

LIQUIDITY MANAGEMENT IN BANKING CRISES

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Introduction

- The nature of banking means that solvent banks may at times be subject to panic runs and consequent illiquidity
- The first line of defence is sound bank liquidity policy, which should be encouraged by regulation
- Lender of last resort is a means to deal with liquidity crises, at a possible cost in terms of risk taking incentives
- We deal with the nature of the problem, outline features of lender of last resort in normal times and crises, and give examples from history

Structure of lecture

Introduction

- 1 Bank liquidity risk
- 2 The lender of last resort (LOLR)
- 3 LOLR in “normal times”
- 4 LOLR in times of systemic crisis
- 5 Historical examples

Conclusion

1 Bank liquidity risk

- Definition of liquidity risk – risk that asset owner unable to recover full value of asset when sale desired (or for borrower, that credit is not rolled over)
- Alternative definition – risk of being unable to satisfy claims without impairment of financial or reputational capital
- Defining liquidity mathematically: $L_1 = P_i/P^*$; $L_2 = \sum_{i=0}^n P_i/P^*$, $L_3 = E(P)/P^*$ where P^* is full value price and P_i is realised price
- Bank liquidity – ability of institution to meet obligations under normal business conditions

Liquidity risk and banking crises

- Bank assets illiquid and long term, liabilities liquid and short term
- Short term liabilities conceptually a means of disciplining bank managers via threat of runs
- But depositors' monitoring of projects is likely to be prone to errors, hence banks vulnerable to "overdiscipline" (runs on solvent banks) leading to socially wasteful liquidation of projects.
- Possibility for runs to affect other banks, via balance sheet similarities under uncertainty or counterparty exposures

Models of bank runs

- Diamond and Dybvig – banks provide liquidity insurance to risk averse depositors who may “run” if they suspect assets inadequate
- Some criticisms of the Diamond-Dybvig model – suggestion bank runs are purely random events
- Chari and Jagannathan - adverse information leads to panics - systematic risks inferred from what may be idiosyncratic
- Gorton - panics mainly in recessions – confirms adverse information hypothesis as panics occur close to period when business failures most acute

Where do runs take place?

- Runs traditionally assumed to take place among retail depositors – but large wholesale depositors more important – better informed and less likely to be covered by deposit insurance
- Interbank market key locus of runs in recent years:
 - Lack of security (collateral) and low levels of information-gathering
 - Link to moral hazard due to implicit guarantees by central banks

- Growing need for liquidity owing to growth in international trading and transactions (notably OTC derivatives can give rise to unexpected liquidity demands)
- Increase in backup lines of credit (e.g. of SIVs) requiring funding if called
- Existence may lead banks to under invest in liquidity
- Range of banks with low credit quality (e.g. East Asia) so long as lenders believe in implicit guarantee
- Subject to quantity and not price rationing due to low levels of information on credit risk
- Short maturity making withdrawal easy
- Subject to sudden increases in credit rationing during periods of stress, due to asymmetric information and resultant adverse selection and moral hazard
- Potential for contagion and global transmission of shocks

Protecting against bank liquidity risk

- Holding liquid assets (net defensive position – cost in terms of lower profitability) UK 1950s 30%, today 1%!
- Dissipating withdrawal risk by diversifying funding sources (liability management)
- Seek low volatility ratio: $VL-LA/TA-LA$ where VL volatile liabilities, LA liquid assets, TA total assets. Prudent banks have ratio < 0
- Backup: capital adequacy to ensure creditworthiness maintained in face of shocks
- Important role of supervision and reserve requirements (need for more explicit regulation?) – and also money market infrastructure ensuring liquidity maintained

Liability management

- Definition of liability management: ensuring maintenance of continuity and cost effectiveness of funding assets. 3 issues:
 - Diversification to reduce liquidity risk - CDs, eurodollars, repos, securitisation, subordinated debt as well as interbank, time and demand deposits
 - Liability mix - choice of:
 - traditional deposits (“products”) incorporating services and with payoff insensitive to fortunes of intermediary, for small users, often insured and hence stable
 - and risk-sensitive investment instruments, for large users, which may be more volatile
 - Northern Rock shows problems of excess reliance on latter
 - Maturity structure - duration matching affects the degree of liquidity risk, but may also reduce flexibility

2 The lender of last resort (LOLR)

- Description: institution, such as the Central Bank, which has the ability to produce at its discretion currency or “high powered money” to support institutions facing liquidity difficulties, to create enough base money to offset public desire to switch into money during a crisis, and to delay legal insolvency of an institution, preventing fire sales and calling of loans
- Operation: discretionary provision of liquidity to an institution or market in reaction to an adverse shock that creates abnormal increase in demand for liquidity not available from an alternative source

- Aims:
 - prevent illiquidity at individual bank leading to insolvency (inability to realise assets at full value owing to asymmetric information)
 - Avoid runs that spill over from bank to bank (contagion) owing to counterparty exposures or asymmetric information making it hard to distinguish sound and unsound banks
- May need direct lending not just open market operations as market lending may fail to reach banks in distress – although worse for moral hazard
- Need to act rapidly before illiquidity becomes insolvency
- Do money markets need liquidity support (market maker of last resort) given importance for liquidity and solvency?

