Adam and Grill: Optimal Sovereign Debt Default

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Overview

Sovereign default to buffer macroeconomic shocks

- Grossman and Van Huyck (1988)
- Minus reputation (excusable default vs. unjustifiable repudiation), plus deadweight losses after default
- Plus *commitment*: Default rates chosen ex ante

Findings

- Lots of insurance when deadweight losses are small
- Little insurance otherwise

Mechanics

Savings problem $\mathcal{P}$ (think of $z_0 \ll \mathbb{E}[z_1^n]$)

$$\max_{b_0,\{a_0^n\}} u\left(z_0 + q_0 b_0 - \sum_{n=1}^{N} q_0^n a_0^n\right) + \beta\mathbb{E}\left[u(z_1^n - b_0 + a_0^n)\right]$$

where $q_0 = \beta,\; q_0^n = \beta\,\pi(z_1^n|z_0),\; n = 1,\ldots,N$

- $N+1$ assets, N states, kernel β: Indeterminate portfolio
- Actuarially fair prices: Full insurance

Interpretation of portfolio choice in $\mathcal{P}$

- Bond plus Arrow securities
- Bond with state contingent default rates, δ_1^n, chosen ex ante

$$a_0^n \equiv b_0 \delta_1^n$$

$$q_0 b_0 - \sum_{n=1}^{N} q_0^n a_0^n = \beta b_0 \left(1 - \sum_{n=1}^{N} \pi(z_1^n | z_0) \delta_1^n \right)$$

But: Default rates are non-negative, $\delta_1^n \geq 0$

- Restriction not binding, due to redundant asset structure

Savings problem $\mathcal{P}'$

$$\max_{b_0,\{a_0^n\}} u\left(z_0 + q_0 b_0 - \sum_{n=1}^{N} q_0^n a_0^n\right) + \beta \mathbb{E}\left[u(z_1^n - b_0 + a_0^n(1-\lambda_1^n)\right]$$

s.t. $a_0^n \geq 0,\ n = 1, \ldots, N$

where $q_0 = \beta,\ \ q_0^n = \beta\, \pi(z_1^n | z_0),\ n = 1, \ldots, N$

- $N+1$ assets, N states, no kernel (overpriced Arrow securities): Determinate portfolio
- Short-selling constraint: Bounded portfolio
- No actuarially fair prices: No full insurance

Interpretation of portfolio choice in $\mathcal{P}'$

- Bond plus overpriced Arrow securities that cannot be shorted
- Bond with state contingent default rates, chosen ex ante, and output losses after default

$$\text{output loss} \equiv a_0^n \lambda_1^n \equiv b_0 \delta_1^n \lambda_1^n$$

Examples with closed form solutions

- Log utility, two periods, $N = 2$, no capital, comparative statics with respect to $\lambda = \lambda_1^n, n = 1, 2$

