Sovereign Default and Capital Controls

Robert A. McDowall

New York University

April 19, 2018

Motivation

- Sovereign debt is subject to lack of commitment, and there are greater incentives to default on external public debts
- Emergence of domestically & externally held public debts introduces new dimension in repayment decisions
- Recent literature explores domicile/default relationship

Question

What does lack of commitment to repay imply for optimal capital control policy?

- The domicile of bondholders matters
- Distinct from conventional capital control theories

New insight Controls as a commitment device

- Optimal controls support equilibrium with foreign lending, mitigate default risk
- Controls employed during bad times

The Canonical Model

Setup

Two period model $t = 0, 1$. Endowment economy inhabited by a sovereign and foreign lenders.

- Sovereign
  - Benevolent, must finance some expenditure (g_0)
  - Chooses how much to borrow from abroad (B_f)
  - Lacks commitment to repay at $t = 1$ ($\delta = 0$ denotes default)
- Exogenous cost of default (ϕ)
- Foreign lenders
  - Deep pocketed, risk neutral. Price bonds according to

$$q = \frac{\delta}{R}$$

The Canonical Model

Planner's Pb.

The period 0 sovereign solves

$$\max\{V_{aut}, V_{rep}\}$$

Where

$$V_{aut} = u(y_0 - g_0) + \beta u(y_1)$$

$$V_{rep} = \max_{c_0, c_1, B_f} u(c_0) + \beta u(c_1)$$

st.

$$c_0 \leq y_0 - g_0 + qB_f$$

$$c_1 \leq y_1 - B_f$$

$$B_f \leq \phi$$

The Canonical Model

Solution

The solution amounts to choosing between the allocations implied by autarchy and repayment.

- Under repayment the sovereign borrows B_f at price $\frac{1}{R}$ according to

$$u'(c_0) = \beta R u'(c_1) + \mu R$$

Where μ is the Lagrange multiplier on the borrowing constraint ($B_f \leq \phi$)

The Model

Implementing the Optimal Allocation

Implementation naturally yields a role for capital control policy.

Economy inhabited by a sovereign, domestic households, and foreign lenders.

- Sovereign
  - Benevolent, sets capital control policy ex-ante (τ), lacks commitment to repay.
- Households
  - Smooth consumption, save in government bonds (B_d)
- Foreign lenders
  - Deep pocketed, risk neutral, purchase government bonds (B_f)

The Model

Households

$$V = \max_{c_0,\, c_1\ B_d} u(c_0) + \beta u(c_1)$$

$$st.$$

$$c_0 = y_0 - qB_d - T_0$$

$$c_1 = y_1 + \delta B_d - T_1$$

$$B_d \geq 0$$

FOC on interior

$$q = \frac{\beta u'(c_1)}{u'(c_0)}$$

- Higher return on public debt ($\downarrow q$) increases household savings

The Model

Foreign Lenders

Risk neutral, deep pockets, access to risk-free asset (return R).

Break even constraint

$$\frac{q(1+\tau)}{\delta} - \frac{1}{R} = 0$$

$$q = \frac{\delta}{R(1+\tau)} \text{ if } B_f > 0$$

- Capital controls (τ) produce wedge between return on debt for foreign lenders and domestic households

The Model

Sovereign

- Must finance expenditure g_0 at time 0
- Issues bonds ($B = B_d + B_f$) and sets capital controls (τ)
- Subject to HH implementability condition ($q = \frac{\beta u'(c_1)}{u'(c_0)}$) and pricing equation

Faces budget constraints

$$(1-\delta)T_0 = g_0 - q[B + \tau B_f]$$
$$T_1 = \delta B + (1-\delta)\phi$$

Where ϕ denotes exogenous cost of default.

