As the preceding discussion suggests, there are many directions for further extension of analysis. One extension would be to come to a more complete assessment of the overall spill-overs of fiscal policy, not only quantifying the trade channel, but also other channels (for example, via the foreign interest rate – see Faini, 2006), and comparing the sizes of these channels.

Discussion

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Empirical analysis of fiscal policy spill-overs in Europe

Beetsma, Giuliodori and Klaassen (BGK in the following) investigate an interesting empirical question that is clearly relevant for European macroeconomic policy. In fact, contributors to the political debate on the virtues and drawbacks of fiscal policy coordination in the Euro area may easily be tempted to draw unwarranted conclusions from the authors' empirical analysis. I will provide support for my concerns in this regard further below by comparing BGK's findings based on panel vector autoregression (PVAR) analysis of fiscal shocks and reduced-form trade equations with alternative policy scenarios studied in a structural model of the G7 economies. Before turning to this comparison, however, I will shortly comment on the empirical approach chosen by the authors.

I find the two-block approach pursued by the authors innovative, useful and very competently executed. Modelling the fiscal block as a PVAR (see equation (1) in the article) they are able to identify quantitatively significant Keynesian-style effects of fiscal shocks using annual data of government spending, cyclically adjusted net taxes and total output for 14 EU countries from 1965 to 2004. Their findings suggest that an unanticipated increase in government spending of 1% of GDP would lead to an increase in total aggregate demand by about 1.5% of GDP within the first two years. The authors relate their analysis to other VAR-based studies of fiscal shocks and conduct extensive robustness exercises that provide further corroboration of their findings.

The trade-block (equation (2) in the article) provides a reduced-form link between domestic output and demand for exports from other EU countries. The country-pair equations also take into account the effect of the bilateral exchange rate. They are estimated via OLS with data from the same 14 EU countries from 1965 to 2004. The authors find that an increase in real GDP of the importing country exerts a strong positive effect on demand for the foreign country's exports. A real depreciation of the exporting country's currency also has a strong positive effect on exports.

Combining the fiscal and trade blocks, the authors estimate partial-equilibrium effects of domestic fiscal shocks on foreign output. For example, Panel A in Table 5 of the article indicates that a government spending increase in Germany by 1% of GDP would raise output in other EU countries between 0.057% (in Greece) and 0.448% (in Belgium) within two years via the foreign-export channel. Thus, the authors conclude that fiscal spillovers via trade in the EU are quantitatively important and will influence the ability of individual countries to meet the requirements of the Maastricht Treaty. They conduct policy experiments suggesting, for example, that the upcoming fiscal contraction in Germany (due to an increase in VAT) will make it more difficult for other countries to meet the Maastricht deficit criteria due to negative trade spill-overs.

A criticism: systematic changes in macroeconomic policy such as the introduction of the Euro will modify the spill-over effects of fiscal shocks

In my view, the empirical effects identified by BGK provide a good summary of the 'normal' effects of fiscal shocks over most of the sample period, 1965–2004. However, I would question their validity as predictions of the size (and possibly even the direction) of spill-overs in today's Euro area. My scepticism derives from the following changes in the systematic conduct of macroeconomic policy in the Euro area since 1999:

(i) the change from fixed-but-adjustable exchange rates to permanently fixed exchange rates due to the introduction of the common currency;

(ii) the change from national monetary policies to a single European monetary policy aiming to stabilize European-wide macroeconomic aggregates, and

(iii) the Maastricht fiscal criteria.

As suggested by the original Lucas critique, changing the systematic component of macroeconomic policy will affect expectations formation and thus also the coefficients of the fiscal and trade block estimated by the authors. For example, changing systematic exchange rate and interest rate policy will modify the effect of unanticipated fiscal shocks as well as the trade-weighted impact of exchange rates on aggregate output.

To illustrate the consequences of fixing exchange rates in Europe and delegating monetary policy to a single European Central Bank for the spill-over effects of fiscal shocks, I will refer to simulation results derived from a structural model of the G7 economies developed by John B. Taylor and described in detail in Taylor (1993) as well as alternative policy scenarios for the European countries (Germany, France, Italy and the UK) studied by Wieland (1996) using that same model. First, I will compare the effect of fiscal impulses under historical monetary conditions as quantified by Taylor (1993) with the findings presented in the article under discussion. Then, I will draw on the results in Wieland (1996) to illustrate how the spill-over effect of a fiscal

shock in Germany would change if European exchange rates are fixed and interest-rate-setting aims to stabilize European-wide aggregates.

Comparing fiscal spill-overs in Taylor (1993) and the article under discussion

The multi-country model used in Taylor (1993) is a precursor of the New-Keynesian micro-founded models of the macro-economy developed in recent years. The model was estimated using quarterly data from 1971 to 1986. While not explicitly derived from microeconomic foundations, Taylor's model embodies many implications of optimizing behaviour by households and firms in its behavioural equations and explicitly accounts for forward-looking behaviour by assuming rational expectations. Monetary policy has short-run real effects arising from staggered wage contracts just as in the more recent New-Keynesian models. Recent studies of interest rate rules by Levin, Wieland and Williams (1999, 2003) confirm that Taylor's model provides recommendations for the design of such rules that are much closer to those derived from micro-founded New-Keynesian models with rational expectations than to those from more traditional Keynesian-style macroeconomic models with backward-looking expectations formation.

