

The Macroeconomics of Imperfect Capital Markets

Anton Korinek

University of Maryland

Lecture 2: Introduction to the Modern Financial System, Part 2

- **Alessandri and Haldane: Banking on the State**

- rising importance of financial markets has led to expanding safety nets: liquidity insurance/deposit insurance/capital insurance
- expanding safety nets have increased moral hazard
 - we need tighter regulation to keep pace with greater moral hazard

- **Haldane: The \$100bn Question**

- externalities in banking:

social cost of banks $>$ private cost

- estimate for social costs in US: \$100bn/year
- increased size of banks raises social costs
 - consider limits on size: \$100bn?!

Adrian, Colla and Shin (2012): Which Financial Frictions? Parsing the Evidence from the Financial Crisis of 2007-9 (NBER Macro Annual)

- Empirical analysis of the channels through which the financial crisis of 2007-09 affected macroeconomic activity, describing
 - evolution of bank lending and market finance
 - behavior of interest rates/spreads
 - effects on different types of borrowers
 - determinants of bank credit supply

Which Financial Frictions?

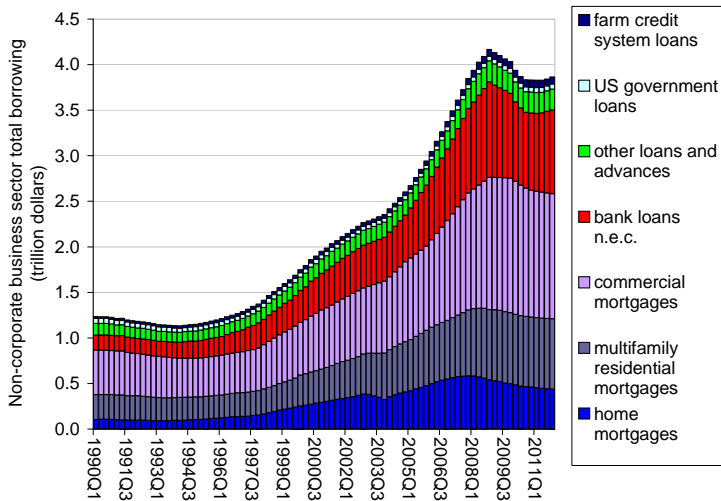


Figure: Credit to Non-Financial Non-Corporate Businesses (US Flow of Funds)

Which Financial Frictions?

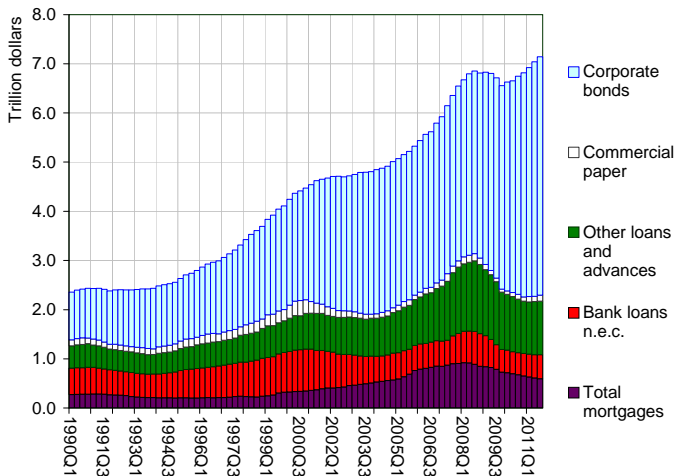


Figure: Credit to Non-Financial **Corporate Sector** (US Flow of Funds)

Which Financial Frictions?

Contrasting access to finance:

- Non-corporate sector (SMEs):
 - mortgages make up two thirds of finance
 - during crisis: 8% decline in credit
- Corporate sector:
 - almost half of funds through market finance
 - during crisis: bank finance declined; market finance made up for it

Which Financial Frictions?

Microeconomic Evidence:

- micro-level dataset of new loans and bonds issued for real investment
- during crisis: loan issuance fell 75%
bond issuance doubled
- risk premium on loans rose four-fold
risk premium on bonds tripled

→ consistent with negative supply shock in bank credit,
leading to increased demand for market finance

→ firms that do not have access to markets are hit severely

→ highest quality firms have easiest access to credit

Which Financial Frictions?