- Sovereign wants to smooth g_0

The Model

Ramsey Problem, Primal Approach

$$V_{rep} = \max_{c_0, c_1, B_f} u(c_0) + \beta u(c_1)$$

$$st.$$

$$c_0 \leq y_0 - g_0 + \frac{B_f}{R} \tag{1}$$

$$c_1 \leq y_1 - B_f \tag{2}$$

$$B_f \leq \phi$$

- (1) and (2) collapse to the economy-wide constraints at risk-neutral prices.

Solution

Implementation

First order condition

$$u'(c_0) = \beta R u'(c_1) + \mu R.$$

Implementing the optimal allocation yields a natural role for capital controls.

$$\tau = \begin{cases} \frac{u'(c_0)}{\beta R u'(c_1)} - 1 & \text{if } \mu > 0 \\ 0 & \text{Otherwise} \end{cases}$$

- Implies an optimal capital control that is countercyclical.
- Imposition of controls displays threshold behavior in initial domestic disposable income

Solution

Numerical

Table: Parameterization

β	R	ϕ	y_0	y_1
0.96	1.04	0.12	1.05	1.0

Table: Comparison for $g_0 = .35$

	Welfare	$\frac{Internal}{Total\ debt}$	τ
Commitment	1	0.5789	0
No Commitment	0.9687	1	0
Capital Controls	0.9985	0.7035	0.1666

