

Do Banks Help or Hurt in Crises? A Coordination Motive for Central Bank / LOLR

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Overall Motivation

- Historically, models and discussions of Lender of Last Resort (LOLR) have focused on the provision of liquidity during banking crises
 - Initiated by Thornton (1802), Bagehot (1873)
- Little focus yet on the questions:
 - How the liquidity support will be organized?
 - Can private agents provide the support?
- Exception: Gorton and Huang (2002a,b,c)
- Our approach: study the coordination amongst banks
 - Focusing on individual incentives of heterogeneous banks
 - Provide a rationale for “crisis manager” role of CB / LOLR

What is a Banking Crisis (Panic)?

- “*A banking panic occurs when bank debt holders at all or many banks in the banking system suddenly demand that banks convert their debt claims into cash to such an extent that the banks suspend convertibility (are taken over by a regulatory body), or act collectively to avoid suspension of convertibility by issuing (joint liability) clearing-house loan certificates.*”
 - Modified from Calomiris and Gorton [CG] (1991)

Costs of Banking Crises

- Economic costs seem to be quite high
 - Evidence from Hoggarth, Reis and Saporta (Bank of England, 2001)
 - Direct resolution costs of the order of 5% of GDP for banking crises alone and 23% for 'twin' crises
 - Output losses measured as GAP1 or GAP2 of the order of 15-20% of GDP
 - Appear significant compared to peer countries that do not suffer crises
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Origins of Banking Crises

- Overwhelming evidence [CG, OCC reports of 1920, 1987] suggests that banking crises
 - Are preceded by unusually adverse economic news, asset price declines, and commercial failures
 - -11.9% (+1.7%) stock return for pre-panic (post) periods
 - Affect banks with assets exposed to the macroeconomic news
 - When risk exposures and leverage are high
 - Are usually also associated with managerial fraud
 - Are NOT caused due to sudden consumption demands of bank depositors (“pure” bank runs)

A Consistent Explanation

- Asymmetric information view [CG]
 - Bank assets have systematic and idiosyncratic shocks
 - Idiosyncratic shocks seen only by each bank
 - Depositors receive macro news but do not see the impact on each bank's assets
 - Withdrawal is the only mechanism to assess bank asset quality
 - Depositors cannot distinguish good banks from bad banks [?]
 - Hence, “run” on a large number of banks
 - Sequential service by itself insufficient to cause a panic
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Asymmetric Information (Cont'd)

- Advantages of this view
 - The focus on vulnerability of asset-side of banks to economic news can explain international comparison on banking panics
 - Provides a natural motivation for provision of joint insurance by banks through clearing-house arrangements
 - Can potentially explain panics initiated by non-commercial banks
 - Baring Brothers in London (1890)
 - LTCM (1998)
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Clearing Houses

- Private arrangements by banks during crises for co-insurance
 - Details in Gorton (1985), Gorton-Mullineaux (1987)
 - Started in NYC in 1853, exist(ed) in many countries
 - Cleared inter-bank liabilities and acted as ‘lender of last resort’ (deposit insurance)
 - Suspended convertibility for members in crises
 - In exchange of assets, issued joint liability loan certificates that acted as deposits
 - No release of bank-specific information during crisis, only aggregate information released
 - Required effective peer-monitoring/supervision
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Clearing Houses (Cont'd)

- Tranquil times:
 - Banks choose to become members of CHs
 - Member banks subject to
 - Admissions test
 - Periodic exams (origins of bank supervision)
 - Capital and reserve requirements
 - Expulsions of violating members
 - Disclosures at the level of *individual* banks

Clearing Houses (Cont'd)

- In a crisis:
 - Asymmetric information about individual bank shocks renders banks illiquid
 - Banks value mechanisms that let them improve their liquidity position
 - Simply receive more liquidity OR
 - Pool information to resolve asymmetry
 - Clearing houses issued joint claims to member banks and suspended convertibility of deposits
 - No member bank failed
 - Disclosures restricted to only aggregate information
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Incentive Compatibility

- Selective liquidations of banks
 - Signals poor quality of their assets
- Expulsions of unhealthy banks in tranquil periods and post-crises
 - Resolves illiquidity but limits moral hazard
- Award of clearing-house loan certificates based on “the market-value of assets” posted by the member bank
 - Also limits moral hazard

Gorton-Huang (2002)

