# Discussion of
# "Sovereigns at Risk"
## by Nuno Coimbra

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- Novel theoretical framework to analyze how banks' balance sheets and government finances interact.

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- **Key mechanism**: endogenous 're-pricing of risk' through a change in the marginal investor.
  - Risk neutral banks absorb all the supply of govt. bonds.
  - As govt debt increases and becomes more risky VaR becomes binding.
  - Risk averse households become marginal investor.
  - Government bond spreads spike.
  - Feedback into level and riskiness of government debt.

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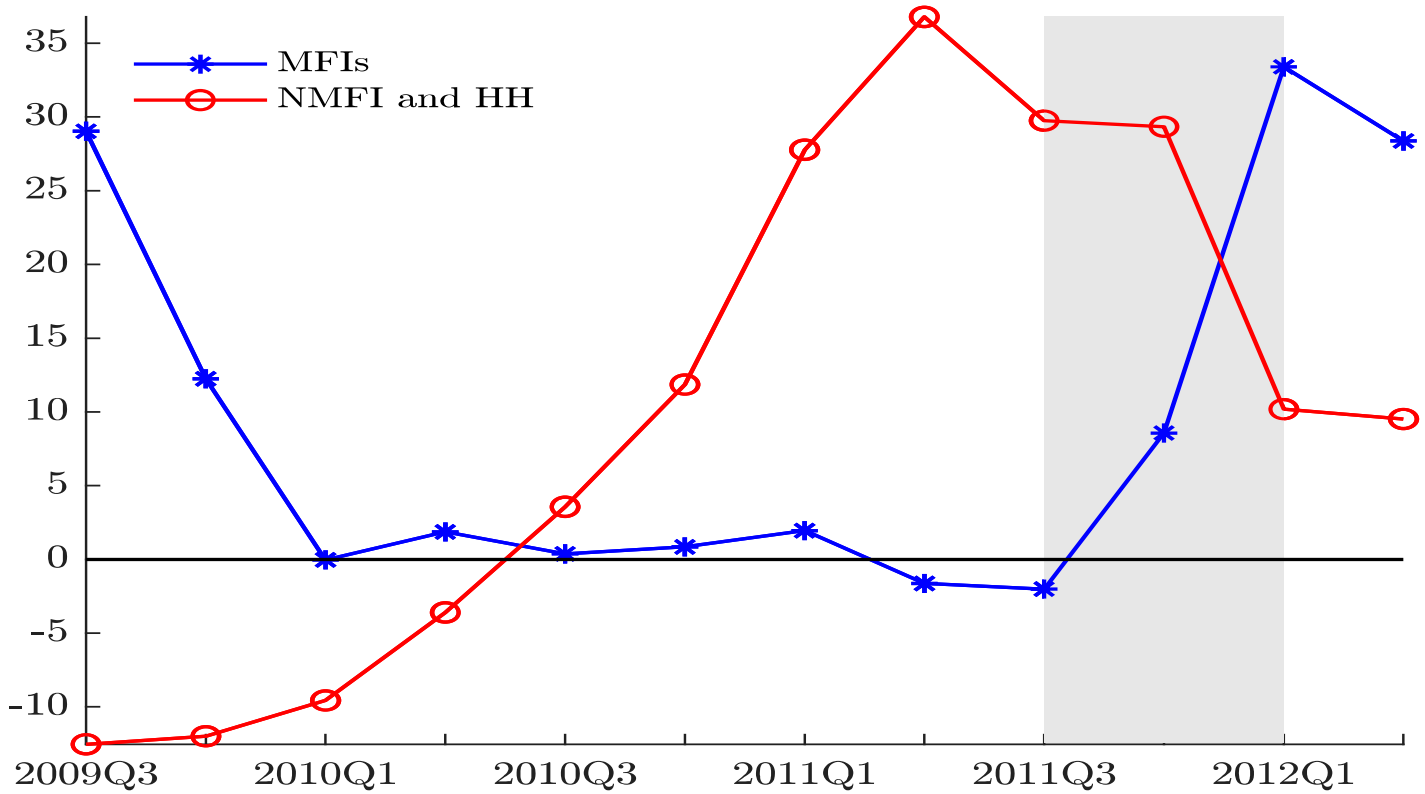


NOTE. Yearly change in the share of bond holdings by MFIs vs Households (Spain, Constrained and LTRO phases).

# This paper

- Novel theoretical framework to analyze how banks' balance sheets and government finances interact.

- **Model is able to reproduce key stylized facts** of going from unconstrained to constrained phase (and back).

  [1] Negative relation between banks' share of bond holdings ($B^B/B$) and households' share ($B^H/B$).

  [2] Positive relation between bond spreads ($R^B/R^D$) and households' share of bond holdings ($B^H/B$).

