



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS



Lecture 3:
**The Federal Reserve's Response
to the Financial Crisis**



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

The Two Main Tools of Central Banking

- Lender of last resort powers
 - For financial stability: Central banks provide liquidity (short-term loans) to financial institutions or markets to help calm financial panics.
- Monetary policy
 - For macroeconomic stability: In normal times, central banks adjust the level of short-term interest rates to influence spending, production, employment, and inflation.



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

The Two Main Tools of Central Banking

- Today's lecture will focus on lender-of-last-resort policy during the financial crisis. Monetary policy will be covered in the next lecture.



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

Financial System Vulnerabilities Before the Crisis

- Private-sector vulnerabilities
 - excessive leverage (debt)
 - banks' failure to adequately monitor and manage risks
 - excessive reliance on short-term funding
 - increased use of exotic financial instruments that concentrated risk



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

Financial System Vulnerabilities Before the Crisis

- Public-sector vulnerabilities
 - gaps in regulatory structure
 - failures of regulation and supervision
 - insufficient attention paid to the stability of the financial system as a whole



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

An Important Public-Sector Vulnerability: Fannie Mae and Freddie Mac

- Fannie Mae and Freddie Mac are private corporations that were established by the Congress and are referred to as government-sponsored enterprises, or GSEs.
- They are the largest “packagers” of individual mortgages into mortgage-backed securities (MBS), which they guarantee against loss.



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

An Important Public-Sector Vulnerability: Fannie Mae and Freddie Mac

- Fannie and Freddie were permitted to operate with inadequate capital to back their guarantees – a point recognized by the Fed and others prior to the crisis.
- Their balance sheets grew rapidly, including through purchases of subprime MBS, exposing them to additional risks.



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

A Key Trigger:

Bad Mortgage Products and Practices

- Exotic mortgages (such as “exploding ARMS”) and sloppy lending practices (such as no-doc loans) proliferated before the crisis.
- Repayment of these loans depended on continually rising house prices.



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

A Key Trigger:

Bad Mortgage Products and Practices

- Rising house prices created home equity for borrowers, allowing them to refinance into more-standard mortgages after a few years.
- When house prices stopped rising, however, borrowers could neither refinance nor meet the (typically increasing) payments on their exotic mortgages.



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

Examples of Bad Mortgage Practices

- interest-only (IO) adjustable-rate mortgages (ARMs)
- option ARMs (permit borrowers to vary the size of monthly payments)
- long amortization (payment period greater than 30 years)
- negative amortization ARMs (initial payments do not even cover interest costs)
- no-documentation loans

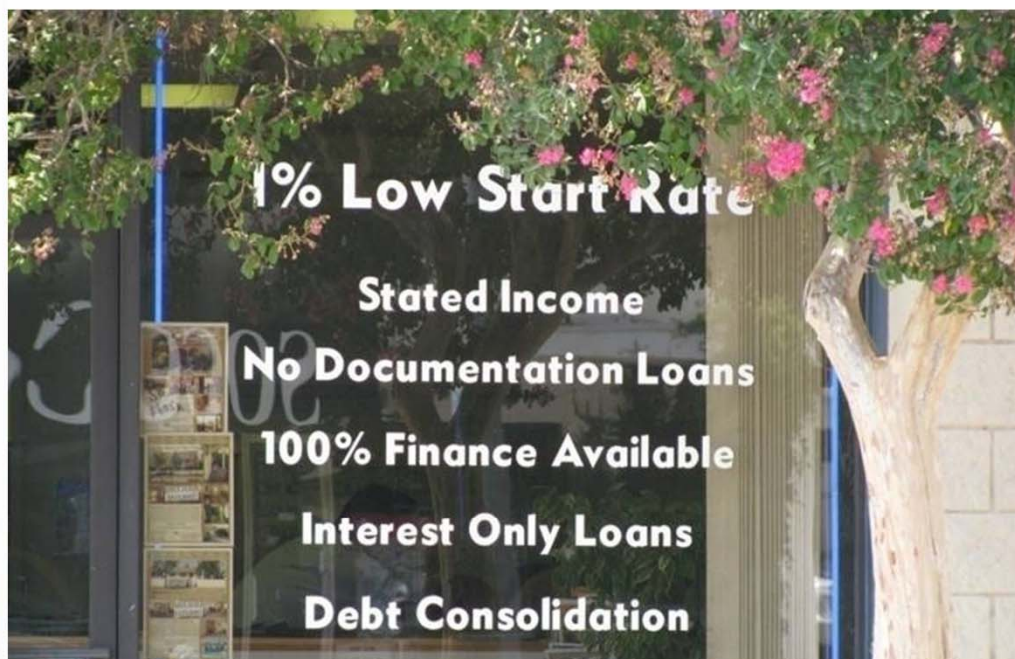
The Deterioration of Lending Practices



You Could Save \$\$\$ With The Combo Loan.

Home Loans Made Easy!

- Low Monthly Payments
- 4 out of 5 Approved[†]
- No Up-Front Cost Or Obligation
- Loans for Homeowners With Less Than Perfect Credit



- 1% Low Start Rate
- Stated Income
- No Documentation Loans
- 100% Finance Available
- Interest Only Loans
- Debt Consolidation



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

The Financing of Exotic and Subprime Mortgages

- Many types of financial institutions “packaged” exotic and subprime mortgages into securities.
 - Some securities were relatively simple in structure—for example, most GSE-backed MBS.
 - Other securities were very complex and opaque derivatives—for example, collateralized debt obligations, or CDOs.
- Rating agencies gave AAA ratings to many of these securities.