Overview

- Model clearing-houses and examine why a central bank may be required
- Systematic shocks known to depositors
- Idiosyncratic shocks known only to each bank
- Bankers can engage in “fraud”
 - Fraud more likely when assets worth less
- Examine unit banks to match pre-1913
 - “High” cost of liquidating assets

Gorton-Huang (Cont'd)

- Poor systematic shocks produce “runs”
- Runs occur on *all banks* since banks are
 - ex-ante all identical
 - ex-post identical as well since
 - Banks have identical systematic exposures
 - Idiosyncratic shocks are unobserved
- Banks can hold low-risk, low-return reserves to reduce incidence of runs but this is inefficient

Gorton-Huang (Cont'd)

- Clearing-house members see each other's idiosyncratic shocks perfectly
 - Check-clearing agency sees bank assets
- Banks with poor shocks are liquidated
 - Not very valuable to joint-confidence
- Proceeds go to liquidated-bank's owners
- With clearing house arrangement
 - Reserves are between unit banking and “big” bank
 - Efficiency is between unit banking and “big” bank

Gorton-Huang (Cont'd)

- “Depositors could not identify bank-specific risk so all banks were vulnerable to runs caused by aggregate events such as increases in bank failures. Moreover, in such a setting the failure of individual banks could cause changes in depositors’ conditional expectations so that other banks experienced runs. Clearinghouses were institutional responses to both the possibility and the actuality of such information externalities.”

Role for Intervention?

- Gorton-Huang (2002) view: Maybe...
 - Introduce goods markets that
 - Require check payments
 - Last for a very short period
 - Suspension of checks/payments-system prevents transfers of goods resulting in social costs
 - Government deposit insurance
 - Enables goods markets to function
 - Must perform effective monitoring in order to limit moral hazard (fraud)

Did Clearing Houses Always Function Well?

- In Gorton-Huang world, once a clearing house is formed it always creates joint-confidence during a crisis
 - In practice, clearing houses did not always get organized quickly enough
 - Anecdotal examples of failures
 - Park (1991), Capie et al. (1994), Goodhart-Schoenmaker (1995), Freixas-Giannini-Hoggarth-Soussa (1999)
 - Proposed reasons behind these failures
 - Parallels from other settings
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1907 Crisis in New York

- Commercial-bank clearing houses assisted Mercantile National Bank
- Trust companies (Trust Company of America, Knickerbocher Trust Company) did not receive organized assistance
- Some of these were in fact solvent
- After two weeks, JPMorgan played a coordinating role, urged New York trust companies, raised funds, stopped the runs
- Similar evidence for lack of support for (non-bank) British Building Societies before 1914

Episodes from England

- Bank of England managed to orchestrate an insurance fund for Baring Brothers, an investment banking house in 1890
 - But had great difficulty in persuading other banks to share in the rescue of Johnson Matthey Bankers in 1984
 - Indeed, Bank of England was itself unwilling to support Overend Gurney in 1866
 - Goodhard-Schoenmaker attribute this to a commercial rivalry between the two banks
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Systematic Evidence

- Failures of private arrangements such as clearing houses are linked to the extent of competition in the banking sector
 - In the US, the Clearinghouse System was brought down following a marked increase in competition in New York
 - Johnson Matthey Bankers case in England also points to a lack of assistance from other banks in a heightened competition setting
 - The presence of foreign banks in a country has also made arrangement of rescues difficult
 - However, in many European countries where competition in banking has been more limited, private organization of liquidity support is still the norm
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Competition and Coordination

- With competition, ex-post objectives of clearing house members are incongruent
 - In Gorton-Huang setting:
 - All banks are exactly identical ex-post in terms of information asymmetry
 - Neither any benefits nor costs to banks from failure of other banks
 - Clearing house maximizes the sum of the welfares of member banks
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Competition and Coordination (Cont'd)

- How does this objective of the clearing house get formed (endogenously)?
 - Member banks need to coordinate on several important decisions
 - When is organized assistance initiated?
 - For which banks?
 - How are the asset-to-certificate conversion rates determined?
 - When can the clearing house exercise authority over healthy banks to support ailing ones?
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Competition and Coordination (Cont'd)

- NYCHA Minutes, October 21, 1907:
 - “The debit balance of the Mercantile Bank having been found to be \$1,900,000, it was agreed to extend aid to that bank for the amount of its balance, in addition to the amount already advanced, and the Manager [of the NYHCA] was requested to make requisition on individual banks for the sum of \$2,000,000.”
 - Gorton (1985)

Competition and Coordination (Cont'd)

- Such transfers would not be desirable ex-post for banks that stand to gain from failure of these banks
- Coordination thus requires unanimity of objectives which in turn appears to require a certain level of homogeneity among member banks
- Evidence of considerable heterogeneity among banks and surplus to some banks and costs to other banks from bank failures
 - Slovin, Sushka and Polonchek (1999), Schumacher (2000).
 - Use of purchase-and-assumption for bank resolution.

