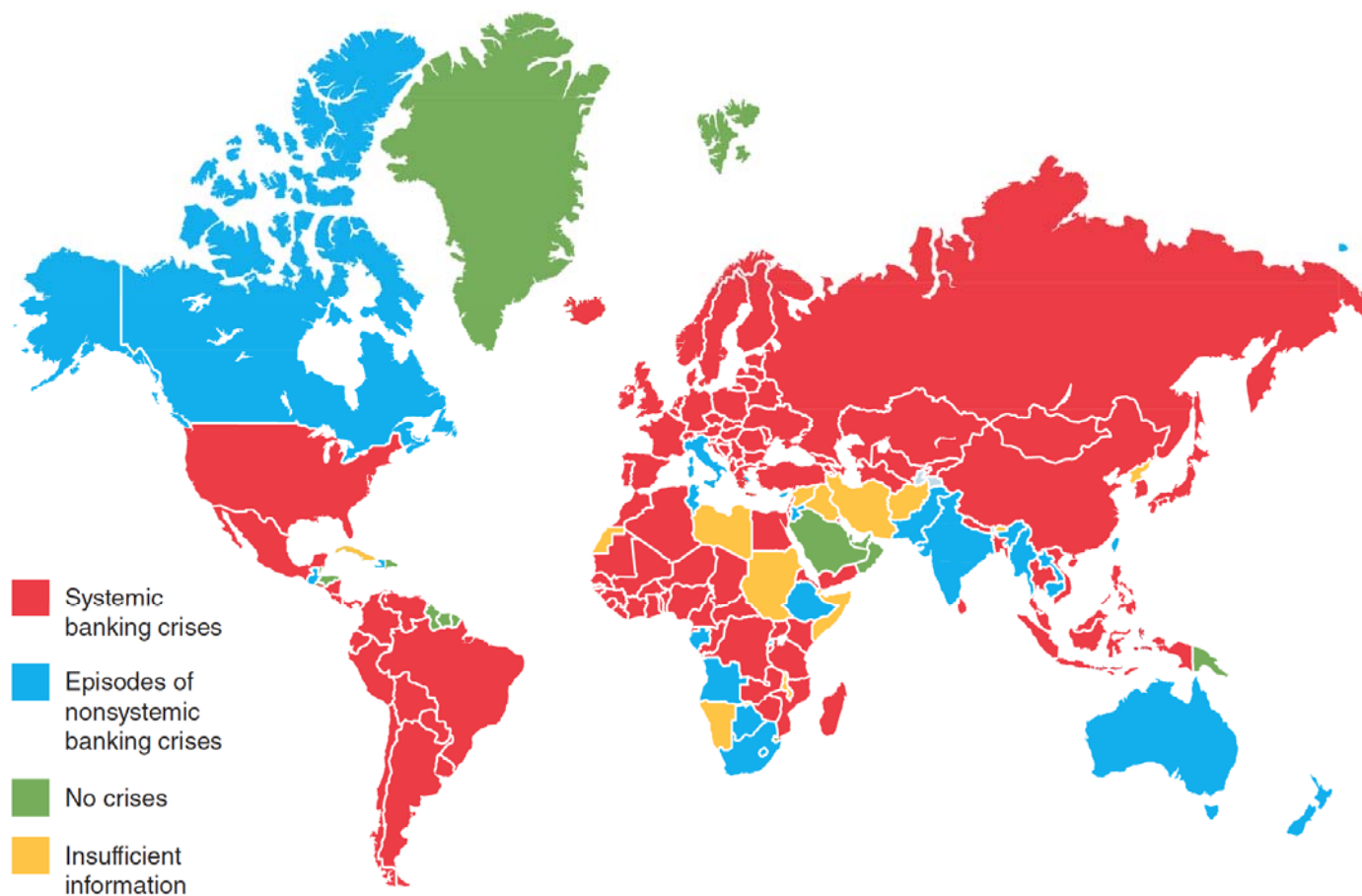


Economics 435  
The Financial System  
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UW Madison  
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# Banking Crises in the World Since 1970



Sources: Luc Laeven and Fabian Valencia, "Resolution of Banking Crises: The Good, the Bad and the Ugly," IMF Working Paper No. WP/10/46 (June 2010), and Luc Laeven, Banking Crisis Database at <http://www.luclaeven.com/Data.htm>.

