

Discussion of Ayres, Navarro, Nicolini, Teles,  
“Sovereign Default: The Role of Expectations”

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Barcelona Summer Forum

Workshop on International Capital Flows

# Introduction

Paper has two parts:

- ▶ Theory: Can expectations of high interest rates be self-fulfilling?
  - ▶ Alternative to Cole-Kehoe in the spirit of Calvo
  - ▶ Importance in timing of actions in generating multiplicity
  - ▶ Properties output process for stable multiple equilibria
  - ▶ OMT-like policy can uniquely implement good outcome
- ▶ Quantitative analysis
  - ▶ Model can account for large and abrupt movements in interest rates
  - ▶ Interpret OMT and subsequent drop in interest rates through lens of model

# My Discussion

- ▶ Quickly review of set up
- ▶ Make 4 comments/suggestions:
  - ▶ Existence of two equilibria with price taking?
  - ▶ Calibration of bi-modal output process
  - ▶ Multiple equilibria or price of risk?
  - ▶ Contrast implications with model with rollover risk

## Two Set-Up in Spirit of Calvo

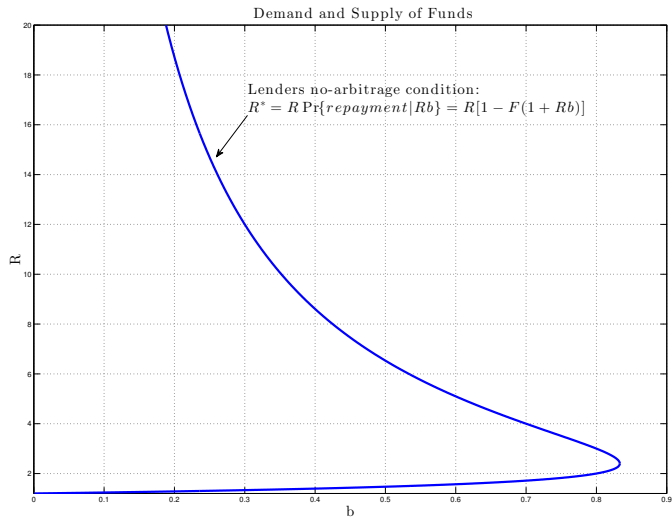
First period:

- ▶ Set-up 1: Interest Rate schedule
  - ▶ Gov't chooses how much to raise from lenders,  $b'$
  - ▶ Faces interest rate schedule  $R(b')$
- ▶ Set up 2: Price-taking
  - ▶ Competitive lenders move first and choose  $R$
  - ▶ Government chooses  $b'$  taking  $R$  as given

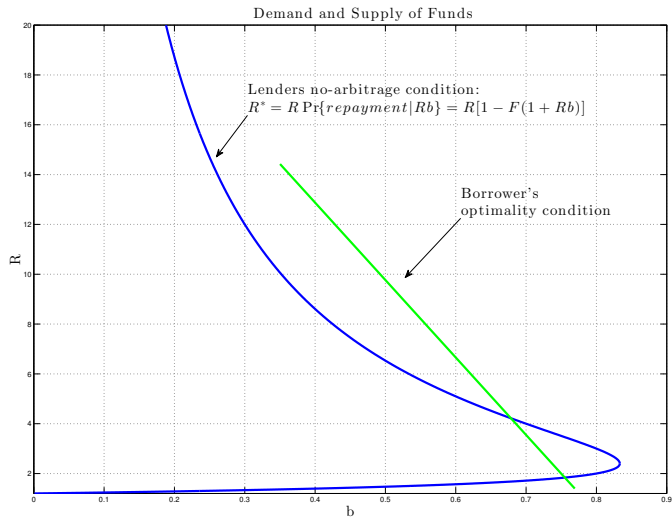
Last period: Borrower either

- ▶ Repays  $Rb'$ , borrower's utility  $U(Y - Rb')$  or
- ▶ Defaults: No repayment to lenders, borrower's utility  $U(1)$

