

# Discussion of Competition, Stability, and Efficiency in the Banking Industry by Corbae and Levine

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# Research Question and Model

- ▶ How does competition affect financial stability and  
How does regulation affect competition, stability, and efficiency?

## Simplified model of the banking industry:

- ▶ Solve for symmetric Cournot equilibrium

Bank FOC wrt investment risk  $S$  and scale  $D_i$  ( $V_i$  is continuation v.)

1.  $p(S_i)AD_i + p'(S_i)R_i(\alpha)D_i + p'(S_i)\beta V_i(N') = 0$
2.  $p(S_i)R_i(\alpha) - p(S_i)r'_D D_i - \frac{\mu_i}{\kappa} = 0$

Free entry determines number of banks  $N$  given entry cost  $\kappa$

3.  $E_i(N) = \text{Initial } E_i(N) \equiv \text{discounted future cash flows}(N) = \kappa$

Government budget constraint: taxes  $F$  fund deposit insurance

4.  $F = (1 - p(S))r^D \times N \times D_i$

- ▶ What makes this a model about banks? Regulation & mispriced debt
- ▶ Policy maker has a rich toolset:  
entry costs  $\kappa$ , bank discount rate  $\beta$ , policy rate  $\alpha$ , leverage constraint  $\lambda$

# Model Insights

- ▶ **Calibration** implies  $N = 3$ , agency:  $\beta = 0.6$  vs investors' DR of 0.96
- ▶ How does competition affect risk-taking?
  - ▶ Depends on whether banks are leverage constrained
  - ▶ Unconstrained: more competition increases risk-taking
  - ▶ Constrained: more competition does not change risk-taking
- ▶ Supportive empirical evidence
- ▶ **Policy experiments**
  - ▶ Tightening leverage req ( $\downarrow \lambda$ ) reduces risk- & credit (big effect)
  - ▶ Mitigating agency issue ( $\beta$ ) reduces risk (rel. small)
  - ▶ Negligible interaction effect b/w gov & leverage on risk-taking
  - ▶ Tightening MP increases risk-taking but not in the long run
  - ▶ Various additional tests including competition from shadow banks, regulatory arbitrage, TBTF, ...

# Discussion

This paper:

- ▶ Tractable model with many policy relevant insights
- ▶ Extensive list of compelling policy experiments
- ▶ Novel quantitative experiments on governance & capital regulation

Comments:

- ▶ (1) More competition from shadow banks
- ▶ (2) Regulatory arbitrage

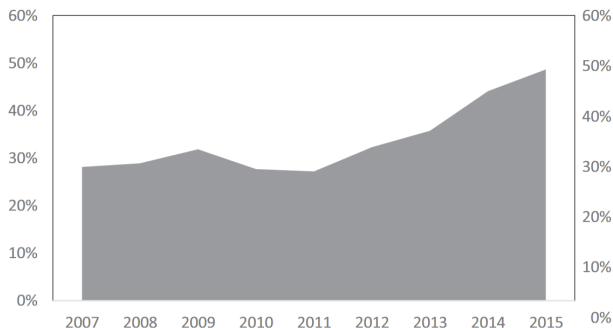
# (1) More competition from shadow banks?

- ▶ Rise in shadow bank competition modeled via rise in deposit costs ( $\gamma \uparrow$ )

	Shadow Banking SR ( $\gamma$ )	Shadow Banking LR ( $\gamma$ )	Regulatory Arbitrage SR ( $\gamma + \lambda$ ) **	Regulatory Arbitrage LR ( $\gamma + \lambda$ ) **	Fintech SR ( $\eta$ )	Fintech LR ( $\eta$ )
N	3	2.5	3	2.76	3	6.57
S	-1.1%	-6.9%	-13.4%	-10%	29.8%	37.6%
D	-33.7%	-26.4%	-39.6%	-35.7%	14.2%	-37.6%
Z	-33.7%	-38.6%	-39.6%	-40.9%	14.2%	36.5%
D/E	-2.7%	-26.4%	-35.7%	-35.7%	-80.7%	-37.7%
p	1.3%	7.9%	14.9%	11.3%	43.8%	31.4%
R	-0.02 bp	0.4 bp	0.1 bp	0.6 bp	0.6 bp	-1.5 bp
$r_D$	-0.06 bp	-0.9 bp	-1.1 bp	-1.4 bp	1.7 bp	4.4 bp
$\pi^*$	-33.2%	-12.3%	-28.8%	-17.6%	87.5%	-48.9%
$E^*$	-31.8%	0%	-6%	0%	490%	0%
V	-31.2%	-7.9%	-21.1%	-11.5%	135%	-36.9%
F/Y	-17%	-201%	-227%	-276%	-56.8%	160%
$Y^*$	-33.6%	-38.3%	-39.9%	-40.9%	113%	147%
cv(Y)	-35.8%	-50.5%	-60.8%	-56.9%	-61.3%	-11.7%

