Fiscal stimulus and the promise of future spending cuts: A comment

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Abstract

Recent evaluations of the fiscal stimulus packages recently enacted in the United States and Europe such as Cogan, Cwik, Taylor and Wieland (2009) and Cwik and Wieland (2009) suggest that the GDP effects will be modest due to crowding-out of private consumption and investment. Corsetti, Meier and Mueller (2009a,b) argue that spending shocks are typically followed by consolidations with substantive spending cuts, which enhance the short-run stimulus effect. This note investigates the implications of this argument for the estimated impact of recent stimulus packages and the case for discretionary fiscal policy.

Keywords: Fiscal multiplier, fiscal stimulus, discretionary fiscal policy, New Keynesian model, crowding out, government spending, macroeconomic modelling.

JEL codes: C52, E62

Recent fiscal stimulus packages such as the U.S. American Recovery and Reinvestment Act (ARRA) or Germany's "Konjunkturpakete I und II" have triggered a new literature on Keynesian-style multiplier effects. A multiplier effect emerges if the increase in government purchases triggers additional purchases by households funded with the income earned from the production paid for by the government. Countervailing crowding-out effects may arise because of the upward pressure on real interest rates due to increased government-debt financing, the expectation of future tax increases and an appreciation of the real exchange rate.

The recent stimulus measures provide new observations that will help gain new insights in the effects of discretionary fiscal policy. Cogan, Cwik, Taylor and Wieland (2009) and Cwik and Wieland (2009) identify the magnitudes and timing of the implied spending increases and tax reductions directly from publicly available documents regarding the particular legislation. They proceed to estimate the GDP effects of the announced policy changes using a range of empirically estimated structural macroeconomic models that account for different assumptions regarding the behavioral responses of households and firms. Their findings suggest that crowding-out effects dominate and the short-run boost to GDP is significantly smaller than the increase in government purchases.

Another widely-used approach aims to identify typical government spending impulses along with their effects on GDP and other variables from historical aggregate time series (cf. Gali, Lopez-Salido and Valles (2007)). An "impulse" is then a change in government spending that is not forecastable by a vector autoregression on the basis of selected aggregates. Identification assumptions are needed to separate the government spending surprise from other surprises defined with respect to the forecast of the VAR.

Using such a VAR approach Corsetti, Meier and Mueller (CMM) (2009a) find that government spending impulses boosts private consumption. The GDP multiplier is about one on impact and increases for a while due to the crowding in of consumption. In addition, they note that government spending later on declines below baseline. Similarly, output falls somewhat in subsequent years. However, 90 percent confidence intervals on ouput and consumption are very large and always include the zero line. Corsetti et al (2009a) then go on to simulate a combination of short-run fiscal stimulus and medium-run spending cuts in a calibrated New-Keynesian macroeconomic model. The simulation results indicate that the anticipation of future spending cuts induces greater short-run multiplier effects of government spending impulses.

Corsetti et al (2009b) extend the analysis to a calibrated two-country model and explore international spillover effects of government spending increases combined with future spending cuts. The anticipated cuts not only strengthen the domestic stimulus effect but also enhance positive cross-border spillovers. The mechanism of transmission is a reduction of long-term real interest rates across the two economies, not a depreciation of the foreign currency.

These findings regarding the effect of future spending reversals raise two questions – a positive and a normative one. First, should observers expect greater short-run multiplier effects from the U.S. and European stimulus packages of 2008 and 2009 than estimated by Cogan et al (2009) and Cwik and Wieland (2009)? Secondly, should governments be advised to combine short-run stimulus packages with medium-term spending reductions?

I. Should recent estimates of the impact of the 2008/09 stimulus packages be revised upwards to account for anticipated spending reversals?

The answer is no. There are at least two reasons. The first reason is related to what is publicly known about these particular policy changes, while the second one lies in the mixed empirical evidence obtained with different approaches for identifying historical impulses.

First, the ARRA legislation and European measures such as the German "Konjunkturpakete" are clearly identified and announced plans of governments approved by their parliaments. There is no need to make identifying assumptions and consider historical VARs in order to estimate the timing and magnitude of these additional government purchases and tax reductions. Instead, these numbers may be obtained directly from the announced plans.

