



# Cross-border spill-overs from fiscal stimulus in a monetary union

Ruthira Naraidoo<sup>a</sup>, Eric Schaling<sup>b,\*</sup>, Mewael F. Tesfaselassie<sup>c</sup>

<sup>a</sup> Department of Economics, University of Pretoria, South Africa

<sup>b</sup> Wits Business School (University of the Witwatersrand) and VU University, Amsterdam, The Netherlands

<sup>c</sup> Kiel Institute for the World Economy, Kiellinie 66, 24105 Kiel, Germany

## ARTICLE INFO

### JEL classification:

E62  
F42  
F45

### Keywords:

Fiscal policy  
New-Keynesian model  
Open economy  
Monetary union  
Rule-of-thumb consumers  
Habit persistence

## ABSTRACT

We analyse domestic and cross-border effects of fiscal policy in a two-region business cycle model of a monetary union. Without relying on debt consolidation via spending reversals along the lines of Corsetti, Meier and Mueller (2010) and Corsetti and Mueller (2014) we show that a fiscal expansion by the core economies of the euro area is associated with crowding in of both core and periphery consumption. Interestingly, cross-border spill-over effects are larger the larger the share of credit constrained households in the periphery.

## 1. Introduction

Following the Eurozone and Greek Sovereign debt crises there have been several policy recommendations by prominent academic economists such as Paul Krugman that the core economies in the Eurozone—especially Germany—should engage in a fiscal expansion to boost economic growth in Europe: “Germany wants to run surpluses and wants everyone else to run surpluses. Germany's tight fiscal policy directly contributes to weakness of overall European demand, and its deficit hawkery is an important reason why other European countries that have low borrowing costs are still pursuing austerity”.<sup>1</sup>

This has also been a prominent theme in the media, for example The Economist of September the 3rd 2016 says: “Within the euro area, the struggling Mediterranean economies need faster rates of GDP growth to bring down unemployment and stabilise government debt. Germany's enormous surpluses mean that its households are buying less from other countries than they ought to. That hurts the growth prospects of the periphery, and raises the risk of a politically induced break-up”.

These calls for actions are backed by empirical studies by e.g. Beetsma et al. (2005), Auerbach and Gorodnichenko (2012) and Corsetti and Mueller (2014) that fiscal expansions tend to be locomotive policies' in the sense that they positively impact both domestic and foreign activity; that is, that they have positive spill-over effects.

In spite of empirical evidence supporting ‘crowding in’ of output of both instigating and recipient countries, typically modern macroeconomic frameworks such as the real business cycle model and the new Keynesian model have a hard time reproducing the stylized fiscal facts. A key reason is that these models feature infinitely-lived Ricardian households, whose consumption decisions at any point in time are based on an intertemporal budget constraint. Ceteris paribus, an increase in government spending lowers the present value of after-tax income, thus generating a negative wealth effect that induces a cut in consumption.

Negative spill-over effects of fiscal expansions on foreign output are also typical results in two-country DSGE environments such as Corsetti and Pesenti (2001), unless special fiscal scenario assumptions are made. Here notable studies are Corsetti et al. (2010) and Corsetti and Mueller (2014), who assume that the fiscal expansion is followed by a spending reversal (an exogenous, debt-financed increase in government spending implies a spending reversal after some time, that is, a decline of government spending below trend after the initial increase), sometimes referred to as debt consolidation.

In this paper we study fiscal expansions in a two-region version of the new Keynesian model of a monetary union. Here one region is seen as representing the core economies of the Eurozone (including Germany), whilst the other region stands for the periphery. Without relying on debt consolidation via spending reversals along the lines of

\* Corresponding author.

E-mail addresses: [ruthira.naraidoo@up.ac.za](mailto:ruthira.naraidoo@up.ac.za) (R. Naraidoo), [eric.schaling@wits.ac.za](mailto:eric.schaling@wits.ac.za) (E. Schaling), [mewael.tesfaselassie@ifw-kiel.de](mailto:mewael.tesfaselassie@ifw-kiel.de) (M.F. Tesfaselassie).

<sup>1</sup> See Krugman's blog for the New York Times <http://krugman.blogs.nytimes.com/2016/08/26/germanys-drag/>.

Corsetti et al. (2010) and Corsetti and Mueller (2014) we show that fiscal expansion by the core economies of the euro area is associated with crowding in of both core and periphery consumption. Interestingly, cross-border spill-over effects are larger the larger the share of credit constrained households in the periphery. The remainder of this paper is organized as follows. Section 2 outlines related literature. In Section 3 we present the model—derive private sector behavior and discuss fiscal policy. In Section 4 we present the equilibrium of the two economies and derive the linearized version of the model. In Section 5 we show our main results while in Section 6 we conduct a number of sensitivity analyses. Section 7 concludes and suggests avenues for further research.

## 2. Related literature

There is a large literature regarding the effects of fiscal policy on consumption and output in DSGE models. Starting with the closed economy RBC model it is well-known that contrary to the empirical evidence and the textbook IS-LM model a fiscal expansion leads to crowding out of consumption. The reason is that the RBC model features infinitely-lived Ricardian households, whose consumption decisions at any point in time are based on an intertemporal budget constraint. *Ceteris paribus*, an increase in government spending lowers the present value of after-tax income, thus generating a negative wealth effect that induces a cut in consumption. This effect is also present in the standard new Keynesian model.

