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

$$u(c_1, c_2) = \begin{cases} u_1(c_1) \\ u_2(c_2) \end{cases} \quad \text{with prob.} \quad \begin{cases} \alpha \\ 1 - \alpha \end{cases}$$

– 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 $\{ \frac{1}{R > 1} \}$ at $t = \begin{pmatrix} 1 \\ 2 \end{pmatrix}$

  – assume $\beta^2 R > 1$

  – maximum scale $\bar{T}$

• 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:

\[ \sum b_i \]
Intermediation

- Dealers’ demand for funds:

\[ \beta_1 D \]

- Investors supply funds inelastically

- Equilibrium borrowing \( \Sigma b_i \) 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)

⇒ 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:

<table>
<thead>
<tr>
<th>assets</th>
<th>liabilities</th>
</tr>
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<tbody>
<tr>
<td>$I$</td>
<td>$rb_i$</td>
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• Can satisfy withdrawal demand even if all investors withdraw if

$$I \geq rb_i$$

• 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. → 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”

⇒ 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