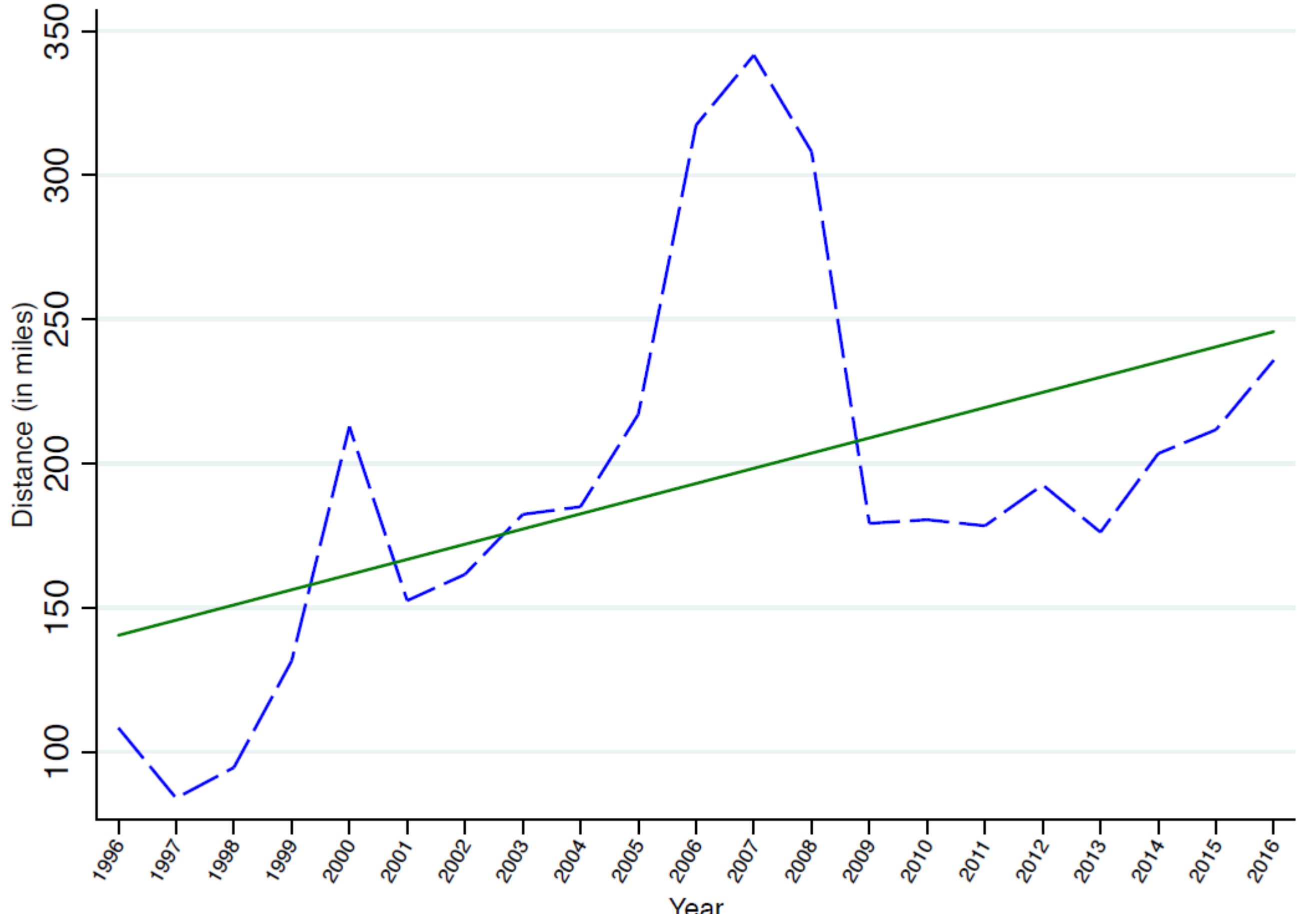
Liquidity and the Structure of Intermediation