# The Cost of Rescuing Banks in a Number of Countries

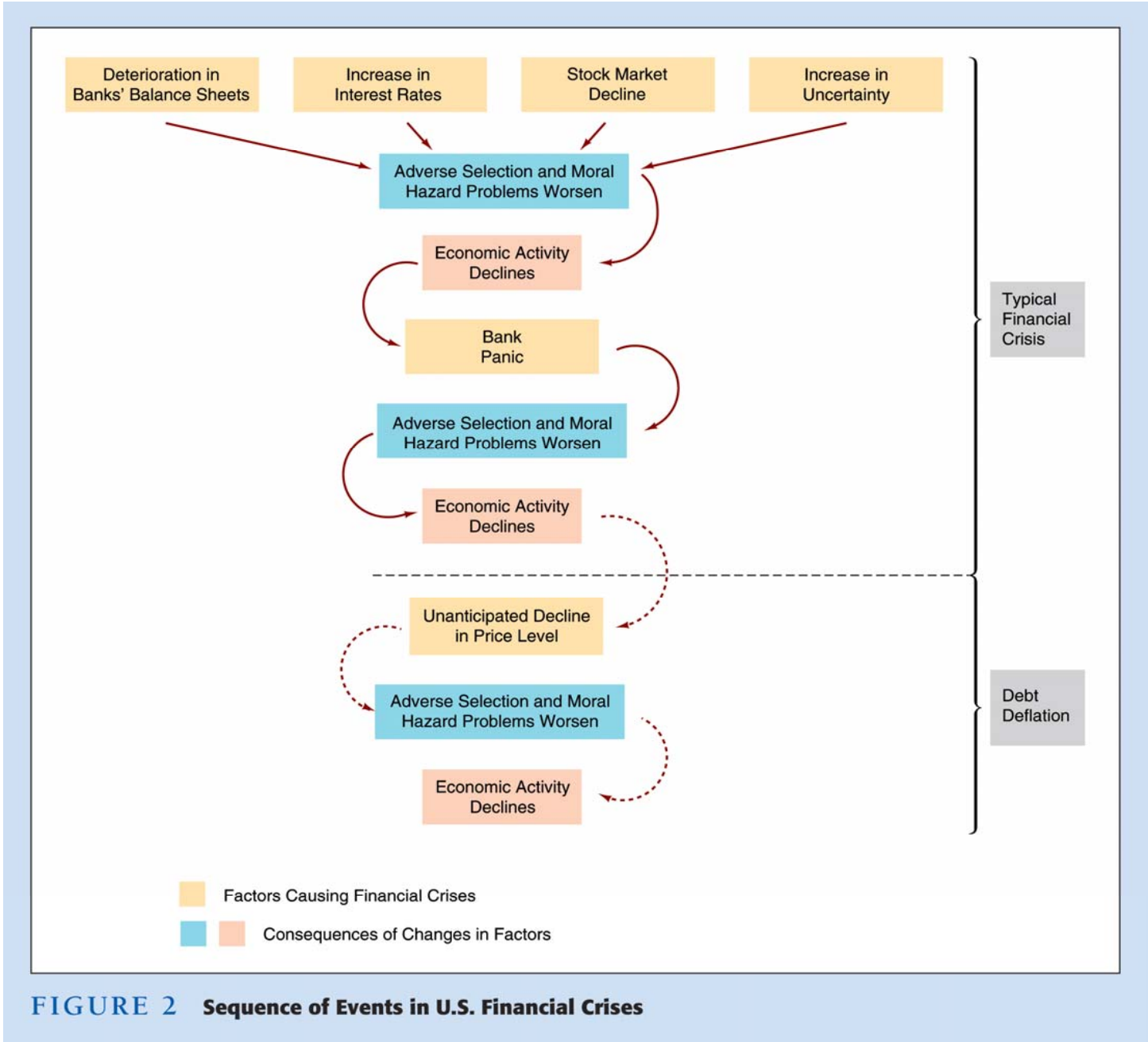
**TABLE 1** The Cost of Rescuing Banks in a Number of Countries