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

The Financing of Exotic and Subprime Mortgages

- Many of these securities were sold to investors.
- Financial institutions also retained some of these securities – often in off-balance-sheet vehicles, financed by cheap short-term funding like commercial paper.



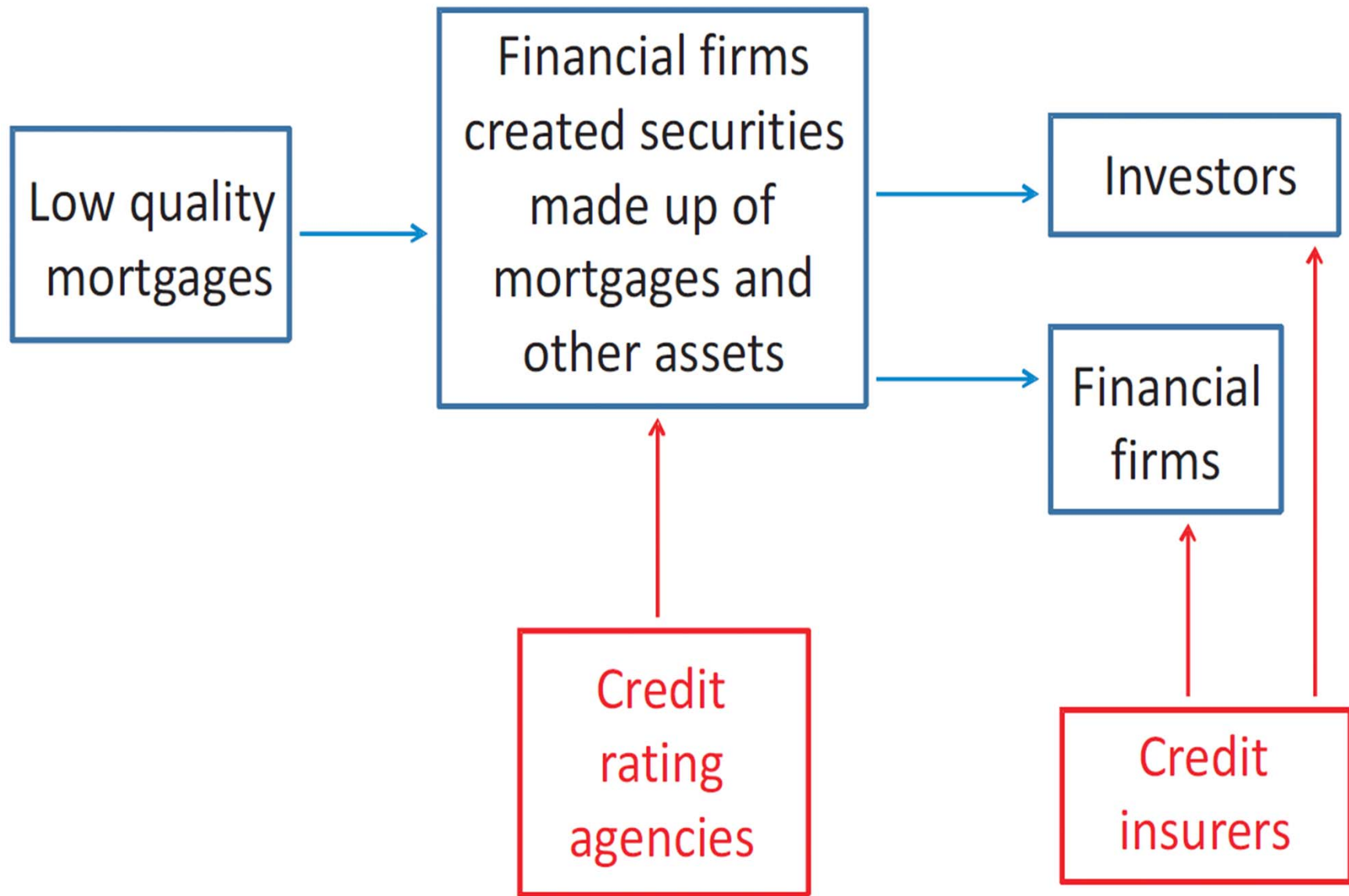
THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

The Financing of Exotic and Subprime Mortgages

- Companies like AIG sold “insurance” to protect investors or financial firms that held these securities.
- These financial system practices amplified the risks of low-quality lending.

Subprime Mortgage Securitization





THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

The Crisis: A Classic Financial Panic

- A financial panic occurs when providers of short-term credit (think *depositors in a bank*) suddenly lose confidence in the ability of the borrower (think *the bank*) to repay; providers of short-term credit then quickly withdraw their funds.



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

The Crisis: A Classic Financial Panic

- As house prices fell, it became clear that the values of many mortgage-related securities would fall sharply, imposing losses on financial firms, investment vehicles, and credit insurers (like AIG).
- Because of complexity of many securities and poor risk monitoring, however, investors and even the firms themselves were unsure about where losses would fall.



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

The Crisis: A Classic Financial Panic

- Runs began, as financial firms and investors pulled funding from any firm thought to be vulnerable to losses.
- These runs generated huge pressures on key financial firms and disrupted many important financial markets.



