中南财经政法大学

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Financial Markets

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Chapter 9 : Banking Management

Preview

- This chapter examines how banks attempt to maximize their profits.

- Although the discussion that follows focuses primarily on commercial banks, many of the same principles apply to other financial intermediaries as well.

Learning Objectives

1. Summarize the features of a bank balance sheet.

2. Apply changes to a bank’s assets and liabilities on a T-account.

3. Identify ways in which banks can manage their assets and liabilities to maximize profit.

4. List the ways in which banks deal with credit risk.

5. Apply gap and duration analysis and identify interest-rate risk.

6. Examine off-balance sheet activities.

The Bank Balance Sheet

- **Liabilities:**
  - Checkable deposits
  - Nontransaction deposits
  - Borrowings
  - Bank capital
- **Assets:**
  - Reserves
  - Cash items in process of collection
  - Deposits at other banks
  - Securities
  - Loans
  - Other assets

Balance Sheet of All Commercial Banks

TABLE 1 Balance Sheet of All Commercial Banks (items as a percentage of the total, June 2014)

Assets (Uses of Funds)*		Liabilities (Sources of Funds)	
Reserves and cash items	19%	Checkable deposits	11%
Securities		Nontransaction deposits	
U.S. government and agency	13	Small-denomination time deposits (<$100,000) + savings deposits	47
State and local government and other securities	6	Large-denomination time deposits	11
Loans		Borrowings	20
Commercial and industrial	12	Bank capital	11
Real estate	25		
Consumer	8		
Interbank	1		
Other	7		
Other assets (for example, physical capital)	9		
Total	100	Total	100

*In order of decreasing liquidity.

Source: http://www.federalreserve.gov/releases/h8/current/.

Basic Banking

- Cash Deposit:

Jane brown opens a checking account with a $100 bill. Bank now puts her $100 bill into its vault, which is part of its reserve.

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

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

- Check Deposit:

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	Checkable deposits +$100	Reserves -$100	Checkable deposits -$100

Basic Banking

- Making a profit:

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

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

- To make a profit, the bank must put to productive use of all or part of the $90 excess reserves (securities or loans)
- Bank loan officers evaluate potential borrowers using 5C's: character, capacity (ability to repay), collateral, conditions (in the local and national economies), and capital (net wealth)
- Banks are in the business of "borrowing short and lending long"

General Principles of Bank Management

- Four types of management：
  - Liquidity Management
  - Asset Management
  - Liability Management
  - Capital Adequacy Management

- Two types of risks：
  - Credit Risk
  - Interest-rate Risk

Liquidity Management and the Role of Reserves

If a deposit outflow of 10 million USD occurs…

- 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		

- Suppose a bank's required reserves are 10%.
- If a bank has ample excess reserves, a deposit outflow does not necessitate changes in other parts of its balance sheet.

Liquidity Management and the Role of Reserves

- Shortfall:

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.
- What can the bank do to meet the reserves requirement?

Liquidity Management and the Role of Reserves

- Option 1: Borrow from other banks or corporations

Assets		**Liabilities**	
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 and the Role of Reserves

- Option 2: securities sale

Assets		**Liabilities**	
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 and the Role of Reserves

- Option 3: borrow from the central bank

Assets		**Liabilities**	
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 and the Role of Reserves

- Option 4: reduce loans by calling in or selling off loans

Assets		Liabilities	
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:

1. Seek the highest possible returns on loans and securities.
2. Reduce risk.
3. Have adequate liquidity.

Four Tools:

1. Find borrowers who will pay high interest rates and have low possibility of defaulting.
2. Purchase securities with high returns and low risk.
3. Lower risk by diversifying.
4. Balance need for liquidity against higher returns from less liquid assets.

