

ECB Conference
Discussion of Behn, Daminato and Salleo's
“A Dynamic Model of Bank
Behavior Under Multiple
Regulatory Constraints”

Anjan V. Thakor

John E. Simon Professor of Finance
and Director of the Ph.D. Program

Washington University in St Louis, ECGI, FTG Fellow

INTRODUCTORY REMARKS

- This paper seeks to understand how banks repond to changes in:
 - Capital requirements
 - Liquidity requirements
 - Their operating environment
- It does so by developing a structural model that accounts for the dynamic effects it wishes to study.

IMPORTANCE OF STUDY

1. From a research standpoint, theoretical literature is divided on: whether higher capital requirements are a good idea, whether we need liquidity requirements, and how these requirements interact.

Theories tell us that banks with more capital will:

- Create less liquidity (Diamond and Rajan (2001),
- Create more funding liquidity (Donaldson, Piacentino and Thakor, (*JFE*, forthcoming))
- Be more valuable (Holmstrom and Tirole (1957), Mehran and Thakor (*RFS*, 2011)).

2. The empirical literature has taught us much. The key things we have learned are that *banks with more capital*:
- Are more valuable to their shareholders (Mehran-Thakor (2011));
 - Create more liquidity (Berger-Bouwman (*RFS* 2009));
 - Lend more (Peek-Rosengren (*AER*, 2000));
 - Have higher quality (less impaired) assets (Perignon, Thesmar, Vuillemeys (*JF*, forthcoming));
 - Have a higher probability of surviving a crisis (Berger-Bouwman (*JFE*, 2013));
 - Gain more market share during crisis (Calomiris and Powell, *NBER*, 2001));

- Have greater access to (uninsured) short-term liquidity (Perignon, Thesmar and Vuillemeys (*JF*, 2017)).

On the issue of an increase in capital requirements, banks first reduce lending but effect is transitory (Thakor (1996)).

- Overall, while we lack consensus, there is increasing evidence that higher capital in banking would be a good thing.
But ... how high?
- Tough question. Some structural models have been built. They show:
 - Optimality of leverage ratios around 10%, RWA ratio 20% (Miles, Yang, Marcheggiano (*EJ*, 2012)).
 - Welfare gains from higher capital requirements—huge social benefits and small social costs.

- What we need is a better understanding of how banks are likely to respond when we increase capital requirements.
 - Far less research on liquidity requirements—relatively new. So we need to understand not only their effects, but also how they interact with capital requirements.
- ⇒ So, this exercise has huge policy relevance, and it also provides interesting insights that future theories can be developed to explain.
- Moreover, the questions this paper seeks to answer are very difficult to answer by conducting reduced-form empirical investigations.

KEY RESULTS: AND WHAT'S REALLY NEW

- Paper develops dynamic, stochastic model of bank behavior with risk neutral decisionmakers in a discrete time, infinite horizon setting.
- Using the parameters the authors estimate from data on 116 institutions supervised by the European Single Supervisory Mechanism (ESSM), model replicates patterns observed in supervisory data:
 - Banks finance asset expansions mostly with debt.
 - ↑ in loans financed with LT debt and equity and ↑ in liquid assets financed with ST debt;
 - Positive relation between adjustments in capital and liquidity ratios.

- Estimated model is then used to conduct a number of counterfactual simulations to examine how banks react to changes in regulatory requirements and economic environment.

Result 1: Banks maintain constant capital buffers when capital requirements go up.

- If cap. req. increases by 1%, banks increase (risk-weighted assets) capital ratio by 1% also.

NEW!

- Reminiscent of Aydin (WP, WashU) evidence that when banks increase credit card limits, *both* borrowers for whom previous limit was binding and those for whom it was not, end up increasing borrowing.

⇒ Inframarginal borrowers maintain buffer between max. borrowing limit and actual borrowing.

Result 2: The way banks adjust to higher capital requirements depends on how close they initially were to the capital requirement.

- More constrained banks reduce lending more than less constrained banks, but the most constrained banks raise equity right away to maintain lending.
- Less constrained banks reduce loans and build up equity through retained earnings.
- New, not surprising.

Result 3: Over time, banks respond to higher capital requirements by building up capital and eventually lending more.

- New! Important result. Dispels banker's assertion that higher capital requirements will lead to *permanent* reductions in lending.
- Reconciles findings that banks with higher capital lend more, but lending declines when capital requirements are increased.