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

Large Financial Firms Came Under Intense Pressure in 2008

- **Bear Stearns:** Forced sale, March 16
- **Fannie and Freddie:** Placed in conservatorship, liabilities guaranteed by the U.S. Treasury, Sept. 7
- **Lehman Brothers:** Filed for bankruptcy, Sept. 15
- **Merrill Lynch:** Acquisition by Bank of America announced, Sept. 15



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

Large Financial Firms Came Under Intense Pressure in 2008

- **AIG:** Received emergency liquidity assistance from the Fed, Sept. 16
- **Washington Mutual Bank:** Closed by regulators, acquisition by JP Morgan Chase announced, Sept. 25
- **Wachovia:** Acquisition by Wells Fargo announced, Oct. 3



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

Policy Response: Overview

- Lessons from the Great Depression
 - In a financial panic, the central bank needs to lend freely to halt runs and restore market functioning.
 - Highly accommodative monetary policy helps support economic recovery and employment.



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

Policy Response: Overview

- Heeding those lessons, the Federal Reserve and the federal government took vigorous actions to stem the financial panic, support key financial markets and institutions, and limit the contraction in output and employment.
- Similar actions were taken by foreign central banks and governments.



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

Global Response

- On October 10, 2008, G-7 countries agreed to work together to stabilize the global financial system. They agreed to
 - prevent the failure of systemically important financial institutions
 - ensure financial institutions' access to funding and capital
 - restore depositor confidence
 - work to normalize credit markets



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

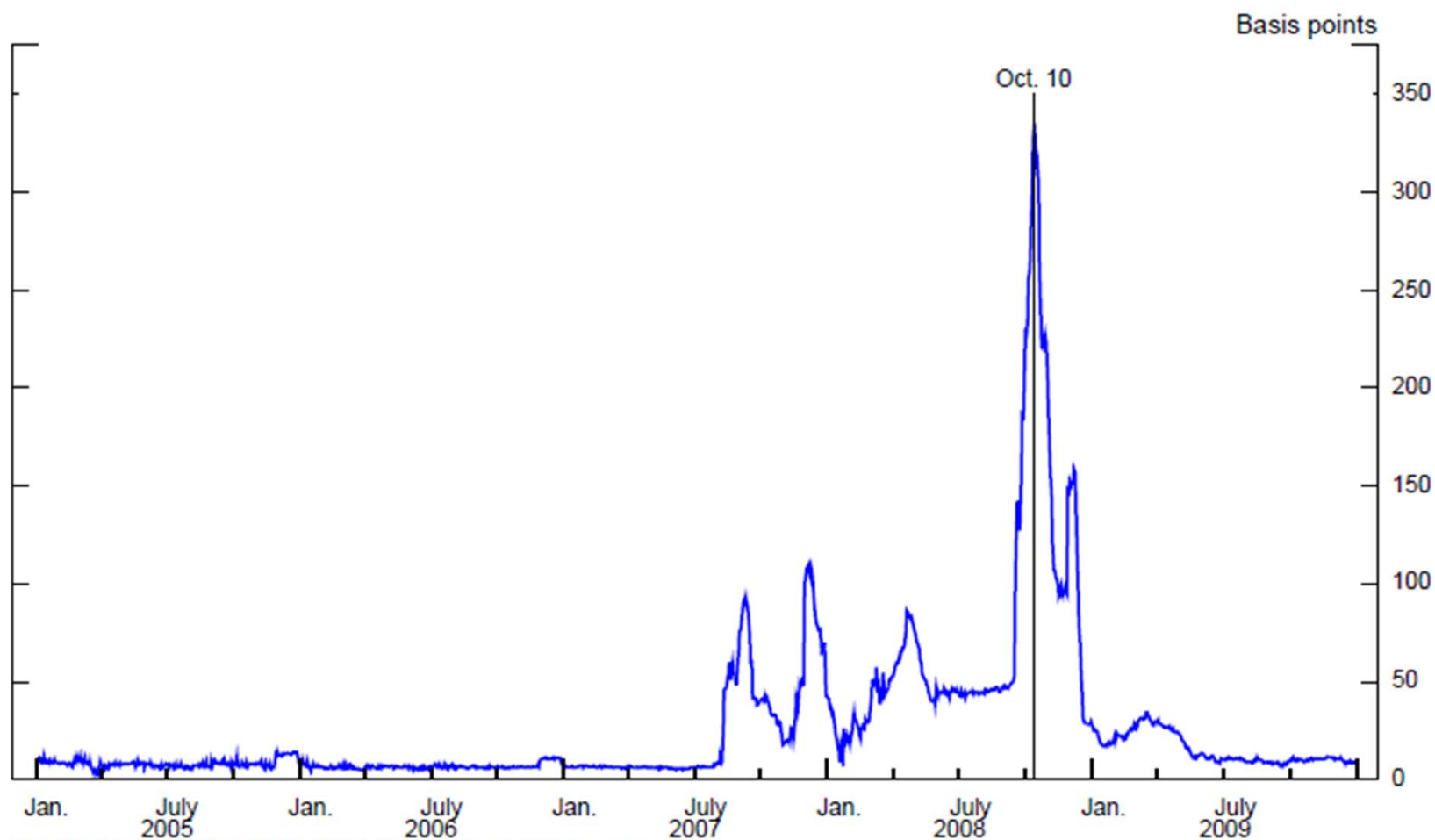
THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

Global Response

- The international policy response averted the collapse of the global financial system.
 - After the announcement, the interest rates banks paid to borrow short-term funds dropped dramatically.

Interbank Rates Fall after Oct. 10, 2008

Cost of Interbank Lending*



*London Interbank Offered Rate (LIBOR) minus overnight index swap rate.
Source: Bloomberg.



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

Federal Reserve Actions: The Discount Window

- The Fed lends to banks through a facility called the discount window.
- As the crisis built, the maturity of discount window loans was extended and the interest rate reduced.
- Regular auctions of discount window funds were conducted to encourage broad participation by financial firms.



