Discussion of:

Capital Requirements for Government Bonds – Implications for Bank Behavior and Financial Stability

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EFA Annual Meeting
FIIT-1: Financial Fragility

Warsaw
August 24, 2018

Motivation

- **Large Literature on the Banks-Sovereign "Doom Loop"**
  1) ↑ credit risk of banks ⇒ ↑ credit risk of dom sovereign
  2) ↑ sovereign credit risk ⇒ ↑ credit risk of banks
     - 2.1) Negative effect on the economy
     - 2.2) Govt guarantees ↓
     - 2.3) **Price of govt bonds held ↓**
     - ... ...

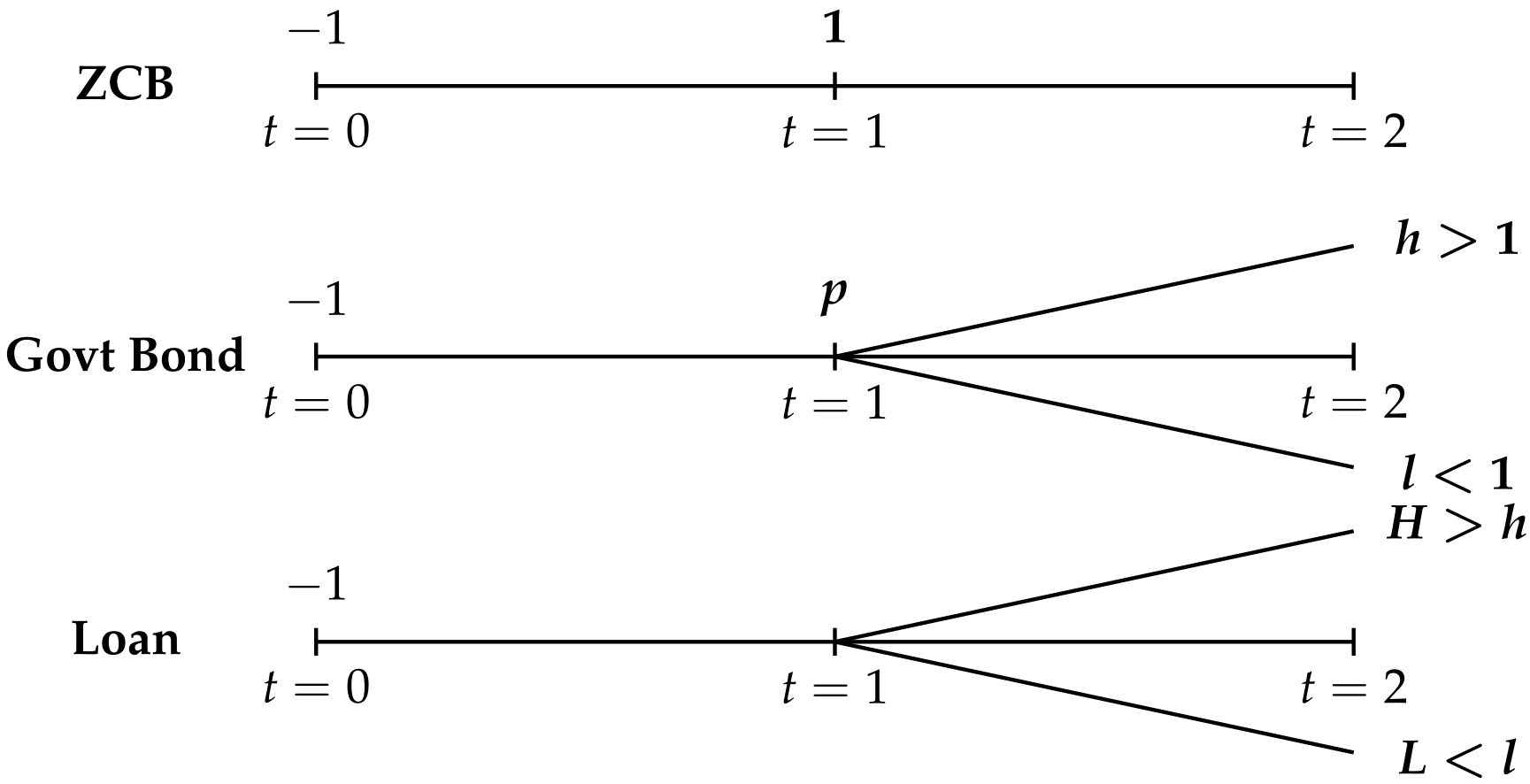
- **How to Make Banks for Resilient to (2.3)?**
  - Capital requirements for govt bonds
  - More capital to absorb losses
  - Less govt bonds held in equilibrium

EUR-Denominated Govt Bonds Have Risk Weight=0

- **This preferential treatment generated a lot of debate**
  - *"Yet finding a way to overhaul the absurd assumption that all government debt carries zero risk, is pretty fundamental for the future health of European finance."* (FT, May 2, 2016)
  - *"Regulators would be wise to set a non-zero risk weight for sovereign bonds from a single country that exceed some given threshold, linked to the amount of capital held by the bank."* (BBG, Dec 26, 2017)
- **Policy proposals**
  - Risk weights>0
  - Concentration limits
  - A mix of the two

Environment

- Single good, no discounting, dates $t = 0, 1, 2$
- Three assets



Assume: $E(Loan) > E(GovtBond) > 1$; $Var(Loan) > Var(GovtBond)$

Agents

1) **Risk Averse Consumers**
   - Initial endowment of 1
   - At $t = 0$, they don't know if they are *early* or *late* consumers
   - Assume half are early consumers

