Interest Rate Risk and Cross-Sectional Effects of Micro-Prudential Regulation

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Summary

- **Question:** how can micro-prudential regulations enhance financial stability?
- **Approach:** Two-period structural model where banks choose lending, deposit issuance, and bond holdings, subject to realistic regulation
- **Main Findings:**
  1. Bank failure rates rise following interest rate tightening, more so when banks anticipated higher volatility
  2. Tighter capital requirements are welfare decreasing (reduce liquidity services), but capital or liquidity requirements tied to bank size can be more effective.
- **This discussion:** consider how extending the model would impact results
  - (i) interest rate risk, (ii) deposit risk, (iii) two-period setting

Bank's bond decision in the model

- Why do banks hold bonds in the model?
  - Decreasing returns → efficient levels of loans and deposits
  - Efficient level of bonds bridges the gap between efficient loans and deposits
  - Bonds also provide liquidity against deposit draws (in reality, credit lines too)
- But bonds have interest rate risk
  - Long maturity, decline in value when interest rates rise
  - Deposits are short duration, so raising deposits and buying bonds increases interest rate risk
  - Optimal bond holdings trade off efficiency + liquidity against interest rate risk

Comment #1: interest rate risk

- In my opinion, this trade-off is somewhat artificial
  - In the model, there is only one type of bond, with a fixed exposure
- In reality, banks can choose their preferred exposure
  - Short-duration bonds will be minimally exposed to interest rate risk
  - Long-duration bonds will be heavily exposed to interest rate risk
  - Bank choice of bond duration (~4 years) squarely interior, could easily be increased or decreased
- Probably more realistic to split into two separate decisions
  - First decide how much value of bonds you need for your **balance sheet**
  - Then choose your preferred **interest rate exposure**

Why do banks take interest rate risk?

- If banks can choose their exposure, why take interest rate risk?
  - Could be speculation, or chasing higher returns
  - But could also be risk management
- Drechsler, Savov, Schnabl (2021): banks use bonds to hedge risk to their **deposit franchise**
  - Banks do not fully pass through changes in interest rates to deposit rate
  - Earn higher spreads when rates are high, lower spreads when rates are low
  - Long-term bonds gain value when rates ↓ and deposit franchise loses value
  - DSS: banks effectively manage portfolios to keep net interest margin stable
- Model abstracts from this, as there are no more deposits beyond $t = 1$.

Greenwald, Krainer, Paul (2024)

- Further evidence from Greenwald, Krainer, Paul (2024)
  - We find that securities losses influence bank lending, but mainly when they pass through into capital requirements
  - Can't reject zero response of bank lending to securities losses otherwise.

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Δ Value AFS	4.83**	5.65**	2.45	2.09	-2.08	-2.53
	(2.14)	(2.37)	(2.48)	(2.59)	(4.81)	(4.92)
Δ Value AFS × AC	7.55**	9.26***	10.86*	14.03**	12.95*	15.18**
	(3.50)	(3.14)	(5.81)	(5.23)	(6.94)	(6.39)
Δ Value AFS × Size			-2.11	-3.08*	-3.99	-4.71
			(1.87)	(1.78)	(3.45)	(3.54)

Comment #2: deposit risk

- Uninsured deposits in the model face risk if the bank defaults
  - But the representative HH is perfectly diversified, only expected loss matters
  - Indifferent bet. uninsured deposit paying $1 for sure vs. $0/$2 with 50% chance
- But by definition, uninsured deposits are **not diversified**
  - Spread across banks, could have billions in insured deposits
  - Uninsured depositors don't do this because they **value concentration**
  - But these benefits come with large exposure to **idiosyncratic bank risk**
- Making depositors averse to idiosyncratic risk would change bank incentives
  - Much harder to get away with risky behavior without losing uninsured deposits

Comment #3: two-period setting

- Two-period setting gains a lot in tractability, but means that the model can't address some important micro-prudential considerations

1. Interactions between runs and the **deposit franchise**
   - Drechsler, Savov, Schnabl, Wang (2024): optimal risk management depends on whether your uninsured deposits run
   - If they don't, then deposit franchise is very exposed to interest rate risk, need long-term bonds to hedge against declines in the interest rate
   - If the deposits run, then you should hold fewer (or shorter maturity) bonds
   - DSSW: this creates a very difficult risk management problem
   - While today's paper has realistic deposit spreads, there are no future deposit spreads in the second period, no deposit franchise to hedge.

Comment #3: two-period setting

- Two-period setting gains a lot in tractability, but means that the model can't address some important micro-prudential considerations

2. Effects of bank securities on **capital requirements**
   - Active debate how securities losses should count toward regulatory capital
   - With multiple (shorter) periods, could dynamically require banks to raise capital in response to bond losses, avoiding failures
   - Greenwald, Krainer, Paul (2024): this would amplify how bond losses (and interest rates) pass through to bank lending and firm investment
   - Regulators face an important trade-off between penalizing speculation ex-post and discouraging proper economic hedging ex-ante

Conclusion

- Nicely executed paper using a sophisticated quantitative model to study the impacts of micro-prudential regulations
- Simplifying assumptions may lead to a few caveats on the results
  1. Banks can adjust the interest rate exposure of their bonds (and may already be doing so effectively)
  2. Diversified uninsured depositors in the model likely more tolerant of idiosyncratic risk than in reality, allowing for more risk taking
  3. Two-period setting abstracts from interesting micro-prudential channels (deposit franchise risk, dynamic response to regulatory capital)
- Exciting research area, much more to be done!