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

Federal Reserve Actions: Special Liquidity and Credit Facilities

- New programs allowed the Federal Reserve to provide liquidity to a variety of financial institutions and markets facing runs or other illiquidity problems.
- All loans were required to be “secured” by adequate collateral.



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

Federal Reserve Actions: Special Liquidity and Credit Facilities

- The purpose was to
 - enhance the stability of the financial system
 - promote the availability of credit to U.S. households and businesses and thereby support the recovery
- This is the traditional lender-of-last-resort function of central banks.



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

Institutions and Markets Covered by the Fed's Lender-of-Last Resort Actions

- Banks (through the discount window)
- Broker–dealers (financial firms that deal in securities and derivatives)
- Commercial paper borrowers
- Money market funds
- Asset-backed securities market



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

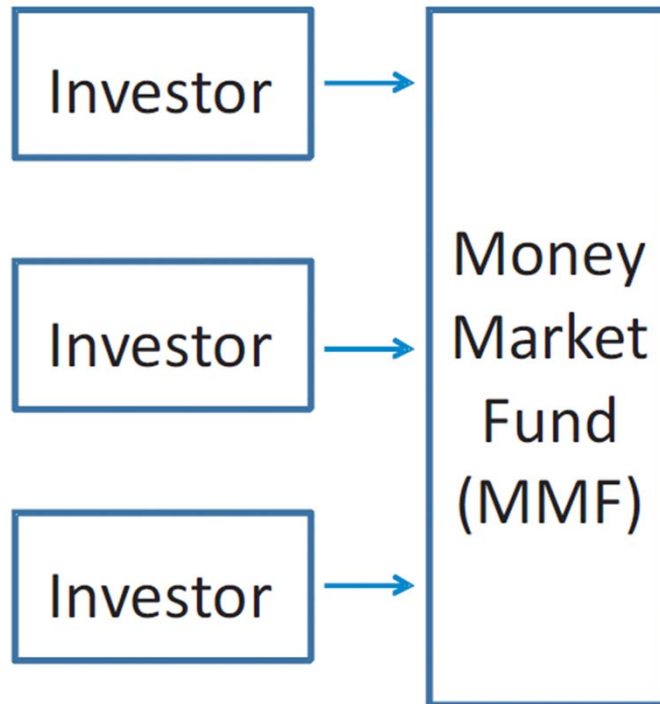
THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

Case Study: Money Market Funds and the Commercial Paper Market

- **Money market funds** (MMFs) are investment companies that sell shares and invest the proceeds in short-term assets.
- MMFs historically have almost always maintained stable \$1 share prices.

Money Market Funds

Purchase
MMF
Shares





THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

Case Study: Money Market Funds and the Commercial Paper Market

- Although MMF shares are not insured, investors use MMFs like checking accounts and expect to be able to earn interest and redeem shares *on demand* for \$1.
- MMFs invest heavily in **commercial paper (CP)** and other short-term assets.



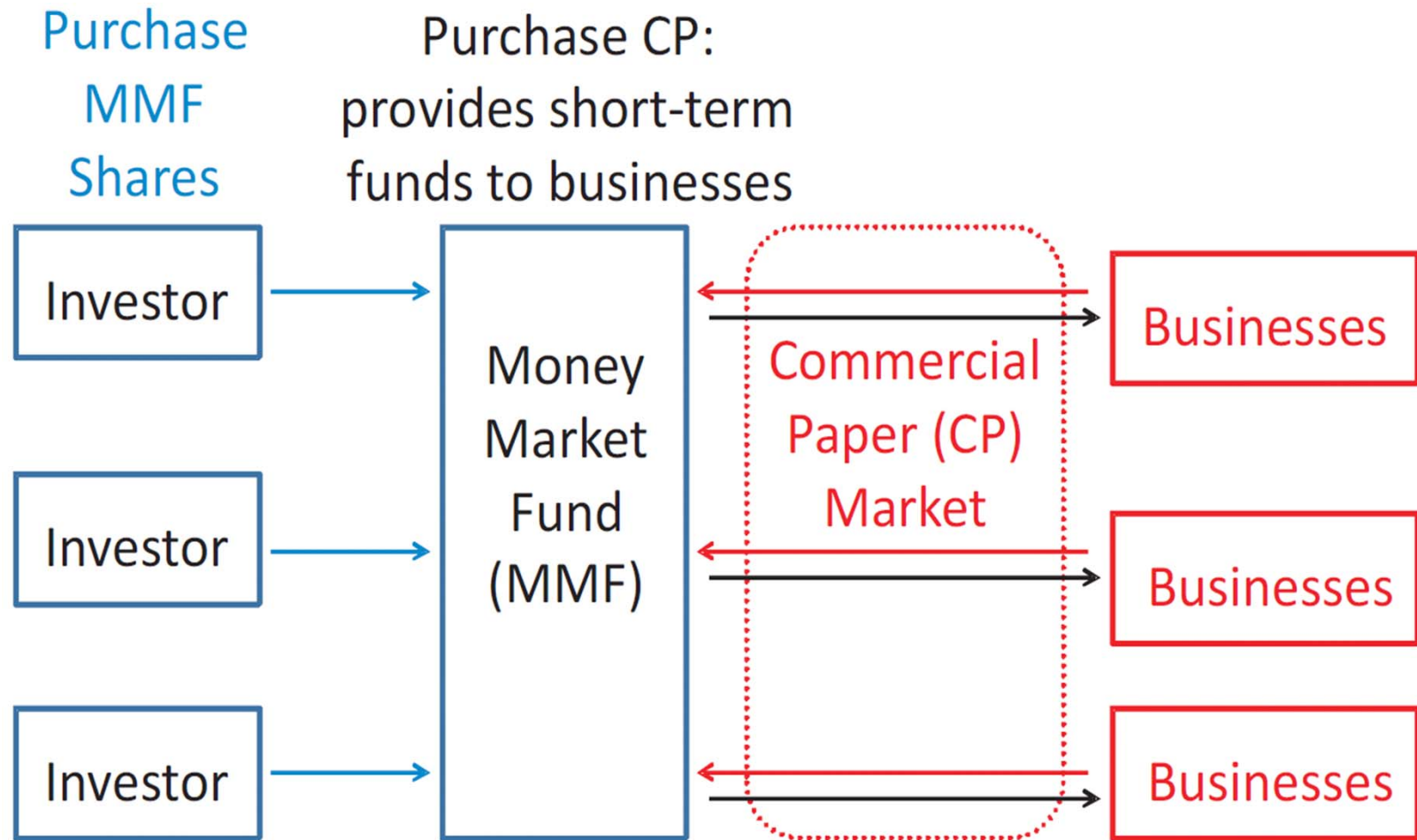
THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