The ARRA includes spending increases and tax cuts spread over 2009 to 2018. Indeed, it also involves some very small spending cuts in 2016 to 2018. Additional medium term spending cuts have not been announced in conjunction with the ARRA legislation. Thus, model-based evaluations that aim to account for the anticipation of rational, forward-looking households and firms should reflect the legislation as it has been passed at the beginning of 2009. The spending cuts planned for 2016 to 2018 are already included in such an assessment by Cogan et al (2009). Should the U.S. government announce additional medium-term spending cuts at a later stage, say in 2011 for the years 2015 to 2018, and Congress pass them into law then they would affect expectations and decisions of households at that time but not retroactively in 2009. As to the European stimulus packages Cwik and Wieland review countries' financial stability plans and collect

information on the specific measures and magnitudes. Indeed, the net effect of these measures is not always positive. For example, in Italy measures intended to raise tax collection overwhelm the planned spending increases and tax reductions. The stimulus packages do not involve announcements for spending increases or cuts after 2010.

Of course, one could still argue that American households might have concluded in January 2009 that they should expect future spending cuts even though none had been promised by the U.S. government. The argument would go as follows: historical experience indicates that past U.S. government spending impulses identified by VAR studies are followed later on by spending cuts. Therefore, households expected such consolidations in the past and will foresee such a consolidation as an unannounced companion to the ARRA. However, these historical dynamics may simply be due to automatic stabilizers that the VAR missed and falsely interpreted as a follow-up to discretionary fiscal stimuli. The VARs typically do not use the real-time data that formed the basis of market participants' expectations at the time the discretionary fiscal measures were initiated.

More importantly, the above-mentioned VAR evidence on the effect of historical government spending impulses does not stand unchallenged. Ramey (2009), for example, uses new variables on military spending dates and professional forecasts in order to better measure historical anticipations regarding fiscal policies. Her findings indicate government spending multipliers for the United States ranging from 0.6 to 1.1. Corsetti et al (2009a) in turn challenge some of her findings and come out on the side of earlier VAR evidence pointing to greater multipliers. Another study by Barro and Redlick (2009), however, estimates defense spending multipliers of 0.6 to 0.7 that may reach unity only in scenarios with the U.S. unemployment rate rising to 12 percent. These authors conclude that

multipliers for non-defense government purchases cannot be reliably estimated because of the lack of good instruments. Thus, the empirical evidence regarding historical government impulses implies a wide range of GDP effects that remains consistent with the GDP impact of the ARRA and the European stimulus packages found by Cogan et al (2009) and Cwik and Wieland (2009) using estimated structural models.

II. Should governments be advised to announce short-run stimulus packages together with medium-term spending reductions?

Corsetti, Meier and Müller (2009a,b) report an interesting set of results regarding the consequences of spending impulses followed by spending reversals in calibrated structural macroeconomic models. Clearly, these findings could have important normative implications for the design of discretionary fiscal policies. The model they use in the article appearing in this journal is a two-country business cycle model. It features significant Keynesian elements by assuming that all firms are constrained in adjusting prices due to Calvo-style contracts and a third of the households are restricted to consume all their current income and abstain from borrowing or saving.

In order to investigate possible policy implications it is important to assess the magnitude of the near-term increase relative to the medium- to long-term reduction in government purchases and quantify their GDP effects jointly as well as separately in an empirically estimated model. **Figure 1** shows the particular path of government spending simulated by Corsetti et al (2009b) and the GDP impact obtained in their model. The bar graph in **Figure 1** indicates government expenditures equal to the solid line in the top left

panel of Figure 1a in Corsetti et al (2009b), while the thick solid line shows the response of

GDP equal to the solid line in the top middle panel of Figure 1a in their paper. [1]