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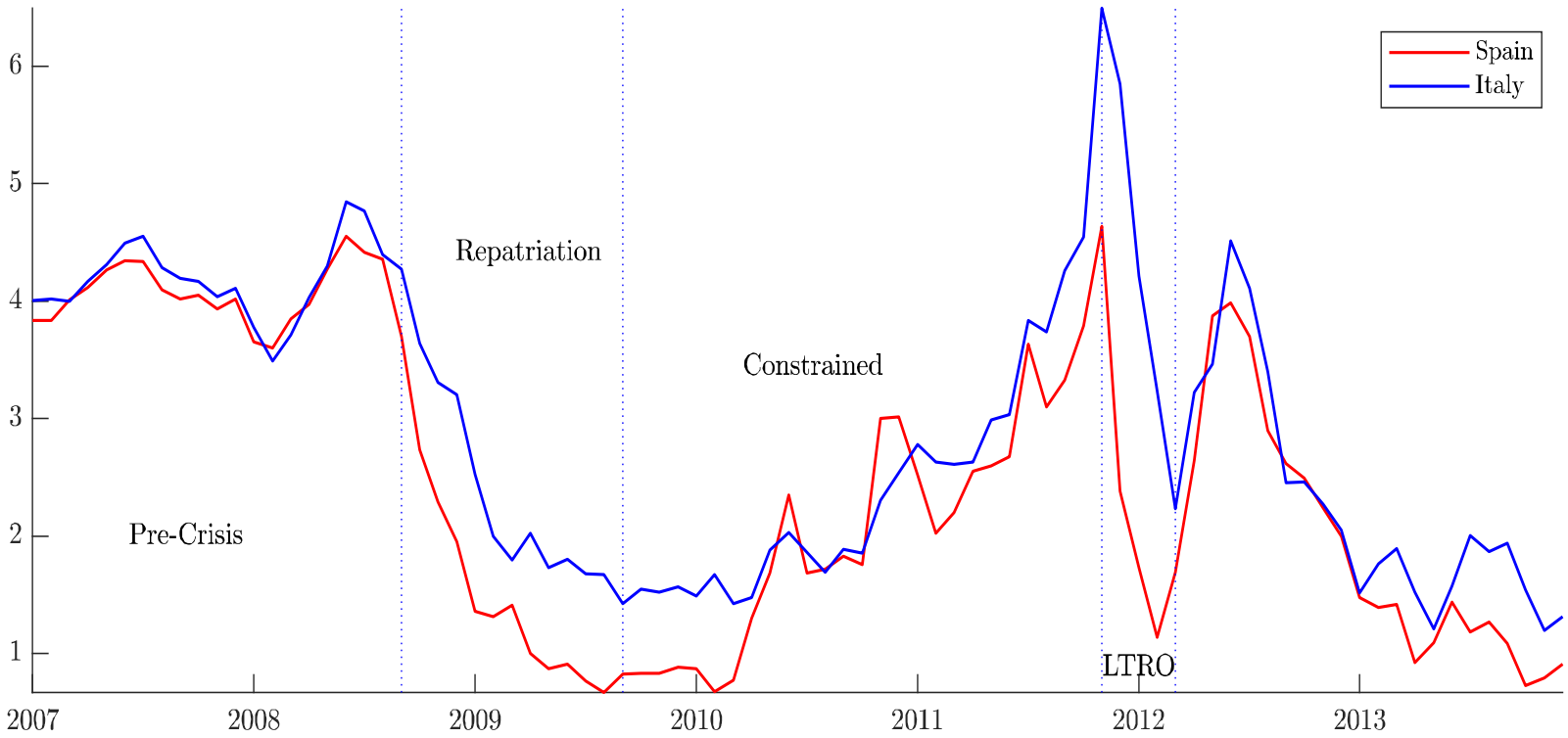


NOTE. Spanish and Italian 1-year bond yields during the sovereign crisis.

# Discussion

[1] An (over)simplified model.

* Two periods (0 and 1) endowment economy.

[2] Comments.

# Households

- Households maximization program:

$$\max_{C_0, C_1, B^H, D} U = U(C_0) + \beta \mathbb{E} U(C_1)$$

subject to:

$$C_0 + B^H + \psi(B^H) + D = \bar{Z} + (1 - \tau_0)\bar{Y}_0$$

$$C_1 = (1 - \tau_1)\tilde{Y}_1 + (1 - \Delta)R^B B^H + R^D D + \Pi$$

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- FOCs (under risk neutrality):

$$R^B \geq \frac{1}{\beta}\mathbb{E}\left[\frac{\left(1 + \psi'(B^H)\right)}{(1 - \Delta)}\right] \qquad R^D = \frac{1}{\beta}$$

Notes: $\tilde{Y}_1 \sim \mathcal{U}[Y_1^L, Y_1^H]$, $\psi'$, $\psi'' > 0$, the (rescaled) Lagrange multiplier on the no short selling constraint is not reported in $R^B$.