Commercial Paper

- **Commercial paper (CP)** is a short-term (typically 90 days or less) debt instrument issued by corporations.
- CP is used by nonfinancial corporations to pay for immediate expenses such as payroll and inventories.
- CP is used by financial corporations to raise funds that they then lend to ordinary businesses and households.

Money Market Funds and the Commercial Paper Market





THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

Lehman Bros., Money Market Funds, and Commercial Paper

- Lehman Brothers was a global financial services firm.
- Like other securities firms, Lehman relied heavily on short-term borrowing (for example, CP) to fund their investments.
- During the 2000s, Lehman invested extensively in mortgage-related securities and commercial real estate (CRE).



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

Lehman Bros., Money Market Funds, and Commercial Paper

- As house prices fell and delinquencies and foreclosures rose, the value of Lehman's mortgage-related assets fell.
- Lehman's CRE holdings also were showing large losses.



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

Lehman Bros., Money Market Funds, and Commercial Paper

- As Lehman's creditors lost confidence, they withdrew funding (for example, ceased purchasing Lehman's CP) and curtailed other business with Lehman.
- With losses mounting, Lehman could not find new capital or another firm to acquire it.
- On September 15, 2008, Lehman filed for bankruptcy.



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

The Run on MMFs

- After the collapse of Lehman Brothers, one MMF that held CP issued by Lehman failed to maintain a \$1 share price.
- This led to a rapid loss of confidence by investors in other MMFs and a sudden flood of redemptions—another example of a run or panic.



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

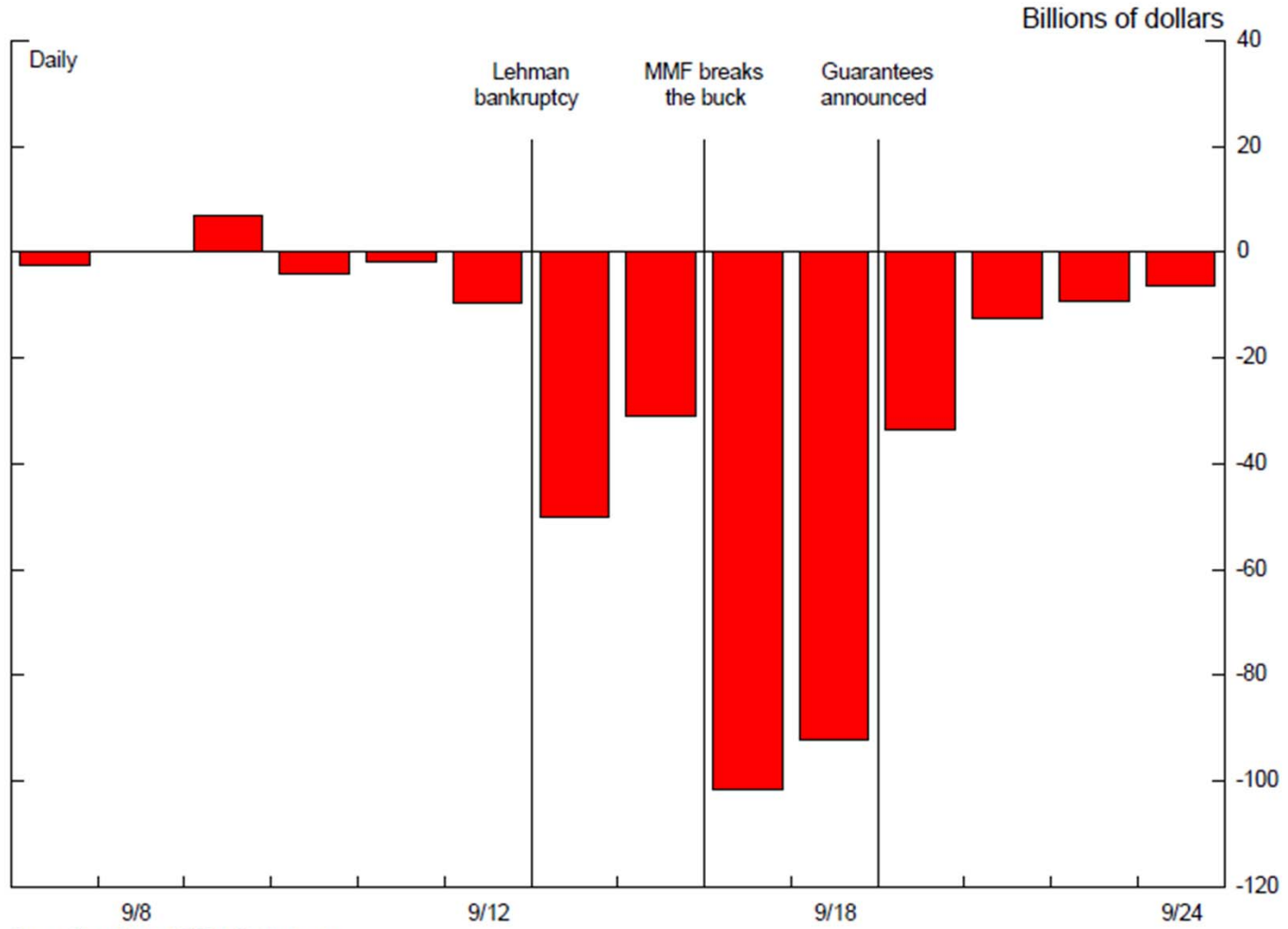
THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