Country	Year(s) of Crisis, 1980–2009	Cost as a Percentage of GDP
Indonesia	1997–2001	57
Argentina	1980–1982	55
Thailand	1997–2000	44
Jamaica	1996–1998	44
Chile	1981–1985	43
Macedonia	1993–1995	32
Turkey	2000–2001	32
South Korea	1997–1998	31
Israel	1977	30
Ecuador	1998–2002	22
Mexico	1994–1996	19
China	1998	18
Malaysia	1997–1999	16
Philippines	1997–2001	13
Brazil	1994–1998	13
Finland	1991–1995	13
Argentina	2001–2003	10
Jordan	1989–1991	10
Hungary	1991–1995	10
Czech Republic	1996–2000	7
Sweden	1991–1995	4
United States	1988	4
Norway	1991–1993	3
<b>Global Crisis of 2007–2009</b>		
Iceland	2007–2009	13
Ireland	2007–2009	8
Netherlands	2007–2009	7
Belgium	2007–2009	5
United Kingdom	2007–2009	5
Luxembourg	2007–2009	5
United States	2007–2009	4
Germany	2007–2009	1

Sources: Luc Laeven and Fabian Valencia, "Resolution of Banking Crises: The Good, the Bad and the Ugly," IMF Working Paper No. WP/10/46 (June 2010); and Luc Laeven, Banking Crisis Database at <http://www.luclaeven.com/Data.htm>.

# The Sources and Consequences of Runs, Panics, and Crises

- Banks' fragility arises from the fact that they provide **liquidity** to depositors.
  - They allow depositors to withdraw their balances on demand.
- First come-first serve aspect means banks are susceptible to “runs” leading to insolvency.
- Recent commercial banks: WaMu, Wachovia (forced sale).
- Recent shadow financial institutions: Bear Stearns; Money Market Mutual Funds



**FIGURE 2** Sequence of Events in U.S. Financial Crises

# The Government Safety Net

- There are three reasons for the government to get involved in the financial system:
  1. To protect investors.
  2. To protect bank customers from monopolistic exploitation.
  - 3. To safeguard the stability of the financial system (susceptible to collapse due to asymmetric info problems) .**
  4. There are three reasons for the government to get involved in the financial system:

# The Government Safety Net

- Government officials employ a combination of strategies to protect investors and ensure stability of the financial system.
  - They operate as the lender of last resort, making loans to banks that face sudden deposit outflows.
  - They provide deposit insurance, guaranteeing that depositors receive the full value of their accounts if the institution fails.
- The safety net causes bank managers to take on too much risk.

# The Unique Role of Banks and Shadow Banks

- As the key providers of liquidity, banks ensure a sufficient supply of the means of payment for the economy to operate smoothly and efficiently.
- They hold illiquid assets to back their liquid liabilities.
  - A banks promise of full and constant value to depositors is based on assets of uncertain value.
- Banks and shadow banks are linked to one another both on their balance sheets and in their customers' minds.



# The Unique Role of Banks and Shadow Banks

- If a bank begins to fail, it will default on its loan payments to other banks and thereby transmit its financial distress to them.
- MMMFs hold large volumes of commercial paper, most of which was issued by banks.
- And banks are the key repo lenders to securities brokers.
- Banks and shadow banks are so interdependent they are capable of initiating contagion throughout the financial system.

# Lender of Last Resort

- The best way to stop a bank failure from turning into a bank panic is to make sure solvent institutions can meet their depositors' withdrawal demands.
- In 1873 Walter Bagehot suggested the need for a **lender of last resort** to perform this function.
  - Such an institution could make loans to prevent the failure of solvent banks, and
  - These institutions could provide liquidity insufficient quantities to prevent or end a financial panic.