Liability Management

- Liability management is a recent phenomenon due to the rise of money center banks
- Checkable deposits have decreased in importance as source of bank funds
- Expansion of overnight loan markets and new financial instruments (such as negotiable certificates of deposits)

Capital Adequacy Management

- Bank capital helps prevent bank failure
- The amount of capital affects return for the owners (equity holders) of the bank
- Trade-off between safety and returns to equity holders
- Bank capital requirements

Capital Adequacy Management

How Bank Capital Helps Prevent Bank Failure: suppose $5 million bad loans have to be written off

High Capital Bank

Assets		Liabilities	
Reserves	$10 million	Deposits	$90 million
Loans	$90 million	Bank capital	$10 million

Low Capital Bank

Assets		Liabilities	
Reserves	$10 million	Deposits	$96 million
Loans	$90 million	Bank capital	$ 4 million

High Capital Bank

Assets		Liabilities	
Reserves	$10 million	Deposits	$90 million
Loans	$85 million	Bank capital	$ 5 million

Low Capital Bank

Assets		Liabilities	
Reserves	$10 million	Deposits	$96 million
Loans	$85 million	Bank capital	−$ 1 million

Capital Adequacy Management

How the Amount of Bank Capital Affects 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

- Trade-off between safety and returns to equity holders:
  - ➢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

- Bank capital requirement

Banks also hold capital because they are required to do so by regulatory authorities.

Application: How a Capital Crunch Caused a Credit Crunch During the Global Financial Crisis

- 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.

Managing Credit Risk

- Screening and Monitoring:
  - Screening
  - Specialization in lending
  - Monitoring and enforcement of restrictive covenants
- Long-term customer relationships

Managing Credit Risk

- **Loan commitments**

A loan commitment is a bank's commitment to provide a firm with loans up to a given amount at an interest rate that is tied to some market interest rate. This method is used to maintain long-term relationships and gather information.

- **Collateral and compensating balances**

Compensating balances: a firm receiving a loan must keep a required minimum amount of funds in a checking account at the bank.

- **Credit rationing**

Refuse to make loan even though borrowers are willing to pay the stated interest rate, or even a higher rate.

Two forms: (1) refuse to make a loan of any amount to a borrower; (2) make a loan but restrict the size of the loan to less than the borrower would like

Managing Interest-Rate Risk

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.

First National Bank

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

Gap and Duration Analysis

- Basic gap analysis:

(rate sensitive assets - rate sensitive liabilities) x change in the interest rates = change in bank profit

- Maturity bucket approach:

  Assets and liabilities may not have the same maturity. We measure the gap for several maturity subintervals, called *maturity bucket*.

- Standardized gap analysis:

  Accounts for different degrees of rate sensitivity

Gap and Duration Analysis

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.

percentage change in market value of security ≈

- percentage-point change in interest rate x duration in years.

Off-Balance-Sheet Activities

- Loan sales (secondary loan participation)

- Generation of fee income

Examples:

- Servicing mortgage-backed securities
- Creating SIVs (structured investment vehicles) which can potentially expose banks to risk, as it happened in the global financial crisis

Off-Balance-Sheet Activities

- Trading activities and risk management techniques:
  - Financial futures, options for debt instruments, interest rate swaps, transactions in the foreign exchange market and speculation
  - Principal-agent problem arises

- Internal controls to reduce the principal-agent problem:
  - Separation of trading activities and bookkeeping
  - Limits on exposure
  - Value-at-risk
  - Stress testing

Chapter 12: Financial Crisis

Preview

- Financial crises are major disruptions in financial markets characterized by sharp declines in asset prices and firm failures.

- This chapter makes use of agency theory, the economic analysis of the effects of asymmetric information (adverse selection and moral hazard) on financial markets, to see why financial crises occur and why they have such devastating effects on the economy.

- We also examine the most recent global financial crisis.

Learning Objectives

- Define the term “financial crisis.”
- Identify the key features of the three stages of a financial crisis.
- Describe the causes and consequences of the global financial crisis of 2007-2009.
- Summarize the changes to financial regulation that developed in response to the global financial crisis of 2007-2009.
- Identify the gaps in current financial regulation and how they might be addressed with future regulatory changes.

What is a Financial Crisis?

The asymmetric information problems (moral hazard and adverse selection), which act as a barrier to efficient allocation of capital, are often described by economists as **financial frictions**.

A **financial crisis** occurs when there is a particularly large disruption to information flows in financial markets, with the result that financial frictions increase sharply and financial markets stop functioning.