2) **Banks**
   - Deposits from risk-averse early/late depositors
   - $Prob(EarlyBank) = Prob(EarlyBank) = 0.5$
   - Banks trade govt bonds and ZCB at $t = 1$ at price p
   - Equity from risk-neutral inverstors

3) **Risk Neutral Investors**
   - Endowed with unbounded capital W_0
   - Opportunity cost ρ

Representative Bank's Problem

Suppose no equity financing:

$$max_{x,u,y,e_0}\ 0.5ln(c_1) + 0.5E(ln(c_2))$$

where

$$\begin{aligned} c_1 &= x + yp \\ c_{2,Hh} &= uH + h\left(\frac{x}{p} + y\right) \\ c_{2,Hl} &= ... \\ 1 &= x + y + u \end{aligned}$$

x: ZCB y: govt bonds u: loan

Interbank Market at $t = 1$

- At $t = 0$
  - Govt bonds have a higher return than ZCB
- At $t = 1$
  - Early banks want payoff at $t = 1$
  - Late banks want govt bonds (higher payoff at $t = 2$)

- At $t = 0$, both banks buy ZCB *and* govt bond
- At $t = 1$, early banks buy from late banks at price p

$\Rightarrow$ In eqm $p = 1$

- if $p < 1$, all banks just buy ZCB at $t = 0$
- if $p > 1$, no banks buys ZCB at $t = 0$

No Equity Financing

- Banks only invest in govt bonds and ZCB
  - No loans are granted
- Investing in loans has two opposing effects:
  1) Loans are illiquid $\Rightarrow$reduce consumption at $t = 1$
  2) Loans have a high return $\Rightarrow$ boost consumption at $t = 2$

*"**In our numerical example,** the effects of the loans' illiquidity on consumption is so strong that even at point $u = 0$ **the marginal utility from date-1 consumption exceeds the expected marginal utility from date-2 consumption**."*

! The model is used for one particular "numerical example"
  - Discuss the intuition behind parameter regions

Now With Equity Capital

$$e_0 + 1 = x + y + u \quad \text{(BC)}$$

$$\rho e_0 = 0.5E(e_1) + 0.5E(e_2) \quad \text{(IC)}$$

- Trade-off of having investors
  - ☹ Need to remunerate investors given their outside option ρ
  - ☺ Budget constraint is relaxed
  - ☺ Investors are risk neutral, they can bear illiquidity

- Banks invest in loans and investors get paid w.p. 0.5
  - If bank is early, they get the entire loan payoff
  - If banks is late, investors get zero at $t = 2$

! But we need expected loan payoff to be just right:
  - $\rho > E(loan)$: opportunity costs higher than loan exp return
  - $E(loan) > E(govt)$: loan has higher exp return than govt

$\Rightarrow$ depositors partially fund the loan

Now With Capital Requirements

- **Capital requirements on loans**

$$CR^{min} = \frac{e_0}{\underbrace{\phi_x x + \phi_y y}_{=0} + \phi_u u}$$

  - Investors invest more, not worth it (for some parameters)
  - Depositors fund the loan to attract investors and leave them part of the payoff from govt bonds at $t = 2$
  - Then $MU(c_2) > MU(c_1) \Rightarrow$ increase c_2 with more loans

  ! Capital requirement on loans $\Rightarrow \uparrow$ investment in loans

- **Capital requirements on loans and govt bonds**

$$CR^{min} = \frac{e_0}{\underbrace{\phi_x x}_{=0} + \phi_y y + \phi_u u}$$

  - Same mechanism: more govt, more loans

LOLR

- **The numerical example is very sensitive to assets' payoff**
  - Govt bonds are illiquid and have lower return than loans
  - Even when the model allows a sovereign shock
  - ▸ What if the return on sovereign bonds is high?
  - ▸ Is this a model for Germany or Italy? Italy in 2011 or 2018?
- **LOLR in the model**
  - Unanticipated shock to govt bonds (lower exp. payoff)
  - LOLR provides liquidity to (early) banks
  - LOLR+capital requirements prevents bank defaults
  - ! LOLR collateral is illiquid loans (Choi et al., 2018)

ECB Accepted Mostly Govt Bonds

- footnote 24 (this is exactly what happened!):

  "In our model government bonds do not serve as collateral. If this were the case, the central bank would have to buy government bonds for the price of 1, protecting illiquid banks from going bankrupt. This would induce a subsidy by the central bank as the market price for government bonds is lower than 1 after the large shock. Furthermore, the central bank would be exposed to credit risks as in the case of bond failures, the central bank would bear losses"

Weak Mapping b/w Model and Eurozone Crisis

- **Doom-loop is about *domestic* govt bonds**
  - Just one (risky) govt bond here
  - What's so special about domestic govt bonds?
- **Banks' funding structure**
  - No government guarantees
  - No wholesale market
- **Peripheral banks *purchased* dom govt bonds in the crisis**
  - Moral suasion by national governments
  - Risk-shifting/gambling for resurrection
  - Increasing chances of bailout

To Sum Up

- Very important and policy-relevant question
- Elegant and intuitive model

1) Fully solve the model
   - Obtain propositions
   - Define/Interpret parameter ranges
2) Understand what the model is telling us
   - A doom-loop model?
   - A model of capital and liquidity regulation?
   - A model of LOLR collateral design?