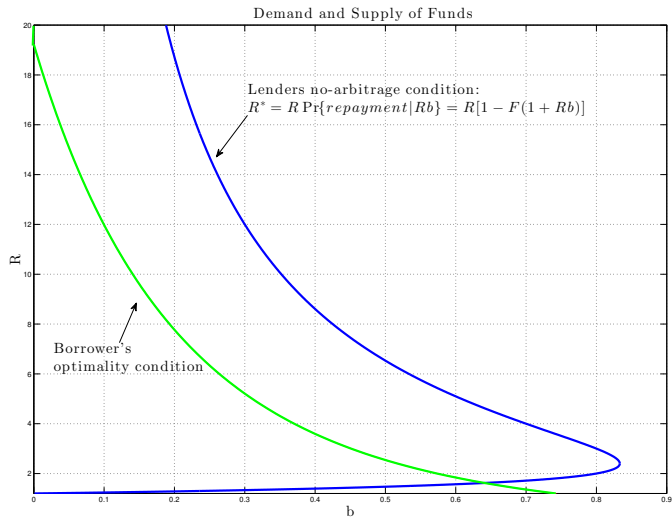
# Lenders No-Arbitrage Condition



# Borrower Demand of Funds



# Existence of two equilibria with price taking?



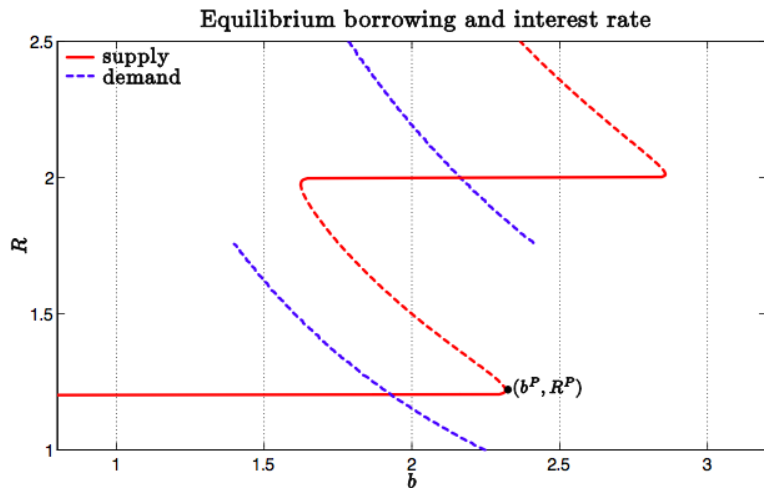
## Refinement

- ▶ Equilibria on downward sloping part of lenders no-arbitrage condition are fragile:
  - ▶ Counterintuitive comparative statics
  - ▶ Do not survive refinement
    - ▶ More equilibria survive the refinement if debt is high, close to “top of Laffer curve”
- ▶ How to ensure reasonable multiplicity? Bi-modal output process

This is important contribution of the paper



# Two stable equilibria



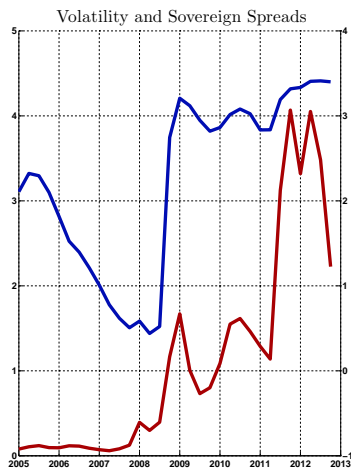
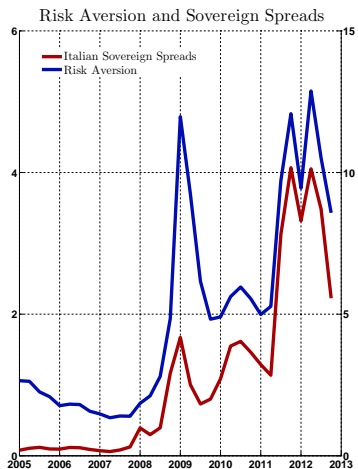
## Implementation in Quantitative Part: Output Process

- ▶ Estimate growth of output using Markov-switching process
  - ▶ Evidence of bi-modal distribution/ two regimes?
- ▶ Map differential growth into stationary output process (period 10 years)
  - ▶ Why not using outcome of Markov-switching process directly along lines of Aguiar-Gopinath
  - ▶ Still get two stable equilibria?

