

# Bank Financial Management

Managing Risk

# GOALS

- Consider risk in more detail
- Understand how banks can mitigate risk
- Basic ideas behind ‘value at risk’, or VAR
- Understand why it is important to measure risk

# LIQUIDITY RISK

- How can banks protect against liquidity risk?
  - hold adequate cash funds
- This may be *mandatory* or *prudential*
- Mandatory systems specify strict ratios
- May differ for different types of deposits
- Difference between time deposits to differ from that on demand deposits?

# LIQUIDITY RISK

- Prudential systems DON'T specify strict ratios
  - Rely upon judgement of Bank Staff
- May result in lower or higher charges than mandatory
- Why might this be?
- Which would you consider safer?

# ASSET MANAGEMENT

- A second line of defence
- Involves two sets of decisions
- First, maintaining a fraction of assets
  - are not cash
  - but can be liquidated very quickly

# ASSET MANAGEMENT

- Assets include
  - lending in the interbank market
  - holding money market instruments
- Must manage assets on balance sheet
  - Insure continuing flow of maturing assets

# ASSET MANAGEMENT

- IF we see flow of loans maturing
  - the bank will have a steady inflow of cash
- This cash can be added to reserves
  - IF it foresees problems
- Or reinvested if no problems are expected

# LIABILITY MANAGEMENT

- A third set of decisions
- A bank can improve its reserve ratio
  - by bidding for deposits
- Usually done in the interbank market
  - This market has special characteristics

# LIABILITY MANAGEMENT

- Characteristics of the interbank market
  - a) Deals are very large
  - b) Deals can be made for O/N to 1Y
  - c) A unique rate of interest for each deal

# LENDER OF LAST RESORT

- Individual banks have many options
  - to deal with a potential shortage of liquidity
- But what about a *systemic event*?
  - For example, if all banks need funds
- The Central Bank steps in
  - becomes the supplier of reserves
  - Either by lending or by buying assets

# LENDER OF LAST RESORT

- BUT if The Central Bank steps in
- They control the market
- The Central Bank sets the price of or quantity of the reserves supplied
- In practice Central Banks set prices

# PAYMENT RISK

- Payment risk is chance funds needed for payment do not arrive at the paying bank
- How long do banks have to pay?
- Time difference between instructions to pay
  - and movement of funds
- One solution is to impose a *clearing delay* or *lag*

# PAYMENT RISK

- This is a refusal to make payments until funds are received
- Varies by nation
  - In The United Kingdom 3 to 5 days
  - In The US 24 hours
  - Confirm for your own nation

# PAYMENT RISK

- Generally reason for the delay is uncertainty as to whether funds will be forthcoming
- IF receiving bank is certain
  - that funds will be transferred
  - THEN it may pay immediately

# PAYMENT RISK

- Other solutions might involve restricting membership of settlement systems
  - Allow only those banks with the highest reputation
  - Or those who impose limits on exposure
- Best case would be to ensure all payment instructions are matched

# MARKET RISK

- The risk asset values vary unexpectedly
- Danger is value falls below value of liabilities
- Six different ways banks reduce exposure

# MARKET RISK

- Diversification
- a) Diversification
- IF assets are not perfectly correlated
  - THEN increasing number of assets in a portfolio lowers risk for given return
  - OR offers a higher return for given risk
- Must add assets with low correlation to the existing portfolio

# MARKET RISK

- International diversification
- Easier for banks with large number of clients and large wealth
- Operating across national boundaries helps
- International diversification allows us to benefit from different timings

# MARKET RISK

- Why is international diversification effective in reducing asset risk?
- Assets drawn from a different nations are exposed to different economies
- Usually a benefit enjoyed by larger banks

# MARKET RISK

- But banks must also limit exposure
- Unwise to concentrate assets too much
  - Countries
  - Industries
  - Companies

# MARKET RISK

- Banks may set limits on asset categories e.g.
  - 20% in household mortgages
  - 10% of portfolio in commercial property
  - 5% in consumer credit
- BUT must find categories with low correlation

# MARKET RISK

- Screening/monitoring is important
- Experience lets banks judge credit risk
- They can determine riskiness by
  - source of income
  - past credit history
  - amount of existing debt

# MARKET RISK

- For individuals banks use credit reporting
- Monitoring allows bank to create reports
  - At regular time intervals
  - But bank will protect its interests
    - may ask for additional funds
    - a seat on board of directors

# MARKET RISK

- Collateral helps banks control risk
- May reduce exposure by taking 'charge' over asset
- Owner of a firm seeking a loan
  - may have to offer a second mortgage on their home

# MARKET RISK

- The bank may hold short-dated assets
- Changes in interest rates change market value of issued debt
- But the effect is larger for long-dated assets
- To counter banks may hold large positions of short-dated government bonds

# DERIVATIVES

- Derivatives which help banks hedge
- Or protect against some risks
- IF a bank holds shares
  - The price might fall
  - The bank can buy a *put* option
  - This gives it the right to sell the asset at a predetermined price

# DERIVATIVES

- A put option costs money
  - BUT can protect against falling prices
- Banks commonly use currency options
  - Protects against exchange rate risk
- This is an important source of risk faced by modern banks who diversify globally

# VALUE AT RISK

- However need to understand scale of risks
- Can identify costs and plan accordingly
- Commonly used model Value at Risk or VaR
- The value at risk in a portfolio ( $p$ ) is
  - the value of expected changes
  - Over some time horizon
  - Subject to a confidence interval

# VALUE AT RISK

- VaR is often used to stress test portfolios
- Understand changes subject to assumptions
- Keep in mind there are ways to calculate VaR
  - Variance / covariance
  - Monte Carlo simulation
  - Historical simulation

# SUMMARY

- We have presented several strategies to reducing risk
- Risk management must be based upon an assessment of the probability and scale of loss
- There are multiple ways of estimating the probability and potential size of loss

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