# Banks

- Banks have exogenous fixed equity ($\bar{E}$) and maximize expected profits under a leverage constraint:

$$\max_{B^B, D} \Pi = \mathbb{E}\left\{(1-\Delta) R^B B^B - R^D D\right\}$$

subject to:

$$B^B = \bar{E} + D$$

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- FOCs:

$$R^B = \frac{1}{\beta} \frac{1}{\mathbb{E}(1-\Delta)} \quad \text{if } B^B/\bar{E} < \chi$$

$$R^B = \frac{1}{\beta} \frac{(1+\eta)}{\mathbb{E}(1-\Delta)} \quad \text{if } B^B/\bar{E} = \chi$$

Notes: $\eta$ is the (rescaled) Lagrange multiplier on the leverage constraint; used $R^D = 1/\beta$ from HHs FOCs.

# Government

- Sets transfers to households $\bar{Z}$ (funded with tax revenues and debt):

$$\begin{aligned} \tau_0 \bar{Y}_0 + B &= \bar{Z} \\ \tau_1 \tilde{Y}_1 &= (1-\Delta) R^B B \end{aligned}$$

- Probability of default depends on transfers ($\bar{Z}$) and period 1 endowment ($\tilde{Y}_1$). Haircut is deterministic:

$$\Delta \equiv \begin{cases} 0 & \text{if } \tau_1 \tilde{Y}_1 > \bar{Z} - \tau_0 \bar{Y}_0 \\ \delta & \text{if } \tau_1 \tilde{Y}_1 \leq \bar{Z} - \tau_0 \bar{Y}_0 \end{cases}$$

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- Start from an equilibrium where $\bar{Z}$ is such that $\mathbb{E}[1 - \Delta] = 1$ and banks are unconstrained. Then increase $\bar{Z}$.

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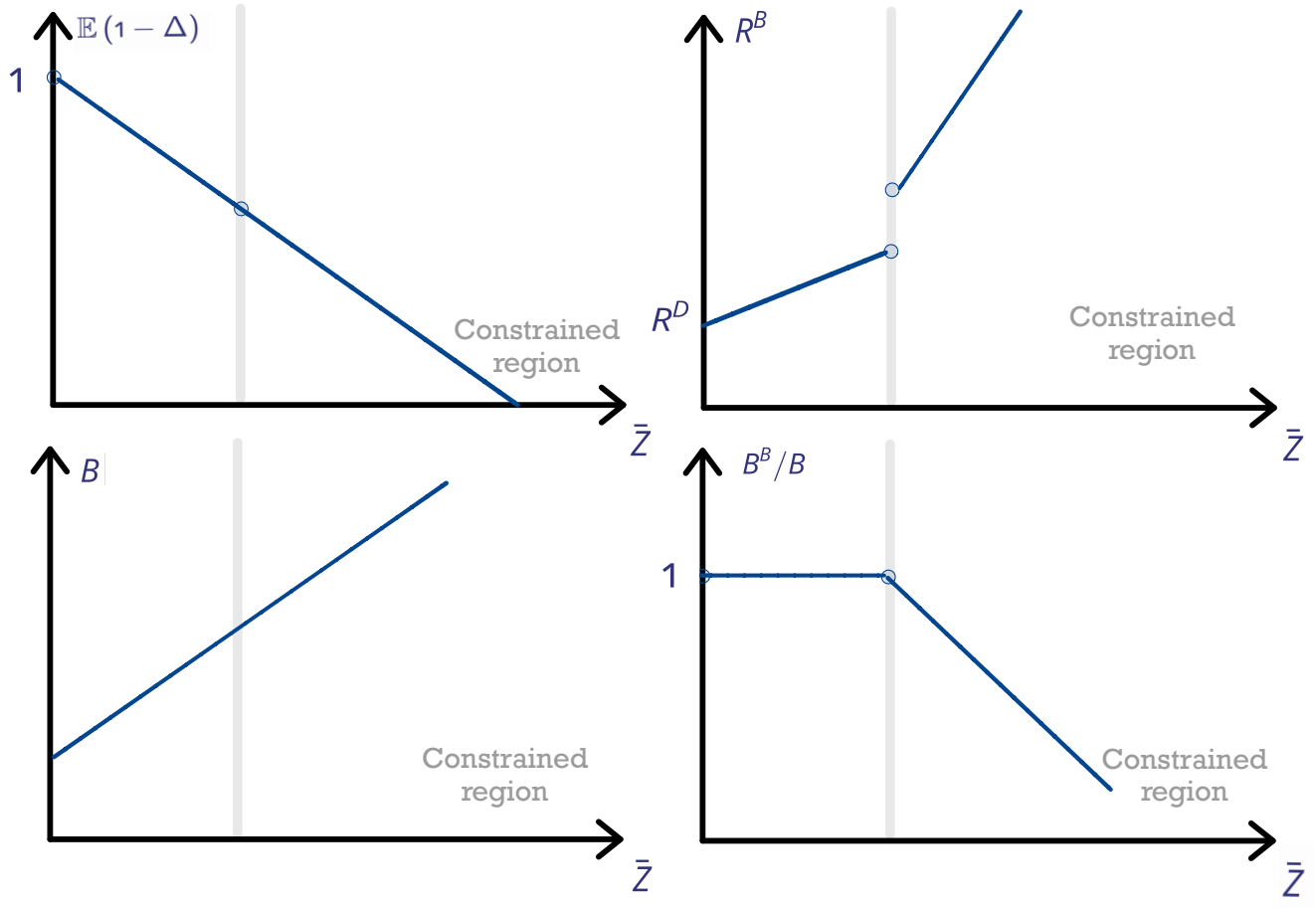