## Unintended consequences of tighter regulation

- ▶ Tighter regulation likely  $\Rightarrow$  shadow banking activity
- ▶ Largest mortgage lender 2010: Wells Fargo with \$100B
- ▶ Largest mortgage lender 2021: Rocket Mortgage with \$340B
- ▶ Shadow Banking Share of Mortgage Origination  
*Source: Buchak, Matvos, Piskorski, and Seru (2018)*



(a) All loans

# The role of shadow banks

- ▶ Higher deposit funding costs induced by non-bank competition shrink banks' profit margins → reduce credit supply but also risk-taking
- ▶ Reduction in profits disincentivizes entry, lowering competition which leads to less risk-taking and also further fewer credit

# The role of shadow banks

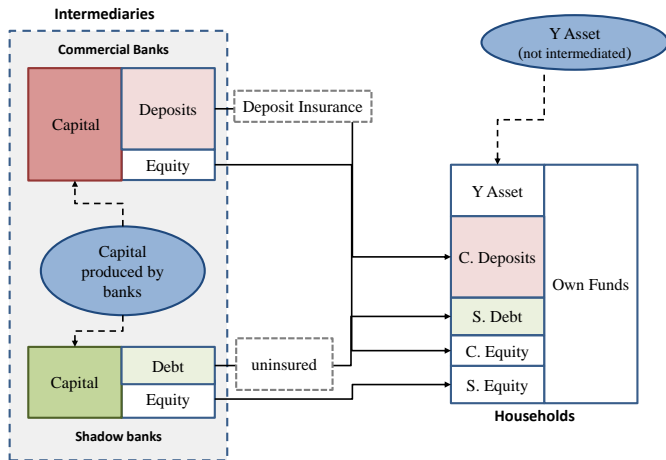
- ▶ Higher deposit funding costs induced by non-bank competition shrink banks' profit margins → reduce credit supply but also risk-taking
- ▶ Reduction in profits disincentivizes entry, lowering competition which leads to less risk-taking and also further fewer credit
- ▶ Two potential limitations of this analysis:
  - ▶ No GE effects considered  
With GE: deposit supply reduction would move  $b$  (liquidity benefit)
  - ▶ Equity supply is assumed to be fixed for incumbents  
Otherwise may flow to banks and non-banks, boosting aggregate bank and non-bank equity capital
  - ▶ In sum: more competition from shadow banks does not necessarily mean less credit or decreased financial stability
- ▶ Example from simplified GE model

Small side notes: would have experiment on top of tightening of leverage constraints



# Effect of tighter capital reg. on the financial system?

## Simplified Model of the Financial System



Key assumption: Deposits and Shadow bank debt provide liquidity services

# Effects of tighter capital reg? Model Insights

- ▶ Liquidity demand effect:
  - ▶ Tighter regulation reduces C-bank deposit supply,  $\uparrow$  liquidity premia
  - ▶ Higher S-bank asset share and MORE S-bank liquidity provision
- ▶ Equity investor competition effect:

# Effects of tighter capital reg? Model Insights

- ▶ Liquidity demand effect:
  - ▶ Tighter regulation reduces C-bank deposit supply,  $\uparrow$  liquidity premia
  - ▶ Higher S-bank asset share and MORE S-bank liquidity provision
- ▶ Equity investor competition effect:
  - ▶ Deposit insurance gives commercial banks a competitive advantage
  - ▶ Common market & technology: investors indifferent b/w bank types
  - ▶ To compete with highly levered traditional banks (deposit insurance), shadow banks lever up more relative to non deposit insurance world
  - ▶ Tightening the capital requirement *reduces* commercial banks' competitive advantage, leverage, S-bank competitive pressure
- ▶  $\Rightarrow$  Higher S-bank intermediation share  
Ambiguous response for S-bank leverage (fragility)

Source: *Begenau and Landvoigt (2022)*

# Tighter Regulation & Competition from Shadow Banks

Bad for credit supply and financial stability?