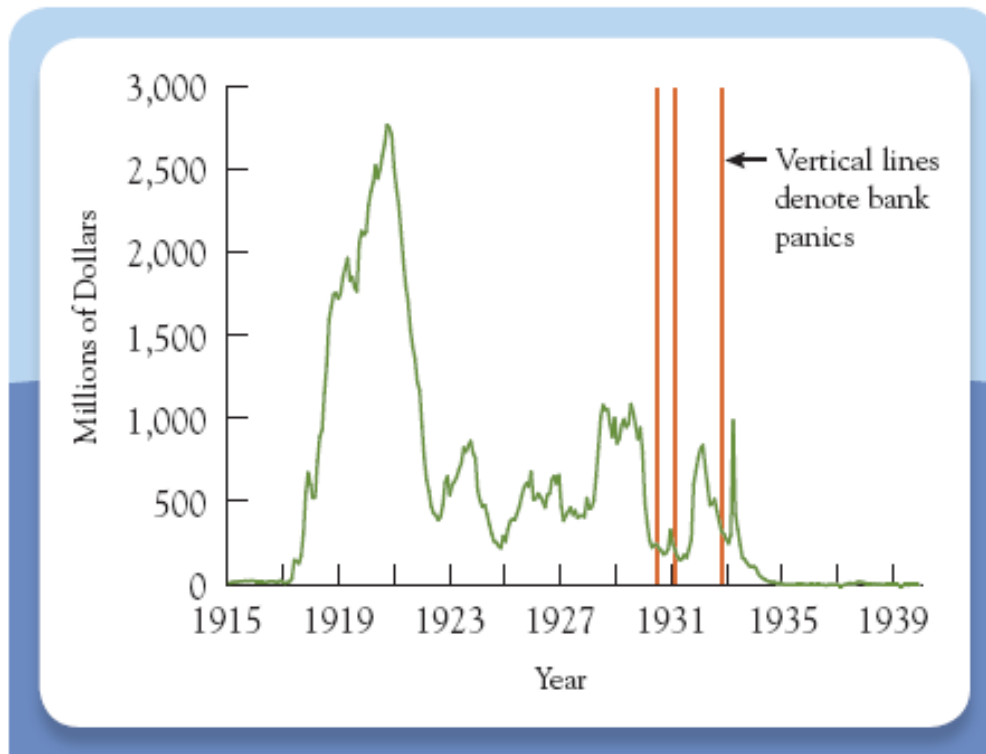
# Lender of Last Resort

- The existence of a lender of last resort significantly reduces, but does not eliminate, contagion.
- While the Fed had the capacity to operate as the lender of last resort in the 1930s, banks did not take advantage of the opportunity.
  - Their borrowing fell during panics.
- The mere existence of a lender of last resort will not keep the financial system from collapsing.

# Failure of the Lenders of Last Resort: Federal Reserve Lending, 1914-1940

Figure 14.2

Lending by the Federal Reserve to Commercial Banks, 1914-1940



As banks became illiquid in the early 1930s, lending declined.

The existence of a lender of last resort is no guarantee it will be used.

# Lender of Last Resort and Moral Hazard

- Knowing that the government will be there, also gives bank managers the incentive to take on too much risk.
  - The central bank's difficulty in distinguishing a bank's insolvency from its illiquidity creates a moral hazard for bank managers.
- It is important for a lender of last resort to operate in a manner that minimizes the tendency for bankers to take too much risk.
- Sometimes, there is no LoLR (for shadow financial institutions)

# Lender of Last Resort

- In the crisis of 2007-2009, we learned that the U.S. lender of last resort mechanism has not kept pace with the evolution of the financial system.
  - Some intermediaries facing sudden flight were shadow banks, which do not normally have access to Fed loans.
- By using its emergency lending authority, the Fed was able to lend to such nonbank intermediaries to stem the crisis.

# Government Deposit Insurance

- Congress' response to the Fed's inability to stem the bank panics of the 1930s was **deposit insurance**.
- The Federal Deposit Insurance Corporation (FDIC) guarantees that a depositor will receive the full account balance up to some maximum amount even if a bank fails.
  - Bank failures, in effect, become the problem of the insurer; bank customers need not worry.

# Government Deposit Insurance

- When a bank fails, the FDIC resolves the insolvency either by closing the institution or finding a buyer.
- Closing the bank is called the *payoff method*.
  - The FDIC pays off all the bank's depositors, then sells all the bank's assets.
- The second approach is called the *purchase-and-assumption method*.
  - The Fed finds a firm willing to take over the failed bank.