The Run on MMFs

- In response, the Treasury provided a temporary guarantee of the value of MMF shares.
- Acting as lender of last resort, the Fed created a program to provide backstop liquidity. Under this program, the Fed lent to banks who in turn provided cash to MMFs by purchasing some of their assets.
- These actions ended the run within a few days.

The Run on MMFs

Net Flows to Prime Money Market Funds



Source: iMoneyNet and FRB staff adjustments.



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

Dislocations in the CP Market

- MMFs responded to the run by curtailing their purchases of short-term assets, including CP.
- Consequently, the demand for newly issued CP dried up and interest rates on CP soared.
- This episode is an example of how a financial crisis can spread in unexpected directions (Lehman → MMFs → CP).



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

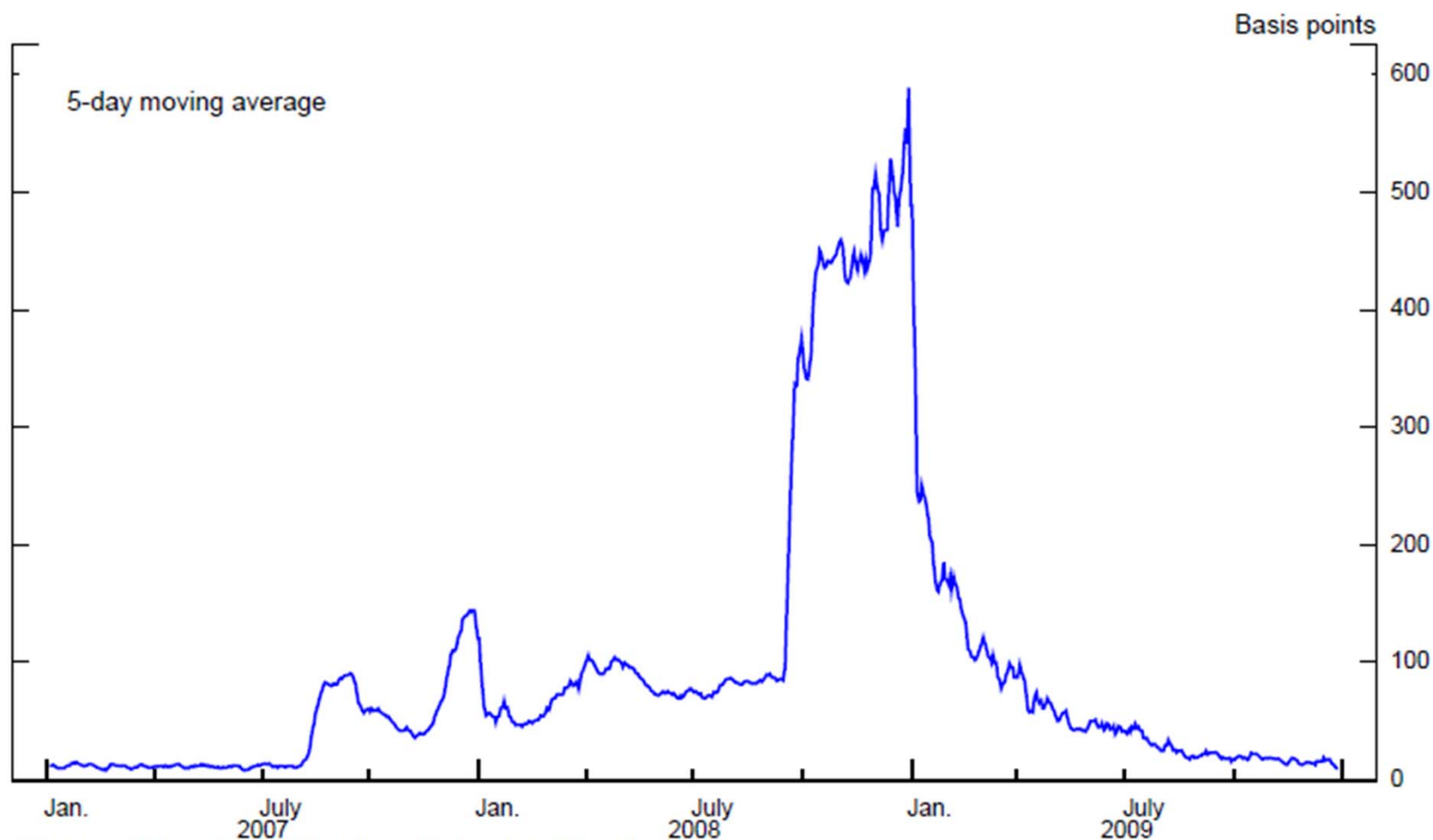
THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

Dislocations in the CP Market

- Strains in the CP market contributed to an overall contraction in credit available to financial institutions and to nonfinancial businesses.
- The Federal Reserve established special programs to repair functioning in the CP market and restart the flow of credit.