Result 4: Liquidity requirements have real effects.

- ↑ in liquidity requirements
 - ⇒ Lower lending
 - Expected!

Result 5: Capital and liquidity ratios interact (positively correlated).

- Faced with higher capital requirements, banks reduce risk on the asset side, but increase refinancing risk by reducing debt maturity. New!
 - ⇒ Liquidity ratio declines. Paper views this as banks taking higher liquidity risk when compelled to reduce insolvency risk via higher capital.

Result 6: When economic conditions worsen (\uparrow in expected impairment rate on loans), banks increase dividend payout ratio.

- New! Paper interprets this as less profitable banks becoming less attractive to shareholders, eliciting a compensatory dividend increase response.

ASSESSMENT AND COMMENTS

- Very interesting paper. Given the increased focus on insolvency risk since the crisis, calibrating capital requirements and analyzing potential bank responses is exactly the way to go.
- Many results are new, and go beyond what we know from the existing empirical evidence.
- So I like the paper and commend the authors.
- Various comments about assumptions and interpretations of the results.

Comment 1: Some of the cost of capital assumptions seem unrealistic and some need better microfoundation.

- Bank's cost of funding is assumed to be independent of its (risk-weighted) capital ratio.
 - Unrealistic (more later).
- Banks are assumed to incur a cost of raising outside equity.

What is the microfoundation for this cost?

- This is at the heart of the debate over how high capital requirements should be set... most papers (including this) assume that there is some cost related to Myers' debt overhang or some adverse-selection cost...but we need more specificity.
- Kisin and Manela (*RFS*, 2016) paper estimates very modest adverse impact on bank profits from higher capital requirements.

Comment 2: Not having a leverage ratio in the analysis is constraining.

- Paper has a risk-weighted assets ratio that introduces some of the interaction between liquidity and capital requirements.
- Important to also have a leverage ratio and see how banks respond to an increase in it.

Comment 3: Competition among banks for deposits is ignored.

- This is a strong assumption—stronger than paper acknowledges
- Perignon, Thesmar and Vuillemeu (*JF*, forthcoming) document that there was *no marketwide* liquidity freeze for European banks during 2008–14 in the sense that banks with higher capital, higher profitability and fewer impaired assets actually *increased* their access to the short-term unsecured CD market.
- Weaker banks with lower capital ratios reduced access to this market.
 - ⇒ During a time of stress, competition for deposits favored higher-capital banks. Consistent with earlier evidence provided in other contexts by Berger and Bouwman (2013), Calomiris and Mason (2003), Calomiris and Powell (2011), and Calomiris and Wilson (2004).

Implications:

- Not allowing interbank competition for deposits is restrictive.
- Provides another perspective on finding that when banks increase their capital, they reduce debt maturity. Paper interprets this as increase in liquidity risk...but it need not be...

Banks with higher capital face lower refinancing risk with ST debt! Perhaps that is why they shorten debt maturity (lower cost).

Comment 4: Connect the findings of the paper to recent related work.

- Dong and Wen (WP, St Louis Fed, 2017) develop incomplete markets model with heterogeneous agents and calibrate it to match U.S. aggregate output fluctuations.
 - ⇒ Show sharp reduction in quality, not liquidity, of private assets was responsible for 2007–09 crisis.
- Their analysis shows excessive injection of public liquidity during a crisis may be welfare reducing.
- There are papers (e.g., Roger and Vitek (WP, IMF 2012)) that have examined this issue. Roger and Vitek’s macro model shows that impact of higher capital requirements on global GDP would be minimal (due to offsetting monetary policy responses).
- Nguyen (2014) shows that \uparrow cap. req. can produce welfare gains $>1\%$ of lifetime consumption.

Comment 5: Alternative interpretation of finding that banks increase dividends during downturns.

- Finding contradicts the usual dividend signaling story about firms increasing dividends when they are more bullish about future earnings.
- *Alternative Interpretations*
 - a) If banks expect to lend less in the future, they anticipate needing less capital \Rightarrow \uparrow dividends now
 - OR*
 - b) Lower profitability \Rightarrow greater attractiveness of risk shifting \Rightarrow reduce capital.

CONCLUSION

- Very interesting paper on how banks can be expected to react to higher capital and liquidity requirements and changes in economic environment.
- More of this kind of research is needed.