Douglas W Diamond[1] Yunzhi Hu[2], and Raghuram Rajan[1]
[1]Chicago Booth [2]UNC Kenan-Flagler

AEA Meetings January 2020

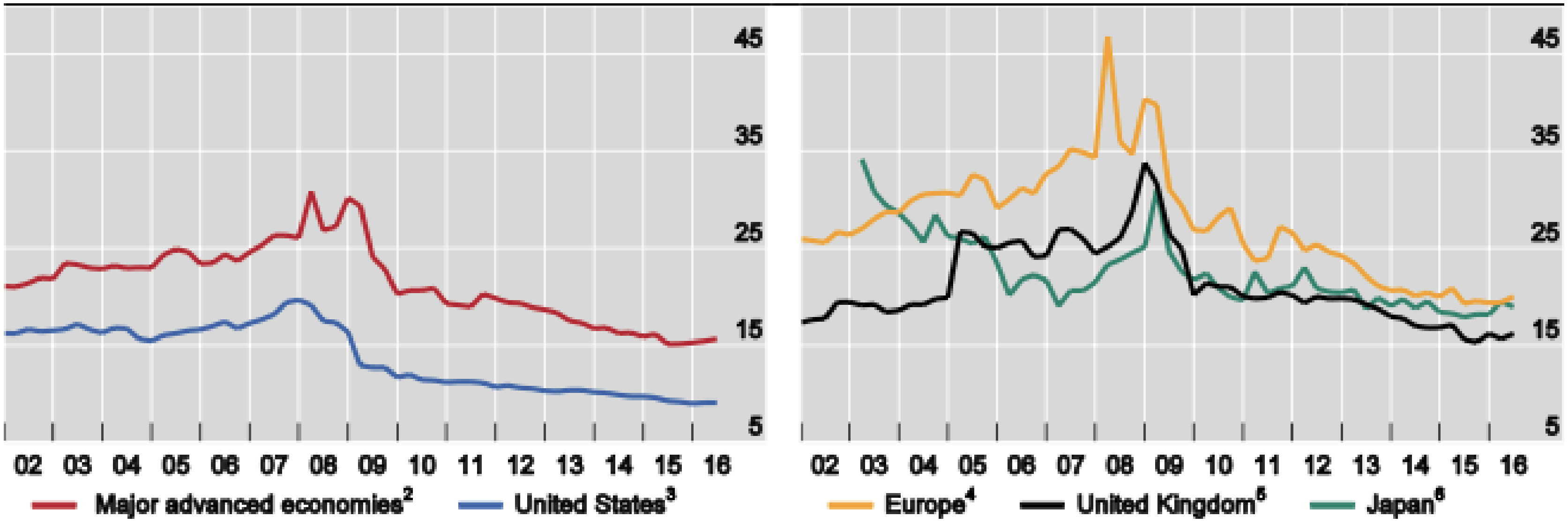
CHICAGO BOOTH
The University of Chicago Booth School of Business

Average lending distance between firm and bank in the United States (Granja, Leuz, and Rajan (2019))



Source: Community Reinvestment Act Small Business Lending Dataset and Summary of Deposits Dataset

Pro-cyclical Intermediary Leverage



[1] Total assets divided by total equity, weighted by asset size. [2] For all the banks showed in this graph. [3] Bank of America, Citigroup, Goldman Sachs, JPMorgan Chase, Lehman Brothers (up to 08Q2), Merrill Lynch & Co, Morgan Stanley, Wachovia Corporation (up to 08Q2) and Wells Fargo & Company. [4] Banco Santander, BNP Paribas, Commerzbank AG, Credit Suisse, Deutsche Bank, UBS, UniCredit SpA. [5] Barclays, HSBC, Lloyds TSB Group, Royal Bank of Scotland. [6] Mitsubishi UFJ Financial Group, Mizuho Financial Group, Sumitomo Mitsui Financial Group.

Sources: Capital IQ; BIS calculations.

Motivation

- What explains the seemingly increased risk taking over the financial cycle?
- What explains low intermediary capital/high leverage at the peak?
- Are the two connected?