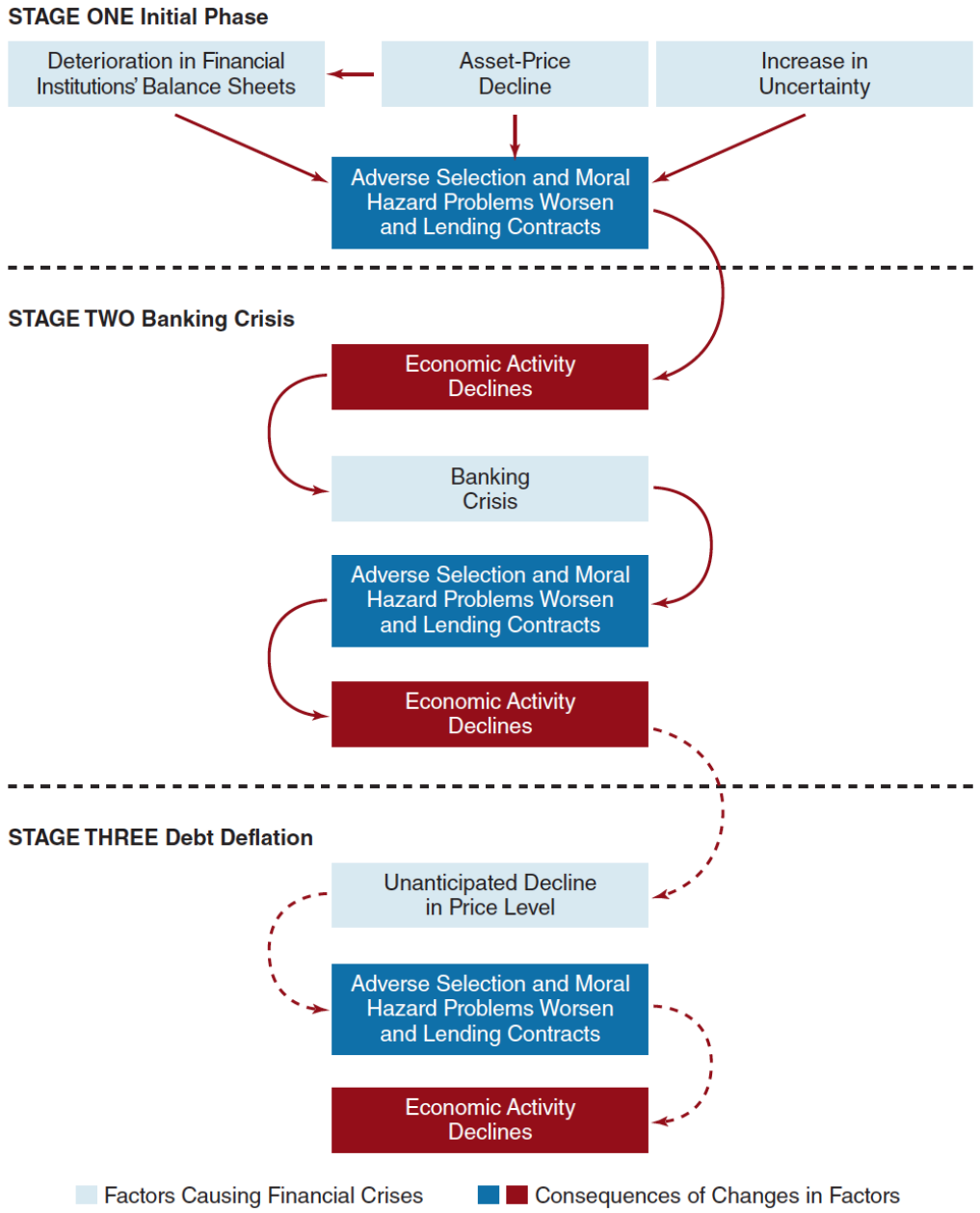
Dynamics of Financial Crises

- Stage One: Initiation of a Financial Crisis
  - Credit Boom and Bust
  - Asset-price Boom and Bust
  - Increase in Uncertainty

- Stage two: Banking Crisis

- Stage three: Debt Deflation

Sequence of Events in Financial Crises in Advanced Economies



Stage One: Initiation Phase

Channel 1: Credit Boom and Bust

- The seeds of a financial crisis can begin with mismanagement of financial liberalization or innovation:
  - elimination of restrictions
  - introduction of new types of loans or other financial products

- Government safety nets creates moral hazard problem, weakening incentives for risk management. Depositors ignore bank risk-taking.

