

Banking and the Management of Financial Institutions



Bank Financial Statement: Statement of Financial Position

Liabilities

- Checkable deposits
- Nontransaction deposits
- Borrowings
- Bank capital

Assets

- Reserves
- Cash items in process of collection
- Deposits at other banks
- Securities
- Loans

Statement of Financial Position of All Commercial Banks (items as a percentage of the total, December 2008)

Assets (Uses of Funds)*		Liabilities (Sources of Funds)	
Reserves and cash items	8%	Checkable deposits	6%
Securities		Nontransaction deposits	
U.S. government and agency	10	Small-denomination time deposits	
State and local government and		(< \$100,000) + savings deposits	37
other securities	12	Large-denomination time deposits	16
Loans		Borrowings	31
Commercial and industrial	13	Bank capital	10
Real estate	31		
Consumer	7		
Interbank	3		
Other	7		
Other assets (for example,			
physical capital)	9		
Total	100	Total	100

*In order of decreasing liquidity.
Source: www.federalreserve.gov/releases/h8/current/.

Basic Banking: Cash Deposit

Suppose Chaichana deposits cash in a saving account with Bangkok Bank with bank notes worth 1,000 baht.

Bangkok Bank

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Basic Banking: Cheque Deposit

Later on, Chaichana deposits cheque in his saving account this cheque drawn on Siam Commercial Bank 1,000 baht.

Bangkok Bank

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Siam Commercial Bank

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Basic Banking: Reserves

Commercial bank is obliged to keep fraction of its deposits as required reserved.
Required reserve ratio = 6.00%

Bangkok Bank

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In Thailand ...

Currently, the reserve requirements ratio is 6% and the reserveable assets consist of:

- minimum 1% in non-remunerated current account balances at the Bank of Thailand, (of which no more than 0.2% in cash at the central cash centers of commercial banks can be counted towards this component)
- maximum 2.5% in vault cash and the rest in eligible public securities.

Basic Banking: Investment

To make a profit, bank must put to productive use all or part of the excess reserves it has available; invest in securities or making loans.

Bangkok Bank

In case, the loan has an interest rate of 7.00% per year, and saving account has an interest of 2.50% per year. Compute the profit that Bangkok Bank earned from Chaichana deposits.

Bank Management

Liquidity Management	the decisions made by a bank to maintain sufficient liquid assets to meet the bank's obligations to depositors
Asset Management	the acquisition of assets that have a low rate of default and diversification of asset holdings to increase profits
Liability Management	the acquisition of funds at low cost to increase profits
Capital Adequacy Management	a bank's decision about the amount of capital it should maintain and then acquisition of the needed capital
Credit Risk	the risk arising from the possibility that the borrower will default
Interest-rate Risk	the possible reduction in returns associated with changes in interest rates

Liquidity Management: Ample Excess Reserves

Suppose that Bangkok Bank's initial financial statement is as follows:

Bangkok Bank			
Reserves	20,000,000	Deposits	100,000,000
Loans	80,000,000	Bank capital	10,000,000

The bank's required reserves are 6.00%. In case a deposit outflow of 10 million baht occurs, bank's financial statement becomes

Bangkok Bank	

Liquidity Management: Shortfall in Reserves

Suppose that Bangkok Bank has no excess reserves, the bank's initial financial statement is as follows:

Bangkok Bank	

When a deposit outflow occurs, holding excess reserves allows the bank to escape the costs of

- Borrowing from the other banks or corporations
- Selling securities
- Borrowing from the central bank
- Calling in or selling off loans

Liquidity Management: (1) borrow from other bank

Bangkok Bank	

Liquidity Management: (2) sell securities

Bangkok Bank

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Liquidity Management: (3) Borrow from central bank

Bangkok Bank

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Liquidity Management: (4) Reduce Loans

Bangkok Bank

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Asset Management: Three Goals

- Seek the highest possible returns on loans and securities
- Reduce risk
- Have adequate liquidity

Asset Management: Four Tools

- Find borrowers who will pay high interest rates and have low possibility of defaulting
- Purchase securities with high returns and low risk
- Lower risk by diversifying
- Balance need for liquidity against increased returns from less liquid assets

Liability Management

- Recent phenomenon due to rise of money center banks
- Expansion of overnight loan markets and new financial instruments (such as negotiable CDs)
- Checkable deposits have decreased in importance as source of bank funds

Capital Adequacy Management

- Bank capital helps prevent bank failure
- The amount of capital affects return for the owners (equity holders) of the bank
- Regulatory requirement

Capital Adequacy Management: Preventing Bank Failure

Consider two banks with identical financial statements, except that High Capital Bank has a ratio of capital to assets of 10.00% while Low Capital Bank has a ratio of 4.00%.

