

# A Macroprudential Approach to Financial Regulation

ECON 43370: Financial Crises

Eric Sims

University of Notre Dame

Spring 2019

# Readings

- ▶ Hanson, Kashyap, and Stein (2011)

# Micro Financial Regulation

- ▶ Traditional approach to banking regulation is *micro* in nature
- ▶ Because of externalities associated with failure, we have deposit insurance (FDIC): basically a form of bail out
- ▶ Promise of bailout leads to a moral hazard problem – banks take on too much risk
- ▶ Regulate banks to mitigate that moral hazard problem
- ▶ Principal regulatory tool: capital (equity)
- ▶ Need some “skin” in the game and a “cushion” to avoid losses

## Example

- ▶ Suppose a bank has assets of \$100 with \$6 of equity (leverage ratio of 16.67)
- ▶ Credit risk: assets fluctuate in value, resulting in fluctuations in equity
- ▶ If assets decline by more than \$6 in value, bank is insolvent
- ▶ Deposit insurance fund promises to make creditors (at least certain kinds of creditors) “whole”
- ▶ e.g. if assets decline in value by \$10, insurance fund is on the hook for \$4

## Example Continued

- ▶ Suppose there is a 99.5 percent probability that assets do not lose more than 6 percent in value
- ▶ If regulator wants probability of failure (and hence losses to insurance fund) equal to 0.5 percent, require capital ratio of 6 percent (maximum leverage ratio of  $100/6 = 16.67$ )
- ▶ Suppose assets lose \$2, so assets now \$98 and capital \$4 (capital ratio of 0.041)
- ▶ To get probability of failure back down to 0.5 percent, need to restore capital ratio to 6 percent
  1. Option 1: raise  $X$  of new capital:

$$\frac{4 + X}{98 + X} = 0.06 \Rightarrow X = 2$$

2. Option 2: sell  $Y$  of assets:

$$\frac{4}{98 - Y} = 0.06 \Rightarrow Y = 31.33$$

## A Couple of Observations

- ▶ First, probability of failure (credit risk wipes out equity) does not depend on *size* of balance sheet. It only depends on *ratio* of capital to assets
  - ▶ Hence, from a micro perspective do not care whether capital adequacy is achieved through **numerator** (raise more capital) or **denominator** (sell assets)
- ▶ Second, there is an implicit assumption that selling assets,  $Y \geq 0$ , does not affect their price and hence has no effect on capital
  - ▶ This is a **partial equilibrium** thought process. At a micro level, any one institution is small and should not affect market prices
- ▶ Third, one doesn't care about the *type* of capital (common or preferred stock)
  - ▶ All that you care about is that there is some junior asset class that gets "wiped out" before more senior creditors (i.e. depositors)

## A Macroprudential Perspective

- ▶ This logic may not make sense from a macro perspective
- ▶ You do not want **many institutions** trying to sell assets at the same time
- ▶ This will lower price (fire sale), which will make it harder to restore capital ratio
- ▶ Pecuniary (price) externality of sorts: individual institution doesn't internalize the effect of it selling assets on others
- ▶ Macroprudential regulation: *an effort to control the social costs associated with excessive balance sheet shrinkage on the part of multiple financial institutions hit with a common shock* (GHS, pg. 5)

# Credit Crunch

- ▶ Balance sheet shrinkage: trying to restore capital adequacy through the denominator
  - ▶ Can do through two ways: cut back on lending or sell existing assets
- ▶ Credit crunch: cut back on new lending. Results in non-financial firms having more difficulty accessing credit, slows aggregate demand
- ▶ Fire sale: sell existing assets. Drives prices down. This puts upward pressure on interest rates on new credit (ties into credit crunch) and exacerbates insolvency concerns

# Why Are Banks Unlikely to Restore Capital Adequacy Through the Numerator?

- ▶ More generally, but particularly in a systemic crisis, institutions are more likely to revert to balance sheet shrinkage
- ▶ Why?
  1. Debt is cheaper than equity (e.g. tax considerations). Some failure of Modigliani-Miller theorem (1958)
  2. Debt overhang (Meyer 1978). Because of seniority of debt, issuing new (junior) equity claims in a time where capital is “impaired” (capital ratios are low) is problematic

# Macroprudential Approach

- ▶ Because of cheapness of debt relative to equity and debt overhang:
  1. Banks unlikely to have enough capital in normal times
  2. In bad times are going to try to restore capital ratios via balance sheet shrinkage
- ▶ Macroprudential policy in a nutshell: try to counter these two tendencies

# Macroprudential Tools

1. Time-varying capital requirements
2. Higher quality capital
3. Dollars of capital, not ratios
4. Contingent capital
5. Focus on debt maturity
6. Regulation of shadow banking system

# Time-Varying Capital Requirements

- ▶ Basic idea: make capital requirements **high** in good times (to build a buffer) and **low** in bad times (to avoid incentives to sell assets)
- ▶ Trying to balance two competing things:
  - ▶ Want adequate supply of credit (argues for making capital requirements low)
  - ▶ Want to minimize likelihood of bank failure (argues for making capital requirements high)
- ▶ In good times, you are not worried too much about (1) – focus on (2) and make requirements high
- ▶ In bad times, you are willing to tolerate higher failure rates to encourage the supply of credit – focus on (1) and make requirements low