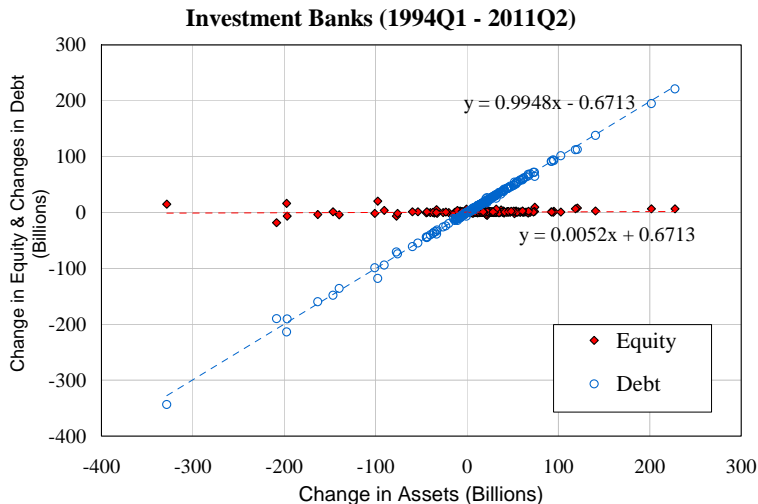


Figure: Balance sheet management of investment banks

Which Financial Frictions?

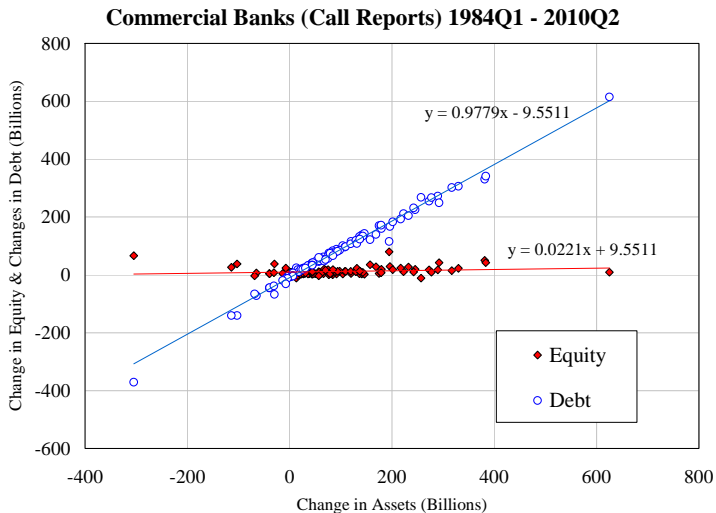


Figure: Balance sheet management of commercial banks

Which Financial Frictions?

Balance sheet management of financial sector:

- for both investment and commercial banks:
 - changes in assets are driven mainly by changes in leverage, not changes in (book) equity
- for investment banks:
 - leverage is procyclical
- risk premia driven by both net worth and leverage

Which Financial Frictions?

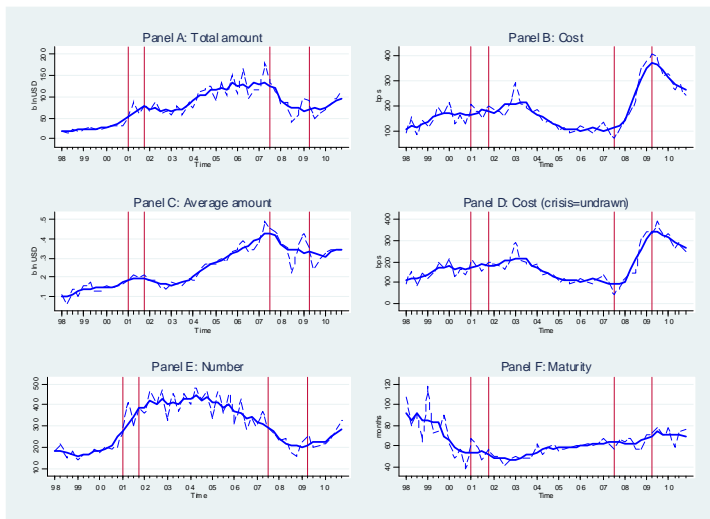


Figure: New issuance of debt (bonds + loans)

Which Financial Frictions?