Figure 1: CMM Government Spending Increases and Cuts with GDP Effects
simulated in the CMM 2009b model
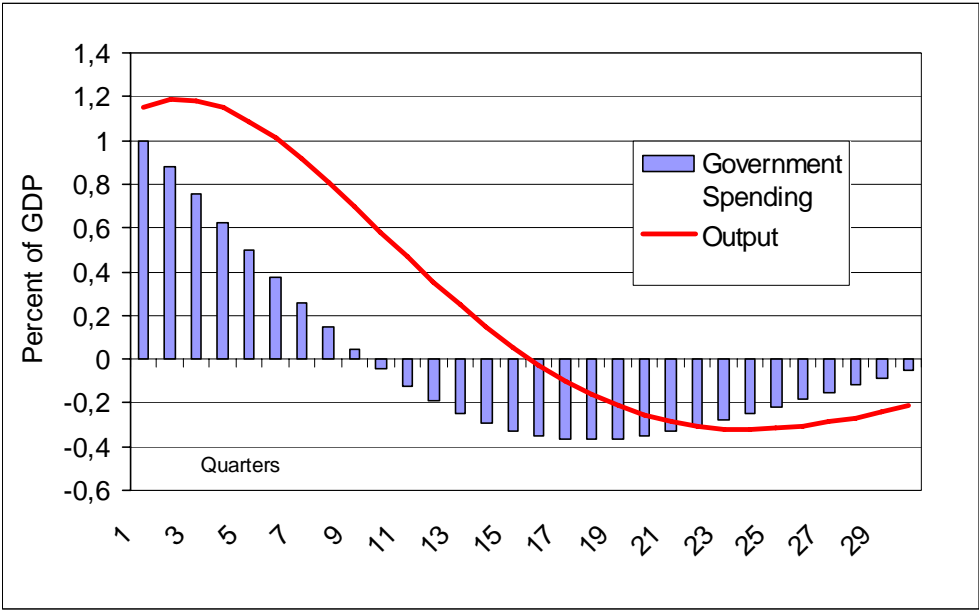
In this simulation, government purchases increase by an amount equal to 1 percent

of GDP in the first quarter. In subsequent quarters the additional amount of purchases

declines in magnitude. Over the first 9 quarters the total sum of additional purchases

amounts to 4.58 percent of GDP, roughly 0.5 percent per quarter. Spending declines below

trend about 10 quarters after the initial impulse. This decline follows from a fiscal rule that

enforces a certain degree of budget consolidation. The spending cuts relative to baseline

are substantial and last for a long time. Between quarters 10 and 30 they sum to about -5

percent. Thus, the overall plan over 30 quarters implies a net reduction of government

purchases below baseline of about 0.4 percent of GDP. It could be called a government

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[1] I thank Giancarlo Corsetti and Gernot Müller in particular for sending all the MATLAB computer codes
necessary to replicate their simulation analysis, as well as the results displayed in their figures.

savings plan rather than a government spending package. The ratio of anticipated spending cuts to spending increases in absolute value is 1.1.

One can calculate the magnitude of spending cuts that would have to be incorporated in the ARRA as announced in January 2009 so as to achieve a profile similar to the path in Corsetti et al (2009ab). As reported by Cogan et al (2009), federal purchases and transfers supporting spending in states and localities amount to 246 bln dollars during the first nine quarters, (1st quarter of 2009 up to and including the 1st quarter of 2011). Net spending increases for the next 21 quarters (2nd quarter of 2011 up to and including the 2nd quarter of 2016) sum up to 180 bln dollars. Thus, the path shown in **Figure 1** could be matched if the U.S. administration would implement spending cuts equal to 450bln dollars from the 2nd quarter of 2011 onwards. This includes 180 bln dollars needed to offset planned future purchases and 270 bln dollars corresponding to 1.1 times the purchases executed in the first nine quarters. 450 bln dollars equals 57 percent of the total of 787 bln dollars allocated to spending increases, transfers and short-run tax cuts by the ARRA legislation. Accordingly, households should have expected the U.S. administration to cut spending by 450 bln dollars (or 3.1 percent of current U.S. GDP) starting in the second quarter of 2011 and spread over four and a half years. It seems a far stretch from reality to assume that U.S. households would have adopted this belief in January 2009 without any supporting announcement by the government or accompanying legislation. Hence, the findings of Corsetti et al (2009a,b) should better not be interpreted as indicative of the likely effects of recent fiscal stimulus packages such as the ARRA.

Nevertheless, it is of great interest to ask how future fiscal stimuli should be designed in light of these studies. Clearly, the multiplier implied by the path of GDP (thick solid line in Figure 1) is substantially greater than one. Output stays above government

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spending up to quarter 22 and takes only slightly lower values in the last few quarters. The cumulative sum of output deviations over 30 quarters totals 7.4 percent of quarterly GDP relative to a net reduction of government spending of -0.4 percent. This finding seems to suggest that it would be better to announce stimulus packages that combine initial spending increases with an announcement that they will be followed later by substantial spending cuts.