In order to generate more plausible positive effects of government expenditure on consumption and output Gali et al. (2007) (GLV) introduce rule-of-thumb (ROT) consumers in a closed economy setting who do not borrow or save; instead, they are assumed to consume their current income fully. They show that the interaction of the latter with sticky prices and deficit financing can account for the existing evidence on the effects of government spending.<sup>2</sup>

In a critique on GLV, Furlanetto and Seneca (2009) state that their results rely on an empirically implausible high degree of price stickiness and too large a share of ROT households in total consumers. Instead, they introduce real rigidities in the form of habit persistence in consumption. This assumption has—amongst others—also been used by Smets and Wouters (2007). More specific, they are then able to reproduce the same consumption multiplier as GLV under only two and a half quarters of price stickiness, instead of four, and only 30 per cent of constrained agents instead of 50 per cent.

According to Leeper et al. (2015) so far no consensus has emerged in the empirical literature on the dynamic impacts of government spending on macroeconomic aggregates. There are starkly different conclusions from similar models and data (see e.g. Coenen et al. (2012) versus Cogan et al. (2010)). They call this the fiscal multiplier morass. They attempt to clear up the morass for the US by using Bayesian prior and posterior analysis of a monetary DSGE model, extended to include fiscal details and two distinct monetary-fiscal policy regimes, to quantify government spending multipliers. They get the following results regarding the transmission mechanisms that underlie government spending multipliers. Posterior mean estimates of short-run output multipliers are comparable across regimes but much larger after 10 years under passive money/active fiscal than under active money/passive fiscal.

There has also been work on the international spill-over effects of fiscal policy on consumption and output. For example, using a two-country business cycle model Corsetti et al. (2010) (CMM) find that consumption spill-over effects are affected by a range of features, including trade elasticities, the size and openness of economies, and

financial imperfections. They highlight the central importance of policy frameworks, notably the medium-term debt consolidation regime. Domestic and foreign crowding in of consumption is a result of their analysis in the case in which a temporary debt-financed increase in government spending gives rise to higher future taxes along with some reduction in spending over time. The anticipated spending reversal not only strengthens the domestic stimulus effect but also enhances positive cross-border spill-over effects. According to our reading of the literature spending reversals work to counter the above mentioned crowding-out effects of RBC models where higher government expenditure lowers the present value of after-tax income, thus generating a negative wealth effect that induces a cut in consumption.

Corsetti and Mueller (2014) (CM) consider the case for fiscal coordination by providing new evidence on the cross-border effects of discretionary fiscal measures. They use a vector auto regression model as well as quantitative two-country business cycle model. They find that large positive spill-over effects cannot be ruled out. The latter are importantly driven by the presence of a budget rule allowing for a systematic response of taxes and government spending to public debt or debt consolidation in short. More specific, an exogenous, debt-financed increase in government spending implies a spending reversal after some time, that is, a decline of government spending below trend after the initial increase.

For a monetary union, Blanchard et al. (2016) show that a fiscal expansion by the core economies of the euro area would have a large and positive impact on periphery GDP assuming that policy rates remain low for a prolonged period. Under their preferred model specification, an expansion of core government spending equal to one percent of euro area GDP would boost periphery GDP by over 1 percent in a liquidity trap lasting three years, nearly half as large as the effect on core GDP.

Our contribution builds on the canonical two-country new Keynesian model by Clarida et al. (2002) (CGG).<sup>3</sup> We extend their model with fiscal policy, ROT households and habit persistence in consumption. Contrary to CGG—who focus on the case of flexible exchange rates—we analyse the case of a monetary union. Without relying on debt consolidation or spending reversals along the lines of CMM and CM, we show that a fiscal expansion by the core economies is associated with crowding in of both core and periphery consumption. These effects are stronger when the share of ROT households in the periphery is larger.

## 3. The model

There is a monetary union composed of two regions, the core and the periphery economy, and labeled  $H$  and  $F$  respectively. The mass of Eurozone population is normalized to one. Region  $H$  and  $F$  households lie, respectively, on the interval  $[0, 1 - \gamma]$  and  $[1 - \gamma, 1]$ , where  $0 < \gamma < 1$ . Each region has a final good and intermediate goods producing sectors. There are the same number of final good producing firms in each region as there are households. Final good producers are perfectly competitive and use as production inputs a continuum of differentiated intermediate goods, whose mass is normalized to 1. The intermediate goods sector is subject to Calvo-type nominal price rigidity.

Moreover, we allow for the presence of rule-of-thumb (ROT) households, who make up a fraction  $\lambda$  of all households in each region and do not have access to capital markets and therefore consume their current labor income net of lump-sum taxes. The rest of the households (“optimizing” or “Ricardian”) can trade internationally a full set of state-contingent Arrow-Debreu securities. Moreover, we allow for consumption habit formation. As is shown in Furlanetto and Seneca

<sup>2</sup> An alternative rationale for a positive effect of government spending on consumption is the presence of non-separable preferences in utility. See for example Tesfaselassie (2013) and the references therein.

<sup>3</sup> Among others, Schaling and Tesfaselassie (2015) use the CGG model to study the performance of simple monetary policy rules in the presence of trend growth.

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