Discussion of Poeschl and Zhang "Bank Capital Regulation and Endogenous Shadow Banking Crises"

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[1]The views expressed in this paper are those of the author and do not necessarily reflect the views of the Federal Reserve Board or the Federal Reserve System

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   - Fluctuations in run prob. driven by fundamentals
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   - model matches business cycles, Great Recession, and boom-busts

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Paper by Poeschl and Zhang (2018) combines 2 and 3

MODEL FRAMEWORK

- Same setup of GKP (2016a)
  - Capital can be held by 3 agents with **different efficiency**: households (high inefficiency), retail banks (RB) (medium inefficiency), shadow banks (SB) (no inefficiency)
  - Financial structure: Households lend to RBs who lend to SBs
  - Agency problem limits borrowing and introduce **role for banks' net worths** as relevant state variables
  - Run on SBs: equilibrium with **RBs not rolling over SBs debt** and absorbing their capital

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- New elements introduced by Poeschl and Zhang (2018) (PZ):
  1. Capital accumulation
  2. Global solution
  3. Endogenous run probability
  4. Additional **regulatory constraints** on banks' leverage

What I learned

MAIN RESULTS:

- Paper focuses on run externality: agents don't internalize impact on run probability
- Paper quantifies welfare cost of runs on SBs: mainly come from **expectation of run episodes**
- A tighter regulatory leverage constraint on RBs
  - **Decreases run probability** (p^R) despite two opposing forces
    - Better capitalized RBs can absorb more capital from SBs in run equilibrium $\Rightarrow p^R \downarrow$
    - SB leverage increases (*spillover effect*) $\Rightarrow p^R \uparrow$
  - Outside of run this policy **decreases the capital stock**
  - Total effect on welfare is **negative**
- A tighter leverage constraint on **BOTH** RBs and SBs
  - Can eliminate spillover effect and **decrease further** p^R
  - Causes **even larger welfare losses**

My Comments: Summary

- Very relevant and ambitious paper: **interaction between RBs regulatory constraint, SBs leverage and run probability is novel**

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- Main Comments
  1. **Run probability and exogenous shocks**
     - Assumptions on sunspot probability and default cost might not be best way to model endogenous run probability
     - Would like to learn more about financial amplification in the model
  2. **MacroPru experiments**
     - It would be great if authors could find a policy that reduces run occurrence AND improves welfare
     - Analize alternative types of MacroPru policies

Endogenous Run Probability in GKP

In GKP 2016b and GKP 2018 the endogenous run probability works as follows:

- The recovery rate on bank lending is

$$x_t^*(Z_t) = \frac{R_{A,t}^*(Z_t)}{R_t} \frac{\phi_{t-1}}{\phi_{t-1} - 1}$$

  where ϕ is leverage and Z_t are real shocks (TFP or capital quality)
- Define $\bar{Z}_t$ such that $x_t^*(\bar{Z}_t) = 1$
- A run equilibrium exists iff $x_t^*(Z_t) < 1$ that is iff $Z_t < \bar{Z}_t$
- A run occurs if a run equilibrium exists AND a sunspot occurs (wprob χ)
- Expected probability of run at time t+1 is given by

$$E_t(p_{t+1}^R) = \chi \cdot prob[Z_{t+1} < \bar{Z}_{t+1} | Z_t]$$

- p_t^R driven by **changes in probability of existence** of run equilibrium
- Run lasts only one period

Endogenous Run Probability in PZ

In Poeschl and Zhang (2018)

- RBs recovery rate **conditional on SBs default** is given by

$$\tilde{x}_t^*(Z_t, \xi) = \xi \frac{R_{A,t}^*(Z_t)}{R_t} \frac{\phi_{t-1}^S}{\phi_{t-1}^S - 1} = \xi x_t^*(Z_t)$$

  where ξ is default cost
- PZ assume a run equilibrium exists whenever $\tilde{x}_t^*(Z_t, \xi) < 1$
- A run occurs if a run equilibrium exists AND a sunspot occurs
- Sunspot probability follows $g(\tilde{x}_t^*)$ with $g(\tilde{x}_t^*)' < 0$ (similar to in GKP 2016a)
- Expected probability of run at time t+1 is given by

$$E_t(p_{t+1}^R) = E_t[g(\tilde{x}_{t+1}^*)\mathbb{1}(E_t(\tilde{x}_{t+1}^*) < 1)]$$

- p_t^R mainly driven by **changes in sunspot probability**
- Run equilibrium persists with probability π

Endogenous Run Probability in PZ (cont.)