## Source of Variation in Interest Rates

- ▶ *“The multiplicity of equilibria that arises under some of those assumptions is consistent with the large and abrupt movements in interest rates that are observed in sovereign debt crises, whereas the single equilibrium is not.”*
- ▶ Possible alternative explanations
  - ▶ Time-variation in price of risk: Longstaff et al., Borri-Verdhelan
  - ▶ Expectations of future rollover risk: Cole-Kehoe
- ▶ Distinguishing important because of different policy implications

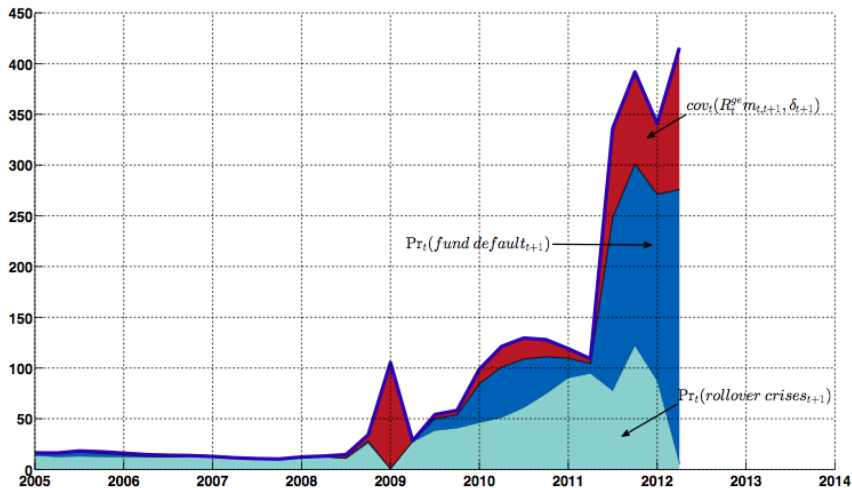
# Time Variation in Expectations or Price of Risk?



From Bocola and DAVIS (2015)

Risk aversion and volatility promising in accounting for spreads

# Model Decomposition of Italian Spreads



From Bocola and DAVIS (2015)

## Important to Distinguish for Policy

If increase in spreads due to changes in expectations:

- ▶ OMT-like policy can be very effective

If increase in spreads due to higher price of risk:

- ▶ Need deeper understanding on how OMT-like policies affect price of risk
  - ▶ Bocola, Gertler-Karadi
- ▶ OMT-like policy may result in subsidy to gov't

# Contrast Implications Relative to Cole-Kehoe

Effects of negative shift of expectations:

- ▶ Issuance:
  - ▶ By construction high interest rate equilibrium have higher debt (unless it acts as a debt limit)
  - ▶ Cole-Kehoe: incentive to reduce debt
- ▶ Maturity composition
  - ▶ Shorten maturity?
  - ▶ Cole-Kehoe: incentive to go long to minimize rollover risk
- ▶ Term structure of interest rates
  - ▶ If process of debt accumulation slow then term structure can get steeper in crisis (counterfactual)
  - ▶ Cole-Kehoe: inversion as in the data

# Conclusion

Great paper!

- ▶ Two parts:
  - ▶ Micro-foundation of multiplicity a la Calvo
  - ▶ Quantitative analysis

I'd focus more on one (or two papers)

- ▶ Think about distinguishing with other story:
  - ▶ Price of risk, Cole-Kehoe, time-varying expectations about bailout/support from ECB, ...

What are peculiar features of this environment?



# Term Structure of Interest Rates