In chapter 5 (pages 178 to 181, Figures 5.11A to 5.11H), Taylor reports on the effect of an unanticipated and permanent fiscal expansion in Germany by 1% of GDP. Monetary policies in all G7 countries are assumed to follow their historical paths while nominal exchanges are flexible. As a result of this fiscal shock German GDP rises by 0.8% within one year. Furthermore, the German price level rises, the DM appreciates vis-à-vis the US$ and German short-term interest rates rise on impact. The effect on German imports is positive and peaks at 1.2%. Figure 5.11G summarizes the effect of the German fiscal shock on output abroad. The effect is positive within the first two years and peaks at 0.15% for France, 0.25% for Italy and 0.3% for the UK.

In Table 7 I compare the spill-over effects simulated by Taylor (1993) to the effects identified by BGK. In both cases, spill-overs are positive and of roughly similar

Table 7. Spill-over effects of German government spending: BGK vs Taylor's model

German expansion	Effect on France		Effect on Italy		Effect on UK	
	Impact	2 Years	Impact	2 Years	Impact	2 Years
BGK: unanticipated spending shock of 1% of GDP (with high endogenous persistence)	0.094%	0.107%	0.085%	0.096%	0.063%	0.072%
Taylor (1993): unanticipated permanent spending increase of 1% of GDP	0.1%	0.12%	0.18%	0.22%	0.17%	0.25%

Source: Taylor (1993) and the article by BGK under discussion.

magnitude. The effects are somewhat larger in Taylor's model, perhaps due to the fact that he considers an unanticipated but permanent increase in German government spending while the effect of the spending shock considered by BGK eventually dies out again. Overall, I would take BGK's empirical findings as a surprisingly close confirmation of the spill-overs computed in Taylor (1993) but requiring far fewer structural identification assumptions. From BGK's perspective I would consider the results in Taylor's monograph as a welcome confirmation of the validity of the direction and magnitude of 'normal' spill-over effects over the earlier part of the sample.

Fiscal spill-overs may change in magnitude and direction with a common currency and single monetary policy

I now turn to the spill-over effects of a German fiscal expansion of 1% of GDP presented in Wieland (1996) using Taylor's model. In this paper I considered the following regime changes:

(1) Exchange rates between the European countries (i.e. Germany, France, Italy and the UK) are permanently fixed.

(2) Nominal interest rates in all G7 countries are set according to Taylor-style monetary policy rules of the following form:

$$(1)\ RS - RS^* = (LP(t+4) - LP) + k(LP - LP^*) + k(LY - LY^*)$$

Here LP denotes the natural logarithm of the price level and LY the natural logarithm of real output. * refers to target and long-run equilibrium values. This rule implies that the short-term nominal interest rate RS responds to changes in expected inflation as well as deviations of the price level and real output from target and equilibrium values with a response coefficient k.

(3) Interest rates in the European countries follow the same path and respond to European-wide averages LP^{EUR} and LY^{EUR}.

These regime changes capture important consequences of European monetary union in 1999 except that the UK did not join this union.

Table 8 reports the spill-over effects in France, Italy and the UK following an unanticipated, permanent increase in German government spending of 1% of GDP, i.e. the same policy shocked considered by Taylor (1993) under historical monetary conditions and flexible exchange rates. Following the increase in government spending, German overall GDP rises by 1.22% in the course of 2 years. Similarly the German price level increases above target. Germany has a large weight in European averages and as a result European interest rates increase by about 60 basis points. At the same time the European currency appreciates substantially vis-à-vis non-European currencies such as the US$ and the Yen (2.5 percentage points vis-à-vis the US$). Due to higher interest rates and exchange rate appreciation the GDP in the other European countries

Table 8. Spill-over effects of German government spending in a monetary union

German expansion	Effect on France	Effect on Italy	Effect on UK
	2 Years	2 Years	2 Years
Wieland (1996): unanticipated permanent spending increase of 1% of GDP. Fixed exchange rates and Taylor-style interest rate rule for Europe in Taylor's 1993 model	–0.47%	–1.03%	–0.17%

Source: Wieland (1996).

declines. Thus, not only the magnitude but also the direction of the spill-over effect changes compared to the earlier historical policy regime.

Conclusions for providing policy advice

Given the important regime changes towards the end of BGK's sample period that are the result of European Monetary Union, I would question whether the fiscal spill-over effects identified as typical during the sample period will remain the same in the future. The simulation of Taylor's multi-country model in Wieland (1996) suggests that a German fiscal shock in the Euro area would lead to increased interest rates for all member economies as well as a real appreciation of the Euro vis-à-vis countries outside the monetary union. As a result real output may well decline. This would be the case if the positive trade effect identified by BGK – although still present – were to be completely offset by the interest rate and exchange rate effects. These potential effects are not well covered by BGK's empirical analysis. The interest rate effect due to ECB policy would only be present in the last five years of their sample and may be underestimated. The exchange rate effect vis-à-vis the US, Japan and other non-European countries is neglected by their empirical analysis based on European country pairs.

Consequently, I would recommend against the use of BGK's estimates of fiscal spill-overs to evaluate the effect of the impending tax increase in Germany on aggregate output in France, Italy or other member economies of the Euro area. First, the direction and magnitude of these spillover effects would need to be corroborated by analysis based on current multi-country models of the Euro area which can account for the general-equilibrium effects of regime change. Such models are being developed at central banks and other institutions. For a review of new structural models used at policy institutions, I would refer the reader to the recent conference of the International Research Forum on Monetary Policy (consisting of the Federal Reserve Board, the European Central Bank, the Georgetown Center for German and European Studies and the Center for Financial Studies) and the IMF in December 2005 at the Federal Reserve Board. (For a list of papers see the conference website at www.cfs-frankfurt.eu.)