FINS3630 BFM FINALS NOTES

Contents

WEEK 6, LIQUIDITY RISK CHAPTER 12

FIs and Liquidity Risk Exposure

- High exposure
  - Depository institutions
  - Loss of confidence in bank-to-bank lending affects liquidity in other markets
- Moderate exposure
  - Life insurance companies
- Low exposure
  - Mutual funds, hedge funds, pension funds, and property-casualty insurance companies
    - Typically low, does not mean zero
    - Bear Stearns Funds

Causes of Liquidity Risk

- Liability-side liquidity risk when depositors or policyholders cash in claims immediately
  - FI's want to minimize cash holdings, as they generate no interest
  - With low cash holdings, FI may be forced to liquidate assets too rapidly
    - Faster sale may require much lower price (fire-sale price)
    - Alternatively, can borrow additional funds
- Asset-side liquidity risk can result from loan commitments (a loan amount that may be drawn down or due in the future), such as the ability to fund the exercise of off-balance sheet loan commitments
  - Liquidity requirements from take down of funds can be met by 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 distribution of *net* deposit drains (new deposits vs withdrawals)
    - Seasonality effects in net withdrawal patterns
    - 2008 problem with low rates: Finding suitable investment opportunities for the large inflows
  - Managed by:
    - Purchased liquidity management
    - Stored liquidity management

Purchased Liquidity Management

- Is an adjustment to a deposit drain, occurs on the liability side
- Managing the liability side preserves asset side of balance sheet
  - Allows it to completely insulate the asset side as it can completely adjust the liability
- DI purchases liquidity through the Federal funds market or repurchase agreement market (interbank markets for shot-term loans)
- However, borrowed funds are at higher rates than interest paid on deposits
- Deposits are insured but borrowed funds not necessarily protected
- Thus, this method should be limited
- Regulatory concerns:

- During financial crisis, wholesale funds were difficult and sometimes impossible to obtain

Stored Liquidity Management

- Liquidate assets to meet withdrawals
- Fed Reserve sets minimum reserve requirements
  - In addition to reserve requirements, banks tend to hold excess reserves
  - Downsides:
    - Opportunity cost of holding excessive cash or other liquid assets instead of investing higher earning assets
    - Decreases size of balance sheet
    - Requires holding excess low return or zero return assets
- Banks can also combine *purchased* and *stored* liquidity management

Asset Side Liquidity Risk

- Risk from loan commitments and other credit lines
  - Met either by borrowing funds and/or by running down reserves
- 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, in the US unused commitments equaled 529%. In 2008, 1015%. Fell back to 609% during the crisis.

Investment Portfolio (Type of Asset Side Liquidity Risk)

- Interest rate risk and market risk can cause value of the investment portfolio to fluctuate
- Risk is that liquidity in a particular market will deteriorate as market traders want to sell and no one wants to buy
- Arguments that technological improvements have increased liquidity in financial markets
  - Some argue that "herd" behavior may actually reduce liquidity i.e. everyone wants to make same type of trade or sales

Measuring Liquidity Exposure

- Net liquidity statement (lists sources and uses of liquidity):
  - Sources of liquidity:
    (i) Highly liquid assets e.g. T-bills
    (ii) Maximum amount of funds that can be borrowed
    (iii) Excess cash reserves
    - With liquidity improvements gained via securitization and loan sales, many banks have added loan assets to statement of sources
  - Uses of liquidity
    - Borrowed or money market funds already utilized
    - Any amounts already borrowed from the Fed

Other Measures

- Peer group comparisons. Usual ratios include:
  - Borrowed funds/ total assets
  - Loan commitments/ total assets, etc.
  - High ratio of these could mean future liquidity problems as it shows that DI relies heavily on short-term money market rather than core deposits

- Liquidity index:
  Weighted sum of "*fire sale price*" *P,* to fair market price, *P**, where the portfolio weights are the percent of individual assets in the portfolio value

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

- Index will always lie between 0 and 1
- E.g. I = 0.5(0.99/1.00) + 0.5(0.85/0.92)

Measuring Liquidity Risk

- **Financing gap = Average loans - Average deposits**
- Or; **Financing gap + liquid assets = financing requirement (borrowed funds)**
- The gap can be used in peer group comparisons or examined for trends within an individual FI
- The implications of the financing requirement are that the level of core deposits and loans as well as the amount of liquid assets determines the DI's borrowing or purchased fund needs
  - The larger the financing gap and liquid asset holdings, the larger amount of funds needed to be borrowed and the greater exposure to liquidity problems
  - Widening financing gap can warn of future liquidity problems as it may indicate increased deposit withdrawals

BIS Approach (Bank for International Settlements)

- **Liquidity coverage ratio:**

$$\text{Liquidity Coverage Ratio} = \frac{\text{Stock of High Quality Liquid Assets}}{\text{Total Net cash outflow over 30 days}} \geq 100\%$$