In the remainder of this comment, I will analyze the impact of such spending increases and reductions in more detail. First, it is instructive to check whether these measures imply a reduction or an increase in the future tax burden perceived by forward-looking households. If one applies a standard quarterly discount factor of 0.99, then the discounted sum of government spending over 30 quarters corresponds to 0.33 percent of GDP.[2] Given that the discounted sum of additional purchases over the first nine quarters is 4.49 percent of GDP, the subsequent spending cuts pay for over 90 percent of the initial stimulus. Thus, it is perhaps not surprising that these particular fiscal measures do not induce crowding-out of private consumption.

Corsetti et al (2009a,b) rely on calibrated New-Keynesian DSGE models. Their findings may be quite sensitive to the particular model and parameterization. It is preferable to base policy recommendations on an estimated model. To assess the robustness of their findings, I evaluate the impact of their particular path for discretionary government spending in a larger-scale New-Keynesian DSGE model originally estimated by Smets and Wouters (2007) with U.S. macroeconomic data. Technically, I simulate the model under the assumption that the government announces the exact path of planned government spending increases and cuts displayed in the bar graph in **Figure 1** in the first quarter of the

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[2] The above-mentioned discount factor of 0.99 corresponds to the steady-state discount factor in Corsetti, Meier and Mueller (2009b) (see Table 1). However, the discount factor during the transition to the steady-state is endogenous in order to ensure stationarity of equilibria in this two-country model.

simulation. This approach requires using a solution method for nonlinear rational

expectations models as in Cogan et al (2009). It makes it possible to study the same

stimulus plan as in Corsetti et al (2009b) without having to introduce an explicit

government spending rule that feeds back on output and government debt. The advantage

of this approach is that it renders the experiment easily portable to different models.

Figure 2: CMM Spending Increases and Cuts with GDP Effects in Smets and
Wouters 2007 model
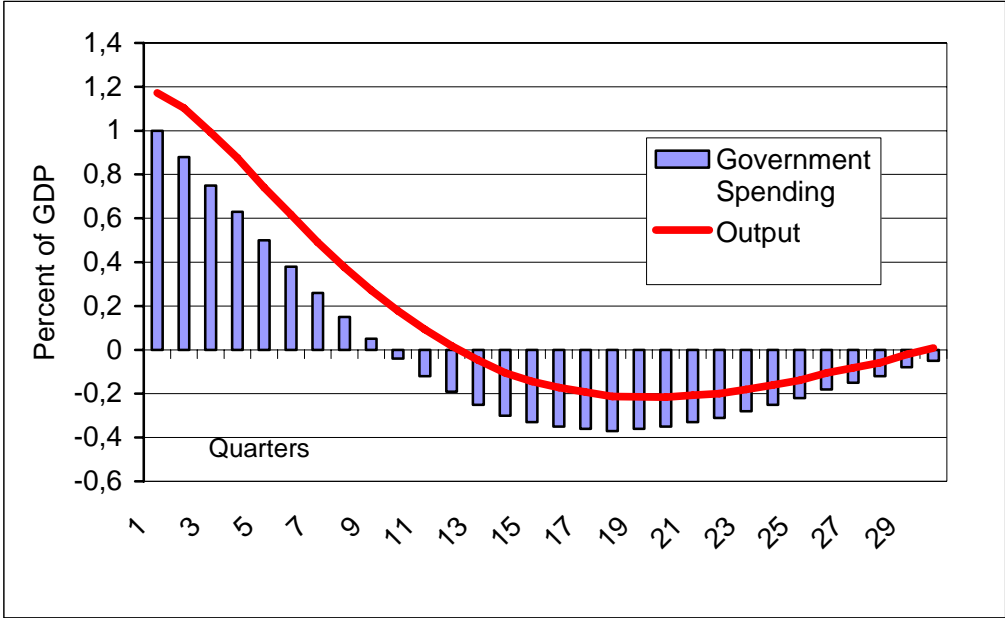
The GDP effect resulting in the Smets and Wouters (2007) model is shown in

Figure 2. It is not as large as in the CMM09b model. Nevertheless, the multiplier remains

above unity. The thick solid line depicting U.S. GDP stays higher than government

spending as a share of GDP for the full length of the simulation.

