CHAPTER 12

Liquidity Risk

Overview

- Causes of liquidity risk
- Methods of measuring liquidity risk
- Consequences of extreme liquidity risk exposure
- Financial crisis

FIs and Liquidity Risk Exposure

- High exposure
  - Depository institutions
  - Loss of confidence in bank-to-bank lending during financial crisis resulted in more widespread liquidity crisis
- Moderate exposure
  - Life insurance companies
- Low exposure
  - Mutual funds, hedge funds, pension funds, and property-casualty insurance companies

Causes of Liquidity Risk

- Liability-side liquidity risk occurs when depositors or policyholders cash in claims
  - With low cash holdings, FI may be forced to liquidate assets too rapidly
    - Faster sale may require fire-sale price
- Asset-side liquidity risk can result from off-balance-sheet loan commitments
  - Liquidity requirements from the borrowing of funds can be met by the FI running down cash assets, selling liquid assets, or additional borrowing

Liability-Side Liquidity Risk for DIs

- Reliance on demand deposits
  - Core deposits
  - Depository institutions need to be able to predict the probability distribution of net deposit drains
    - Calculated as the difference between deposit withdrawals and deposit additions
    - Seasonality effects in net withdrawal patterns (e.g., end of year and summer due to Christmas and vacations)
    - 2008 problem with low rates: Finding suitable investment opportunities for the large inflows
  - Managed drain on deposits by:
    - Purchased liquidity management
    - Stored liquidity management

Purchased Liquidity Management

- Sources: federal funds market and/or repurchase agreement markets
- Managing the liability side preserves asset side of balance sheet
- Borrowed funds likely at higher rates than interest paid on deposits
- Deposits are insured but borrowed funds not necessarily protected
- Regulatory concerns:
  - During financial crisis, wholesale funds were difficult and sometimes impossible to obtain

Stored Liquidity Management

- Liquidate assets to meet withdrawals
  - In addition to reserve requirements set by the Federal Reserve, DIs tend to hold excess reserves
  - Downsides:
    - Contraction of asset size
    - Requires holding excess low-rate assets
    - Opportunity cost of holding excessive cash or other liquid assets
- DI may use some combination of purchased and stored liquidity management

Asset-Side Liquidity Risk

- Liquidity risk from loan commitments and other credit lines
  - Met either by borrowing funds and/or by using cash assets
- Current levels of loan commitments are dangerously high
  - Commercial banks in particular have been increasing commitments over the past few years, presumably believing commitments will not be used
  - In 1994, unused loan commitments to cash equaled 529%. In 2008, 1,015%. Fell back to 609% during the crisis.

Investment Portfolio and Asset-Side Liquidity Risk

- Interest rate risk and market risk of the investment portfolio can cause values to fluctuate
- Arguments that technological improvements have increased liquidity in financial markets
  - Some argue that "herd" behavior may actually reduce liquidity

Financing Gap

- Defined as difference between average loans and average (core) deposits

  FG = Average loans – Average deposits

  FG = -Liquid assets + Borrowed funds

  FG + Liquid assets = Borrowed funds

- Potential for insolvency highlights need for managers of DIs to actively manage liquidity planning

Sources and Uses of Liquidity

- Net liquidity statement:
  - Sources of liquidity: (i) Cash type assets, (ii) maximum amount of borrowed funds available, (iii) excess cash reserves
    - Historical sources and uses of liquidity statements may assist manager in identification of future liquidity issues
  - Uses of liquidity
    - Borrowed or purchased funds already utilized
    - Any amounts of cash already borrowed from the Fed via discount window loans

Other Measures

- **Peer group comparisons**: Usual ratios include borrowed funds/total assets, loans to deposits, etc.
- **Liquidity index**:
  - Weighted sum of "fire sale price", *P*, to fair market price, *P**, where the portfolio weights are the percent of the portfolio value formed by the individual assets

$$I = \Sigma w_i(P_i / P_i^*)$$

Ratios

- **Liquidity coverage ratio (LCR)**
  - (Stock of high-quality liquid assets)/(Total net cash outflows over the next 30 calendar days) >= 100%

- **Net stable funding ratio (NSFR)**
  - (Available amount of stable funding)/(Required amount of stable funding) > 100%

Other Liquidity Risk Control Measures

- Contractual maturity mismatch
- Concentration of funding
- Available unencumbered asset
- LCR by significant currency
- Market-related monitoring tools

Liquidity Planning

- Planning is a key component of measuring and coping with liquidity risk and associated costs
  - Make funding decisions before liquidity problems arise
  - Lower the cost of funds by identifying an optimal funding mix
  - Minimize the need for excess reserve holdings

Liquidity Planning (Continued)

- Delineate managerial responsibilities
  - Identify who responds to regulatory agencies, who discloses information to the public, etc.
- Detailed list of funds providers, important to anticipate the expected pattern of withdrawals in a crisis
  - Example: Mutual/pension funds more likely to withdraw during crisis than correspondent banks and small businesses
  - Allow for seasonal effects

Liquidity Planning (Concluded)

- Identify size of potential deposit and fund withdrawals over various future time horizons
  - Identify private market alternatives to meet the liquidity needs of withdrawals
- Set internal limits on subsidiaries' and branches' borrowings and boundaries on risk premiums
- Plan the sequence of asset disposal to meet liquidity needs

Bank Runs

- Can arise due to concern about:
  - Bank solvency
  - Failure of a related FI
  - Sudden changes in investor preferences
- Demand deposits are first come, first served
  - Depositor's place in line matters
- Bank panic: Systemic or contagious bank run on deposits of banking industry

Alleviating Bank Runs

- Measures to reduce likelihood of bank runs:
  - Deposit insurance and discount window
  - FDIC
  - Direct actions, such as TARP (2008-2009)

- Not without economic costs
  - Protection may encourage DIs to increase liquidity risk

Life Insurance Companies

- Life insurance companies hold reserves as a buffer to offset policy cancellations (surrenders) and other working capital needs
- Pattern is normally predictable
- Solvency concerns can still generate runs on the life insurance company
- State guaranty schemes deter runs on life insurance companies

Liquidity Risk for P-C Insurers

- Assets tend to be shorter term and more liquid than life insurers
- Claims are virtually impossible to predict
  - Hurricane Andrew and Hurricane Katrina precipitated severe liquidity crises for many PC insurers
- Near failure of giant insurer, AIG (2008)
  - Credit default swaps (CDS)
  - Restructuring and federal government bailout

Investment Funds

- Mutual funds, hedge funds
  - Net asset value (NAV) of the fund is market value divided by number of shares in fund
  - Risk of runs is less than that faced by banks
  - Asset losses will be shared on a *pro rata* basis, so position in line does not matter
  - But, MMMFs faced significant liquidity risk at beginning of the crisis
- Hedge funds implicated in some of the most severe liquidity crises faced by FIs

Pertinent Websites

Bank for International Settlements	www.bis.org
Federal Reserve	www.federalreserve.gov
FDIC	www.fdic.gov