Yes! Via corporate liquidity

- Liquidity: the wealth (net worth) of experts in the real sector (firms) who are able to produce with specialized assets.
  - Current net worth/liquidity ⇒ Can reduce upfront borrowing.
  - Increased anticipated future net worth/liquidity ⇒ Increases the future value of the firm as collateral (Shleifer-Vishny (1992)).
- Financial intermediaries:
  - Increase corporate governance through screening, monitoring, and certification
  - Certify intermediation services through “skin in the game” capital

This paper

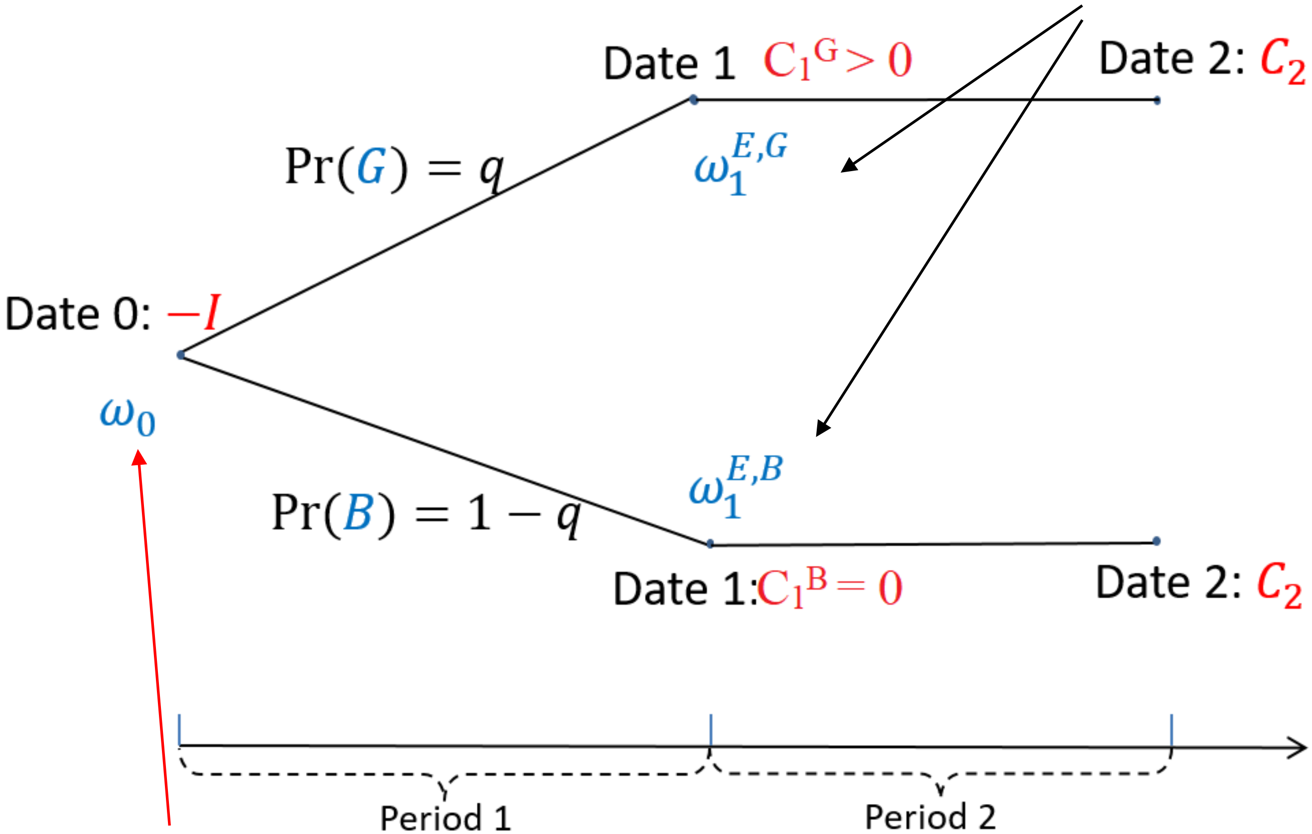
- What changes over the financial cycle: corporate liquidity!
  - Perhaps affected by monetary policy
- Current and future liquidity alters the need for governance services provided by intermediaries
  - Lowers up front borrowing and increases debt recovery
  - e.g., Liquid housing market
- Periods of abundant anticipated liquidity narrow sources of finance:
  - Increases dependence of corporate borrowing on continuing liquidity while reducing need for “skin in the game” intermediary capital.
  - Riskier loans may be made
- May seem like low intermediary capital causes intermediary risk taking but…

