

Sovereign Debt, Risk Sharing, and Austerity Programs

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Abstract (extended)

We construct a dynamic model of sovereign debt related to Arellano (2008), where the economy's aggregate income and the cost of default is stochastic, and the outstanding debt is periodically renegotiated in equilibrium as in Bulow and Rogoff (1989). As in Krugman (1989), in a recession the sovereign can provide effort to increase the probability of recovery, however part of the gains of good performance will go to the creditors, causing moral hazard. We characterize analytically the equilibrium in terms of the price of the non state-contingent sovereign debt, the probability of renegotiation and the consumption and reform effort dynamics.

We find that during a recession, in the decentralized equilibrium, the government's limited commitment to repay the sovereign debt induces excessive consumption volatility in comparison to the constrained optimal allocation. Intuitively, the possibility to renegotiate the outstanding debt does not span the full set of states, in particular the aggregate income shock. Moreover, the government underprovides reform effort, as it cannot grab the full gains of good performance, thus the expected duration of the recession is too long compared to the first-best as well as the second-best allocation. This inefficiency leaves potential for external intervention.

To this end, we study a small open economy in a persistent recession with an endogenous probability of recovery to normal time in each period. The recession causes an increase in the risk premium due to the increase in the risk that the outstanding sovereign debt is renegotiated. In this environment, we analyze the effect of several assistance programs run by an

international authority (e.g., the IMF, ECB, or the EU) that can provide a guarantee for the repayment of the sovereign debt conditional on repeated compliance, and possibly fiscal austerity and reform effort. Without the fiscal austerity requirement, the debt guarantee generates a moral hazard problem, whereby the troubled country has an incentive to expand the debt even further (and enjoy initially high consumption) after the external intervention. This drives up the expected cost of the intervention, thus having a fiscal austerity requirement is essential. Still, we find that forgiving a cost equivalent part of the outstanding debt upfront and leaving the country with the market interest rate is better than running an assistance program with a debt guarantee and fiscal austerity requirement. Implying that simple interventions that cannot control the reform effort do even worse than the already inefficient decentralized equilibrium. Once reform effort is under control of the external authority, assistance programs can be welfare improving.

The constrained optimal allocation on the other hand entails a low consumption and high reform effort of the debtor country in the short run, followed by the promise of a progressive increase in consumption and a reduction in reform effort. In each future period where a favorable default cost realization threatens the debtor country to leave the dynamic contract, consumption will jump up and reform effort down, while being smooth in periods between. This implies that threats - resembling the recent "Grexit" - to exclude the sovereign from the contract if renegotiating debt obligation on the basis of a low default cost realization, are not part of the optimal contract. The optimal dynamic contract reduces, but does not eliminate, the risk that the country exits unilaterally the standby agreement and renegotiates its sovereign debt. Finally, we show that the constrained optimal allocation cannot be implemented by allowing for (aggregate income) state-contingent sovereign debt or a state-contingent assistance program as long as reform effort cannot be perfectly monitored and contracted.

In the quantitative analysis, among matching other targets, we calibrate the model to match the default premium at the average debt-output ratio observed for the GIIPS countries in the recent European sovereign debt crises. We find that the inefficiency of the decentralized equilibrium is substantial and that non state-contingent assistance programs with and without fiscal austerity requirements may lead to sizeable welfare losses compared to the much simpler policy of just forgiving debt upfront. Compared to the previous quantitative sovereign debt literature in Arellano

(2008) and Mondoza and Yue (2012) for example, our model is successful in replicating both the debt-output ratio and the debt premium observed in the data.