# Government Deposit Insurance

- Depositors prefer the purchase-and-assumption method.
  - The transition is typically seamless.
  - No depositors suffer a loss.
- Because the U.S. Treasury backs the FDIC, it can withstand virtually any crisis.
- Since its inception, deposit insurance clearly helped to prevent runs on commercial banks.

# Government Deposit Insurance

- However, it did not prevent the crisis of 2007-2009 and the runs associated with it.
  - Deposit insurance only covers depository institutions.
- However, as the system developed, shadow banks gained importance.
- These entities are sufficiently like banks that they, too, face the risk of runs by their short-term creditors.

# Government Deposit Insurance

- These nonbanks lack the benefits of deposit insurance.
  - However, later in the financial crisis they had access to a lender of last resort.
- Although some traditional banks suffered runs during the crisis, most of the runs were against shadow banks.

## Section 13(3) Federal Reserve Act

In unusual and exigent circumstances, the Board of Governors of the Federal Reserve System, by the affirmative vote of not less than five members, may authorize any Federal reserve bank, during such periods as the said board may determine, at rates established in accordance with the provisions of section 14, subdivision (d), of this Act, to discount for any participant in any program or facility with broad-based eligibility, notes, drafts, and bills of exchange when such notes, drafts, and bills of exchange are indorsed or otherwise secured to the satisfaction of the Federal Reserve bank. . .

<http://www.federalreserve.gov/aboutthefed/section13.htm>

# Problems Created by the Government Safety Net

- In protecting depositors, the government creates moral hazard.
- Comparing bank balance sheets before and after the implementation of deposit insurance:
  - In the 1920s, banks' ratio of assets to capital was about 4 to 1.
  - Today it is about 9 to 1.
- Most economic historians believe government insurance led to this rise in risk.
- Incentives to become “too big to fail” or “too interconnected to fail”

# Problems Created by the Government Safety Net

- Whenever the government provides such a safety net without charging an appropriate fee for it, they create an incentive for financial institutions to take risks that can threaten the system as a whole.
- However, in the midst of a crisis, they must balance the often-conflicting goals of *crisis management* and *crisis prevention*.

# Regulation and Supervision of the Financial System

- Government officials employ three strategies to ensure that the risks created by the safety net are contained.
  - Government *regulation* establishes a set of specific rules for bank managers to follow.
  - Government *supervision* provides general oversight of financial institutions.
  - Formal *examination* of banks' books by specialists provides detailed information on the firms' operation.

# Reg & Sup of the Financial System

**Table 14.1**

Regulators of Depository Institutions

Type of Intermediary	Regulators
Commercial Banks	<ol style="list-style-type: none"><li>1. Federal Deposit Insurance Corporation</li><li>2. Office of the Comptroller of the Currency (Nationally chartered banks)</li><li>3. Federal Reserve System (State-chartered banks that are Federal Reserve members)</li><li>4. State authorities (All state-chartered banks)</li></ol>
Savings Banks Savings and Loans	<ol style="list-style-type: none"><li>1. Office of Thrift Supervision</li><li>2. Federal Deposit Insurance Corporation</li><li>3. State authorities</li></ol>
Credit Unions	<ol style="list-style-type: none"><li>1. National Credit Union Administration</li><li>2. State authorities</li></ol>



# Regulation and Supervision of the Financial System

The consequences of regulatory competition are twofold.

1. Regulators force each other to innovate, improving the quality of the regulations they write.
2. It allows bank managers to shop for the most lenient regulator - the one whose rules and enforcement are the least stringent.
  - AIG regulated by OTS b/c it'd purchased a small bank

# Reg & Sup of the Financial System

- As of 2012, the U.S. Treasury had closed the OTC and merged it with the Office of the Comptroller.
- Some shadow banks, such as securities brokers, are subject to regulation by both the Securities and Exchange commission (SEC) and the commodity Futures Trading Commission (CFTC).
- The SEC also regulates MMMFs.
- Hedge funds have not been subject to regulation at all.

