

Intermediate Macroeconomic Theory

Chapter #20: The Financial System - Opportunities and Dangers

December 1

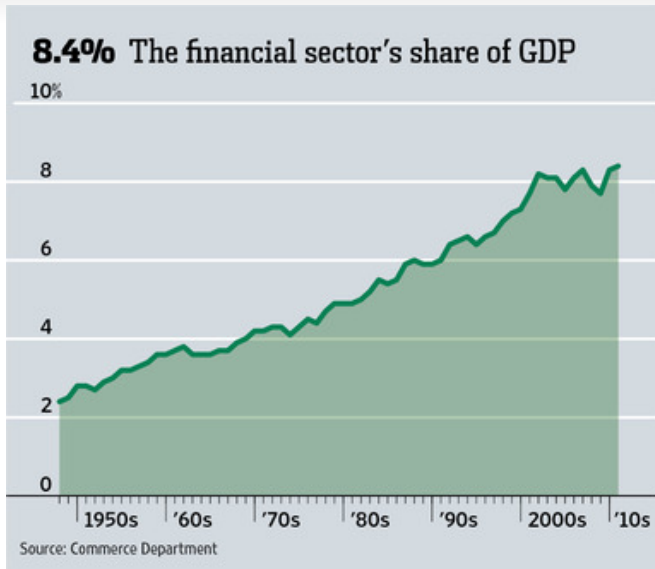
Key Points

1. What do financial institutions do?
2. Six common features of financial crises
3. Policy responses to financial crises
4. Policies to prevent financial crises

What does the financial system do?

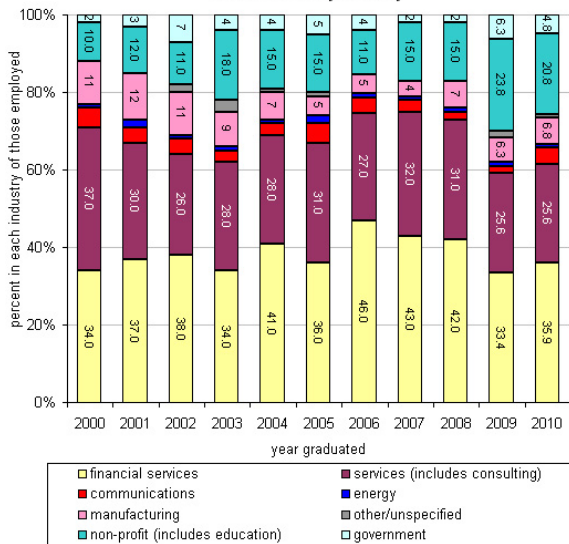
- Consider the investment and saving part of the circular flow model.
- Both financial markets and intermediaries and how they channel savings into investment.
- Note that financial intermediaries can act through markets or directly.

Finance a growth share of US economy

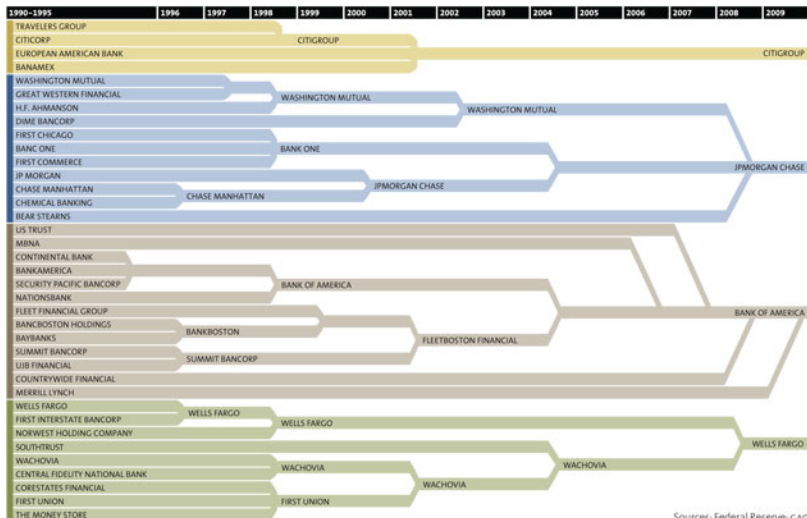


Finance a growth share of US economy

Members of Princeton Class with Full-Time Jobs at Graduation, Broken Down by Industry



Financial sector growing more concentrated



Sources: Federal Reserve; GAO

Financial Markets

1. Bond market

- Where bonds are bought and sold
- Firms sell bonds (borrow money) to finance investment
- This is called debt finance

2. Stock market

- Where stocks are bought and sold
- Firms sell stock (issue equity) to finance investment
- A stock represents a share of ownership in the business
- This is called equity finance

What are financial intermediaries?