Competition and Coordination (Cont'd)

- Kindleberger, 1989:
 - “... the optimum may be a small number of actors, closely attuned to one another in an oligarchic relation, like-minded, applying strong pressure to keep down the chiselers and free-riders, prepared ultimately to accept responsibility.”

Competition and Coordination (Cont'd)

- Goodhart-Schoenmaker (1995)

“Although rescues financed on an implicit central bank-commercial banks basis may seem desirable, it is doubtful how far it will be sustainable much longer. These rescues depend on the cohesion of a well-defined group of banks, which are prepared to finance a self-supporting regime under the leadership, usually, of a central bank.”

Competition and Coordination (Cont'd)

“... Greater competition has made commercial banks less willing to participate (in such cartels and coalitions), and reduced the clout of the central bank in dragooning unwilling volunteers. Growing fuzziness of dividing line between banks and non-banks, and the problems raised by foreign banks, would allow for endless discussion and recrimination over the question of *what share of the rescue each volunteer should take.*”

Sketch of a Model

- Different group of banks
 - “Domestic” group: exposed to local shocks
 - “Foreign” group: exposed primarily to foreign shocks
- Depositors can distinguish between groups but not within within a group
- Banks in the same group are negatively affected from a failure (information spillover)
 - E.g., Failure of a domestic bank conveys adverse information about local shocks
- Banks in the other group can benefit from the failure through flight to quality and increased depositor base.
 - E.g., If sufficiently many banks in a group fail

Model (Cont'd)

- Three dates, $t = 0, 1, 2$
- N banks in each group
- Banks invest in risky investments
- Early liquidation of the risky asset is costly
 - Asset specificity of (at least some) bank investments
- Returns depend on a systematic component (specific to each group) and an idiosyncratic component (bank specific)
- Depositors get their reservation utility

Model (Cont'd)

- Risky assets:
 - Independent across groups
 - Systematic component within each group:
 - Good state with probability $\frac{1}{2}$, else Bad state
 - Idiosyncratic component for each bank:
 - $\Pr(R \text{ in good state}) = \Pr(R \text{ in bad state}) = q > 1/2$

State/ Return	High (R)	Low (R)
Good	$q > 1/2$	$1 - q$
Bad	$1 - q$	q

Model (Cont'd)

- At $t = 1$, n banks' returns are realized in each group.
- Using that information, depositors update their beliefs about whether they can get the reservation utility from their bank.
- Suppose k domestic banks failed out of n at $t = 1$.
- $\Pr(\text{Good state}) = \frac{q^{n-k}(1-q)^k}{q^{n-k}(1-q)^k + (1-q)^{n-k}q^k}$
- If k is large enough and future profitability of loans R_1 is low enough, then remaining domestic banks may become unviable too

Model (Cont'd)

- For sufficiently high number of failures in one group (domestic), depositors run on all banks in that group
- They liquidate their funds and migrate to the banks in the other group (foreign)
 - Provided foreign group has fewer number of failures
- Early liquidation of domestic assets has social costs
 - “Captive” firms rationed from borrowing
- To resolve asymmetric information, banks in the same group have incentives to help each other
 - Through liquidity support and/or coalition formation
- To capture competitive surplus from failures, banks in the other group do not have any incentive to help.