Solution

Controls to support markets

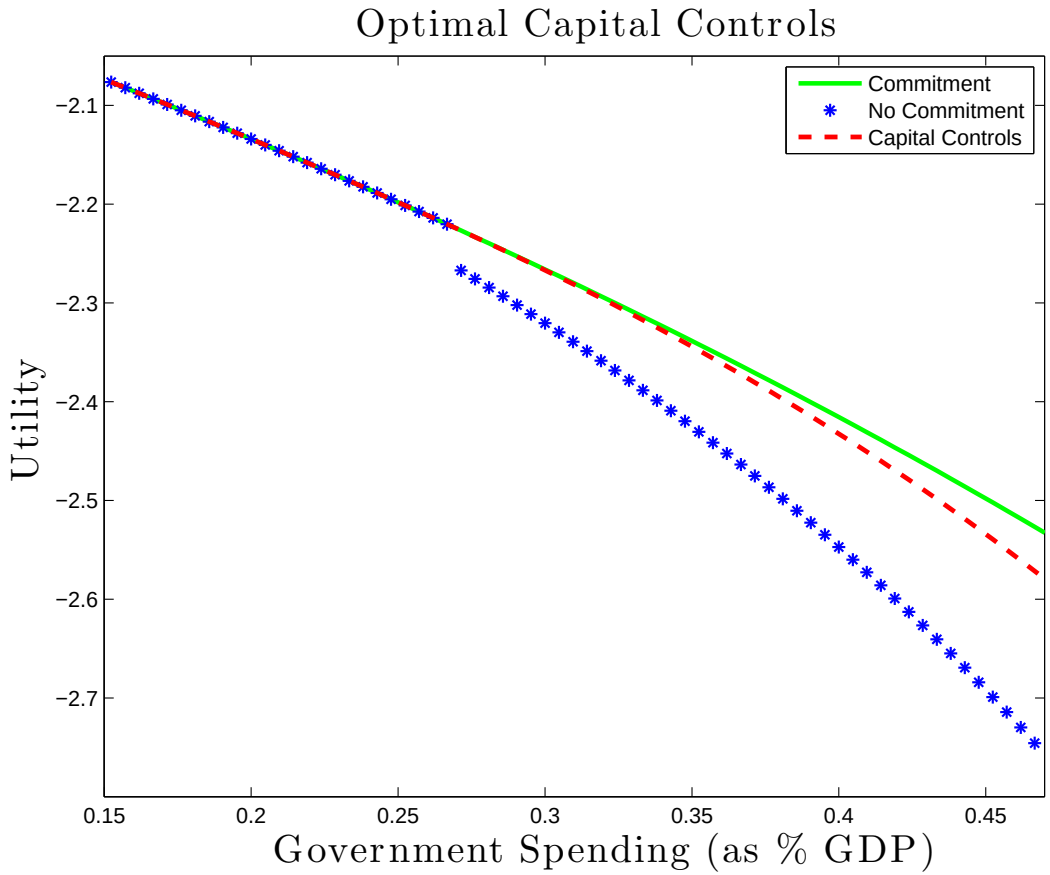

Figure: Welfare Comparison

Solution

Controls in bad times

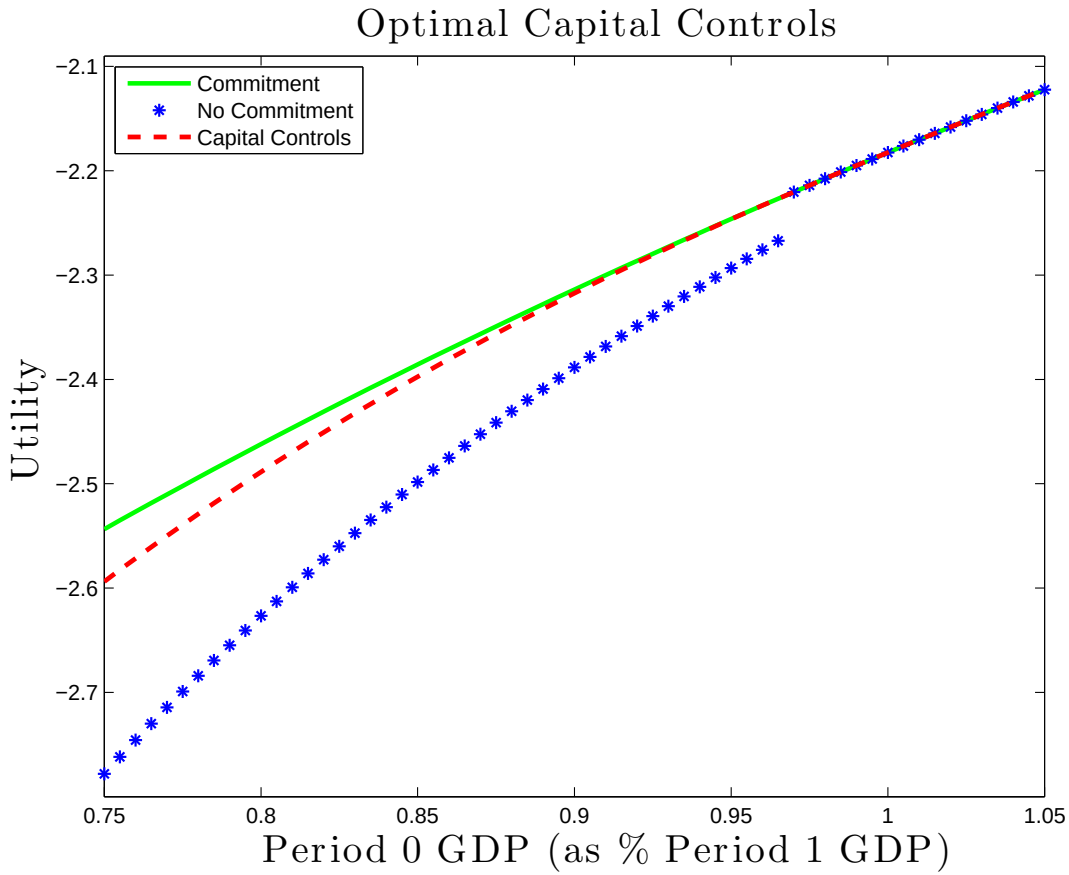

Figure: Countercyclical Controls

Conclusion

- A novel rationale for countercyclical capital control policy
- Controls support foreign lending in an environment without commitment
- Uncertainty introduces further tradeoff
  - mitigation of default risk & increased bond revenue vs. distorting consumption/savings & the option value of default