- Businesses that help manage savings and channel it to investment
- Include:
 - Commercial banks
 - Investment banks
 - Hedge funds
 - Mutual funds
 - Pension funds
 - Insurance companies

Why use financial intermediaries?

1. Risk management

- When you make an investment, you are assuming some of the risk in the business
- 2 types of risk:
 1. Idiosyncratic risk - risk specific to a particular business or sector
 2. Systemic risk - risk faced by all businesses
- Diversification can help to mitigate idiosyncratic (but not systemic) risk
- Example: Financial intermediaries help individuals diversify savings (e.g. mutual fund buys a pool of assets)

Why use financial intermediaries?

2. Mitigate effects of asymmetric information

- Asymmetric information: when one party in a transaction knows more than another
- e.g. the business making investment knows more about its risk than the shareholder/lender
- 2 problems:
 1. Adverse selection
 - Businesses with worse risks are more likely to seek external funding (either debt or equity)
 2. Moral Hazard
 - Business managers may not monitor investments well if they are not bearing all of the risk
- Financial intermediaries help by:
 1. Examining investments before loans are made/equity purchased to determine risks
 2. Monitor business to ensure that it uses investor money productively

What is a financial crisis?

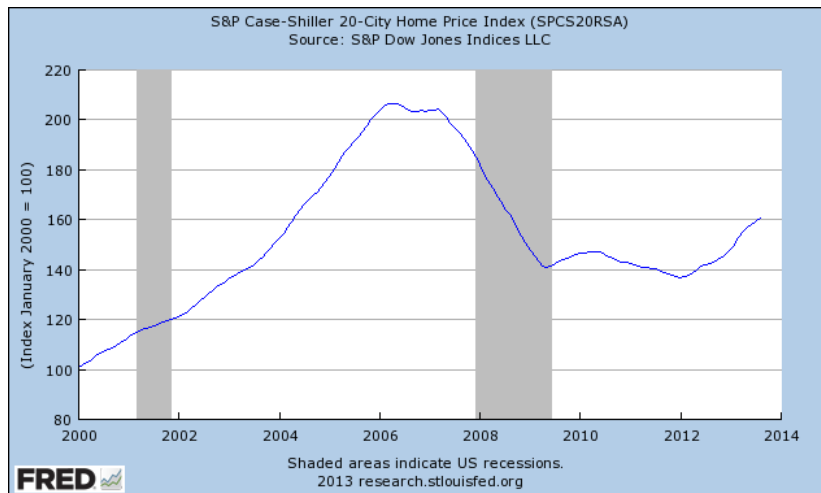
- A major disruption of the financial system.
- Larry Summers: like a power outage
- Six common features.
- We'll consider each of these and an example from the Financial Crisis of 2008-2009.

1. Asset price boom and bust

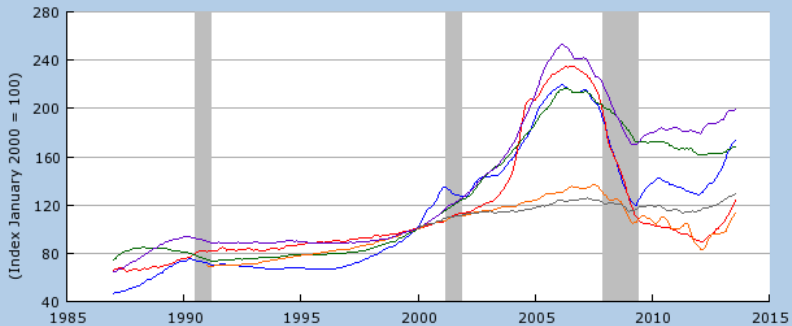
- People call this a “bubble”
- 2008-2009:
 - Centered around home prices

Home prices, early 2000s:

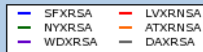
- Home prices fell about 30% from peak in 2006