Costs of lender of last resort

- Liquidity assistance may lead to support for insolvent, leading to direct costs for central bank and Ministry of Finance
- Reduces need for banks to hold liquidity as risk passed to central bank
- May allow uninsured depositors to exit bank
- Increases moral hazard/risk taking as well as weakening market discipline
- Removes pressure on regulators to close failing banks promptly (especially if separate institution)
- Difficulty of too-big-to-fail
- Conflicts with monetary policy regime – and fiscal if Ministry of Finance guarantees
- Unresolved problems of cross border banks (EU)

Minimising costs

- Ensure only support for institutions whose failure entails systemic risk
- Demand high quality collateral and penal interest rate
- In non systemic crisis ensure only support for institutions that are illiquid but solvent with acceptable collateral
- Ensure borrower only requests LOLR as last resort, via penal interest rate (risk of adverse selection), harsh conditionality,
- Or at least ensuring shareholders have made efforts to gain liquidity support/all market sources of funds exhausted

- Central bank seeks private solution before LOLR (creditors, major banks)
- Adequate information on financial institutions (best that central bank is supervisor?)
- Involvement of fiscal authorities if risk bank is insolvent (or central bank may itself face difficulties, as in Finland)
- To avoid monetary conflict, sterilise liquidity – otherwise risk of inflation, capital outflows and collapsing currency (Indonesia)
 - Requires instruments be available such as reverse repos, foreign exchange swaps and deposit facilities
 - Need excess foreign exchange reserves or alliances with other central banks if there is a currency board

Transparency and ambiguity

- Reduce moral hazard by making access to facilities uncertain – market not to take for granted the action to be followed by authorities – decision on case by case basis
- Spell out necessary but not sufficient conditions for LOLR? (e.g. precondition of solvency and exhausting available sources of funds)
 - Reduce incentives for unnecessary crises
 - Incentive for stabilising private sector actions
 - Reduces risk of forbearance and political interference
 - Less technically challenging
- Ex ante transparency may heighten risk of run
- Strong case for ex post transparency

3 LOLR in “normal times”

- How should LOLR operate when there is a problem for an individual bank but no systemic crisis?
- Three main instruments:
 - Discount of eligible paper
 - Advances with or without collateral
 - Repos of acceptable assets
- Value of collateral should exceed that of the LOLR support – but a solvent bank might not have sufficient collateral, while an insolvent one with ample collateral might still take risks
- So collateral requirement may need to be suspended at times (take every asset or seek government guarantee)

- Generally domestic currency (banks to be responsible for foreign exchange risk management)
- Interest rate above market rate to ensure other sources exhausted but not much over it (or would cause further problems)
- But should be complemented by implicit price of conditionality (e.g. liquidity restoration, restrictions on new business or on dividend payments)
- Size limit on lending a multiple of banks capital to limit exposure to credit risk – but need to avoid provoking preventative runs

- Provisions for repayment - LOLR must be for short term only so examination can assess long term viability
- If default on LOLR loans, closure needed, or if too-big-to-fail, nationalised with owners and managers dismissed
- Confidentiality to avoid giving rise to panic, or rise in borrowing costs/loss of reputation to bank

4 LOLR in times of systemic crisis

- Situation of panic, flight to quality, widespread contagion
- Aim to reassure public that financial disorder will be limited and stop panic runs – public announcement and visibility
- May need to provide uniform support for all banks short of liquidity even if suspect to be insolvent – to protect payments system and macroeconomy
- Collateral and solvency requirements relaxed (as they depend on resolution of panic)
- No penalty rates as would worsen panic – still normal restrictions and supervision

- Also suspend judgement of which institutions systemically important
- Liquidity to be part of overall crisis management strategy involving central bank, supervisors and ministry of finance
- May require general macroeconomic policy easing (e.g. interest rate cuts) as a crisis is itself a form of tightening – although care needed to avoid inflation/exchange rate collapse (sterilisation still an option)
- Possible imposition of capital controls
- May be blanket deposit guarantee by government – LOLR still needed if credibility lacking (or fear delay in repayments) – may also need to guarantee central bank