The model in four slides

- Corporate expert needs to borrow for a two-period project of size I
- After starting project, incumbent expert may need to sell out (or raise more financing) at interim date
- Only other experts can run the project. They are the natural bidders at an interim date.
- Their bids allow the incumbent to sell out if needed but also help the financier enforce payments.
- Financiers
  - Bank – can screen experts
  - Direct investors -- cannot
- Financiers can enforce debt by
  - Seizing project on non-payment and selling to other experts or threatening to do so.
  - Directly appropriating cash flows if corporate governance/cash flow pledgeability is high.

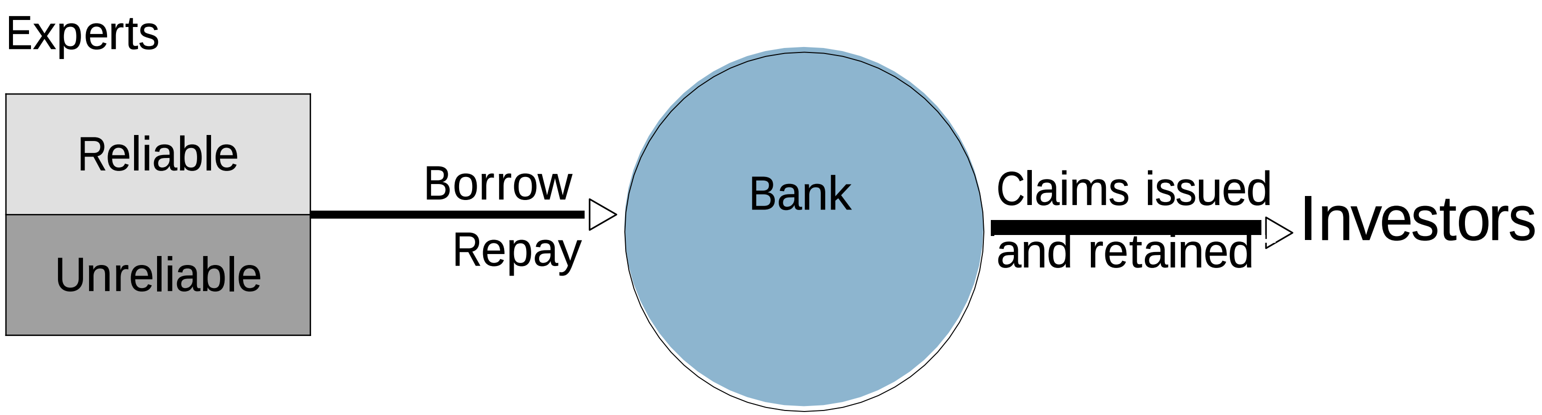
The project and current and future liquidity

- Three-date, two-period, uncertain future industry liquidity



- Initial expert has liquidity ω_0 and needs to borrow at least $I - \omega_0$ at date 0 through short-term debt contract D_1
  - ω_0 – our notion of current liquidity, ω_1^{E,s_1} is anticipated future liquidity in state s_1.