# Asset Holding Restrictions and Minimum Capital Requirements

- Restrict bank balance sheets.
- These regulations take two forms:
  - Restrictions on the types of assets banks can hold.
  - Requirements that they maintain minimum levels of capital.

# Asset Holding Restrictions

- U.S. banks cannot hold common stock.
- Regulations also restrict both the grade and quantity of bonds a bank can hold.
  - Banks are generally prohibited from purchasing bonds that are below investment grade.
  - Holdings from any single private issuer cannot exceed 25% of their capital.
- The size of the loans they can make to particular borrowers is also limited.

# Minimum Capital Requirements

- Minimum capital requirements complement those limitations on bank assets.
- Capital requirements take two basic forms:
  1. Based on the leverage ratio, the amount of capital divided by the bank's total assets: to be classified as well capitalized, a bank's leverage ratio must exceed 5%; a lower leverage ratio, especially one below 3%, triggers increased regulatory restrictions on the bank.
  2. Risk-based capital requirements

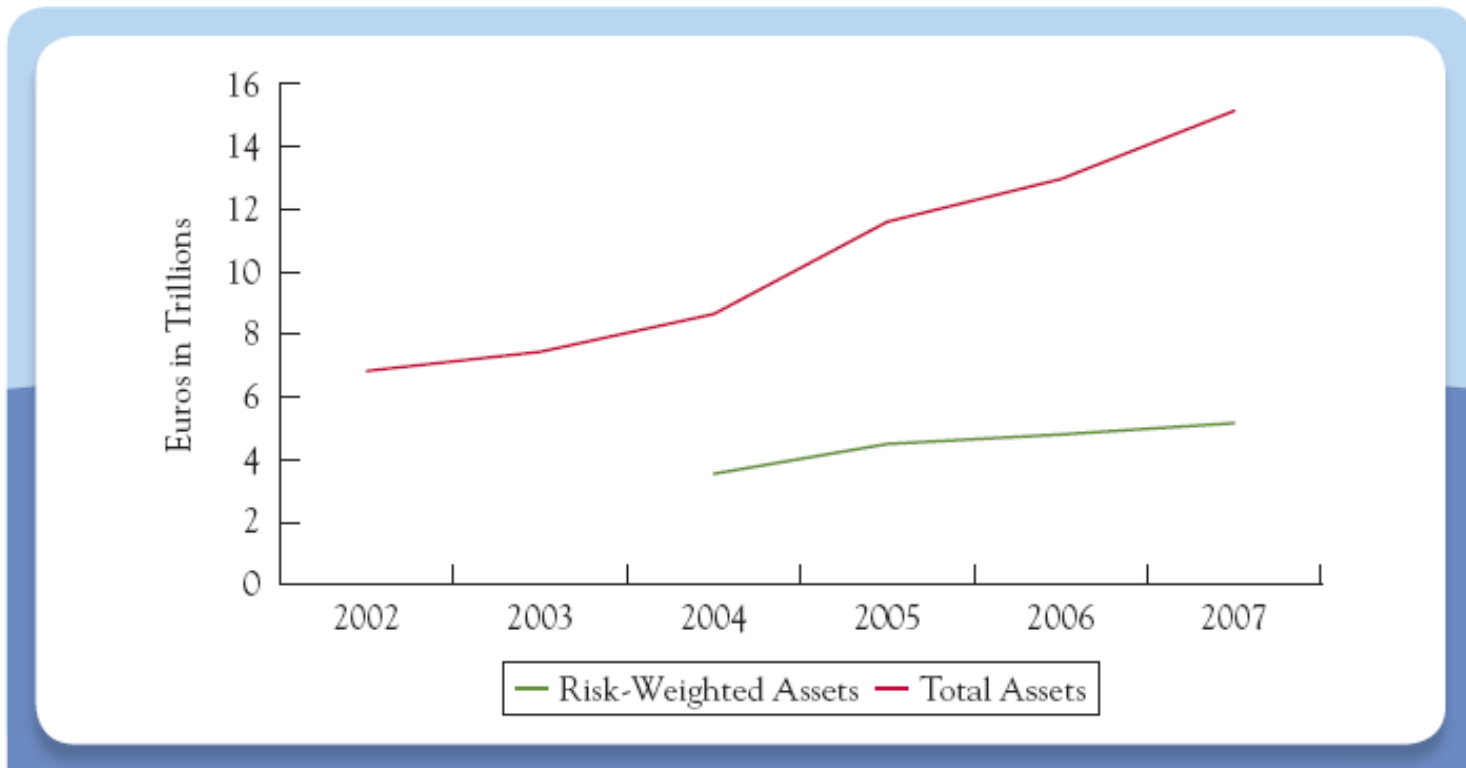
# Asset Holding Restrictions and Minimum Capital Requirements