	Base	15%	20%	30%
<b>Capital and Debt</b>				
1. Capital	3.15	0.30%	0.72%	1.64%
2. Debt share S	31.95%	4.01%	6.91%	13.79%
3. Capital share S	33.68%	-0.15%	-1.73%	-4.79%
4. Leverage S	83.18%	0.34%	0.80%	1.80%
5. Leverage C	89.95%	-5.56%	-11.12%	-22.22%
<b>Deposit Rates</b>				
6. Deposit rate S	0.45%	-1.28%	-3.05%	-6.80%
7. Deposit rate C	0.39%	-6.01%	-12.04%	-26.83%
<b>Welfare</b>				
8. Default S	0.30%	5.85%	14.12%	34.08%
9. Default C	0.23%	-83.96%	-98.28%	-100.00%
10. GDP	1.29	0.02%	0.05%	0.12%
11. Liquidity Services	1.48	-3.54%	-6.96%	-14.09%
12. Consumption	1.21	0.081%	0.098%	0.107%
13. Welfare gain		0.054%	0.044%	0.005%

Source: *Begenau and Landvoigt (2022)*

# Tighter Regulation & Competition from Shadow Banks

Bad for credit supply and financial stability?

Not necessarily!

- ▶ Removing competitive advantage from commercial banks also lowers risk-taking incentives for competitors
- ▶ GE effects mitigates bank funding cost impact from  $\downarrow \lambda$
- ▶ Flow of equity into existing banks and their competitors mitigate regulation effect on credit supply
- ▶ Assumptions: capital markets for shadow bank equity works
  - ▶ No asymmetric info
  - ▶ Investors understand risk return trade-off

## (2) Regulatory Arbitrage Experiment

- ▶ Reg. arbitrage modeled via rise in deposit costs & leverage increase
- Effects very similar to shadow bank experiments

	Shadow Banking SR ( $\gamma$ )	Shadow Banking LR ( $\gamma$ )	Regulatory Arbitrage SR ( $\gamma + \lambda$ ) **	Regulatory Arbitrage LR ( $\gamma + \lambda$ ) **	Fintech SR ( $\eta$ )	Fintech LR ( $\eta$ )
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# Alternative Regulatory Arbitrage Experiment

- ▶ Within current set-up:
  - ▶ Capture notion of regulatory arbitrage as evading regulation
  - ▶ Akin to an increase in  $\lambda$  or use  $\tilde{D}_i < D_i$  in leverage constraint.
  - ▶ Evading regulation may lower funding costs, i.e., a decrease in  $\gamma$
- ▶ Augmented setup
  - ▶ Consider what if banks could conceal amount of risk-taking  $S_i$  from regulators/ investors  $\lambda$  and/or  $\beta$  are increased

## Closing Remarks

Very useful laboratory to explore policy issues

- ▶ Accessible with code available on Dean's site
- ▶ Enhances our comprehension of how regulatory frameworks influence competition and the stability of the banking sector

Consider:

- ▶ GE effects on prices (especially relevant for long run)
- ▶ Allowing for equity issuance
- ▶ Alternative regulatory arbitrage experiment



# References

- Begenau, Juliane and Tim Landoigt. 2022. "Financial regulation in a quantitative model of the modern banking system." *The Review of Economic Studies* 89 (4):1748–1784.
- Buchak, Greg, Gregor Matvos, Tomasz Piskorski, and Amit Seru. 2018. "Fintech, regulatory arbitrage, and the rise of shadow banks." *Journal of financial economics* 130 (3):453–483.