Home Price Index for San Francisco, California (SFXRSA), Home Price Index for Las Vegas, Nevada (LVXRNSA), Home Price Index for New York, New York (NYXRSA), Home Price Index for Atlanta, Georgia (ATXRNSA), Home Price Index for Washington D.C. (WDXRSA), Home Price Index for Dallas, Texas (DAXRSA)



Shaded areas indicate US recessions.
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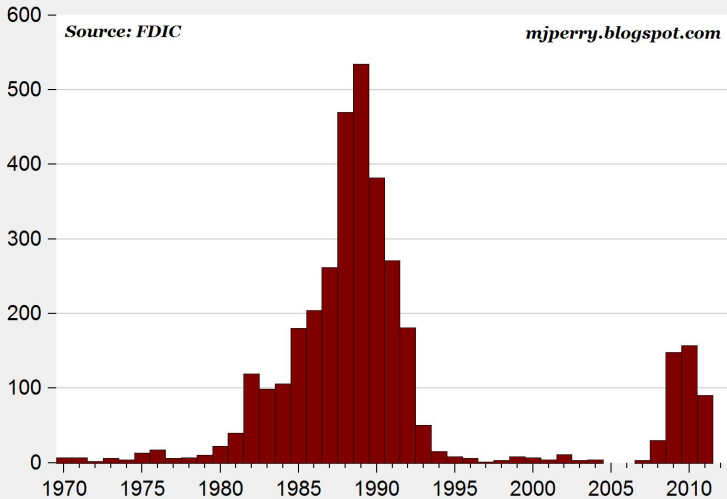
Why did prices increase so much?

- Demand for housing went up
- Why?
 - People thought home prices would keep rising (a self-inflating bubble)
 - Lower loan standards
 - Lower mortgage rates b/c of:
 - Federal reserve policy
 - Fannie and Freddie
 - Securitization (rise of Mortgage Backed Securities (MBS))

2. Insolvencies at financial institutions

- e.g., bank failures
- Precipitated by asset price declines
- If assets < liabilities, insolvent
- Amplified by leverage
- 2008-2009:
 - Lots of small banks - 492 FDIC insured banks failed
 - Some huge financial institutions failed (this is where most assets are).