- In the years leading up to the financial crisis of 2007-2009, banks in the U.S. and Europe purchased large volumes of mortgage backed securities.
  - These assets carried (misleadingly) high ratings.
  - This meant the amount of capital they needed to hold under their national capital rules was reduced.
  - Lower capital meant more leverage, which increase both risk and expected return.

# Asset Holding Restrictions and Minimum Capital Requirements

Figure 14.3

Total Assets and Risk-Weighted Assets of the 10 Largest Publicly Listed Banks in Europe and the United States, 2002-2007



# Supervision and Examination

- The government enforces banking rules and regulations through an elaborate oversight process called **supervision**.
  - This relies on a combination of monitoring and inspection.
  - It is done both remotely and through on-site **examination**.



# Supervision and Examination

- All chartered banks must file quarterly reports known as call reports.
- Every depository institution that is insured by the FDIC is examined at least once a year.
  - At the largest institutions, examiners are on site all the time.
  - They follow a process known as *continuous examination*.
  - Largest institutions are continuously monitored, with on-site examiners
- Evaluation of past-due loans, ensure loans are written off, i.e., balance sheet reflects operations accurately

# Supervision and Examination

- Supervisors use the **CAMELS** criteria to evaluate the health of the banks they monitor.

**C**apital adequacy,

**A**sset quality,

**M**anagement,

**E**arnings,

**L**iquidity, and

**S**ensitivity to risk.

CAMELS not released, used to advise banks on highest returns/risk at acceptable levels

# Micro-prudential Versus Macro-prudential Regulation

- Is the goal of financial stability the same as the stability of individual financial institutions?
- Not necessarily, hence:
- From **micro-prudential** oversight to **macro-prudential** regulation.

# Micro-Versus Macro-prudential Regulation

- **Common Exposure**
  - When many institutions have exposure to the same specific risk factor, it can make the system vulnerable to shock to that factor.
  - Intermediaries may be *directly* exposed to a frail institution through financial contracts.
  - Exposed *indirectly* and unknowingly via their counterparties, who are themselves directly exposed to a frail institution.
  - All institutions may be vulnerable to the same underlying risks.
- **Pro-cyclicality.**
  - Financial activity is prone to virtuous and vicious cycles.
  - The interaction between financial and economic activity can be mutually reinforcing leading to unsustainable booms and busts.
  - Euphoria feeds euphoria and vice versa.