- Eventually, losses on loans begin to mount, and asset values fall, leading to a reduction in capital.

Stage One: Initiation Phase

- Financial institutions cut back in lending, a process called **deleveraging**. Banking funding falls as well.

- As financial institutions cut back on lending, no one is left to evaluate firms. Financial frictions rise, limiting the financial system’s ability to address adverse selection and moral hazard.

- Economic spending contracts as loans become scarce.

Stage One: Initiation Phase

Channel 2: Asset-price Boom and Bust

A financial crisis can also begin with an asset pricing boom and bust:

- A pricing bubble starts, where asset values exceed their fundamental prices.
- When the bubble bursts and prices fall, corporate net worth falls as well. Moral hazard increases as firms have little to lose.
- Financial institutions also see a fall in their assets, leading again to deleveraging.

Stage One: Initiation Phase

Channel 3: Increase in Uncertainty

Finally, a financial crisis can begin with an increase in uncertainty:

- Many 19th century crises initiated with a spike in rates, due to a liquidity problem or panics
- Moral hazard also increases as loan repayment becomes more uncertain
- Other periods of high uncertainty can lead to crises, such as stock market crashes or the failure of a major financial institution

Stage Two: Banking Crisis

Deteriorating balance sheets lead financial institutions into insolvency. If severe enough, these factors can lead to a **bank panic**:

- Panics occur when depositors are unsure which banks are insolvent, causing all depositors to withdraw all funds immediately
- As cash balances fall, financial institutions must sell assets quickly, further deteriorating their balance sheet
- Adverse selection and moral hazard become severe – it takes years for a full recovery

Stage Three: Debt Deflation

If the crisis also leads to a sharp decline in prices, **debt deflation** can occur, where asset prices fall, but debt payments do not adjust, increases debt burdens.

- Debt payments are typically fixed in nominal terms, not indexed to asset values
- An unanticipated decline in the price level raises the value of borrowing firms' and households' liabilities in real terms but does not raise the real value of their assets. Borrowers' net worth in real terms thus declines
- Net worth drops lead to an increase in adverse selection and moral hazard, which is followed by decreased lending
- Economic activity remains depressed for a long time

The Global Financial Crisis of 2007-2009

Causes of the 2007-2009 Financial Crisis:

- Financial innovations emerge in the mortgage markets
  - Subprime mortgage
  - Mortgage-backed securities
  - Collateralized debt obligations (**CDOs**)

- Housing price bubble forms
  - Increase in liquidity from cash flows surging to the United States
  - Development of subprime mortgage market fueled housing demand and housing prices

FYI Collateralized Debt Obligations (CDOs)

- The creation of a collateralized debt obligation involves a corporate entity called a *special purpose vehicle (SPV)* that buys a collection of assets such as corporate bonds and loans, commercial real estate bonds, and mortgage-backed securities.

- The SPV separates the payment streams (cash flows) from these assets into buckets that are referred to as tranches.

- The highest rated tranches, referred to as super senior tranches are the ones that are paid off first and so have the least risk.

- The lowest tranche of the CDO is the equity tranche and this is the first set of cash flows that are not paid out if the underlying assets go into default and stop making payments. This tranche has the highest risk and is often not traded.

The Global Financial Crisis of 2007-2009

- Agency problems arise
  - “Originate-to-distribute” model is subject to principal-(investor) agent (mortgage broker) problem
  - Borrowers had little incentive to disclose information about their ability to pay
  - Commercial and investment banks (as well as rating agencies) had weak incentives to assess the quality of securities
- Information problems surface
- Housing price bubble bursts

The Global Financial Crisis of 2007-2009

- Effects of the 2007-2009 Financial Crisis
  - After a sustained boom, housing prices began a long decline beginning in 2006.
  - The decline in housing prices contributed to a rise in defaults on mortgages and a deterioration in the balance sheet of financial institutions.
  - This development in turn caused a run on the shadow banking system.