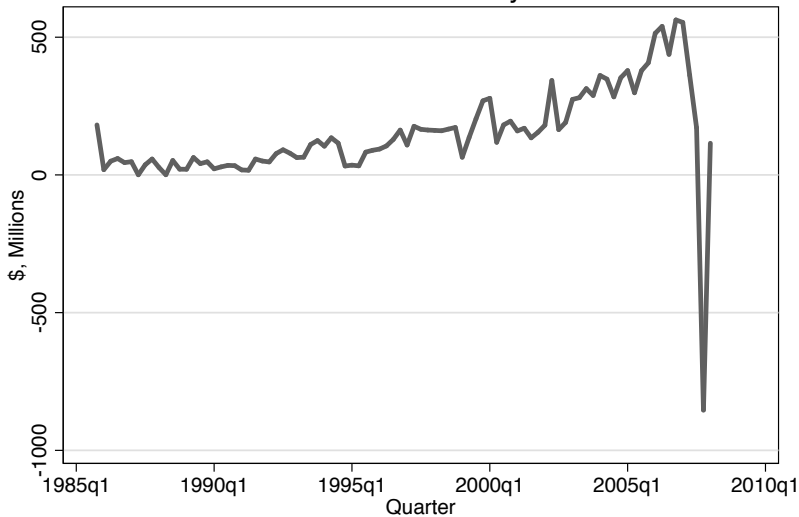
U.S. Bank Failures, 1970-2011



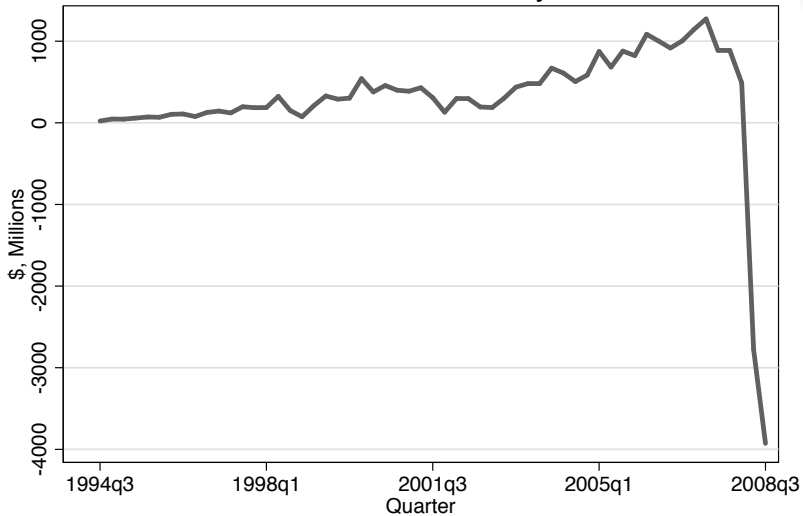
Large financial institution failures of 2008:

- Countrywide, January 2008
- Bear Stearns, March 2008
- AIG, March 2008
- Fannie Mae, September 2008
- Freddie Mac, September 2008
- Lehman Brothers, September 2008
- Washington Mutual, October 2008
- IndyMac, October 2008
- National City, November 2008
- Wachovia, December 2008
- Many others close to failure: Goldman Sachs, Morgan Stanley, Merrill Lynch all become commercial banks (they were investment banks)

Bear Stearns Quarterly Profits



Lehman Brothers Quarterly Profits



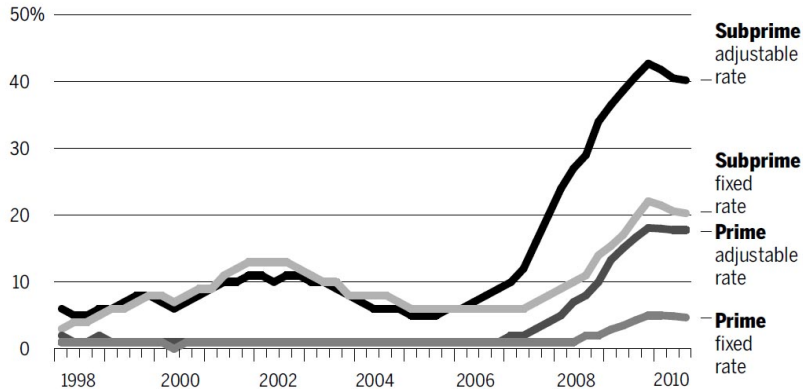
What was the root of these insolvencies in 2008-2009?

- Fall in home prices means that some homeowners owe more than their house is worth
 - e.g., say you buy a \$200k house and put 20% (\$40k) down - you are borrowing the remaining \$160k
 - Now assume that home prices fall 30%.
 - Price is now \$140k < \$160k that you owe
 - So you are better off not paying mortgage, letting bank claim house and then buying it or a similar house

Mortgage Delinquencies by Loan Type

Serious delinquencies started earlier and were substantially higher among subprime adjustable-rate loans, compared with other loan types.

IN PERCENT, BY TYPE



NOTE: Serious delinquencies include mortgages 90 days or more past due and those in foreclosure.

SOURCE: Mortgage Bankers Association National Delinquency Survey

Figure 11.2

What was the root of these insolvencies in 2008-2009?

- So an increase in mortgage defaults
- Because of price declines, bank gets house that is worth less than loan was - so they take losses
- These losses worsen their balance sheet and pushes them towards insolvency

What was the root of these insolvencies in 2008-2009?

- Same thing also going on with MBS (which most mortgages part of)
 - Value of an MBS depends upon the expected, discounted value of all mortgage payments for the mortgages in the pool behind the MBS
 - As people default, less money coming in to MBS so its price falls
 - As prices of homes fall, expectations about future declines increase and therefore price of MBS falls
 - As prices of MBS fall, institutions holding MBS take hits to balance sheets, pushed towards insolvency

What was the root of these insolvencies in 2008-2009?