High Capital Bank			
Reserves	6,000,000	Deposits	90,000,000
Loans	94,000,000	Bank capital	10,000,000

Low Capital Bank			
Reserves	6,000,000	Deposits	96,000,000
Loans	94,000,000	Bank capital	4,000,000

Suppose both banks got caught up in the bad loans, only to find that 5 million baht of their loans became worthless later. When these bad loans are written off (valued at zero), as a consequence, bank capital and asset value declined.

High Capital Bank			

Low Capital Bank			

Capital Adequacy Management: Returns to Equity Holders

Return on Assets: net profit after taxes per dollar of assets

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

Return on Equity: net profit after taxes per dollar of equity capital

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

Relationship between ROA and ROE is expressed by the Equity Multiplier: the amount of assets per dollar of equity capital

$$EM = \frac{\text{Assets}}{\text{Equity Capital}}$$

$$\frac{\text{net profit after taxes}}{\text{equity capital}} = \frac{\text{net profit after taxes}}{\text{assets}} \times \frac{\text{assets}}{\text{equity capital}}$$

$$ROE = ROA \times EM$$

Capital Adequacy Management: Safety

- Benefits the owners of a bank by making their investment safe
- Costly to owners of a bank because the higher the bank capital, the lower the return on equity
- Choice depends on the state of the economy and levels of confidence

Asymmetric Information

- The unequal knowledge that each party to a transaction has about the other party.

Adverse Selection

- The problem created before transaction occurs that the people who are the most undesirable from the other party's point of view are the ones who are most likely to want to engage in the financial transaction.

Moral Hazard

- The risk that one party to a transaction will engage in behaviour that is undesirable from other party's point of view.

Application: How a Capital Crunch Caused a Credit Crunch in 2008

- Shortfalls of bank capital led to slower credit growth
 - Huge losses for banks from their holdings of securities backed by residential mortgages.
 - Losses reduced bank capital
- Banks could not raise much capital on a weak economy, and had to tighten their lending standards and reduce lending.

Credit Risk: Overcoming Adverse Selection and Moral Hazard

- Screening and Monitoring
 - Screening
 - Specialisation in lending
 - Monitoring and enforcement of restrictive covenants
- Long-term customer relationships
- Loan commitments
- Collateral and compensating balances
- Credit rationing

Macaulay Duration

- The weighted average term to maturity of the cash flows from a bond. The weight of each cash flow is determined by dividing the present value of the cash flow by the price, and is a measure of bond price volatility with respect to interest rates.

Modified Duration

- The measurable change in the value of a security in response to a change in interest rates.
- Modified duration follows the concept that interest rates and bond prices move in opposite directions. This formula is used to determine the effect that a 100-basis-point (1%) change in interest rates will have on the price of a bond.

Example

Bank A lends 10 million baht for 3 years at a fixed interest rate of 7.00 percent (prevailing market interest rate at the inception of the loan.)

- Compute Macaulay Duration and Modified Duration of this lending.
- What happened if market interest rate changes by 50 basis points?

Exercise

Compute Macaulay Duration and Modified Duration of a 5-year loan at an interest rate of 10.00 percent. What happened if market interest rate changes by 30 basis points?

Interest-Rate Risk

First National Bank			
Assets		Liabilities	
Rate-sensitive assets	\$20M	Rate-sensitive liabilities	\$50M
Variable-rate and short-term loans		Variable-rate CDs	
Short-term securities		Money market deposit accounts	
Fixed-rate assets	\$80M	Fixed-rate liabilities	\$50M
Reserves		Checkable deposits	
Long-term loans		Savings deposits	
Long-term securities		Long-term CDs	
		Equity capital	

- If a bank has more rate-sensitive liabilities than assets, a rise in interest rates will reduce bank profits and a decline in interest rates will raise bank profits
- The average duration of its assets is three years, whereas the average duration of its liabilities is two years.
- Suppose that interest rates changes by 5.00 percentage points, what happened to the sensitivity of bank profits to changes in interest rates?

Interest Rate Risk: Gap Analysis

- **Basic gap analysis:**
(rate sensitive assets - rate sensitive liabilities) x Δ interest rates = Δ in bank profit
- **Maturity bucked approach**
 - Measures the gap for several maturity subintervals.
- **Standardised gap analysis**
 - Accounts for different degrees of rate sensitivity.

Interest Rate Risk: Duration Analysis

% Δ in market value of security $\approx$ - percentage point Δ in interest rate x duration in years.

- Uses the weighted average duration of a financial institution's assets and of its liabilities to see how net worth responds to a change in interest rates.