.00	-0.17	0.00	-0.10	-0.19	-0.86	-0.13

Table 4. Single Country Cumulative Growth Impact of the Actual Fiscal Changes in 2011-2012, Baseline multipliers, Headline Fiscal Measure in Relation to GDP.

Cumulative Growth Impact of Actual Consolidation in 2011-2012, Headline Fiscal Measure in Ratios (percent)																					Inward			
From:	Austria	Belgium	Brazil	France	Germany	Greece	Ireland	Italy	India	Netherlands	Portugal	Spain	Korea, Republic of	Russian Federation	Sweden	Switzerland	China, P.R.: Mainland	Japan	United Kingdom	United States	Total	Domestic	Spillovers	
To:																								
Austria	-0.82	-0.01	0.00	-0.05	-0.18	-0.01	0.00	-0.09	-0.01	-0.01	-0.01	-0.04	-0.01	-0.02	0.00	-0.01	-0.02	-0.02	-0.05	-0.06	-1.4	-0.8	-0.59	
Belgium	-0.01	-0.92	0.00	-0.17	-0.13	-0.01	-0.01	-0.07	-0.01	-0.06	-0.01	-0.08	-0.01	-0.01	-0.01	0.00	-0.02	-0.01	-0.11	-0.06	-1.7	-0.9	-0.79	
Brazil	0.00	0.00	-0.23	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	-0.02	-0.01	-0.01	-0.02	-0.3	-0.2	-0.10	
France	0.00	-0.02	0.00	-1.58	-0.05	-0.01	0.00	-0.05	0.00	-0.01	-0.01	-0.07	-0.01	-0.01	0.00	0.00	-0.01	-0.01	-0.05	-0.04	-2.0	-1.6	-0.37	
Germany	-0.01	-0.01	0.00	-0.05	-0.90	-0.01	0.00	-0.04	-0.01	-0.02	0.00	-0.04	-0.01	-0.01	0.00	0.00	-0.02	-0.01	-0.05	-0.04	-1.2	-0.9	-0.33	
Greece	0.00	0.00	0.00	-0.01	-0.01	-2.71	0.00	-0.02	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.01	-2.8	-2.7	-0.08	
Ireland	0.00	-0.05	0.00	-0.07	-0.06	-0.01	-1.31	-0.05	0.00	-0.02	-0.01	-0.09	-0.01	-0.01	0.00	0.00	-0.02	-0.04	-0.21	-0.22	-2.2	-1.3	-0.88	
Italy	0.00	-0.01	0.00	-0.04	-0.04	-0.01	0.00	-1.73	0.00	-0.01	0.00	-0.05	0.00	-0.01	0.00	0.00	-0.01	-0.01	-0.03	-0.04	-2.0	-1.7	-0.28	
India	0.00	0.00	0.00	-0.01	-0.01	0.00	0.00	-0.01	-0.62	0.00	0.00	-0.01	-0.01	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.03	-0.7	-0.6	-0.11	
Netherlands	-0.01	-0.04	0.00	-0.07	-0.13	-0.01	-0.01	-0.05	0.00	-1.08	-0.01	-0.06	-0.01	-0.01	-0.01	0.00	-0.01	-0.01	-0.09	-0.04	-1.6	-1.1	-0.57	
Portugal	0.00	0.00	0.00	-0.04	-0.03	0.00	0.00	-0.02	0.00	-0.01	-2.02	-0.17	0.00	0.00	0.00	0.00	0.00	0.00	-0.03	-0.02	-2.4	-2.0	-0.33	
Spain	0.00	-0.01	0.00	-0.06	-0.03	-0.01	0.00	-0.04	0.00	-0.01	-0.03	-3.17	0.00	-0.01	0.00	0.00	-0.01	-0.01	-0.04	-0.02	-3.4	-3.2	-0.26	
Korea, Republic of	0.00	0.00	0.00	-0.01	-0.02	-0.01	0.00	-0.01	-0.01	-0.01	0.00	-0.01	-1.07	-0.01	0.00	0.00	-0.13	-0.06	-0.02	-0.10	-1.5	-1.1	-0.40	
Russian Federation	0.00	0.00	0.00	-0.02	-0.03	0.00	0.00	-0.03	0.00	-0.01	0.00	-0.02	-0.01	-1.06	0.00	0.00	-0.02	-0.01	-0.02	-0.03	-1.3	-1.1	-0.21	
Sweden	0.00	-0.01	0.00	-0.02	-0.03	0.00	0.00	-0.02	0.00	-0.01	0.00	-0.02	0.00	-0.01	-0.38	0.00	-0.01	-0.01	-0.04	-0.03	-0.6	-0.4	-0.21	
Switzerland	-0.01	0.00	0.00	-0.04	-0.06	-0.01	0.00	-0.04	-0.02	-0.01	0.00	-0.03	-0.01	-0.01	0.00	-0.24	-0.01	-0.02	-0.03	-0.05	-0.6	-0.2	-0.35	
China, P.R.: Mainland	0.00	0.00	0.00	-0.01	-0.02	0.00	0.00	-0.01	-0.01	-0.01	0.00	-0.01	-0.02	-0.01	0.00	0.00	-0.74	-0.05	-0.02	-0.11	-1.0	-0.7	-0.29	
Japan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	-0.02	-0.89	-0.01	-0.03	-1.0	-0.9	-0.10	
United Kingdom	0.00	-0.01	0.00	-0.02	-0.02	0.00	-0.02	-0.01	0.00	-0.01	0.00	-0.02	0.00	0.00	0.00	0.00	0.00	-0.01	-2.10	-0.04	-2.3	-2.1	-0.17	
United States	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.91	-1.0	-0.9	-0.04	
PPP-weighted average	-0.01	-0.01	-0.01	-0.08	-0.07	0.00	-0.01	-0.07	-0.05	-0.02	-0.01	-0.10	-0.04	-0.05	0.00	0.00	-0.16	-0.09	-0.11	-0.30	-1.19	-1.0	-0.19	