The impact of the fiscal package on the economy depends importantly on the

particular response of monetary authorities. For this reason, the simulation of the Smets and

Wouters model shown in **Figure 2** assumes that the interest rate is set according to the

same policy rule as in Corsetti et al (2009b). Thus, the reduction in the multiplier effect

results from differences in the structure and parameterization of the empirically-estimated model relative to their calibrated model.

The monetary policy rule in Corsetti et al (2009b) implies that the nominal interest rate, i_t, responds to deviations of the inflation rate, π_t, from target by a factor of 1.5:

$$i_t = \bar{i} + 1.5(\pi_t - \bar{\pi}) \tag{1}$$

Here, a bar over a variable refers to its steady-state value. Interestingly, this rule does not involve an interest rate response to the output gap as in the original Taylor (1993) rule. Taylor's rule featured a coefficient of 0.5 on this gap. It is more relevant from an empirical perspective, because it matches Fed policy during the early Greenspan years (1987 to 1993) very well. Thus, I modified the policy rule to make it more similar to the original Taylor rule:

$$i_t = \bar{i} + 1.5(\pi_t - \bar{\pi}) + 0.5y_t \tag{2}$$

In the simulation, the output gap, y_t, is defined as the percentage difference between the actual level of output and the level of output that would be realized in the Smets and Wouters model if prices and wages were flexible. The outcome under Taylor's rule is reported in **Figure 3**.

Once one takes into account that the U.S. Fed tends to raise the federal funds rate along with increases in the output gap, the response of output to fiscal policy is reduced. During the first 9 quarters of spending increases, the multiplier effect is now roughly equal to unity. Thus, using an empirically estimated model of the U.S. economy together with an empirically relevant interest rate rule implies a fiscal multiplier that is quite a bit smaller than in Corsetti et al (2009b). However, it is still bigger than in the case of the assessment of the ARRA conducted by Cogan et al (2009). Thus, the anticipation of future spending cuts continues to play an important role in boosting output and consumption from the start.

Figure 3: CMM Spending Increases and Cuts with GDP effects under standard Taylor rule (0.5*output gap, SW 07 model)
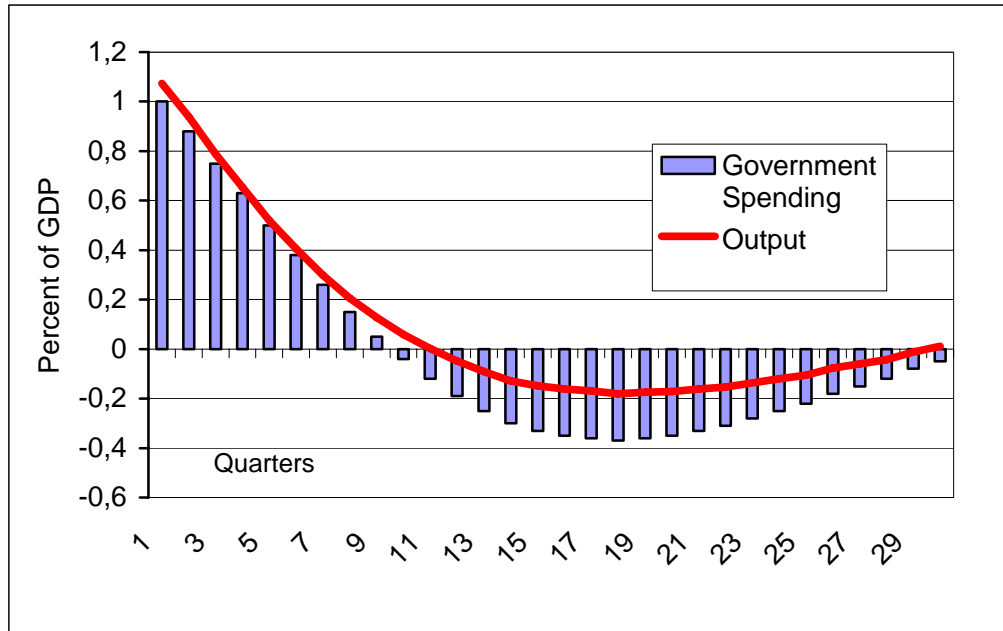
In the next step, I investigate the effect of the spending cuts separately from the initial increase in purchases. Market participants are informed that the government plans reducing purchases in two and half years' time and form expectations accordingly. The resulting path for GDP is shown in **Figure 4.** Output increases from the first quarter onwards reaching a peak in the ninth quarter of the simulation. During this period no additional government purchases are executed. Thus, for the first nine quarters the "spending" multiplier is equal to infinity. It arises from planned and anticipated government savings rather than spending. As a consequence of the anticipated future reduction in government spending, private consumption and investment increase today. This increase is accompanied by a rise in labor supply generating greater output. Note, monetary policy is again assumed to follow the interest rate rule without output gap response as in Corsetti et al (2009b).

