

Discussion of:

# A Model of a Systemic Bank Run

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# Motivation

- Observers claim that some recent events are “just like” a bank run
  - draw policy conclusions based on this analogy
- We have a canonical model of bank runs
  - Diamond and Dybvig (1983) and many subsequent variations
- However:
  - some critical elements of the common story about recent events are not in the model
  - (there is also some debate about the policy conclusions of the basic model)

- Goal: build a richer version of the Diamond-Dybvig framework
  - more directly linked to current events
  - use this model to inform current policy debate
- Key shortcomings of standard model:
  - (i) the current crisis is a run by intermediaries, not depositors
  - (ii) the crisis also has important *systemic* elements
- I will argue that (ii) is the relevant issue
  - start with the basic Diamond-Dybvig model

## The Diamond-Dybvig model

- Continuum of depositors
  - each may be patient or impatient
  - expected utility:  $\phi u(c_1) + (1 - \phi) u(c_2)$
- Bank divides assets between storage and investment
  - investment yields  $R > 1$  if held to maturity
  - but only yields  $q \leq 1$  if liquidated early
- Competition leads bank to maximize  $E[u]$  subject to feasibility
- A run equilibrium exists under some conditions

## The Diamond-Dybvig model: a “bank-on-bank” run

- Continuum of **local banks**
  - each may **have** patient or impatient **depositors**
  - expected utility:  $\phi u(c_1) + (1 - \phi) u(c_2)$
- **Core** bank divides assets between storage and investment
  - investment yields  $R > 1$  if held to maturity
  - but only yields  $q \leq 1$  if **sold to outside investors**
- Competition leads **core** bank to maximize  $E[u]$  subject to feasibility
- A run equilibrium exists under some conditions

- ⇒ A “wholesale” run is not very different from a “retail” run  
(in modeling terms)
- The paper does more than relabel variables, of course
    - differentiates local bank and its depositors
    - has location-specific risk that generates a role for core banks  
⇒ true tiering of financial system
  - However, I would argue that is not the main issue/contribution
    - I want to focus on systemic effects

## The Diamond-Dybvig model: a system-wide run

- It is also easy to model a system-wide bank run
- Suppose there are many core banks
  - each core bank has its own set of local banks/depositors
  - depositors in a core bank run if they observe a negative “sunspot” signal
- Suppose all depositors coordinate on the same signal
  - then a run, when it occurs, will be system wide
  - but ... is this a *systemic* run?

- In the model above, there is no linkage between the core banks
  - systemic  $\approx$  a run on some banks adversely affects other banks
- One approach: payoff externality in liquidation costs (“fire sale”)
  - suppose  $q(L)$  where  $L =$  total assets liquidated with  $q'(L) \neq 0$
- Fire sale pricing  $\Rightarrow$  high return on assets between  $t = 1$  and  $t = 2$ 
  - why don't outside investors buy, drive up prices?
  - answering this question is not trivial
  - optimal policy response may depend critically on the answer
- The paper looks at two theories: [loss aversion](#) and [moral hazard](#)



## Loss aversion

- Return  $R$  is random and heterogeneous across assets
- Some outside investors are experts who pay fair value
  - fixed mass of these investors
- All other outside investors are loss averse
  - willing to pay the value of the asset in the worst state
- As  $L$  increases, larger fraction of sales goes to loss averse investor
  - a run on some bank lowers average sale price;  $q'(L) < 0$
  - this makes other banks more susceptible to a run

## Moral hazard

- Classic lemons problem
  - banks know value of their assets, outside investors do not
  - banks would like to unload worst assets
- When depositors run, bank is forced to sell all assets
- Forced sales improve average quality of assets sold
  - a run on some banks raises the sale price;  $q'(L) > 0$
  - this makes other banks *less* susceptible to a run
  - runs counter to common view of current events

## Comments: (1) policy implications

- Conclusion: trust the policy implications of the loss-aversion model
- Paper offers some preliminary thoughts on what these implications might be
  - govt purchases of assets at above-market prices: good
  - offers taxpayers a high expected return
- But ... what if taxpayers are loss averse?
- Paper is careful not to make welfare statements
  - but ... we would like to be able to evaluate policy proposals in terms of welfare

## (2) Theories of $q(L)$

- The paper considers two specific theories of  $q(L)$ 
  - many other possibilities; how sensitive are results?
- Will any model with  $q'(L) < 0$  lead to same policy recommendation?
  - probably not
- How can we judge whether the loss aversion theory is really useful?
  - personally, I would prefer a theory that does not rely on “funny” preferences
- What other tests should a model pass before I trust its recommendation?

### (3) Multiplicity

- The model has multiple equilibria
  - a “fundamental” run and a self-fulfilling run
- Do the policy conclusions of the model vary across equilibria?
  - seems possible (perhaps even likely)
- If so, how can we determine which is the relevant one?

## (4) Probability of a crisis

- Paper views the current situation as triggered by an unlikely shock
  - ex ante probability of a bust  $\approx 0$ , or ...
  - bust state was “irrationally ignored” when contracts were signed
- What if the bust state was *rationally* ignored?
  - agents anticipate government intervention following some event(s), make contractual arrangements accordingly
  - these arrangements can make the event more likely to occur (Ennis and Keister, 2008a,b)
- Do the ex post policy prescriptions depend on the cause of the crisis?
  - perhaps not, but seems worth thinking about

## Summary

- Paper addresses an important issue
  - builds a model that can be used for policy evaluation
  - designed to match some features of the current crisis
- Exercise requires one to be explicit about the forces at work
  - “fire sale” story is very common, but ...
  - surprisingly difficult to fit into a standard model
- Results so far are interesting, but more could be done
  - real payoff is a more detailed evaluation of policy proposals