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Fiscal shocks and helicopter money in open economy

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ABSTRACT

We study the effects of expansionary fiscal shocks in a two-country DSGE model with perpetual youth. We consider two alternative financing regimes, monetary financing and debt financing, and find that a money-financed fiscal stimulus is more expansionary on output and inflation. We investigate how the transmission mechanism is related to the open-economy dimension and how structural parameters affect macroeconomic dynamics.

1. Introduction

One of the relevant consequences of the recent economic and financial crises regarded the severe challenges imposed to the modus operandi of monetary policy. Throughout the world, central banks have first reduced interest rates to very low levels and then experienced many new tools of intervention. Such changes occurred notwithstanding the wide consensus reached both in the literature and in monetary policy practice at the start of the new millennium as to best conduct central banking. The Federal Reserve reacted to the subprime mortgage crisis by creating innovative facilities to provide liquidity to financial markets and institutions, before starting a long series of quantitative easing programs that quintupled its balance sheet with respect to the 2007 level. The European Central Bank moved first by simply modifying the technical features of some of its instruments (mainly the maturity of open market operations and collateral requirements) before undertaking a true cultural revolution in 2015 with the adoption of a quantitative easing policy. More in general, most central banks have used “unconventional” policy tools (including negative interest rates) to face the extraordinary challenges induced by the financial turmoils.

During the Great Recession many governments also relied on fiscal policies in order to sustain aggregate demand. Such interventions increased structural deficits and, in turn, public debts. At the end of 2014, according to the BIS, issuances of government debt were eighty percent higher at a global level with respect to 2007. Such macroeconomic policies, however, were not always successful in helping a rapid recovery in aggregate demand. In particular, output, employment and inflation have not reached their target level for a long time on both sides of the Atlantic. This is also probably due to the scarce or absent coordination between monetary and fiscal policies. This scenario has revived the interest in additional policy measures that may stimulate the economy without using the nominal interest rates and without inducing further increases in government debt. Recently, Lord Turner (2013, 2016) revived the idea of a “helicopter drop”, i.e. an injection of outside money into the economy. Such expansion in the central bank balance sheet could take on different forms, going from the original paradigm of Milton Friedman (1948, 1969), implemented with a direct

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[1] As mentioned above, this seems to be a realistic way to investigate the introduction of “helicopter money” in our paper, assuming close cooperation between the fiscal and the monetary authorities. The US experience after the Great Financial Crisis can be considered as a sort of example, given the quite contemporaneous expansion conducted by the Treasury, via tax reductions and the TARP program, and by the Federal Reserve, through the first wave of quantitative easing. Such coordinated policy response may be one of the relevant factors that have induced a faster recovery of the US economy with respect to other advanced economies (such as the Eurozone).

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transfer to bank, fiscal or pension accounts, to a money-financed fiscal stimulus, as a more effective response to cope with stagnating economy and inflation below target. Buiter (2014), Giavazzi and Tabellini (2014), Reichlin et al. (2013) and Galí (2017) consider the effectiveness of a fiscal stimulus financed through money creation, requiring neither an increase in the stock of government debt nor higher taxes, current or future.[1] Buiter (2014) shows that an injection of such "helicopter money" boosts aggregate demand because fiat money is considered as irredeemable net wealth by the private sector. Galí (2017) uses a baseline closed-economy DSGE model to assess the effects of a money-financed fiscal stimulus, in comparison to other financing schemes. He shows that a money-financed fiscal stimulus induces larger output levels than a debt-financed one. In a model with heterogenous agents, Punzo and Rossi (2016) compare the redistributive effects of the two financing schemes when government increases public spending.

In this paper we study a money-financed fiscal stimulus in a two country DSGE model. We investigate the effects of an increase in government spending and of a tax cut and compare the macroeconomic dynamics with the ones following a standard debt-financing scheme. Our analysis contributes to the literature in two dimensions. First, following Di Giorgio and Nisticò (2007, 2013), we consider a perpetual youth structure of the demand side of the economy to break Ricardian equivalence. In such an environment fiscal policy can produce relevant wealth effects because of the coexistence into the economy of heterogenous agents. This framework also allows for a richer investigation of different fiscal policies and financing schemes with respect to representative agent models which imply fiscal policy neutrality.[2] Second, our analysis is conducted in a fully specified two-country DSGE model to explore the international transmission of fiscal shocks. In this framework, the real exchange rate and the terms of trade affect primary deficits and the supply-side through their effect on marginal costs. This is in addition to the standard demand effect on consumption. Moreover, in our model net foreign assets are an important determinant of private consumption because of the perpetual-youth structure. Such dynamics are critically affected by the mechanism used to finance fiscal expansion.

