Discussion of:

Repo Runs

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Overview

- Paper presents a model of potentially-fragile financial institutions
  - in the tradition of Diamond & Dybvig
- Uses this model to examine stability/fragility of different institutional arrangements for maturity transformation
  - commercial banking
  - tri-party repo, bilateral repo
  - money market mutual funds, etc.
- Shows that fragility depends on the details of the arrangements

My discussion

- Present a simpler model
  - 3 time periods
  - captures many (but not all) of the features of their model
- Use this model to summarize their results
  - relate them to the existing literature
- Offer some comments

A simple model

- $t = 0, 1, 2$

- mass N of investors with Diamond-Dybvig preferences

$$u(c_1, c_2) = \left\{ \begin{array}{c} u_1(c_1) \\ u_2(c_2) \end{array} \right\} \text{ with prob. } \left\{ \begin{array}{c} \alpha \\ 1-\alpha \end{array} \right\}$$

  - endowment of 1 at $t = 0$, none later

  - can store good between periods

- N dealers (or "banks") with linear preferences

$$u(c_0, c_1, c_2) = c_0 + \beta c_1 + \beta^2 c_2$$

  - large endowment at $t = 0$

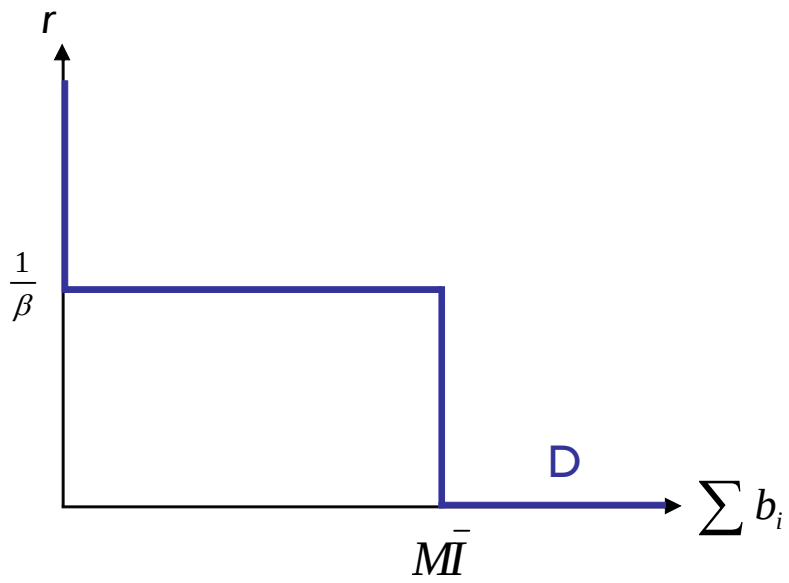
Technologies

- Each dealer has access to an investment technology
  - investment at $t = 0$ yields $\left\{ \begin{array}{c} 1 \\ R > 1 \end{array} \right\}$ at $t = \left\{ \begin{array}{c} 1 \\ 2 \end{array} \right\}$
  - assume $\beta^2 R > 1$
  - maximum scale $\overline{I}$

- Dealers accept demand deposits from investors
  - offer interest rate $r > 1$ in *each* period
  - borrow an amount b_i ($\sim$ leverage)

Intermediation

- Dealers' demand for funds:



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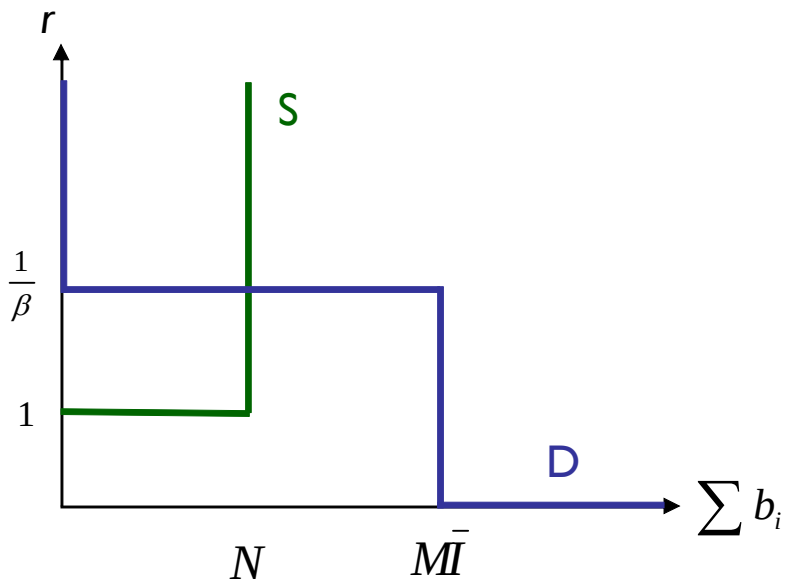