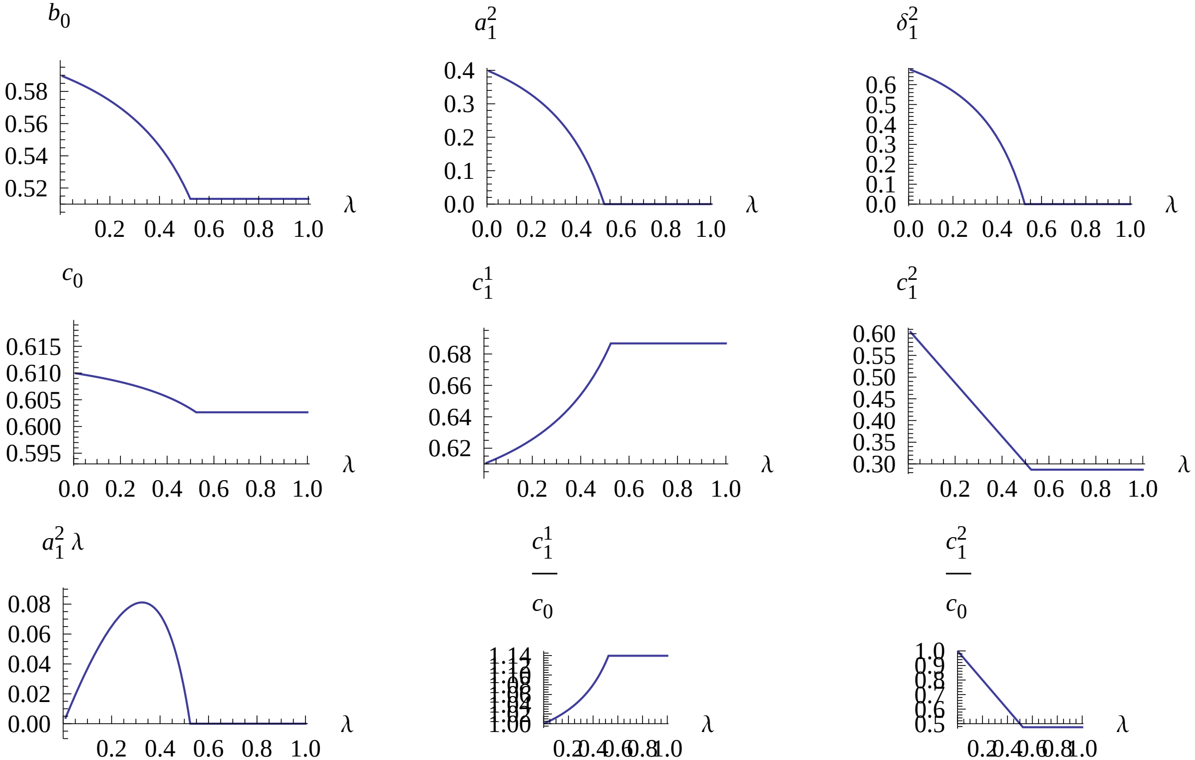

Figure 1: Small risk of downturn

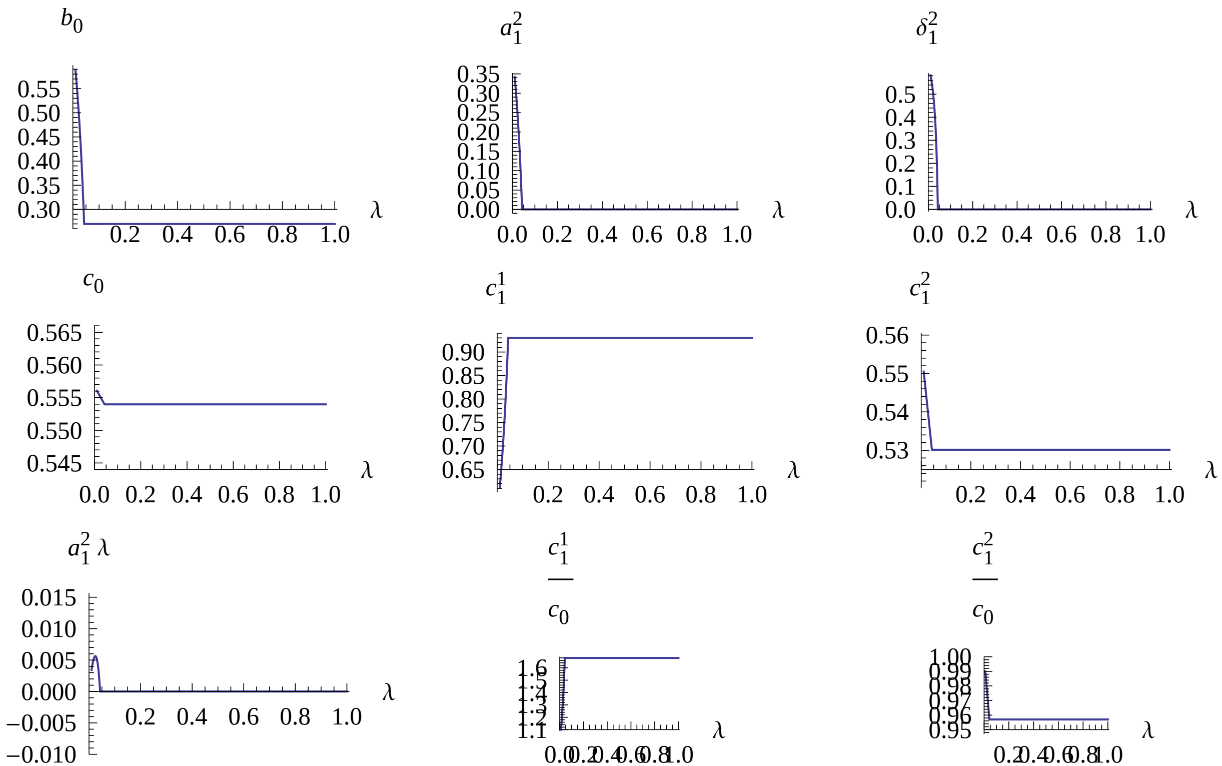

Figure 2: Large risk of downturn

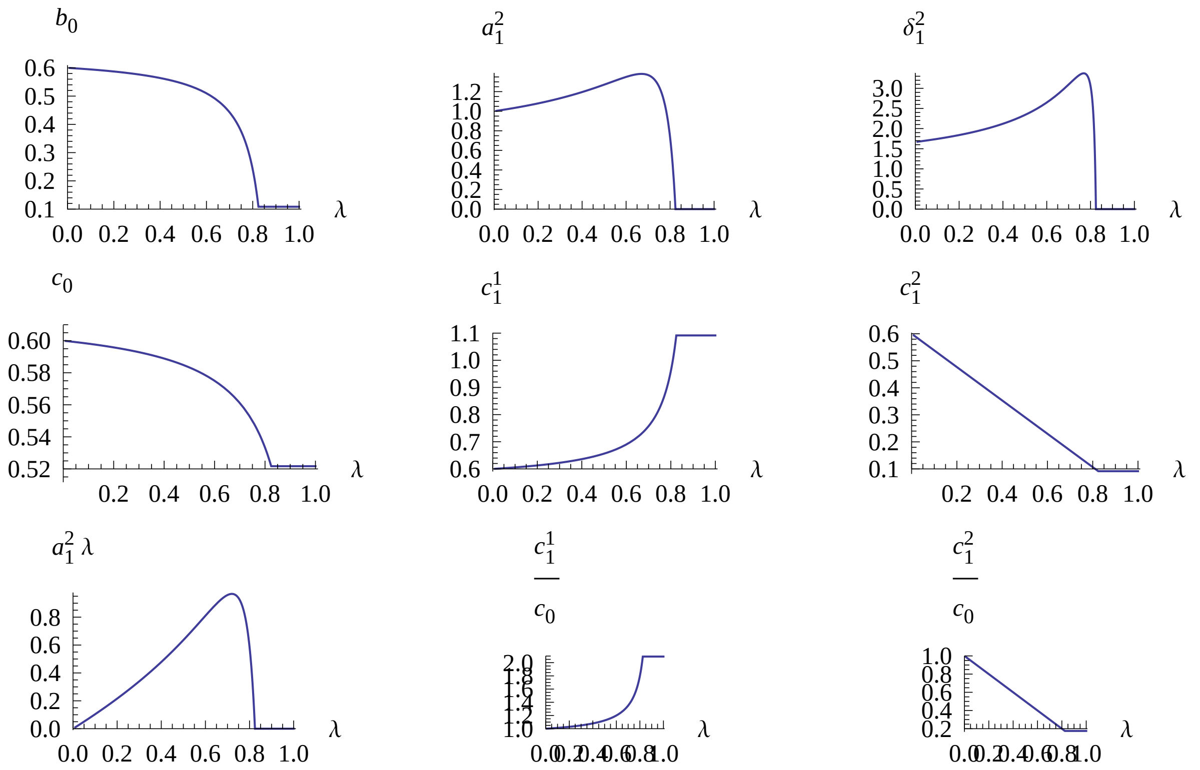

Figure 3: Small risk of desaster

Sovereign Debt?

What's wrong with existing models?

- Central predictions, in particular default in bad states, also follow in models without commitment

Restrictive specification of deadweight losses

- Legal costs are fixed costs
- But specification requires proportional ones ($b_0 \delta_1^n \lambda_1^n$)

Commitment on the part of the borrower (but not on the part of the lender)?

- Implausible
- Lack of commitment as defining feature of sovereign borrowing

Commitment on the part of the borrower, yet deadweight losses after "default"

- Rationale: Due to costly explicit contracting, coding delayed until state is known and implicit agreement risks being "forgotten"
- Unrealistic: Sovereign debt contracts are lengthy, detailed

- Implausible: Contracting costs tiny relative to debt, would expect full insurance
- Inconsistent: Problem easily solvable by specifying statute of limitation
- Provocative: Requires one-sided commitment on part of *borrower*

Alternative view

- Lack of commitment
- Non-contingent bonds because macro shocks can be manipulated

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References

Grossman, H. I. and Van Huyck, J. B. (1988), ‘Sovereign debt as a contingent claim: Excusable default, repudiation, and reputation’, *American Economic Review* **78**(5), 1088–1097.