The Role of the Intermediary



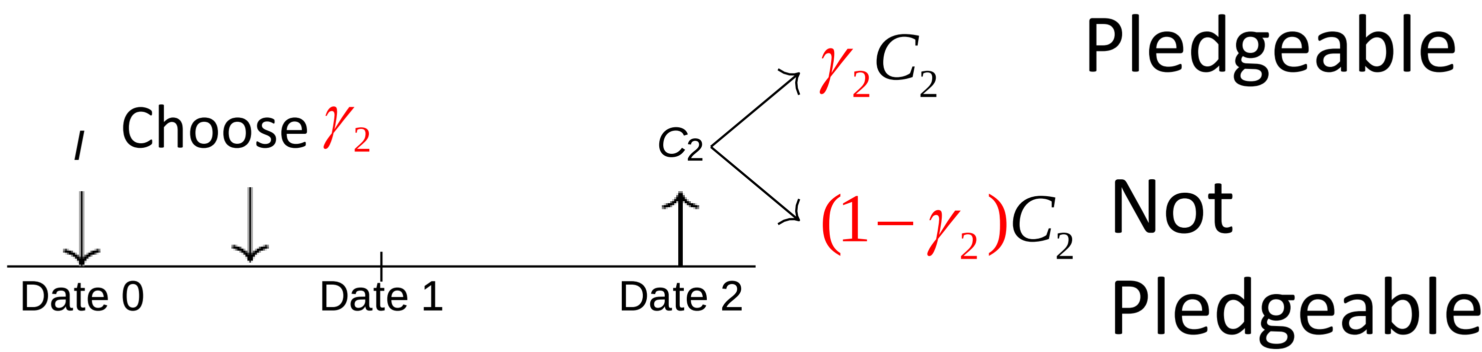
► Only reliable experts can increase cash flow pledgeability. Only banks can screen for such experts up front.

- Higher pledgeability increases the fraction of verifiable cash flow that any lender can appropriate

► Bank: Costly screening thus enhances governance/pledgeability

- Bank capital: costly equity retention to commit to screening/monitoring

Governance/pledgeability of cash flows



- Reliable incumbent can increase pledgeability and borrowing capacity
  - Can increase γ_2 from $\underline{\gamma}$ to $\overline{\gamma}$ after date 0.
  - $\gamma_2 C_2$ is verifiable and can be a committed date-2 payment to any investor.
  - Increased γ_2 may allow more to be borrowed at date 1 (and may increase bids for the firm at date 1).
  - But γ_2 is set by the incumbent after borrowing. Why would she increase it if it increases her repayment?
    - Higher incentive to increase if high need to sell/raise funds
    - Incentive lower if high debt outstanding

Payment Enforcement

- Debt enforcement by banker at date 1 through threat of sales to other experts for the amount they bid.
  Experts with higher net worth can bid more.
- ω_1^{E,s_1} – outside experts' own funds (anticipated future liquidity in state s_1)
- Cash flow pledgeability: $\gamma_2 C_2$
- At future date 1 experts will bid:

$$B_1^{E,s_1}(\gamma_2) = \min\left\{ \underbrace{\omega_1^{E,s_1}}_{\text{date-1 liquidity}} + \underbrace{\gamma_2 C_2}_{\text{pledgeability-based borrowing}}, \underbrace{C_2}_{\text{value of asset}} \right\}$$