- Deterioration of financial institutions' balance sheets:
  - Decline in housing price led to write down the values of MBS and CDOs
  - Deleverage, sell of assets and restrict the availability of credit

The Global Financial Crisis of 2007-2009

- Run on the Shadow Banking System
  - Shadow Banking System: hedge funds, investment banks, and other non depository financial firms, which are not as tightly regulated as banks.
  - Repos: repurchase agreements are short-term borrowing that uses assets like mortgage-backed securities as collateral.
  - Haircuts: lenders require over-collateralization.

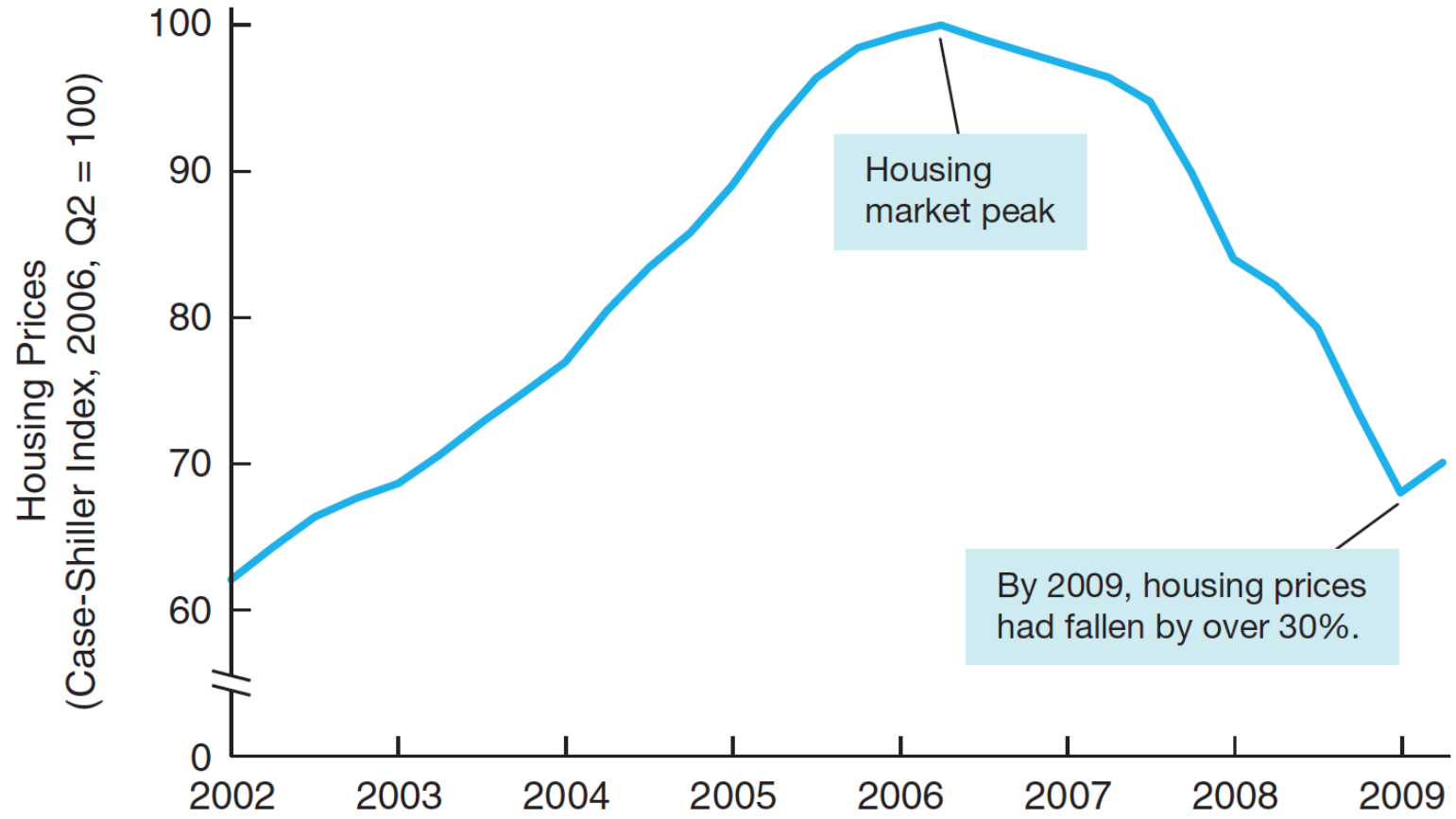
- High-profile firms fail
  - Bear Stearns (March 2008)
  - Fannie Mae and Freddie Mac (July 2008)
  - Lehman Brothers, Merrill Lynch, AIG, Reserve Primary Fund (mutual fund) and Washington Mutual (September 2008)