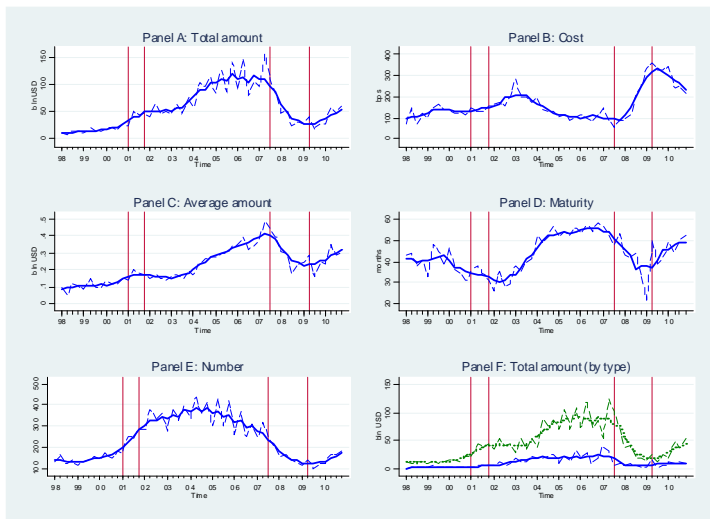


Figure: New issuance of loans

Which Financial Frictions?

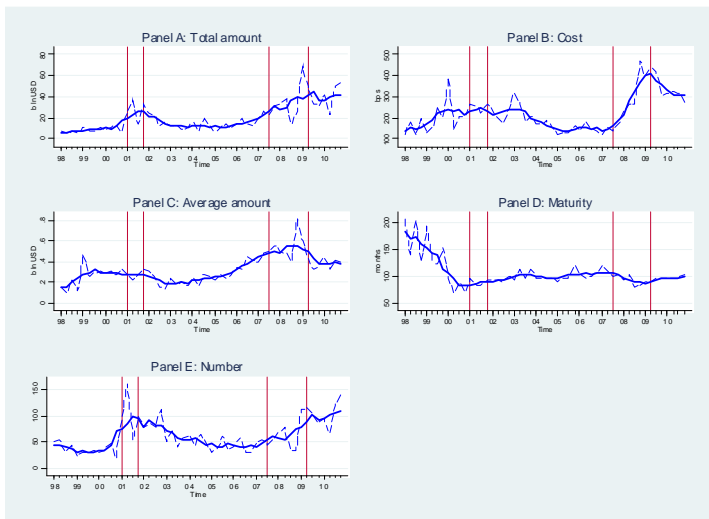


Figure: New issuance of bonds

Adrian, Colla and Shin (2012)

- Loans:
 - issuance dropped by 75%
 - spread increased four-fold
 - maturities shorten
 - both revolving credit lines and term loans dropped, the former recovering more quickly
- Bonds:
 - bonds more important than commercial paper
 - issuance doubled
 - spread tripled
 - maturities also shorten

Which Financial Frictions?

Five Important Features to Incorporate in Models:

- 1 Distinguish between direct and intermediated finance
- 2 In crisis, intermediated finance contracts but direct finance expands
- 3 Spreads on both types of finance rose
- 4 Intermediate finance is driven by change in leverage not equity
- 5 Bank leverage is procyclical

Looting: The Economic Underworld of Bankruptcy for Profit

- Document events around a number of financial crises in 1980s:
 - US Savings & Loan crisis
 - Chilean financial crisis
 - Dallas housing bubble
 - junk bond market collapse
- Suggests common reasons behind these collapses:
 - bankruptcy for profit
- in presence of guarantees and lax regulation, firm owners may have incentive to extract more than the true NPV from a firm and then send it into bankruptcy
 - losses are absorbed by guarantors
- looting strategy may impose large costs on society, typically greater than what was extracted

A Simple Model

- Necessary ingredients:
 - limited liability: allows borrowers to exploit creditors
 - inefficient contracting: creditors do not (cannot) discipline borrowers
- Assume corporation that can obtain unlimited amount of government loans
- V ... true net present value (NPV) of a
 M .. maximum dividend that owners are allowed to extract
- if $V > M$, standard value maximization
→ government guarantee irrelevant
- if $M > V$, owners borrow and pay themselves M
→ bankruptcy for profit
→ owners maximize amount extracted