- Difficulties of LOLR and guarantees in case of dollarised currency
- If LOLR or guarantees insufficient (e.g. in dollarised economy), emergency measures include securitisation of deposits, forced maturity extension or deposit freeze – economically damaging
- Liquidity assistance must not be long term policy – should be used to stop panics and buy time for evaluation of financial system
- Ultimate backup is fiscal policy. Government may need to recapitalise or close insolvent banks in a long term restructuring (Sweden, Finland)

5 Historical examples (1)

2007-8 Subprime crisis

- Details from earlier lecture; Fed and ECB in August and thereafter intervened heavily to reduce the liquidity crisis in interbank market – reducing collateral standards sharply also (even CDOs – banks hoard top quality collateral)
- Bank of England sought to avoid moral hazard but hand forced by events:
 - Liquidity support for interbank market
 - LOLR for Northern Rock, with guarantee for all deposit holders by Treasury) as considered too big to fail and retail run possibly contagious – ultimately nationalised. Signalling problem of emergency facility aggravated run.
- Fed was forced to implicitly extend safety net to include investment banks (Bear Stearns rescue via JP Morgan)
- General question – was problem liquidity or solvency?

(2) Continental Illinois 1984

- Loan problems from LDC debt and weak energy prices (lack of diversification of assets)
- Reliance on wholesale deposits and international markets due to restrictive interstate banking regulations (lack of diversification of liabilities)
- Run started in the international interbank market, as Japanese, European, and Asian banks began to cut credit lines and withdraw overnight funding
- US nonbanks then sought to withdraw also

- Run occurred despite blanket deposits guarantee (not just to uninformed depositors)
- Sizeable interbank exposures (179 banks vulnerable)
- Major rescue operation:
 - \$5.5 bn line of credit arranged by twenty-eight banks,
 - \$2 bn of new capital infused by the Federal Deposit Insurance Corporation and a group of commercial banks, and
 - LOLR (discount window) funds from the Fed (with \$4.5 bn in discounts being done in the week beginning 16 May)
- No contagion due to scale of rescue
- Not nationalised but government representative on board
- Genesis of too-big-to-fail?

(3) Systemic liquidity crisis – Mexico 1994-5

- Privatisation of banks in 1991-2 at high prices led to asset growth to ensure profitability – and deteriorating asset quality (27% of assets liquid)
- Bankers funded selves in volatile domestic and foreign wholesale markets rather than developing deposit franchise (63% of liabilities volatile)
- Banks vulnerable, with funding volatility ratio 50% (76% in dollar part of balance sheet)
- In 1994 peso devalued after speculative attack, followed by free float and 56% loss of value – interest rates rose

- Lack of disclosure, creditor rights and foreign exchange liquidity hindered liquidity management of banks
- Run notably by international depositors – selling negotiable paper and refusing to roll over maturing claims
- Short term dollar loans by deposit insurer acting as LOLR (borrowed from central bank) limited to 28 days, high 25% interest rate, collateralisable by government securities or equity of recipient bank – realised \$3.9 billion
- Further MEX\$38 billion also lent by LOLR
- Reserve requirement relaxed so banks could liquidate assets held against volatile dollar liabilities – also banks allowed to create synthetic short dollar position with derivatives helping to cover forex risk on dollar loans

Conclusion

- Liquidity risks are endemic to banking given the maturity transformation they undertake
- First line of defence should be appropriate liquidity policy on asset and liability side, supported by adequate capital and firm supervision
- Despite these, solvent banks can face liquidity difficulties at times of stress necessitating liquidity support
- Emerging issues – do markets need liquidity support? – do banks need tougher regulation of liquidity?

- Role of lender of last resort in non crisis periods is to avoid unnecessary failures, with suitable safeguards for central bank balance sheet and to minimise moral hazard
- Role of lender of last resort in crisis periods is to prevent contagious panic by all means available – central bank requires government support
- Case of Continental Illinois shows the operation of emergency liquidity assistance for single institution, Mexico showed operation at systemic level, Subprime has shown elements of both
- Must be temporary policy with restructuring of banks and corporate borrowers in the long term

References

- Banque de France (2008), “Liquidity”, Financial Stability Review
- Davis E P (2003), “Lectures in banking economics”, www.brunel.ac.uk/depts/ecf/lectures/5007
- He D (2000), “Emergency liquidity support”, IMF Working Paper 00/79
- Hoelscher D S and Quintyn M (2003), “Managing systemic banking crises”, IMF Occasional Paper
- Ingves S (2002), “Meeting the challenges for the Chinese financial sector”, Second China Financial Forum, May 15-16 2002