The Global Financial Crisis of 2007-2009

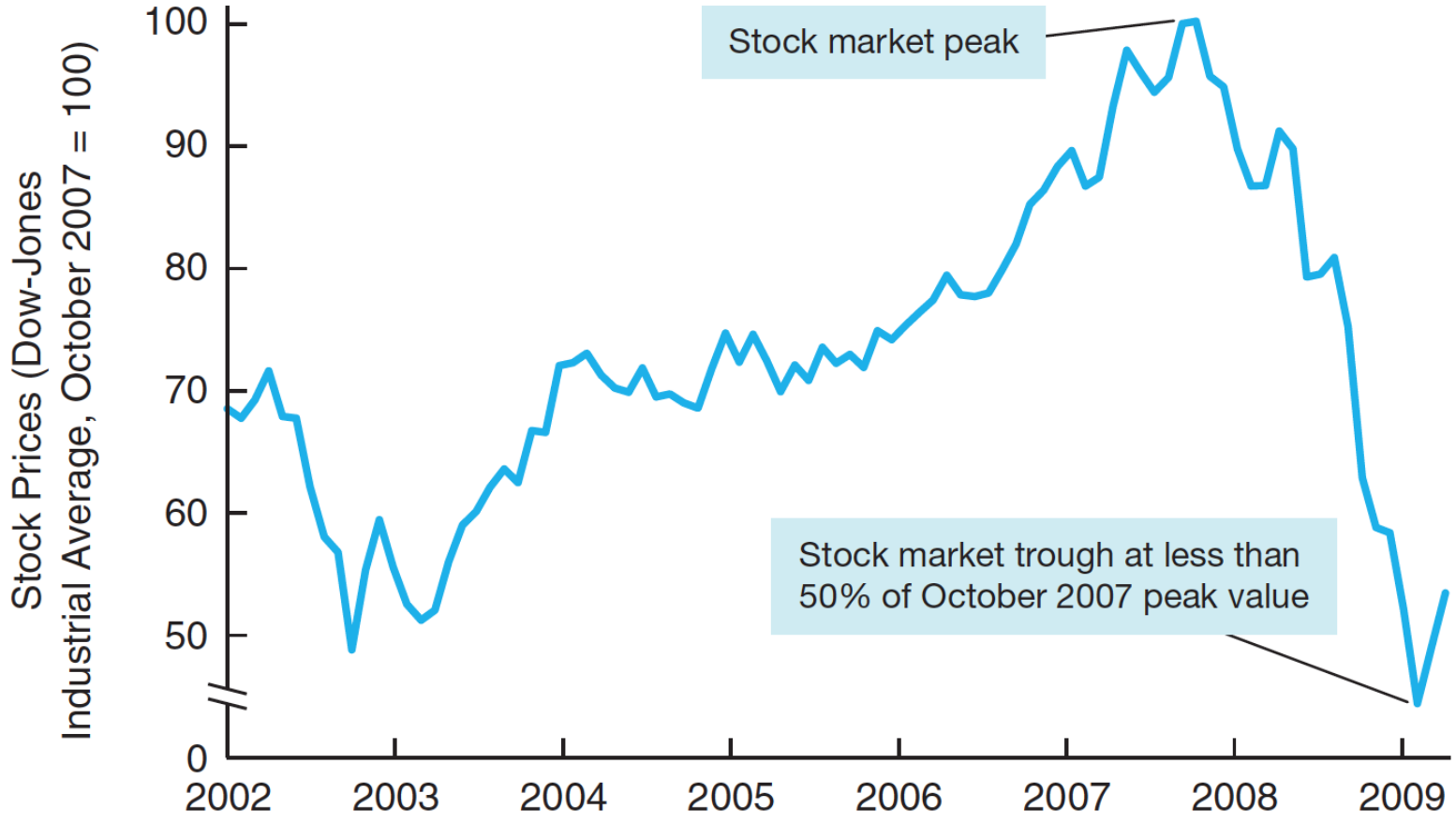
- Crisis spreads globally
  - Sign of the globalization of financial markets
  - TED spread (the difference between the three-month Treasury bill and the three-month LIBOR based in U.S. dollars) increased from 40 basis points to almost 240 in August 2007.