Possible issues with default cost ξ

- Default cost does not imply any resource cost $\Rightarrow$ it **implies a transfer from RBs to HHs during a run**. Is this realistic?
- Why does run equilibrium existence depend on $\tilde{x}(Z_t, \xi)$ rather than $x_t(Z_t)$? Does this mean that banks default even if they would have resources to pay back borrowers?

Endogenous Run Probability in PZ (cont.)

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SUGGESTION: Why not use same approach of GKP 2018 ?

- Drop default cost (and π)
- Run probability link to fundamentals is more intuitive
- Possible problem: in current model TFP shock might not generate enough amplification and endogenous fluctuations in x_t and p^R
- ξ and π might be needed to generate meaningful impact of SB runs

Financial Amplification in the Model

How strong is endogenous amplification in no-run equilibrium?

- Key to understand how leverage and x_t move with standard shocks
- Without fixed capital usually TFP causes small movements in asset prices and bank net worth
- In previous version of paper financial crises much less persistent than data
- It would be useful to see some IRFs for financial crises

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SUGGESTION Make sure you have amplification in No-Run equilibrium:

- Use capital quality shock
- Introduce nominal rigidities

Macroprudential Policies

- Model features several externalities $\Rightarrow$ competitive equilibrium is inefficient
- However computing optimal policy is extremely challenging
- Authors' approach: consider simple rule for RBs leverage

$$\phi_t^R = \frac{Q_t k_t + \gamma b_t^R}{n_t^R} \leq min(\hat{\phi}_t^R, \bar{\phi}_t^R)$$

  where $\hat{\phi}_t^R$ is leverage in comp. eq., and $\bar{\phi}_t^R = \frac{\hat{\phi}_t^R}{1+\tau_t}$
- $\Rightarrow$ regulatory constraint always binding if $\tau_t > 0$
- Tricky part with simple rules: finding one that improves welfare
- In the model this type of MacroPru does not improve welfare
  - Decline in capital out of run states more than compensate decline in p_t^R

Macroprudential Policies

MY SUGGESTIONS:

1. Make current regulatory constraint contingent on n_t^R
   - Assume that $\bar{\phi}^R$ kicks in only when $n_t^R > \bar{n^R}$
   - Consider occasionally binding constraints: regulation active only when incentive constraint not binding (high n_t^R)

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2. Alternative rule targeted at risk weight on b_t^R
   - Current rule weights b_t^R as in competitive equilibrium (γ)
   - Might look at rule curtailing lending to SBs more directly
   - Maybe use tax on lending to SBs ?

$$\frac{Q_t k_t + \gamma(1+\tau_t^b) b_t^R}{n_t^R} \leq \hat{\phi}_t^R$$

Conclusions

- Very interesting paper: novel tradeoffs linked to increasing RBs capital buffers
- Paper can be improved in two dimensions
  1. Modify endogenous run probability
  2. Experiment alternative policies to try to obtain welfare gains

In older version of paper financial crises much less persistent than data

	Schularick and Taylor (2012)			Model		
	0 yr	0-1yr	0-2yr	0 yr	0-1yr	0-2yr
real GDP	-2.02%	-4.46%	-6.3%	-1.89%	-1.46%	-1.16%
real Investment	-3.45%	-12.45%	-19.9%	-8.32%	-6.15%	-4.69%
Bank Assets	-1.89%	-6.98%	-7.7%	-3.69%	-2.89%	-2.21%

Table 2: Untargeted financial crisis moments.