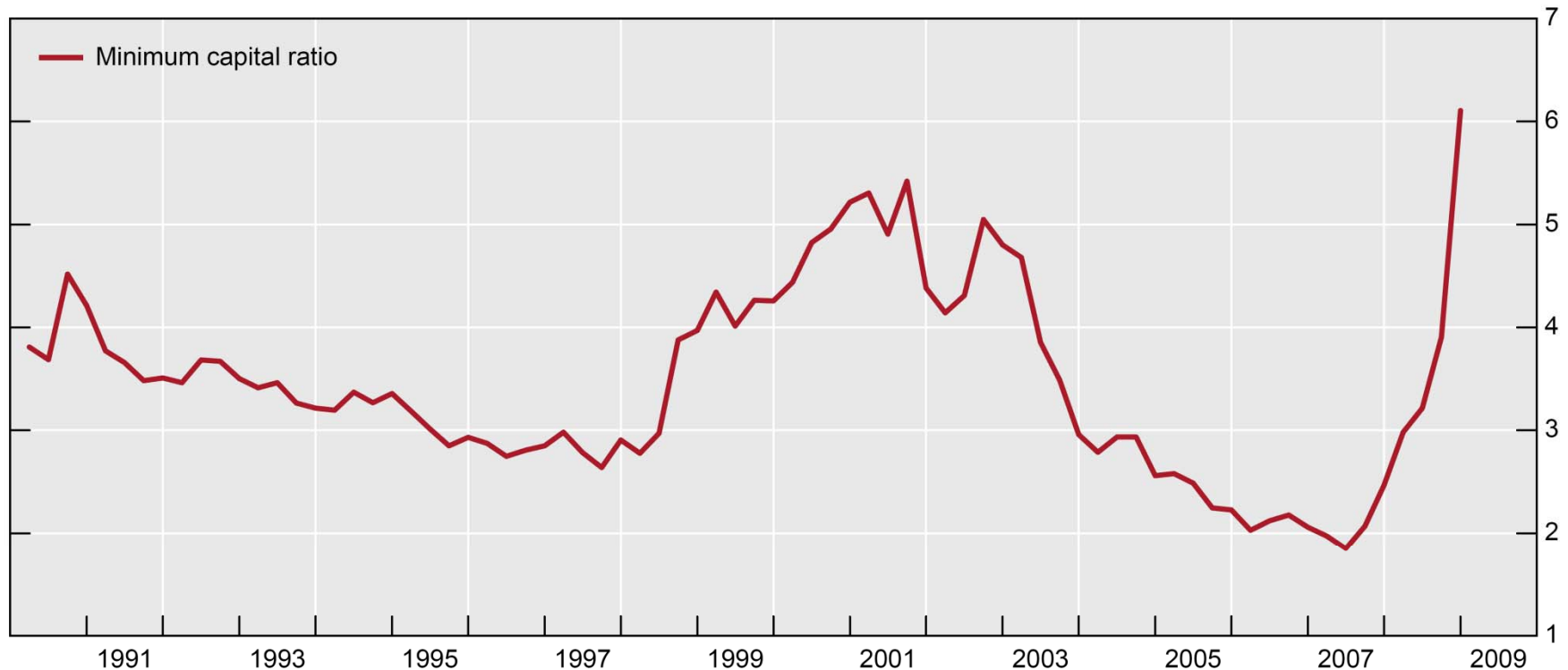
# Micro-prudential Versus Macro-prudential Regulation

- **Macro-prudential Policy.**
  - This aims to make intermediaries bear, or internalize, the costs that their behavior imposes on others.
  - To be effective in limiting systemic threats, a systemic capital surcharge probably would be disproportionately larger for firms that contribute the most to systemic risk.
    - Intermediaries would have an incentive to limit the systemic risks they create.
  - In good times, capital requirements would rise above the long-run average to create a capital buffer against adverse shocks and to discourage euphoria.

# An Example of Countercyclical Buffers

Graph 1

## Procyclical assessment of credit risk<sup>1</sup>



<sup>1</sup> The capital charge (in percentage points) is a measure of portfolio credit risk based on the risk weights embedded in the internal ratings based approach (IRB) methodology of Basel II. The IRB formula is applied to the exposures in a credit portfolio that includes rating categories ranging from AAA to Caa3. We follow Catarineu-Rabell et al (2005) in setting the portfolio shares of each rating class. For each exposure and observation in the sample we proxy the probability of default with the EDF taken from the database of Moody's KMV.

Sources: Moody's KMV; authors' calculations.

Source: Drehmann, Borio, Tsatsaronis, "Anchoring countercyclical capital buffers: the role of credit aggregates," BIS Working Papers No. 355 (Nov. 2011).

# Micro-prudential Versus Macro-prudential Regulation

- Regulators could require banks to buy catastrophe insurance.
- Could also have banks issue so-called contingent convertible bonds that convert to equity in the event of a capital shortfall.
- Ultimately, addressing systemic risk will require a broad framework of macro-prudential supervision that includes
  1. Rules and mechanisms that promote better risk management on the part of intermediaries, and
  2. Reforms that reduce the vulnerability of the financial system to the liquidation of any single financial firm.