- Bailout package debated
  - House of Representatives voted down the $700 billion bailout package on September 29, 2008.
  - It passed on October 3, 2008.
  - Congress approved a $787 billion economic stimulus plan on February 13, 2009.

Housing Prices and the Financial Crisis of 2007–2009



Stock Prices and the Financial Crisis of 2007–2009



Inside the Fed: Was the Fed to Blame for the Housing Price Bubble?

- Some economists have argued that the low rate interest policies of the Federal Reserve in the 2003–2006 period caused the housing price bubble.

- Taylor argues that the low federal funds rate led to low mortgage rates that stimulated housing demand and encouraged the issuance of subprime mortgages, both of which led to rising housing prices and a bubble.

- Federal Reserve Chairman Ben Bernanke countered this argument, saying the root cause was the proliferation of new mortgage products that lowered mortgage payments, a relaxation of lending standards that brought more buyers into the housing market, and capital inflows from emerging market countries.

- The debate over whether monetary policy was to blame for the housing price bubble continues to this day.

Global: The European Sovereign Debt Crisis

- The increase in budget deficits that followed the financial crash of 2007-2009 led to fears of government defaults and a surge in interest rates.

- The sovereign debt, which began in Greece, moved on to Ireland, Portugal, Spain and Italy.

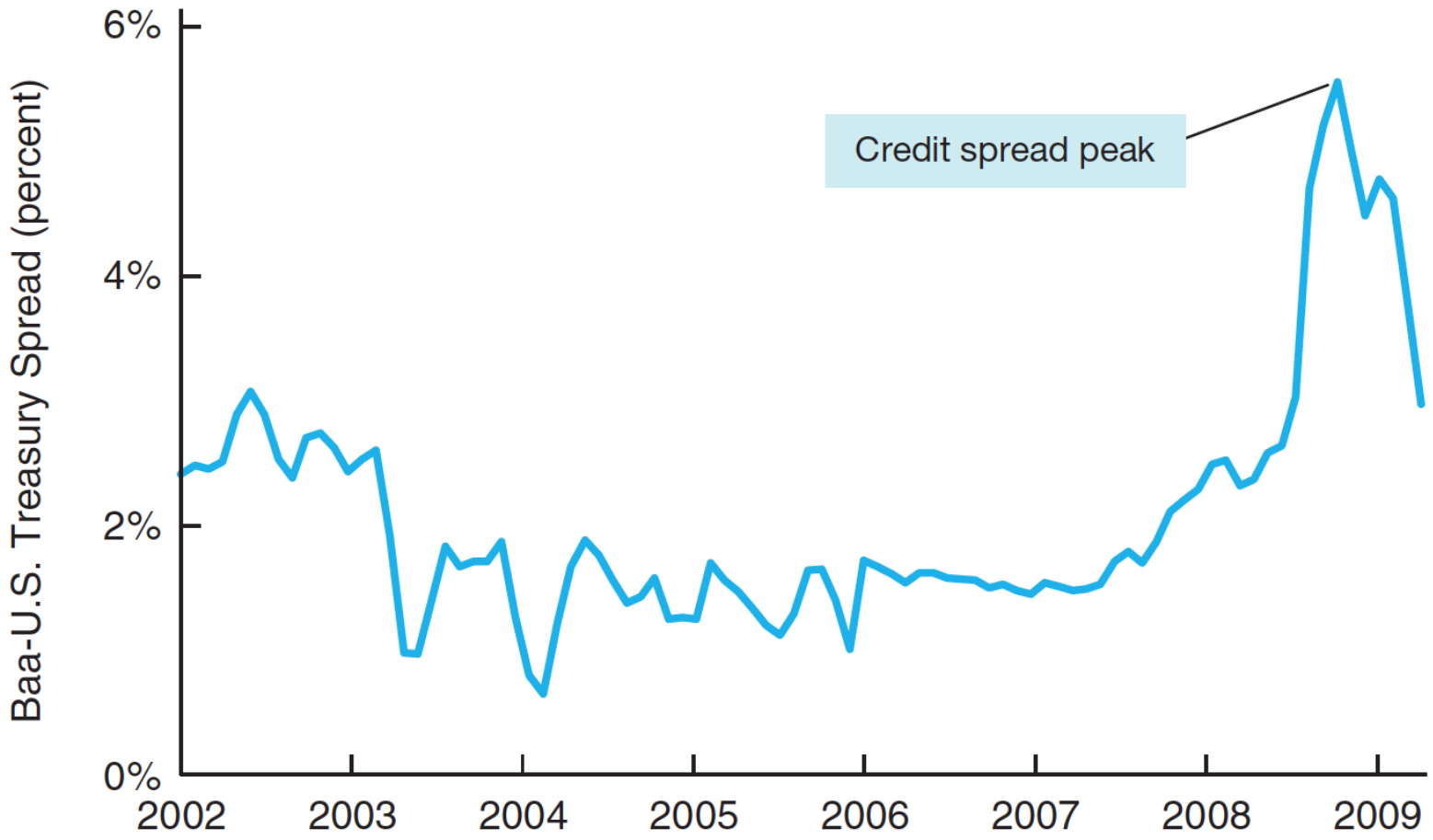
- The stresses created by this and related events continue to threaten the viability of the Euro.

The Global Financial Crisis of 2007-2009

Height of the 2007-2009 Financial Crisis

- The stock market crash gathered pace in the fall of 2008, with the week beginning October 6, 2008, showing the worst weekly decline in U.S. history.
- Surging interest rates faced by borrowers led to sharp declines in consumer spending and investment.