CP Rates Soared during the Crisis

Cost of Short-term Borrowing*



Note: Spread between the A2/P2 nonfinancial rate and the AA nonfinancial rate.
Source: Depository Trust & Clearing Corporation.



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

Support of Critical Institutions: Bear Stearns and AIG

- In March 2008, a Fed loan facilitated the takeover of the failing broker–dealer, Bear Stearns, by the bank JP Morgan Chase.
- In October 2008, the Fed intervened to prevent the failure of the nation’s largest insurance company, AIG.



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

Case Study: **AIG**

- In September 2008, AIG—a multinational insurance and financial services firm—faced serious liquidity problems that threatened its survival. Many losses came from the insurance it sold on bad mortgage-related securities.
- Because AIG was interconnected with many other parts of the global financial system, its failure would have had a massive effect on other financial firms and markets.



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

Case Study: **AIG**

- However, AIG also owned sizable assets that could be used as collateral. To prevent its collapse, the Federal Reserve loaned AIG \$85 billion, using AIG assets as collateral. Later, the Treasury provided additional assistance.
- The rescue of AIG prevented even greater shocks to the global financial system and global economy.



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

Case Study: **AIG**

- Over time, AIG stabilized. It has repaid the Fed with interest and has made progress in reducing Treasury's stake in the company.
- The problems at Lehman, AIG, and other companies highlighted the need for new tools to deal with systemically critical financial institutions on the verge of failure.

Consequences of the Crisis for Spending, Output, and Employment

- Spending and output contracted sharply in response to reduced credit flows, skyrocketing borrowing costs, and plummeting asset values.
 - GDP fell a total of more than 5 percent from its peak to its trough.
 - Manufacturing output declined nearly 20 percent, and new home construction plummeted 80 percent.
 - More than 8-1/2 million people lost their jobs.
 - Unemployment rose to 10 percent.

Consequences of the Crisis for Spending, Output, and Employment

- Many of our trading partners were also hit by recessions—it was a global slowdown.
- Threat of a second Great Depression was very real.



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

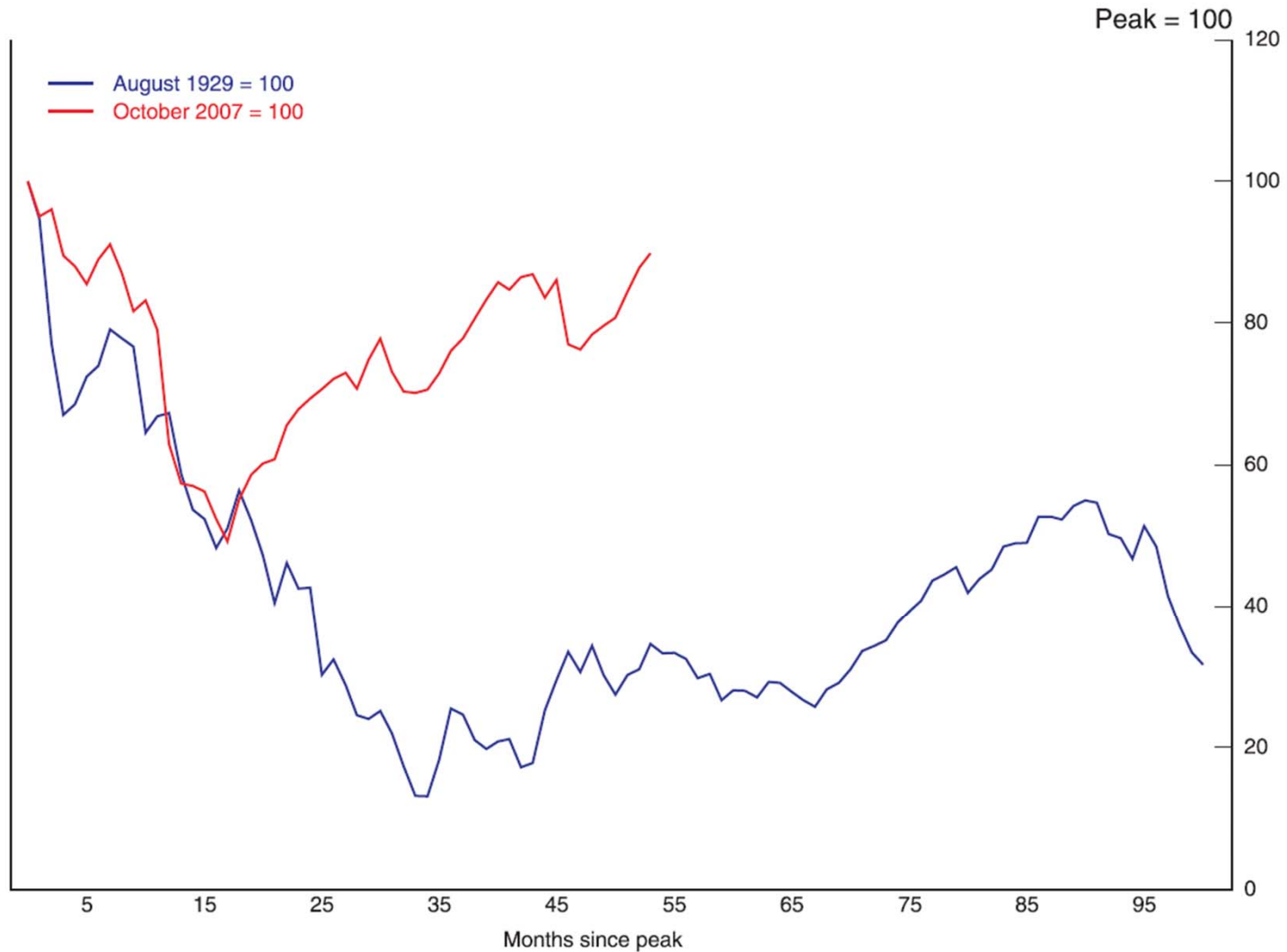
THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