Results

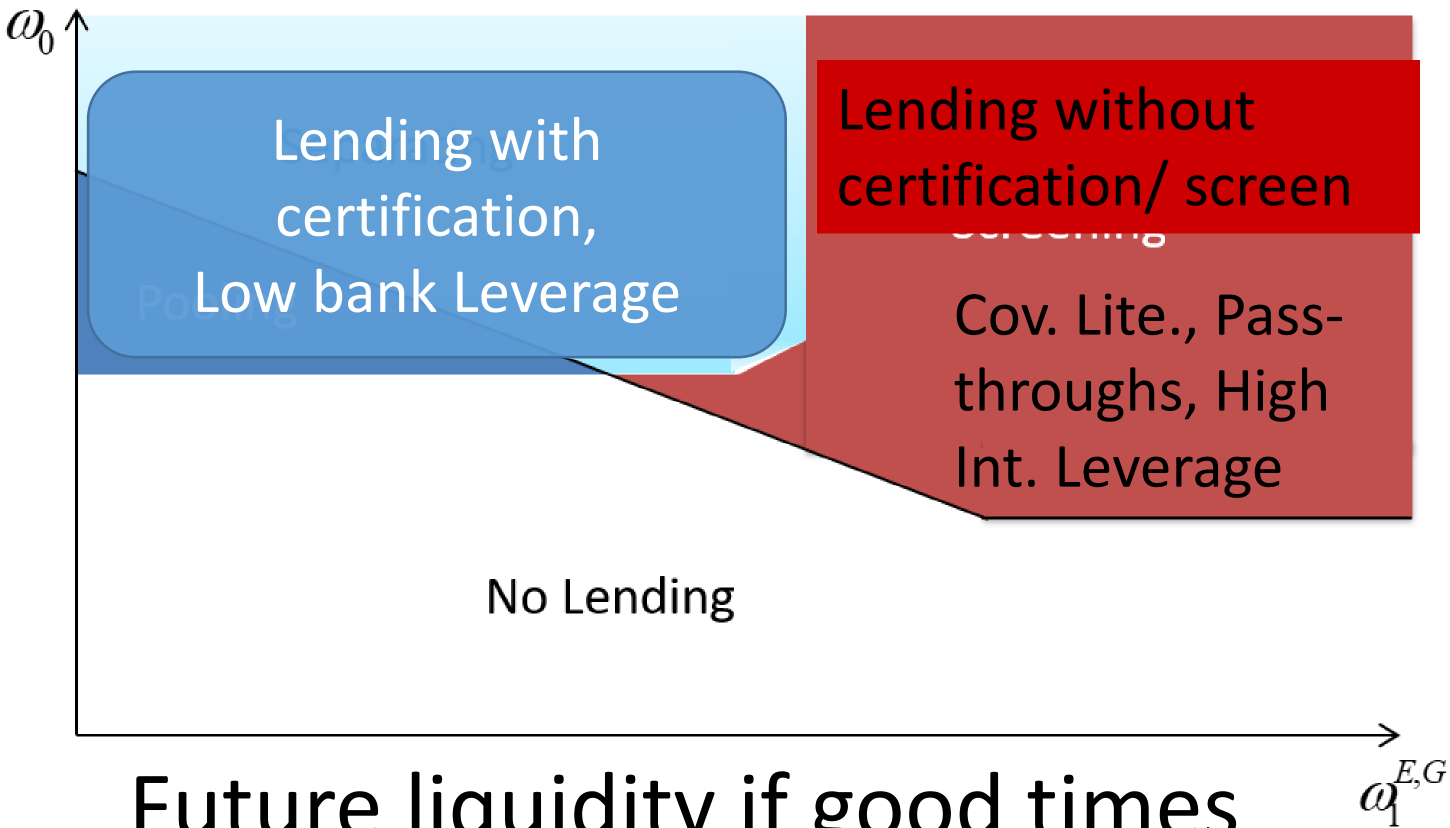
- Higher anticipated corporate liquidity, higher debt repayment can be supported without pledgeability
- Higher debt outstanding, lower incentive to raise pledgeability

Implications for equilibria

- High future corporate liquidity =>higher amount can be borrowed today
  - Low pledgeability set and low need for intermediation
  - Banks have low capital
  - Higher credit risk, especially if liquidity does not materialize
- Moderate corporate liquidity=>moderate borrowing today
  - High pledgeability and high need for intermediation
  - Banks have high capital to commit to perform screening services
  - Lower credit risk but more credit rationing

Equilibrium Roles for Intermediaries

Current
Liquidity



Future liquidity if good times
continue

Conclusion

- Abundant corporate liquidity reduces the need for governance and also intermediary services that enhance governance.
  - Narrows sources of finance
- Reduced need for intermediary to commit to providing services implies less need for intermediary capital.
  - Demand for intermediary capital low
  - Pass-through entities proliferate
- Resulting low corporate pledgeability/low intermediary capital can really hurt the economy if corporate liquidity evaporates.
- High liquidity, not low capital, is ultimate cause of risk taking in the model.