Discussion of “Sovereign Default: The Role of Expectations”
by G. Navarro, J.P. Nicolini, and P. Teles

Veronica Guerrieri

The Monetary and Fiscal History of Latin America
April 2014
What the paper is about

general idea:
sovereign debt crisis can be driven by changes in expectations

- a model of sovereign default can generate multiple equilibria
- reviving Calvo (1988): interest rate schedule contingent on debt market value rather than debt face value
- stability criterion may rule out some equilibria
- quantitative exploration . . .
Environment

- representative agent in small open economy
- endowments equal 1 in period 1 and $y \sim F(y)$ in period 2
- initial level of debt equal to 0
- in period 1 agent can borrow in a non-contingent bond in international markets
- in period 2 decides whether to repay or default
- after default the lender gets 0 and the agent gets $y = 1$
- risk-neutral foreign lenders who face a safe return $R^*$
Two variants of the model

1. debt market value (Calvo) $\rightarrow$ multiplicity
   - agents choose how much financing he needs $b = c_0 - 1$
   - lenders choose a schedule $R(b)$
   - amount repaid if no default $d = bR(b)$

2. debt face value (Arellano) $\rightarrow$ uniqueness
   - agents choose how much to repay if no default $d$
   - lenders choose a schedule $R(d)$
   - financing that the agents get is $b = d/R(d)$
Multipliclity vs Uniquenss

1. debt market value (Calvo) $\rightarrow$ multiplicity
   - repay iff $y - bR(b) \leq 1$
   - schedule:
     $$R^* = R(b)[1 - F(1 + bR(b))]$$

2. debt face value (Arellano) $\rightarrow$ uniqueness
   - repay iff $y - d \leq 1$
   - schedule:
     $$R^* = R(d)[1 - F(1 + d)]$$
Building the Schedule . . .

define \( h(R|b) \equiv R[1 - F(1 + bR)] \)
A Continuum of Schedules
A Continuum of Schedules

\[ R \]

\[ b \rightarrow b_{\text{max}} \]
Stability

$h(R|b)$

$R^*$

$R_1$ $R_2$ $R$
Stability

\[ h(R \mid b) \]

- \( R^* \)
- \( R \)
- \( R_1 \)
- \( R^* \)
- \( R_2 \)
- \( R^\wedge R_2 \)
Robust Multiplicity

$h(R|b)$

$R_1$ $R_2$ $R_3$ $R_4$
Robust Multiplicity (continued)
Robust Multiplicity (continued)
Sufficient Condition for Uniqueness

- to get uniqueness it is enough that $h(R|b)$ is quasi-concave

- sufficient condition:
  $$\log R + \log(1 - F(1 + bR))$$ non-increasing in $R$

- condition only in terms of the hazard rate:
  $$\frac{f(x)}{1 - F(x)}$$ non-decreasing
Policy

- Mario Draghi: “Whatever it takes”!
- deep pocket agent offers to lend any $b \leq b^{\text{max}}$ at $R(b^{\text{max}})$
- this will make only the good equilibrium to survive
- this actually works even if multiple robust equilibria!
In summary

Multiplicity

Policy

Recovery

\[ h(R|b) \]

\[ R^* \]

\[ R_n \]

\[ R^P \]

\[ R_1 \]

\[ R_2 \]

\[ R_3 \]

\[ R_4 \]
Policy

\[ R \quad \text{versus} \quad b \]

- \( R \) increases with \( b \) up to \( b_{\text{max}} \).
- Beyond \( b_{\text{max}} \), \( R \) decreases.

**In summary**

- Multiplicity
- Policy
- Recovery
In summary

Multiplicity

Policy

Recovery

Recovery

Lorenzoni and Werning (2013): if lenders can recover something after default, multiplicity may disappear for low levels of $b$

say lenders can collect $x(R, b)$ after default

equilibrium $R(b)$ solves $R^* = h(R|b)$ where

$$h(R|b) = R[1 - F(1 + bR)] + x(R, b)F(1 + bR)$$

so for large $R$, the expected return cannot be too low...
Recovery (continued)

\[ h(R|b) \]

\[ R^* \]

\[ R_1 \quad R_2 \]

\[ b \downarrow \]
How Likely is a Crisis?

- multiple $R(b)$ schedules $\rightarrow$ probabilities attached to sunspots

- timing: $b$ chosen and then sunspot shock realized

- if prob of bad equilibrium is too high, agent may choose $b$ in uniqueness region

- $\rightarrow$ prob of the bad equilibrium cannot be too high...

- this put some restriction on how likely is a crisis
How Likely is a Crisis? (continued)