Banking and the Management of Financial Institutions

This lecture examines how banking is conducted to earn the highest possible profit.

The Bank Balance Sheet

A. The basic bank balance sheet

Total assets = total liabilities + bank capital

B. Assets

1. Reserves (total reserves)
    a. Reserves are a bank's deposits at the Federal Reserve plus currency held by the bank (vault cash).
    b. Total reserves = required reserves + excess reserves
    c. Required reserves are the reserves that a bank is required to hold against checking deposits.

2. Deposits at other banks
    a. Small banks hold deposits at larger banks in exchange for help with services like check clearing, foreign exchange transactions, and purchasing securities.
3. Securities including U.S. Treasury and agency securities and state and local government securities.
4. Loans
    a. Banks make profits primarily by issuing loans.
    b. Loans comprise over ½ of all bank assets.
5. Other assets include physical capital such as bank buildings and office equipment.

C. Liabilities

1. Checkable deposits

   a. The owner can write checks to third parties.

   b. Ex., demand deposits and other checkable deposits.

   c. Checkable deposits are payable on demand (the depositor must be paid immediately).

   d. These accounts pay the lowest interest, whereas the costs involved with servicing them are high.

2. Nontransaction deposits

   a. These deposits are the primary source of bank funds.

   b. Owners cannot write checks on them, but they pay higher interest. They also are <u>not</u> payable on demand.

   c. Ex., savings deposits and small and large time deposits.

3. Borrowings
    a. Banks can borrow funds from the Federal Reserve, other banks, their parent company, or other companies.
    b. They account for about 20% of all bank liabilities.

D. Bank capital (or the bank's net worth)
    1. A bank's net worth is increased by selling equity (stocks) and keeping retained earnings.
    2. Bank capital is the cushion against a drop in the value of bank assets that could push the bank into insolvency (total liabilities > total assets).

Basic Banking

A. The T-account is a basic bank balance sheet with assets on one side and liabilities and bank capital on the other side.

Assets	Liabilities
Required reserves	Checkable deposits
Excess reserves	Borrowings (banks)
Loans	Borrowings (Fed)
Securities	Bank capital

B. Suppose $100 is deposited into a checking account at a bank (assume the required reserves ratio, rrr, is 10%).

Assets		Liabilities	
Required reserves	+ 10	Check. deposits	+ 100
Excess reserves	+ 90		

1. When checking deposits (CD) rise (fall), a bank's total reserves increase (fall) by the same amount. Its excess and required reserves rise by (1 – rrr)×CD and rrr×CD, respectively.

C. Now, suppose that a bank makes a $90 loan.

Assets		Liabilities
Loans	+ 90	
Excess reserves	– 90	

1. When a loan is made (paid off), excess reserves decrease (increase) by the same amount.

General Principles of Bank Management

A. Four primary concerns of a bank manager

1. Liquidity management is the acquisition of assets that are liquid enough to meet the demand for cash by depositors.
2. Asset management is the acquisition of a diversified set of assets with a high rate of return but a low default risk.
3. Liability management involves obtaining funds at a low cost.
4. Capital adequacy management entails acquiring and maintaining an appropriate amount of bank capital.

B. Liquidity management and the role of reserves

1. Consider the following example (in millions of $).

Assets		Liabilities	
Required reserves	10	Check. deposits	100
Excess reserves	10	Borrowings (banks)	0
Loans	80	Borrowings (Fed)	0
Securities	10	Bank capital	10

Assume the required reserves ratio is 10%.

2. Suppose $20 million in deposits are withdrawn. The bank is now short of its reserve requirements by $8 million.

Assets		Liabilities	
Required reserves	8	Check. deposits	80
Excess reserves	– 8	Borrowings (banks)	0
Loans	80	Borrowings (Fed)	0
Securities	10	Bank capital	10

3. The bank has 4 immediate ways to acquire $8 million in reserves.

   a. They can borrow the funds from another bank in the federal funds market.

Assets		Liabilities	
Required reserves	8	Check. deposits	80
Excess reserves	0	Borrowings (banks)	8
Loans	80	Borrowings (Fed)	0
Securities	10	Bank capital	10

   b. They can sell some securities.

Assets		Liabilities	
Required reserves	8	Check. deposits	80
Excess reserves	0	Borrowings (banks)	0
Loans	80	Borrowings (Fed)	0
Securities	2	Bank capital	10

c. They can borrow the funds directly from the Fed.