Our paper is linked to the large theoretical literature on the effects of fiscal policy in open economy that started with the Redux model of Obstfeld and Rogoff (1995). This strand of literature highlights that the international transmission of fiscal shocks is deeply affected by the degree of home bias in government consumption and the way in which monetary policy is conducted (see Ganelli, 2005; Di Giorgio et al., 2015). Corsetti and Pesenti (2001) and Devereux and Engel (2003) develop standard DSGE open-economy models where balanced-budget fiscal expansions lead to an appreciation of the exchange rate. Most of the recent empirical evidence shows, however, that the exchange rate depreciates after a positive fiscal shock (see for example Bénétrix and Lane, 2013). Di Giorgio et al. (2018) discuss how it is possible to reconcile such evidence with the theoretical literature and provide a model coherent with the former by assuming a positive spillover effect of government consumption on private sector productivity.

With respect to the recent literature on the fiscal role of monetary policy (as in Buiter, 2014 and Galí, 2017), we believe that our model is the first contribution in investigating the issue in an open-economy setting. Our simulations show that a money-financed fiscal stimulus is generally more expansionary, a finding coherent with the previous literature. It is, however, less powerful with respect to a closed economy setting because of the counteracting effect induced, in an open economy, by the appreciation in the real exchange rate that limits the initial expansion of the primary deficit. We analyze the qualitative implications of the model highlighting the international transmission of the different adopted policies and the role played by the most relevant structural features and parameters.

The rest of the paper is organized in the following way. Section 2 presents the two-country non-Ricardian DSGE model. In Section 3 we provide a numerical simulation of the effects of fiscal expansions on key macroeconomic variables, for different degrees of coordination and financing schemes. Section 4 concludes.

2. The model

The world economy consists of two structurally symmetric countries, H and F, of equal size. Households, in each country, supply labor inputs to firms and demand a bundle of consumption goods consisting of both home and foreign goods. The productive sector produces a continuum of perishable goods, in the interval [0, 1], which are differentiated across countries and with respect to one another. There are nominal rigidities in the form of a Calvo (1983) price-setting mechanism and we break Ricardian equivalence through a perpetual-youth structure of the demand side of the economy, along the lines of Di Giorgio and Nisticò (2007, 2013).

In country H we consider two coordination schemes between fiscal and monetary policy. If fiscal policy is financed by debt or taxes, the central bank sets the short-term interest rate through a Taylor-type feedback rule, while, in the case of monetary financing, the interest rate adjusts accordingly to guarantee equilibrium in the money market. Country F controls the short-term interest rate through a Taylor-type feedback rule and has a balanced budget.

2.1. The demand side

We adopt a discrete-time stochastic version of the perpetual youth model introduced by Blanchard (1985) and Yaari (1965). Each period, in each country, a constant share γ of traders in the financial markets is randomly replaced by newcomers with zero-financial wealth; from that period onward, these newcomers start trading in the financial markets and face a constant probability γ of being replaced as the next period begins. Consumers have log-utility preferences over consumption C_t, real money balances M_t/P_t and leisure $1 - L_t$, supply labor services in a domestic competitive labor market and demand consumption goods. Consequently, each domestic household belonging to cohort j maximizes the following utility function

$$E_0 \sum_{t=0}^{\infty} \beta^t (1-\gamma)^t \left[\log C_t(j) + \delta \log(1 - L_t(j)) + \chi \log \left(\frac{M_t(j)}{P_t} \right) \right]$$

subject to the flow budget constraint

$$\begin{aligned} P_t C_t(j) + E_t\{\mathcal{F}_{t,t+1} Q_{H,t}(j)\} + B_{H,t}(j) + \mathcal{E}_t B_{F,t}(j) + M_t(j) \\ \leq \frac{1}{1-\gamma} \left[(1 + i_{t-1}) B_{H,t-1}(j) + \mathcal{E}_t (1 + i^*_{t-1}) B_{F,t-1}(j) \right. \\ \left. + Q_{H,t-1}(j) + M_{t-1}(j) \right] + W_t L_t(j) + P_t D_t(j) - P_t T_t(j) \end{aligned} \quad (1)$$

where β represents the discount factor, $\mathcal{E}$ is the nominal exchange rate defined as the domestic price of one unit of foreign currency, i and i^* are domestic and foreign nominal interest rates, $B_{i,t} (i = H, F)$ denotes two internationally traded riskless zero-coupon nominal bonds issued in the two currencies by the governments to finance their budget deficits, $Q_{H,t}(j)$ denotes cohort j's holdings of the portfolio of state-contingent assets, denominated in domestic currency, for which the relevant discount factor pricing one-period claims is $\mathcal{F}_{t,t+1}$.[3] Moreover,

[1] Notice that, with respect to the previous studies of Di Giorgio and Nisticò (2007, 2013), we introduce real money balances in the model and allow for different financing schemes in case of fiscal expansions (debt and money). Notice also that Di Giorgio and Nisticò (2013) have tradable and non-tradable goods and that in Di Giorgio and Nisticò (2007) the available financial assets were somehow more limited given the absence of non-contingent government bonds.

[3] Given the assumption of complete financial markets, the stochastic discount factor is unique.