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- Simple model highlights a parallel in the pricing equations under:
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- Question: What defines the natural buyer?
- Probably a mix of the two (and others, e.g. technology, information, hedging, etc).
- Adjustment costs could generate larger amplification of increases in sovereign risk. But would attenuate the effects of policy!

# Comment #2: Richness vs. Simplicity

- Simple model delivers main results without:
  - Endogenous fiscal limit.
  - Taxation policy.
  - Distribution of haircuts conditional on default.
  - Sophisticated VaR constraint.
  - Exogenous cost of default ($\Gamma$).
  - Markov fiscal regimes.

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  - Distribution of haircuts conditional on default.
  - Sophisticated VaR constraint.
  - Exogenous cost of default ($\Gamma$).
  - Markov fiscal regimes.
- Many moving parts, hard to keep track of what is going on.
  - Simplify the exposition of the basic mechanism.
  - If not, explain why all ingredients are needed.

# Comment #3: Dissecting the key mechanism

- In the full model, the increase in spreads ($1/q_t^B - 1/q_t^D$) due to the change in the marginal investor is amplified by three factors:
  - *Roll over*: Lower $q_t^B$ feeds into higher $E(B_{t+1})$.
  - *Laffer curve*: Higher $B_t$ means higher taxes, lower deposits, and higher $q^d$.
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  - *Dynamic effect*: Higher $B_t$ leads to higher $E(B_{t+1})$.

- Question:
  - What is the relative contribution of these amplification effects?

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- A more realistic representation of bond market clearing condition:

$$B = B^H + B^B + B^F$$

  where $B^F$ is bond held by foreigners.

- Questions:
  - Can the model be used to say something about foreign investors?
  - Role of moral hazard?

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- Model's stark predictions on some key variables during the *constrained* are somewhat unexploited.

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- Data for Spain (and to some extent for Italy) is used for motivation only.
- Model's stark predictions on some key variables during the *constrained* are somewhat unexploited.
- Questions:
  - Are the predictions of the model in line with the experience of other countries?
  - Provide some more formal evidence.

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  - Ireland, Italy, Portugal, Spain.
- Sample period: 2009Q3-2012Q1 (*constrained* and *LTRO* phases).

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- Sample period: 2009Q3-2012Q1 (*constrained* and *LTRO* phases).
- **Positive** relation between $\Delta B^H$ and $\Delta(R^B/R^D)$

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | All countries | No stress | Stress | Italy & Spain |
| Beta | 0.16* | 0.04 | 0.25** | 0.51*** |
| T-stat | (1.88) | (0.25) | (2.27) | (3.76) |
| R2 | 0.37 | 0.14 | 0.40 | 0.52 |
| Observations | 66 | 22 | 44 | 22 |

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- Panel (within) specification with six countries:
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- Sample period: 2009Q3-2012Q1 (*constrained* and *LTRO* phases).
- **Negative** relation between $\Delta B^B$ and $\Delta B^H$:

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | All countries | No stress | Stress | Italy & Spain |
| Beta | -0.23* | -0.17 | -0.26 | -0.22 |
| T-stat | (-1.71) | (-0.7) | (-1.68) | (-1.27) |
| R2 | 0.13 | 0.13 | 0.13 | 0.08 |
| Observations | 66 | 22 | 44 | 22 |

# Summary

- Great paper.

- Main suggestions:

  [1] Defining features of natural buyers.

  [2] Richness vs. simplicity.

  [3] Role of foreign investors.

  [4] Formal empirical evidence.

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