

Discussion of

“Capital Regulation, Liquidity Requirements and Taxation in a Dynamic Model of Banking”

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The paper examines critical issues in bank regulation:

The Impact of

- Bank closure rules
 - Capital constraints
 - Liquidity constraints
-and combinations of these*

On Bank Decisions:

- Bank lending
- Bank capital structure (debt vs. equity)

On Key Metrics:

- *Bank efficiency, social value, and default rates*

Review of the Model:

1. *Uncertainty: Two exogenous sources:*

- **Credit shock** Z which affects profitability of loans
 - Loan income = $Z_t * \Pi(L_t)$ where $\Pi' > 0$, $\Pi'' < 0$
- **Liquidity shock (deposit level)** D
 - Deposits insured against default, pay riskless rate r

$\{Z, \log D\}$ are mean-reverting processes, negatively correlated.

2. *Decisions: Banks choose each period:*

- Amount to **lend** L_t
 - Fraction δ matures each period, avg. maturity = $1/\delta - 1$
 - Costs to reduce loan portfolio (“fire sales”)
- Amount to **borrow** $-B_t$ (1-period maturity at riskless rate)
- Unregulated banks **default endogenously if** $E < 0$

3. **Objective** (both unregulated, regulated banks)

- Maximize value E of discounted equity cash flows
 - Shareholder pay-outs/pay-ins are *residual* cash flow after lending, borrowing decisions
 - Substantial extra costs (30%) to raising equity capital
 - Costs to liquidating loans (4%) through “fire sales”
 - *Unregulated* banks choose *endogenous default* if $E < 0$

4. **Constraints** (both unregulated, regulated banks)

A. Fully collateralized borrowing

- If borrowing, must be able to repay (without further equity issuance) *worst state* $\{Z_d, D_d\}$
 - Simulation results depend on (arbitrary?) “worst case”
 - One-year, riskfree debt a strong assumption.

Regulation adds *additional constraints*:

B. Closure Rule: Closure if negative (accounting) net worth K

- If the (end period, or *ex post*) net worth is negative,
i.e. *ex ante* net worth $K_t + \text{ex post income}_t < 0$,
the bank is reorganized ***even if otherwise $E > 0$ (earlier closure)***

C. Capital Requirement: (restricts L, B decisions)

- *Ex ante* net worth exceeds fraction k of loans,
i.e. $K_t \geq k L_t$ (> 0 , i.e. *ex ante* net worth positive).
- Only slightly stricter than Closure Rule if $k = 0$

D. Liquidity Requirement: (restricts L, B decisions)

- Total cash available *ex post* /the worst-case cash flow $\geq \ell$ ($= 1$)
- Again depends on “worst case”
- Constraints C & D can be applied jointly

Approach: A dynamic structural model of banking firm (fixed point solution of Bellman equation)

- Given previous levels of $\{B, L, K\}$, banks choose current $\{B, L\}$ to maximize equity value subject to relevant constraints
 - Different regulations → different borrowing, lending levels
 - Adjustment costs as noted (loan “fire sales”, raising new equity)
- Subsequent $\{D, Z\}$ are realized, net worth K updated, solvency determined, and (if solvent) residual cash flow is paid as dividend (negative dividend = new equity at high cost)
- Can look at $\{B, L\}$ decisions *given* previous state variables
 - Assumes previous $B = 0, D = 2, L = 4.1 \rightarrow K = 2.1$, vs. steady state $K = 0.65$
- Or, using dynamic simulations, find average or “steady state” of relevant variables. This seems preferred.

Metrics to evaluate decisions

- 1) *Efficiency*: Market value of bank assets,
less expected default costs (covered by deposit insurance),
less investment in riskless assets (no net benefit from those)
- 2) *Social Value*: Efficiency plus expected NPV of taxes.

Key Conclusions: *given calibrated parameters*

- **Capital constraints** (mild) can *improve* Efficiency, Social Value
more loans, less borrowing, and more equity capital vs. non-reg.
(though Table 4 shows mkt. lev. of cap-constrained bank higher!?)
- **Liquidity constraints** *reduces lending, efficiency, social value*
- **Default risk reduced by either or both constraints** (to zero!)
 - Question calibration?

Critiques/Suggestions:

- ***Model doesn't allow loan risk as a choice***
(except indirectly through loan volume)
 - For example, *capital constraint* could lead to lower lending but possibly higher risk, if decision variable.

- ***“Regulation” is a combination of Closure and other rules—***
 - Metrics better with Closure and Cap Regs, but less favorable as Cap Reg k rises...
 - Leaves concern that the *closure rule is what creates the important results*, not Cap Regs.
 - Not sure current results “suggest optimal $k^* > 0$ ”
 - Simple static model can't answer, as no continuation

Critiques/Suggestions, Con't.

- ***Restructuring rules after default somewhat arbitrary***
 - **Is cost of new capital injection by regulators included in efficiency metrics? (if no default, not relevant...)**
 - **One might think restructuring by regulators involves less cost than unregulated default.**
 - **But same default cost proportion λ**

In Sum: An Excellent, Theoretically Solid Structural Model

- ***Wish list for future:***
 - ***Loan-risk choice***
 - ***Longer term bank debt***
 - ***Multiple investment types with risk weighting***
 - ***Optimize capital requirement k ($k^* = 0??$)***

- ***Before concluding “capital regs are clearly best” , examine how estimated benefits depend upon:***
 - ***Closure rule alone (may produce all gains, $k > 0$ hurts)***
 - ***Default cost assumptions (and is no default realistic?)***
 - ***Examine sensitivity to “Worst case” assumptions***