Assets		Liabilities	
Required reserves	8	Deposits	80
Excess reserves	0	Borrowings (banks)	0
Loans	80	Borrowings (Fed)	8
Securities	10	Bank capital	10

d. They can call in (not renew) some loans. This action, however, will antagonize those customers who will likely take their business to another bank in the future.

Assets		Liabilities	
Required reserves	8	Deposits	80
Excess reserves	0	Borrowings (banks)	0
Loans	72	Borrowings (Fed)	0
Securities	10	Bank capital	10

4. Banks are willing to forgo some returns to hold excess reserves because they are insurance against the costs associated with deposit withdraws.
5. The higher the costs associated with meeting reserve requirements, the more excess reserves a bank will hold.

C. Asset management

1. Banks seek out borrowers who will pay a high interest rate but are not likely to default.
2. Banks try to purchase securities with high returns and low risk.
3. Banks prefer to diversify their asset base to lower their risk.
4. Banks manage their assets, so they can cover their deposit outflows without incurring large costs to meet their reserve requirements.

D. Liability management

1. Prior to 1960, liability management was not really needed.
    a. Checkable deposits could not pay interest, so banks could not compete with each other for funds. Hence, a bank's main source of funds was more or less fixed.
    b. The overnight lending market was not well established, so banks rarely borrowed from each other.
2. Starting in the 1960s, financial innovation lead to a greater emphasis on liability management.
    a. Large banks developed new financial instruments like negotiable CDs (starting in 1961) that gave banks a way to acquire new funds.
    b. The development of the overnight lending market (ex., the federal funds market) gave banks a means to immediately raise funds to meet reserve requirements.

3. Banks responded to their new abilities to raise funds by setting asset growth targets and then seeking out increased liabilities to fund that growth.

E. Capital adequacy management

1. A higher level of bank capital helps to prevent a bank failure.

    a. Suppose a bank has $8 million in bank capital but must write off $10 million in bad loans (loan value declines by that amount).

        i. The bank then becomes insolvent because the bank's assets fall below its liabilities (i.e., its capital equity is – $2 million).

        ii. The government then sells off the bank's assets to pay its liabilities and the stockholders lose all of their equity interest in the bank.

b. If a bank with $15 million in capital must write off $10 million in bad loans then its capital falls to $5 million.

Assets		Liabilities	
Loans	– 10	Bank capital	– 10

c. The higher the level of bank capital, the smaller the chance the bank will become insolvent.

2. A lower level of bank capital raises the return for stockholders.

a. Return on assets (ROA) indicates the amount of profits generated, on average, by each dollar of assets.

$$\text{ROA} = \text{net profit after taxes/assets}$$

b. Equity multiplier (EM) is the assets per dollar of equity capital.

$$\text{EM} = \text{assets/equity capital}$$

c. Return on equity (ROE) indicates the amount of profits per dollar of equity (bank) capital. [Equity holders like a high level of ROE.]

$$\text{ROE} = \text{net profit after taxes/equity capital}$$

$$\text{ROE} = \text{EM} \times \text{ROA}$$

d. Banks with a high asset-to-equity ratio (EM) will have a high ROA which pleases stockholders. The high ROA and EM, however, means the bank has less equity (as a function of assets) to cushion against loan defaults.

3. Bank capital requirements

a. More equity benefits stockholders by reducing the likelihood of bankruptcy (and the total loss of their investment) but costs shareholders a lower ROA.

b. Since banks, which are a critical component of the economy, have an incentive to hold less capital, the government requires banks to hold a certain amount of equity to protect against a shortfall of bank capital.

4. Strategies to raise bank capital (equity) relative to assets

   a. The bank can issue equity (common stock). (strategy 1)

   b. The bank can reduce its dividend to the shareholders as a way to raise retained earnings and equity. (strategy 2)

   c. The bank can reduce assets by selling securities and/or contracting their lending. (strategy 3)

      i. During an economic downturn, banks often use strategy 3 to raise their equity-to-assets ratios.

      ii. During the Great Recession, many banks contracted their lending to raise their equity-to-assets ratios in response to higher than expected defaults on loans.