- Investors supply funds inelastically

- Equilibrium borrowing Σb_i is determined by supply N

Properties of equilibrium

- Note: individual b_i are indeterminate
  - each dealer is indifferent over a broad range
  - aggregate leverage is pinned down (by the supply of funds)
  - individual leverage can vary across dealers

- Dealers make profit (rents on their fixed-capacity technology)

$\Rightarrow$ Simple model captures many features of the overlapping-generations model in the paper

Fragility

- Is a dealer susceptible to a self-fulfilling run at $t = 1$?
- Dealer has:

assets	liabilities
$\overline{I}$	rb_i

- Can satisfy withdrawal demand even if all investors withdraw if

$$\overline{I} \geq rb_i$$

- Otherwise, baseline bankruptcy rule:
  assets divided evenly among investors who withdraw early
- Dealer is fragile if and only if this "liquidity constraint" is violated
  - a patient investor who does not join the run receives zero

- Note: in the standard Diamond-Dybvig model, **all** funds come from depositors
  - the liquidity constraint is always violated
  - the bank is always susceptible to a run
- New here:
  - internal funds (capital, profits) can help a dealer survive a run
  - fragility depends on leverage b_i

- The literature following Diamond-Dybvig has focused on flexibility in the deposit contract (payment schedule)
  - banks don't pay depositors at face value until everything is gone
  - suspension, rescheduling, etc. $\longrightarrow$ state-contingent payoffs
- Question: are banks fragile when the deposit contract is endogenous?
  - answer depends on features of environment, esp. commitment
- The approach here is similar in spirit
  - examine fragility under specific institutional arrangements

Tri-party repo with "unwind"

- At $t = 1$, dealer borrows funds and repays all investors
- Asks investors if they want to reinvest until $t = 2$
  - offers unmatured investment as collateral
  - uses redeposited money to pay off intraday loan
- If insufficient funds are redeposited, dealer fails
  - note: happens only if liquidity constraint is violated
  - in this event, agents who did redeposit keep their collateral
  - investors discount value of collateral by $\gamma < 1$

- Key issue: payoffs available to a patient investor who expects a run
  - does not redeposit: r
  - redeposits: $\gamma R \kappa_i$

- Introduces a "collateral constraint"

$$\gamma R \kappa_i \geq r$$

  - dealer is fragile if this condition **and** liquidity constraint are violated

$\Rightarrow$ Improvement over the baseline arrangement, but still fragile

Tri-party repo with no unwind

- Now suppose dealer asks "Who wants to roll over their repo loan?"
  - if sufficiently many agree, the dealer continues
  - otherwise, liquidate dealer, divide funds evenly among investors
- An investor's payoff is now independent of his choice if others run
  - receives an even share of the collateral, regardless of his answer
  - no (strict) incentive to run
- Key feature: no way for an investor to "get out first"

$\Rightarrow$ This arrangement is stable (not fragile)

- Paper applies same methodology to other arrangements
  - bilateral repos, money market mutual funds, etc.
- Main point: the institutional arrangements generates a game
  - some games admit bad equilibria (fragility), others do not

Comments

- This is an interesting and worthwhile exercise
  - we observe different types of financial arrangements, some have appeared to be more robust than others
  - need a framework for understanding why
- My comments will focus on policy implications

(1) Why does this unwind arrangement exist?

- In the model, it is a clearly inferior arrangement

- Possible answers:
  - historical accident (perhaps combined with laziness)
  - it serves some useful purpose that is missing from the model

- Answer may not matter for a positive analysis of fragility
  ...but is clearly important for thinking about policy implications
  - is there scope for welfare-improving regulation? If so, what?
  - would want to be explicit about the source of market failure

(2) Capital requirements and leverage ratios

- First thought: regulation of b_i would be very useful
  - dealers are indifferent over a wide range
  - a cap on b_i might costlessly eliminate fragility of high-leverage dealers
- But .. if dealers anticipate a possible run, they will not be indifferent
- The model treats a run as an unexpected shock
  - makes normative analysis of ex ante regulation difficult
- Could you add a probability $q > 0$ of a run?

Summary

- Interesting paper
- Current approach focuses on positive analysis of fragility
- What can be done in terms of normative analysis?
  - there are a lot of interesting policy questions
  - here, or in future work