The Forced Safety Effect: How Higher Capital Requirements Can Increase Bank Lending

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Main Questions

How do tighter capital requirements affect bank lending?

- framework of analysis: stylized banking model with an **implicit subsidy** from **government guarantees** and **legacy loans**
- focus: effects of capital requirements on **total** vs **marginal subsidy** –> bank incentives to increase or decrease lending in response to tighter CR

Relevance of the Question

Investigating the **financial stability** and **real effects** of changes in **bank capital requirements** is very relevant both from a (macro)prudential policy and an academic point of view

- Tighter CR increase the **stability of the banking sector**: lower bank failures and associated costs
- But...might result into a reduction in the **supply of credit**: impose costs on the real economy

Impact of CR on **safety of banking sector** vs **credit supply**: *key trade-off* for setting capital requirements!

Main Contribution

- Bank lending could **increase** in response to tighter CR –> *no financial stability vs credit supply trade-off*
- Tighter capital requirements have **non-monotonic effects** on banks lending decisions –> *overall effects depend on the initial level of CR*

–> Ultimately the importance of the channel is of a quantitative nature

Banking Setup

- **two dates**: 1 and 2
- continuum of **households**:
  - own bank liabilities
  - risk neutral, no discounting and deep-pocketed
- **government**: insures bank deposits with no premium (ex-post lump-sum taxes)
- **bank**:
  - takes lending decisions and adjusts liabilities (capital and deposits)
  - has (risky) legacy assets
  - benefits from limited liabilities (no internalization of losses) and deposit insurance (no pricing of bank risk)

Banking Setup

ASSETS		**LIABILITIES**
(*new loans*)	x	k+c=$\gamma(x+\lambda)$(*capital*)
(*legacy loans*)	λ	d=(1-γ)$(x+\lambda)$(*deposits*)

where:

λ: date-1 **legacy loans** (predetermined) with risky payoff at date-2

x: **new loans** that mature at date-2 –> *decision var.*

k: date-1 **existing capital**

c: **change in capital** (net issuance/dividends payments) –> *decision var.*

γ is the capital requirement

d: date-1 **deposits** (perfectly elastically supplied)

Bank Default

The **bank defaults** on depositors if the date-2 total cash flows are too low to repay deposits:

$$d > X + A\lambda$$

- $X(x)$: the payoff function for new loans
- $A\lambda$: the risky payoff for legacy loans
- A it is distributed as $f(A)$ with positive support $[a_0, a_1]$ and mean 1
- $a_0 = d - X/\lambda$ is the realization of A below which the bank defaults on deposits
- $p = \int_{a_0}^{a_H} f(A)dA$ the probability that the bank does not default

Bank Lending

A Bank (with a strictly positive probability of default) chooses **new lending**, x, to maximize the shareholders expected date-2 payoff:

$$\max_x \int_{a_0}^{a_H} [X(x) + A\lambda - (d)]\, f(A) dA - (c)$$

where

$$d = (1-\gamma)(x+\lambda)$$
$$c = \gamma(x+\lambda) - k$$

Optimal lending s.t.

$$\int_{a_0}^{a_H} X_x - (1-\gamma) f(A) dA - \gamma = 0$$

–> Exp marginal returns on loan = Exp marginal cost of lending

$$X_x p = \gamma + p(1-\gamma)$$

Tighter Capital Requirements

1. **Capital composition effect**: Higher CR implies that banks substitute (subsidized) deposits with capital –> higher expected marginal cost of lending –> reduce lending

2. **Safety effect**: Higher equity reduce the bank probability of failure –> higher expected marginal returns (–>lower expected marginal cost of lending) –> increase lending

Overall effects on bank lending ambiguous

If (2) dominates: NO safety vs credit supply TRADE-OFF

–> 1+2: doesn't it mean that ultimately the effect on lending depends on the effect on marginal costs of lending? if tighter CR reduce cost of lending than lending supply increases.

Tighter Capital Requirements

Overall effects on bank lending: U-shaped relationship w.r.t. CR:

- **for low CR** a large increase in CR needed
- **for larger CR** also works for a small increase in CR

–> Which of the two effects dominate is ultimately a quantitative question!

Quantification of Effects

Model Parameters Values:

- CR: 13%, Basel III
- Annual probability bank default: 3%, Laeven and Valencia (2012)
- Corporate tax: 24%, OECD 2017
- Interest rate: 1.2%, 2017

1 pp CR increase:

- **baseline calibration**: generate a small increase in lending.
- **for lower CR** (8%) (and higher bank default prob?): causes a more substantial cut in lending.
- for the same level of CR, **weaker banks** (overvalued legacy assets): increase lending

–> What is the distinguished role of CR and benchmark level of **bank default** in driving the results?

Calibration

Proper quantitative assessment of the mechanism would be interesting!

EA:

- **pre-Basel III**/pre-crisis (2001-2006): Moody's average yearly expected default frequencies: $< 1\%$
- Beginning of the **implementation of Basel III**: Moody's EDF's between 3% and 4%.

–> What would be the implications for low CR-low default probability vs high CR-high default probability?

Are there gains/losses of tightening CR in more distressed/less economies/periods?

Positive vs Normative Analysis

- Does a cut in credit necessarily dominates the increase in bank safety and implied social costs of bank defaults?
- A growing number of papers studies the effects of **capital requirements and leverage constraints** in quantitative macro-banking models (e.g. Van Den Heuvel, 2008; Christiano and Ikeda, 2014; Martinez-Miera and Suarez, 2014; Corbae and D'Erasmo, 2017; Mendicino, Nikolov, Suarez, Supera, 2018; Begenau, 2018)
- A common feature: focus on the **long run allocation** of the economy and **social welfare**
- Previous results suggest need for **higher optimal capital requirements** for banks
- Would be interesting to explore the implications of your model/channels for **optimal** CR in a **quantitative setting**

Summary

- VERY nice paper: trade-off Safety vs Credit Cut might not be crucial when rising CR!
- Proper quantitative assessment of the mechanism would be interesting
- As well as assessment of the overall/welfare effects of CR tightening