Comparison to the Great Depression

- In terms of economic consequences, the Great Depression was considerably more severe than the recent recession.
- The forceful policy response to the recent financial crisis and recession likely averted much worse outcomes.

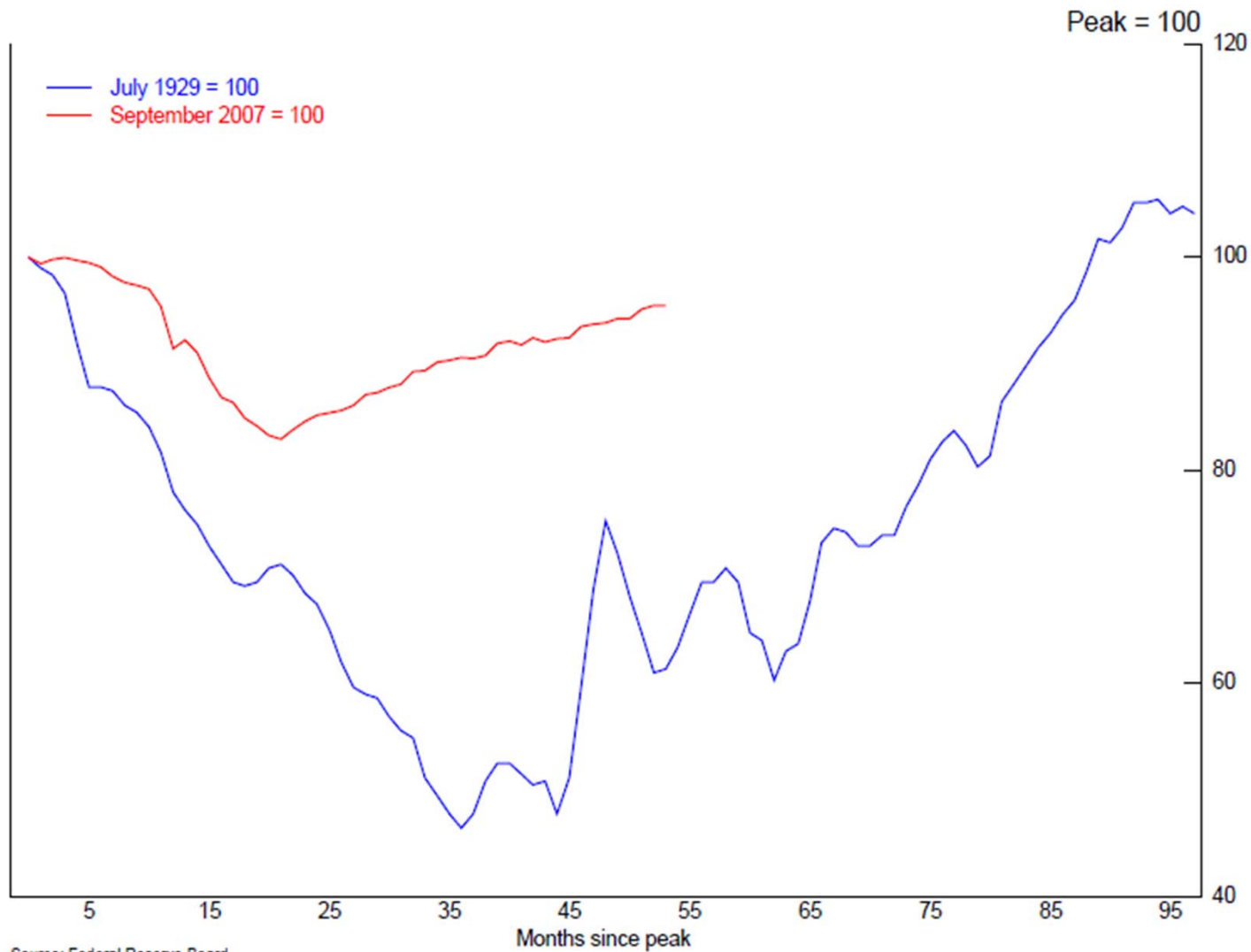
Comparison to the Great Depression

S&P 500 Composite Index



Comparison to the Great Depression

Industrial Production



Source: Federal Reserve Board.



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

THE FEDERAL RESERVE'S RESPONSE TO THE FINANCIAL CRISIS

Lecture 4

- Lecture 4 will discuss the aftermath of the financial crisis:
 - the recession and monetary policy response
 - the sluggish recovery
 - changes in financial regulation following the crisis
 - implications of the crisis for central bank practice



THE FEDERAL RESERVE AND THE FINANCIAL CRISIS