  - Aims to ensure that a DI maintains an adequate level of high-quality assets that can be converted into cash to meet liquidity needs for a 30-day time horizon under an 'acute liquidity stress scenario'
  - **Definition of high quality liquid assets pg 362**

- **Net stable funds ratio** (greater than 100%, not greater than or equal to)

$$\text{Net Stable Funding Ratio} = \frac{\text{Available stable funding}}{\text{Required stable funding}} \geq 100\%$$

  - Evaluates liquidity over the entire balance sheet and provides incentives for Dis to use stable sources of financing
  - Limits reliance on short-term wholesale funding
  - Looks at it longer term; requires a minimum amount of stable funding to be held over a one-year time horizon based on liquidity factors assigned to liquidity exposures on balance sheet assets
  - **List of available stable funding pg 365**

Other Liquidity Risk Control Measures

- *Contractual maturity mismatch* – compare assets with liabilities in time bands based on maturity e.g. overnight, 7/14 days, 9 months etc.
- *Concentration of funding* – identify those sources of wholesale funding that are of significance that withdrawal of these funds could trigger liquidity problems
- *Available unencumbered asset* – identify the quantity and key characteristics, including currency denomination and location of banks available unencumbered assets.
    - These assets have potential to be used as collateral or raise additional funding and hence additional sources of liquidity
- *LCR by significant currency* – monitor the LCR in significant currencies. This will allow DIs and supervisors to track potential currency mismatch issues that could arise.
- *Market-related monitoring tools* – monitor high frequency market data with little or no time lag. These measures can be used as early warning indicators in monitoring potential liquidity difficulties at banks

Liquidity Planning

- Make funding decisions *before* liquidity problems arise
- Lower the cost of funds by planning an optimal funding mix
- Minimize the need for reserve holdings

- 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 funds/pension funds more likely to withdraw than correspondent banks and small businesses
    - Allow for seasonal effects
- Identify size of potential deposit and fund withdrawals over various future time horizons
    - Identify potential alternative sources to meet the liquidity needs within these horizons
- Set internal limits on subsidiaries' and branches' borrowings and limits on risk premiums for funding sources
- Plan the sequence of asset disposal to meet liquidity needs

Bank Runs: A sudden and unexpected increase in deposit withdrawals from a DI

- Deposit drains may arise for a number of reasons:
    - Concerns of the bank's solvency
    - Failure of a related FI leading to heightened depositor concerns
    - Sudden changes in investor preferences regarding financial assets (such as T-bills etc.) relative to deposits
- Demand deposits are first come, first served
    - Depositor's place in line determines amount they will be able to withdraw; only a proportion will get paid in full when assets are valued less than deposits
- As bank run increases in intensity, more depositors join the line and liquidity crisis develops -> DI may initially meet demand by decreasing cash reserves, fire-sale, borrowing etc. but will face insolvency if continues to grow

- Incentives for depositors to join the line and withdraw without asking questions causes fundamental instability in banking system
- Bank panic: Systemic or contagious run on deposits of the banking industry

Alleviating Bank Runs

- Measures to reduce likelihood of bank runs:
    - Discount window – provides lending programs (3 programs, detail pg 369)
    - Federal deposit insurance corporation (FDIC) – makes sure that the depositor's claim is fully insured so they don't need to join the line
    - Direct actions such as TARP (2008-2009) – gave US Treasury funds to buy toxic mortgages and also increase deposit insurance
    - Fed lending to investment banks in the crisis
- Not without economic costs
    - Protections can encourage DIs to increase liquidity risk

Liquidity Risk for Life Companies

- Life cos. hold reserves such as government bonds as a buffer to offset policy cancellations (surrenders)
    - Surrender value: the amount received by an insurance policy holder when cashing in a policy early
- The pattern is normally predictable
- Usually premium is enough, but if not then can sell relatively liquid assets to meet surrenders e.g. government bonds
- Solvency concerns can still generate runs
- Led to limits on ability to surrender policies

Liquidity Risk for Property-Casualty Insurers

- PC insurers sell policies insuring against certain contingencies impacting property or individuals
- PC claims are virtually impossible to predict. As a result, problem is less severe for PC insurers as assets tend to be shorter term and more liquid
- However, spikes in claims can be problematic
    - Hurricane Andrew and Hurricane Katrina precipitated severe liquidity crises for many insurers
- Near failure of giant insurer, AIG (2008)
    - Credit default swaps
    - Restructuring and government bailout

Investment Funds

- IF's sell shares as liabilities to investors and invest the proceeds in assets
- E.g. Mutual funds, hedge funds
    - IF's willingness to provide instant liquidity to shareholders while it invests funds exposes it to liquidity problems
    - Net asset value (NAV) of the fund is market value (price at which shares are sold), so the incentive for runs is not like the situation faced by banks
        - Asset losses will be shared on a *pro rata* basis, so position in line does not matter
    - Incentive for runs are generally absent but, Money Market Mutual Funds faced liquidity risk at beginning of the financial crisis p373 history
- Hedge funds implicated in some severe liquidity crises