Summary

- Banks may fail to coordinate or act co-operatively due to competitive effects
 - Efficient projects may get liquidated due to shortage of funds in the inter-bank market
 - Though there is no shortage of aggregate liquidity
 - Clearing-houses and coalitions may function well only amongst relatively homogeneous groups of banks
 - Central Bank can remedy the outcome
 - Injection of fundsAND / OR
 - Coordinating (persuading!) other groups of banks
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Another Possibility

- When forming coalitions, banks reveal information about their assets
- If banks are competitors in the same market, this can erode their competitive advantage
- With increased competition, banks may not be willing to reveal their assets
- This is another possible reason why private arrangements may not work in competitive markets
- Consistent with statements in the literature but no direct evidence

Expanding View of CB / LOLR

- Traditional view is one of *crisis lender*:
 - Freixas-Giannini-Hoggarth-Soussa (1999)
“*discretionary* provision of liquidity to a financial institution (or the market as a whole) by the central bank in reaction to an adverse shock which causes an abnormal increase in demand for liquidity which cannot be met from an alternative source.”
- Complementary view of *crisis manager* or *crisis coordinator* also deserves attention
 - Finds a nice parallel in the debate on international lender-of-last-resort
 - Sovereign debt restructuring: Fischer (1999)
 - Bank resolution in the EU: Freixas (1999)

References

- Acharya, V. and T. Yorulmazer (2003) *Information Contagion and Inter-bank Correlation in a Theory of Systemic Risk*, Working Paper, London Business School.
- Bagehot, W. (1873) *Lombard Street: A Description of the Money Market*. London: H.S.King
- Calomiris, C. and G. Gorton (1991) *The Origins of Banking Panics: Models, Facts and Bank Regulation*, in Hubbard, G.R. (ed), *Financial Markets and Financial Crises*, University of Chicago Press, Chicago, pp. 107-73.
- Capie, F., Goodhart, C., Fischer, S. and N. Schnadt (1994) *The Future of Central Banking: The Tercentenary Symposium of the Bank of England*, Cambridge University Press, Cambridge.
- Fischer, S. (1999) *On the Need for an International Lender of Last Resort*, Address to the American Economic Association and the American Finance Association, New York, January 3.
- Freixas, X. (1999) *The Lender of Last Resort in Today's Financial Environment*, CREI, Universitat Pompeu Fabra, Barcelona, Issue 4, 1-24.
- Freixas, X., Giannini, C., Hoggarth, G. and F. Soussa (1999) *Lender of Last Resort: A Review of the Literature*, Financial Stability Review, Bank of England, Issue 7, 151-167.
- Goodhart, C. and D. Schoenmaker (1995) *Should the Functions of Monetary Policy and Banking Supervision Be Separated?* *Oxford Economic Papers*, Volume 47, Issue 4, 539-560
- Gorton, G. (1985) *Clearinghouses and the Origin of Central Banking in the United States*, *The Journal of Economic History*, Vol. XLV, No. 2, 277-283.
- Gorton, G. and L. Huang (2002a) *Banking Panics and the Origin of Central Banking*, NBER Working Paper 9137.

References (Cont'd)

- Gorton, G. and L. Huang (2002b) *Bank Panics and the Endogeneity of Central Banking*, NBER Working Paper 9102.
- Gorton, G. and L. Huang (2002c) *Liquidity, Efficiency and Bank Bailouts*, NBER Working Paper 9158.
- Gorton, G. and D. J. Mullineaux (1987) *The Joint Production of Confidence: Endogenous Regulation and Nineteenth Century Commercial-Bank Clearing Houses*, *Journal of Money, Credit and Banking*, Volume 19, Issue 4, 457-468.
- Hoggarth, G., Reis, R. and V. Saporta (2001) *Costs of Banking System Instability: Some Empirical Evidence*, Working Paper, Bank of England.
- Kindleberger, C. (1978) *Manias, Panics, and Crashes: A History of Financial Crises*. New York: Basic Books.
- Park, S. (1991) *Bank Failure Contagion in Historical Perspective*, *Journal of Monetary Economics*, 28, 271-286.
- Schumacher, L. (2000) *Bank Runs and Currency Run in a System without a Safety Net: Argentina and the 'Tequila' Shock*, *Journal of Monetary Economics*, 46, 257-277.
- Slovin, M., Sushka, M. and J. Polonchek (1992) *Information Externalities of Seasoned Equity Issues: Difference between Banks and Industrial Firms*, *Journal of Financial Economics*, 32, 87-101.
- Slovin, M., Sushka, M. and J. Polonchek (1999) *An Analysis of Contagion and Competitive Effects at Commercial Banks*, *Journal of Financial Economics*, 54, 197-225.
- Thornton, H. (1802) *An Enquiry into the Nature and Effects of the Paper Credit of Great Britain*. Edited by F. A. Hayek. Fairfield: Augustus M. Kelley.