## Market vs. Regulatory Requirements

- ▶ Market may impose higher capital adequacy standard than regulators
- ▶ In other words, regulatory requirements may be non-binding
- ▶ To make them binding, need higher **average** capital requirements
- ▶ GHS argue for something like 15 percent (close to double current regulatory requirements)

## Better Capital Requirements

- ▶ Traditional requirements: “Tier 1” capital to risk-weighted assets
- ▶ Tier 1: includes both common and preferred stock
- ▶ Preferred stock is a hybrid debt instrument: more senior to common stock
- ▶ This exacerbates debt overhang problem
- ▶ Common stock wiped out first; preferred stockholders more senior claimants in event of bankruptcy
- ▶ Lots of preferred stock: difficult to recapitalize because new equity will go to “bail out” more senior preferred stockholders
- ▶ Conclusion: focus on common equity

## Focusing on Dollars, not Ratios

- ▶ Corrective action: when capital ratios fall below specified level, put institution in “penalty box” (e.g. no dividends, compensation restrictions) until adequacy restored
- ▶ But focusing on ratios gives institutions option of numerator or denominator
- ▶ Basic idea: require or strongly incentivize focusing on the numerator
- ▶ Suggestions: *dollar* targets for new capital (as in stress tests) or ratio computed based on backward-looking measure of maximum assets (which adjusts for size/scale, but makes adjusting denominator ineffective at restoring adequacy)

# Contingent Capital

- ▶ Corrective action based on dollars of capital: recapitalize when you get into trouble
- ▶ Could be difficult to do “on the fly”
- ▶ Alternative: force institutions to issue debt securities that convert to equity in some specified state of the world
  - ▶ Reverse convertibles or contingent convertibles
  - ▶ Capital insurance
- ▶ Logic: banks don't want to raise equity (they view it as expensive). Develop an arrangement where they only raise new equity when it is most valuable (a crisis)

# Debt Maturity

- ▶ Crises are about runs: debt is not rolled over (or withdrawn), forcing asset sales and potential losses
- ▶ Easier to “run” on debt the shorter the maturity – i.e. can’t demand my funds back on the fly if maturity is several years
- ▶ Non-internalized externality: banks don’t internalize the fact that if they can’t roll over short term debt, they will have to engage in asset sales, which imposes a cost on others
- ▶ So private market: too much short term debt
- ▶ Suggestion: regulate maturity structure of debt

# Shadow Banking System

- ▶ Fire sale risk applies to any intermediary engaging in maturity transformation
- ▶ In some respects, rise of shadow banking system was attempt to evade regulations associated with traditional banking
- ▶ To make the system safe, need *similar* capital requirements on non-depository institutions

# Haircuts

- ▶ A Repo haircut (overcollateralization) is essentially a form of a capital requirement
- ▶ Suppose haircut is zero: I can borrow \$100 million to finance \$100 million of assets (infinite leverage, no equity)
- ▶ Suppose haircut is 10 percent: I can borrow \$90 million to finance \$100 million of assets (leverage of 10, \$10 million equity)
- ▶ Basic logic: if loans can be made via traditional bank subject to capital requirement or via securitization and shadow banking system, if capital is costly relative to debt, credit intermediation will migrate towards unregulated system
- ▶ Put them on similar playing field
- ▶ Second, requiring bigger haircuts (more capitalization) makes failure to roll over short term debt less consequential

# The Costs of Capital Requirements

- ▶ In economics, there is no free lunch
- ▶ Requiring more and better capital – less susceptibility to run dynamics (benefit)
- ▶ Cost: if capital is more expensive form of financing, this will reduce overall credit supply
- ▶ Why is equity a less preferred form of financing than debt?  
Some failure of Modigliani-Miller (1958)
  - ▶ *Not* simply that equity is riskier (more junior) than debt
  - ▶ More likely:
    - ▶ Tax treatment
    - ▶ “Money premium” to short term debt

## Not So Costly?

- ▶ GHS argue that the costs of higher capital requirements are not that high
- ▶ Back of the envelope calculations: might increase lending rates 25-35 basis points. Not that big of a deal
- ▶ Empirically: little obvious association between capital ratios and lending spreads
- ▶ “Competition Hypothesis”: more competition results in lower capital ratios
- ▶ Ties into our discussion of charter value: banks facing more competition tend to have lower capital, yet even smaller banks with large capital ratios seem to survive and in some cases thrive
- ▶ Big issue (ties into regulation of shadow banks): don't want to overly encourage business to leave regulated sector for unregulated sector

# Capital Regulations

- ▶ **Basel I:** minimum tier 1 capital to risk-weighted asset ratio of 8 percent
  - ▶ Weights: 0 for Treasuries and cash, 20 percent for AAA securitizations (i.e. MBS), 50 percent for residential mortgages, 100 percent (corporate debt)
  - ▶ Tier 1 capital: common stock, preferred stock, retained earnings
- ▶ **Basel III:** updates Basel II by:
  - ▶ Higher common equity requirement
  - ▶ Time-varying capital ratios
  - ▶ Systemically important firms have to have more capital
  - ▶ Imposes some liquidity requirements as well (net stable funding ratio)

# Dodd-Frank and Coming to Grips with Shadow Banking

- ▶ Here, GHS argue that progress has not been so good
- ▶ Tighter and common sense regulations on banks
- ▶ But non-bank entities engage in credit provision as well
- ▶ Need to keep the playing field level
- ▶ Dodd-Frank gave Fed greater supervisory power but made it harder to invoke 13(3)