

OPTIMAL DEBT MANGEMENT AND COLLABLE BONDS

The recent turbulent years have shifted the research attention to government debt management and optimal debt structure issues. Most of the optimal debt management theoretical literature so far has abstracted from the empirical evidence that shows that Debt Management Offices rarely buy back their debt and that they prefer to leave the outstanding instruments to mature. The motivation for this theoretical choice has been mainly because of tractability and computational simplicity.

Faraglia et al (2017) empirical analysis finds that in the past callable bonds have been extensively used from the Second World War until the '80s in the US. In particular FMOS show that in the '50s callable bonds were on average 40% of the long bond issued and in the '80s 25%. Most of the callable bonds have been called back at the first calling date available. This implies that the debt managers have actively managed the structure of debt using these instruments.

In this project we aim to study under which circumstances the government wants to buy back debt and the extent of the repurchases.

The original project proposed one year ago for the CERF fellowship as now developed further and taken a first step toward the use of callable bonds in an optimal fiscal policy environment.

In Faraglia et al. (2017) we have extended our optimal fiscal policy model allowing the government to choose how much long term debt the government would like to repurchase after one period from issuance. This has been done in order to validate the no buy back assumption.

In particular, first we check that in a model with full buyback and frictionless financial markets, actually full buy back is not always optimal. Then we introduce transaction costs to issuance and repurchases calibrated to bid ask spreads in government bond rates in the US. We find that the government would want to buy back long term debt only occasionally, when debt is low and when debt is decreasing. Full buy back is then rarely optimal.

Moreover we develop a three period game that shows how the government could face the shutdown of secondary markets if full repurchases are allowed and a probability of default is assumed. This result shows how reluctant government are to enter the secondary markets and how only callable bonds could incorporate the option price of repurchases.

These results are important for the further development of our theory. Now we know that under a calibrated version of the no buy back model actually the government would like to have a little freedom and occasionally buy back some of its debt. In the next steps we will then allow the government to have the opportunity to buy back debt closer to maturity to mimic the callable bond structure. Once this is achieved we will turn to the data and compare our results with the empirical evidence.

The current first steps towards the full callable bond model are currently incorporated in the revision of Faraglia, Marcet, Oikonomou and Scott (2017) under revision for the *Review of Economic Studies* (please do not incorporate this in the web version of the report because the paper is still under revision).

Moreover these preliminary results have been presented or are scheduled to be presented in: Lausanne HEC (Feb 2017), St Louis Federal Reserve (March 2017), NY CUNY (April 2017), Stony Brook (April 2017), Surrey (May 2017), CEF (Society for Computational Economics, June 2017), NYU (June 2017).