

PA974-001

# Policy Responses to the Great Recession

Lecture 6 (9/22/09)

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# Outline

- Interpreting balance sheets, and
- Managing liquidity risk,
- Asset Management,
- Capital Adequacy

# Basic Banking—Cash Deposit

First National Bank				First National Bank			
Assets		Liabilities		Assets		Liabilities	
Vault Cash	+\$100	Checkable deposits	+\$100	Reserves	+\$100	Checkable deposits	+\$100

- Opening of a checking account leads to an increase in the bank's reserves equal to the increase in checkable deposits

# Basic Banking—Check Deposit

First National Bank			
Assets		Liabilities	
Cash items in process of collection	+\$100	Checkable deposits	+\$100

When a bank receives additional deposits, it gains an equal amount of reserves; when it loses deposits, it loses an equal amount of reserves

First National Bank		Second National Bank	
Assets	Liabilities	Assets	Liabilities
Reserves	+\$100	Reserves	-\$100
	Checkable deposits		Checkable deposits
	+\$100		-\$100

# Basic Banking—Making a Profit

First National Bank			
Assets		Liabilities	
Required reserves	+\$10	Checkable deposits	+\$100
Excess reserves	+\$90		

Second National Bank			
Assets		Liabilities	
Required reserves	+\$10	Checkable deposits	+\$100
Loans	+\$90		

- Asset transformation-selling liabilities with one set of characteristics and using the proceeds to buy assets with a different set of characteristics
- The bank borrows short and lends long

# Bank Management

- Liquidity Management
- Asset Management
- Liability Management
- Capital Adequacy Management
- Credit Risk
- Interest-rate Risk

# Liquidity Management: Ample Excess Reserves

Assets		Liabilities	
Reserves	\$20M	Deposits	\$100M
Loans	\$80M	Bank Capital	\$10M
Securities	\$10M		

Assets		Liabilities	
Reserves	\$10M	Deposits	\$90M
Loans	\$80M	Bank Capital	\$10M
Securities	\$10M		

- If a bank has ample excess reserves, a deposit outflow does not necessitate changes in other parts of its balance sheet

# Liquidity Management: Shortfall in Reserves

Assets		Liabilities	
Reserves	\$10M	Deposits	\$100M
Loans	\$90M	Bank Capital	\$10M
Securities	\$10M		

Assets		Liabilities	
Reserves	\$0	Deposits	\$90M
Loans	\$90M	Bank Capital	\$10M
Securities	\$10M		

- Reserves are a legal requirement and the shortfall must be eliminated
- Excess reserves are insurance against the costs associated with deposit outflows

# Liquidity Management: Borrowing

<b>Assets</b>		<b>Liabilities</b>	
Reserves	\$9M	Deposits	\$90M
Loans	\$90M	Borrowing	\$9M
Securities	\$10M	Bank Capital	\$10M

- Cost incurred is the interest rate paid on the borrowed funds

# Liquidity Management: Securities Sale

<b>Assets</b>		<b>Liabilities</b>	
Reserves	\$9M	Deposits	\$90M
Loans	\$90M	Bank Capital	\$10M
Securities	\$1M		

- The cost of selling securities is the brokerage and other transaction costs

# Liquidity Management: Federal Reserve

<b>Assets</b>		<b>Liabilities</b>	
Reserves	\$9M	Deposits	\$90M
Loans	\$90M	Borrow from Fed	\$9M
Securities	\$10M	Bank Capital	\$10M

- Borrowing from the Fed also incurs interest payments based on the discount rate

# Liquidity Management: Reduce Loans

<b>Assets</b>		<b>Liabilities</b>	
Reserves	\$9M	Deposits	\$90M
Loans	\$81M	Bank Capital	\$10M
Securities	\$10M		

- Reduction of loans is the most costly way of acquiring reserves
- Calling in loans antagonizes customers
- Other banks may only agree to purchase loans at a substantial discount

# 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 When Assets Decline

High Bank Capital				Low Bank Capital			
Assets		Liabilities		Assets		Liabilities	
Reserves	\$10M	Deposits	\$90M	Reserves	\$10M	Deposits	\$96M
Loans	\$90M	Bank Capital	\$10M	Loans	\$90M	Bank Capital	\$4M

High Bank Capital				Low Bank Capital			
Assets		Liabilities		Assets		Liabilities	
Reserves	\$10M	Deposits	\$90M	Reserves	\$10M	Deposits	\$96M
Loans	\$85M	Bank Capital	\$5M	Loans	\$85M	Bank Capital	-\$1M

# Capital Adequacy Management: Returns to Equity Holders

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

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

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

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

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

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

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

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

# 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

# Credit Risk: Overcoming Adverse Selection and Moral Hazard

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

# 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

# Interest Rate Risk: Gap Analysis

Basic Gap Analysis:

(rate-sensitive assets – rate sensitive liabilities)

×  $\Delta$  interest rates =  $\Delta$  in bank profits

Maturity Bucket Approach

measures the gap for several maturity subintervals

Standardized Gap Analysis

accounts for differing degrees of rate sensitivity

# Interest Rate Risk: Duration Analysis

Duration Analysis:

$\% \Delta$  market value of security  $\approx$   
–percentage point  $\Delta$  interest rate  $\times$  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

# Off-Balance-Sheet Activities

- Loan sales (secondary loan participation)
- Generation of fee income
- Trading activities and risk management techniques
  - Futures, options, interest-rate swaps, foreign exchange
  - Speculation

# Off-Balance-Sheet Activities (cont'd)

- Trading activities and risk management techniques (cont'd)
  - Principal-agent problem
  - Internal Controls
    - Separation of trading activities and bookkeeping
    - Limits on exposure
    - Value-at-risk
    - Stress testing