Managing Credit Risk

A. Screening

1. The lender collects information from potential borrowers on their assets, liabilities, income, and credit history.
2. The lender uses this information to assess whether or not to provide the potential borrower with a loan.

B. Specialization in lending

1. Some banks specialize in lending to local firms or a particular industry.
2. An advantage of specialization is that it provides banks with more knowledge about local firms or a particular industry, so they can better assess which loans are good credit risks.
3. A disadvantage is that these banks often do not have a diversified loan portfolio, so the bank is susceptible to shocks to the local economy or a particular industry.

C. Monitoring and enforcement of restrictive covenants

1. Banks monitor borrowers' activities to make sure they are complying with the restrictive covenants.
2. Banks enforce those covenants when borrowers are not complying with them.

D. Long-term customer relationships

1. A long-term relationship with a potential borrower reduces a bank's cost of information collection.
2. This relationship also discourages the borrower from engaging in risky behavior because it could reduce the borrower's likelihood of getting a loan in the future.

E. Loan commitments are a bank's commitment to provide a firm with a line of credit (i.e., loans) over a specified time period at some market-determined interest rate.

1. This arrangement is beneficial to the firm because it provides the firm a source of funds as needed.
2. The loan commitments provide the bank with a long-term relationship that can facilitate information collection.

F. Collateral and compensating balances

1. Collateral reduces a bank's risk because it decreases the lender's loss from a default. It also reduces moral hazard because the borrower has more to lose from a default.
2. Compensating balances are a form of collateral in which the bank requires the borrower to keep a minimum amount in a checking account with the bank in exchange for a loan.
3. Compensating balances also make it easier for a bank to directly observe the financial behavior of the borrower.

G. Credit rationing (has two forms)

1. The bank can refuse to make a loan of any amount.
2. The bank makes the loan but restricts the size to less than what the borrower would like.

Managing Interest-Rate Risk

A. Gap analysis measures the sensitivity of bank *profits* to changes in the interest rate.

1. Identify short-term (interest rate sensitive) assets and liabilities on the balance sheet.
2. Calculating the change in profits from a change in the interest rate (R):

$$\Delta\text{Profits} = [\text{Assets(st)} - \text{Liabilities(st)}] \times \Delta R$$

Assets(st) = short-term assets
Liabilities(st) = short-term liabilities

3. Example: Assets(st) = \$30 million, Liabilities(st) = \$50 million, and the interest rises by 5%.

$$\Delta\text{Profits} = [30 - 50] \times 0.05 = -\$1.5 \text{ million}$$

B. Duration analysis measures the sensitivity of the *market value* of a bank's total assets and total liabilities (i.e, the bank's net worth) to an interest rate change.

1. Find the average (weighted) duration of both a bank's total assets and total liabilities.
2. Calculating the change in the market value of a bank's balance sheet from a change in the interest rate:

$$\Delta\text{Market value} = [(\text{Assets} \times D_A) - (\text{Liabilities} \times D_L)] \times [-\Delta R]$$

D_A = average duration of total assets
D_L = average duration of total liabilities

3. Example: Assets = \$100 million, D_A = 3 years, Liabilities = \$90 million, D_L = 2 years, and the interest rises by 5%.

$$\Delta\text{Market value} = [(100 \times 3) - (90 \times 2)] \times [-0.05] = -\$6 \text{ million}$$

Off-Balance Sheet Activities

A. Off-balance sheet activities are activities such as trading financial instruments and income generated from fees and loan sales that impact bank profits but are not on the balance sheet.

B. Loan sales occur when a loan is sold on the secondary market for a profit and is removed from the bank's balance sheet.

C. Generation of fee income

   1. Some activities such as making foreign exchange trades and servicing a mortgage-backed security provide a revenue stream without any additional risk.

   2. Other activities such as guaranteeing securities and providing back up credit lines expose the bank to additional risk.

D. Trading activities and risk management

1. Banks both conduct transactions in foreign exchange markets and trade in financial futures, options for debt instruments, and interest rate swaps.
2. These activities are off-balance sheet and can be very speculative in nature.
3. Traders have incentives to engage in speculative activities but do not directly bear the majority of the costs if those actions do not work out.
4. Bank managers must set up internal controls (ex., limits on the size of trades) to prevent traders from being too risky.
5. One way banks assess their risk exposure is to conduct a "stress test" to determine if the bank can survive a very low probability, bad event.