Table 5. Single Country Cumulative Growth Impact of the Actual Fiscal Changes in 2011-2012, Baseline multipliers, Headline Fiscal Measure in Real Terms

Cumulative Growth Impact of Actual Consolidation in 2011-2012, Headline Real Fiscal Measure (percent)																						
From:	Austria	Belgium	Brazil	France	Germany	Greece	Ireland	Italy	India	Netherlands	Portugal	Spain	Korea, Republic of	Russian Federation	Sweden	Switzerland	China,P.R.: Mainland	Japan	United Kingdom	United States	Inward	
																					Total	Spillovers
To:																						
Austria	0.12	0.00	0.01	-0.01	-0.13	-0.02	0.00	-0.06	0.02	-0.01	-0.01	-0.04	0.00	0.03	0.01	0.00	0.04	-0.01	-0.04	-0.01	-0.1	-0.23
Belgium	0.00	-0.43	0.01	-0.04	-0.10	-0.02	0.00	-0.04	0.04	-0.02	-0.01	-0.08	0.00	0.02	0.01	0.00	0.03	-0.01	-0.08	-0.01	-0.7	-0.32
Brazil	0.00	0.00	1.28	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	-0.01	0.00	0.01	0.00	0.00	0.03	-0.01	-0.01	0.00	1.3	0.01
France	0.00	-0.01	0.01	-0.35	-0.04	-0.01	0.00	-0.03	0.01	0.00	-0.01	-0.07	0.00	0.01	0.00	0.00	0.02	-0.01	-0.04	-0.01	-0.5	-0.18
Germany	0.00	0.00	0.01	-0.01	-0.65	-0.01	0.00	-0.03	0.01	-0.01	-0.01	-0.04	0.00	0.02	0.01	0.00	0.03	-0.01	-0.03	-0.01	-0.7	-0.08
Greece	0.00	0.00	0.00	0.00	-0.01	-3.81	0.00	-0.01	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	-3.8	-0.03
Ireland	0.00	-0.02	0.01	-0.02	-0.04	-0.01	-0.75	-0.03	0.01	-0.01	-0.01	-0.09	0.00	0.01	0.01	0.00	0.03	-0.03	-0.16	-0.05	-1.1	-0.40
Italy	0.00	0.00	0.01	-0.01	-0.03	-0.02	0.00	-1.13	0.01	0.00	-0.01	-0.05	0.00	0.02	0.00	0.00	0.02	-0.01	-0.03	-0.01	-1.2	-0.10
India	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	1.57	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.02	-0.01	-0.01	-0.01	1.6	-0.01
Netherlands	0.00	-0.02	0.00	-0.02	-0.09	-0.02	-0.01	-0.03	0.01	-0.38	-0.01	-0.06	0.00	0.01	0.01	0.00	0.02	-0.01	-0.07	-0.01	-0.7	-0.28
Portugal	0.00	0.00	0.01	-0.01	-0.02	0.00	0.00	-0.01	0.00	0.00	-2.50	-0.17	0.00	0.00	0.00	0.00	0.01	0.00	-0.02	0.00	-2.7	-0.22
Spain	0.00	0.00	0.01	-0.01	-0.02	-0.01	0.00	-0.02	0.01	0.00	-0.04	-3.16	0.00	0.01	0.00	0.00	0.01	0.00	-0.03	0.00	-3.3	-0.12
Korea, Republic of	0.00	0.00	0.02	0.00	-0.01	-0.02	0.00	-0.01	0.04	0.00	0.00	-0.01	-0.35	0.02	0.00	0.00	0.22	-0.04	-0.01	-0.02	-0.2	0.17
Russian Federation	0.00	0.00	0.00	0.00	-0.02	-0.01	0.00	-0.02	0.01	0.00	0.00	-0.02	0.00	1.73	0.00	0.00	0.03	-0.01	-0.01	0.00	1.7	-0.05
Sweden	0.00	0.00	0.01	0.00	-0.02	0.00	0.00	-0.01	0.01	0.00	0.00	-0.02	0.00	0.01	0.73	0.00	0.02	-0.01	-0.03	0.00	0.7	-0.06
Switzerland	0.00	0.00	0.01	-0.01	-0.04	-0.01	0.00	-0.03	0.06	0.00	0.00	-0.03	0.00	0.01	0.00	0.13	0.02	-0.01	-0.02	-0.01	0.1	-0.07
China,P.R.: Mainland	0.00	0.00	0.01	0.00	-0.01	0.00	0.00	-0.01	0.02	0.00	0.00	-0.01	-0.01	0.02	0.00	0.00	1.28	-0.03	-0.02	-0.02	1.2	-0.07
Japan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	-0.64	0.00	-0.01	-0.6	0.03
United Kingdom	0.00	0.00	0.00	0.00	-0.01	0.00	-0.01	-0.01	0.01	0.00	0.00	-0.02	0.00	0.01	0.00	0.00	0.01	0.00	-1.57	-0.01	-1.6	-0.06
United States	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	-0.01	-0.01	-0.17	-0.2	0.00
PPP-weighted average	0.00	0.00	0.06	-0.02	-0.05	0.00	0.00	-0.05	0.14	-0.01	-0.01	-0.10	-0.01	0.08	0.01	0.00	0.28	-0.06	-0.08	-0.05	0.1	-0.04