- The unemployment rate shot up, going over the 10% level in late 2009 in the midst of the “Great Recession, the worst economic contraction in the United States since World War II.

Credit Spreads and the 2007–2009 Financial Crisis



Government Intervention and the Recovery

- Short-term Responses and Recovery in the US
  - ➢ Financial Bailouts: In order to save their financial sectors and to avoid contagion, financial support was provided by many governments to bail out banks, other financial institutions, and even the so-called “too-big-to-fail” firms that were severely affected by the financial crisis.
  - ➢ Fiscal Stimulus Spending: To boost their individual economies, most governments used fiscal stimulus packages that combined government expenditure and tax cuts.
- Short-term Responses and Recovery in other countries
  - ➢ Japan’s consecutive stimulus packages, totaling $568 billion, were among the highest during the crisis, but these proved largely ineffective
  - ➢ European nations showed moderate success.

Long-Term Responses

- With the individual emergency national bailouts to rescue national economies and financial sectors, global leaders looked to building a more stable and robust global financial system. Steps taken by governments included:

  - Implement sound macroeconomic policies
  - enhance their financial infrastructure
  - develop financial education and consumer protection rules
  - enact macro- and micro-prudential regulations.

Long-Term Responses

- At the international level
  - proactive globally-binding supervision was designed
  - financial market discipline enforced
  - systemic risk managed

- To avoid collective action problems and to ensure that policy actions are mutually consistent with national growth objectives, aggregate plans began to be drafted simultaneously. The first ever of these is the Mutual Assessment Process launched in 2009 by the G20.

2008 Financial Crisis

Crash Course Economics: The 2008 Financial Crisis

https://www.bilibili.com/video/BV1rt4y1m7Xz

Acknowledgment

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