NOTE: this is different from typical excessive risk-taking story

The General Model

- three time periods $t = 0, 1, 2$, interest rates r_1, r_2
- initial investment in bank W_0
- bank receives insured deposits of L_0
- bank purchases assets worth $A = W_0 + L_0$,
capital requirement: $W_0 \geq cA$
- assets pay off $\rho_1(A)$ and $\rho_2(A)$
- bank pays dividends Δ_1 and Δ_2
- deposit liabilities $L_1 = (1 + r_1)L_0 - \rho_1(A) + \Delta_1$
- maximization of true value (in period 1 terms):

$$V^* = \max_{A, \Delta_1} \frac{\rho_2(A) - (1 + r_2)[(1 + r_1)L_0 - \rho_1(A) + \Delta_1]}{1 + r_2} + \Delta_1$$

$$\text{s.t. } 0 \leq cA_0 \leq W_0$$

- observe: dividend payment Δ_1 cancels out

The General Model (2)

- maximization under limited liability (with constraint $\Delta_1 \leq M(A)$):

$$E = \max_{A, \Delta_1, \Delta_2} \frac{\Delta_2}{1 + r_2} + \Delta_1$$

$$\text{s.t. } 0 \leq cA_0 \leq W_0$$

$$\Delta_1 \leq M(A)$$

$$\Delta_2 \leq \max \{0, \rho_2(A) - (1 + r_2) [(1 + r_1) L_0 - \rho_1(A) + \Delta_1]\}$$

- define M^* as maximum $M(A)$ given that $0 \leq cA_0 \leq W_0$

Theorem

If $M^ \leq V^*$, A is chosen to maximize true economic value*

If $M^ > V^*$, A chosen to maximize $\Delta_1 = M(A)$; default in period 2*

→ bankruptcy as an optimal choice

Observe: bankruptcy for profit involves negative NPV projects (looting)

Extension to Fraud

- often fraudulent activities F used to increase $M(A, F)$ at a cost $C(F)$
- denote $M^* = \max_{A, F} M(A, F) - C(F)$
- intuition from before holds: looting if $M^* > V^*$

Observe: looting is more likely if

- V^* small
- constraint M is lax
- cost of fraud $C(F)$ is low

Examples of Looting

- 1 Inflated Net Worth (e.g. accounting for goodwill)
→ relaxes constraint $cA_0 \leq W_0$
- 2 Riding the Yield Curve if $r_1 < r_2$:
coupon rate of bonds will satisfy $r_1 < r_L < r_2$
→ seeming short-term profits $r_L A > r_1 A$
→ if $(r_L - r_1) > c$, then looting is possible
- 3 Acquisition, Development and Construction Loans:
no-recourse loans to developers that included development fees, origination fees and interest for first several years (but were almost certain to default)
→ if initial fees $> c$, incentive to loot

1982 Financial Crisis in Chile

- “Peso problem:” currency peg expected to depreciate
→ interest premium on domestic currency
- correct accounting treatment:
interest differential = risk premium, to be held as reserve
- at first, banks booked interest differential as profits
- after regulators intervened and forbid currency mismatch, banks engaged in dollar lending to (unhedged) borrowers
→ currency mismatch hidden as credit risk
→ bank and borrower complicit (and often related)
- eventually the system collapsed

US Savings and Loans Crisis in 1980s

- early 1980s: S&L industry in trouble
- federal government relaxed regulations to avoid rescue (forbearance):
 - generous accounting for net worth (e.g. goodwill depreciation over 40 years)
 - generous definition of “current income” (e.g. fees)
- liberalized their lending activities
- ample evidence for looting in Texas:
using comparison of S&L sector with bank sector, excessive resolution costs of \$100bn

Collateral Damage:

① Real Estate Boom and Bust in Dallas

- looting banks and parasitic developers continued building even when no longer commercially viable
- bubble fueled by “honest” developers who failed to understand

② Bubble in Market for Junk Bonds and Takeovers

- Mike Milken at Drexel Burnham Lambert worked with captive S&Ls
- corporate takeover relied on ability to raise billions of dollars quickly
- captive S&Ls helped him to inflate his reputation:
 - guaranteed successful underwriting
 - refinance failing projects
- empire collapsed in 1989