Figure 4: GDP effect of CMM Spending Cuts Alone   (rule without output gap, SW 07 model)
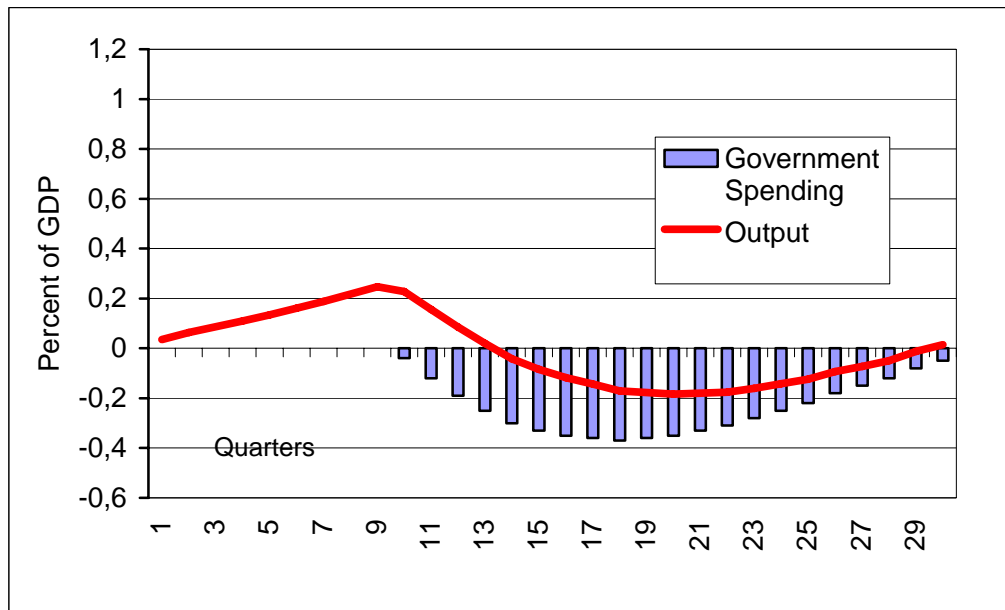
I. Conclusions

The empirical case for greater multiplier effects of the recent U.S. and European stimulus packages due to market participants' expectation of drastic spending cuts starting as early as 2011 appears rather weak. However, the effects of spending reversals reported by Corsetti et al (2009a,b) and the stimulative power of anticipated spending cuts revealed in this paper have normative implications. Rather than trying to quickly increase government purchases in a recession, fiscal authorities may instead counter the downturn by announcing future cuts in government spending. The effect of such spending reductions could even be greater than suggested by the preceding simulations. Both models assume that spending cuts translate to a reduction of lump-sum taxes. Accounting for the distortionary nature of taxes in practice would imply a greater and longer-lasting stimulus from anticipated government spending cuts. Of course, it is crucial that government announcements regarding future consolidation by spending cuts are credible. In Europe, the

Stability Pact implied by the Maastricht treaty provides an avenue for improving individual governments' credibility.

In the case of Europe, the question of spillovers between countries is also of great interest. Using a mult-country model, Cwik and Wieland (2009) find that spillovers between Germany, France and Italy are negligible or even negative even though export demand is significantly positively related to income in the other countries. Because of the common currency, fiscal stimulus in one member country induces higher interest rates and an appreciation vis-à-vis other currencies, thereby offsetting the direct demand effects for other member countries' exports.

Corsetti, Meier and Müller (2009b) report significant positive spillovers in a two-country model with a flexible exchange rate. These spillovers have a non-Keynesian flavour. They are driven by a reduction in the long-run world real interest rate rather than a depreciation of the currency of the country that does not engage in fiscal stimulus. It would be of interest to investigate to what extent such effects would arise in an empirically estimated multi-country model and how sensitive they are to the magnitude and credibility of future spending cuts.

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