- Leverage is important
 - Many homeowners had little equity in home - not 20%, sometimes zero or negative equity
 - Many financial institutions were leveraged 40 to 1 or more (in this case, if assets fall by 2.5% then bankrupt)

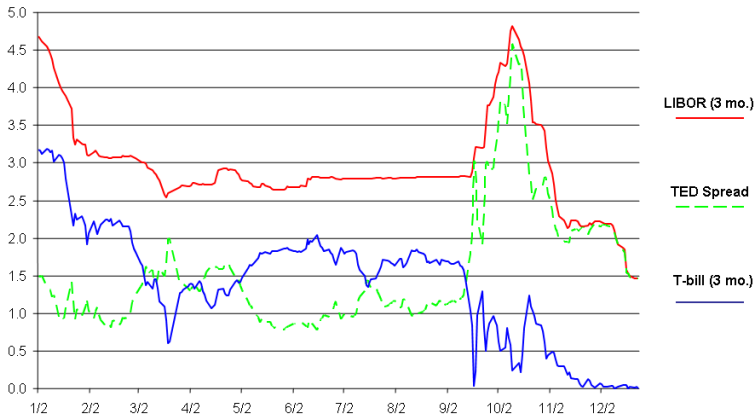
3. Falling confidence

- Lenders/investors not sure if other financial institutions will fail or asset prices decline more, so sell off assets
- Sale of assets pushes down asset prices further, so more pushed towards insolvency
- 2008-2009:
 - Huge failures lead many to wonder - who's next?
 - Exacerbated by complex financial arrangements and many products traded "over the counter" so hard to determine market prices
 - Leads to spike in interest rates for banks and other businesses to borrow at
 - Higher interest rates reflect lower prices for corporate debt - so more asset prices fall, pushing more towards insolvency

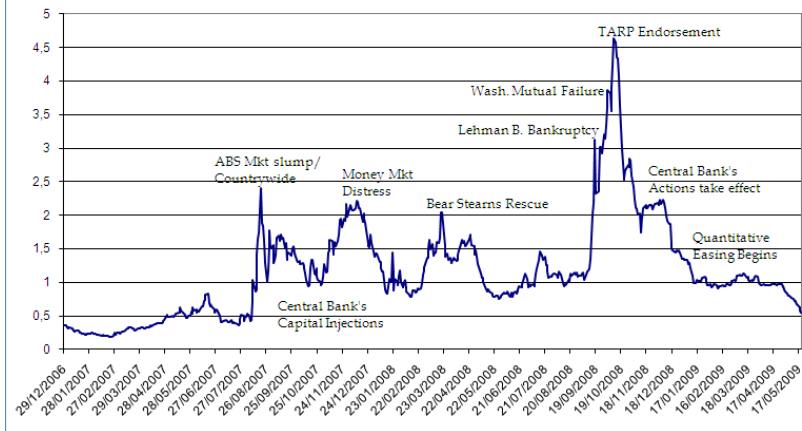
TED Spread & Components - 2008

The "TED Spread" is a measure of credit risk for inter-bank lending. It is the difference between: 1) the three-month U.S. treasury bill rate; and 2) the three-month LIBOR rate, which represents the rate at which banks typically lend to each other. A higher spread indicates banks perceive each other as riskier counterparties.

Percent

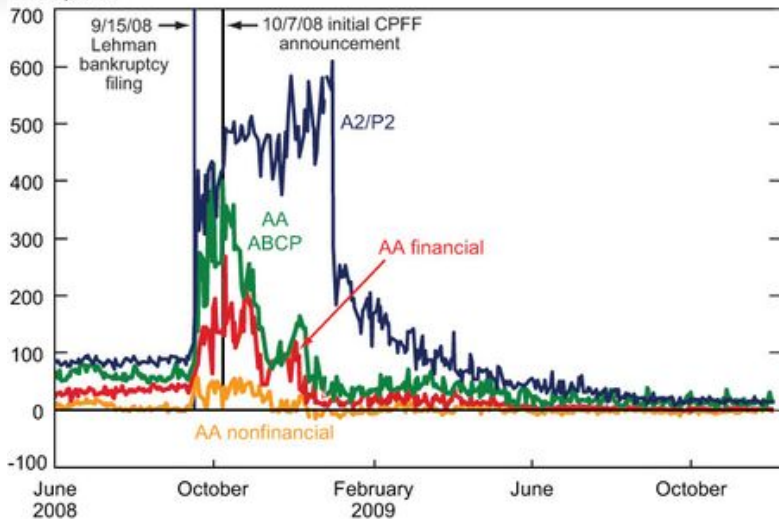


TED Spread



One-Month Commercial Paper Spread

Basis points



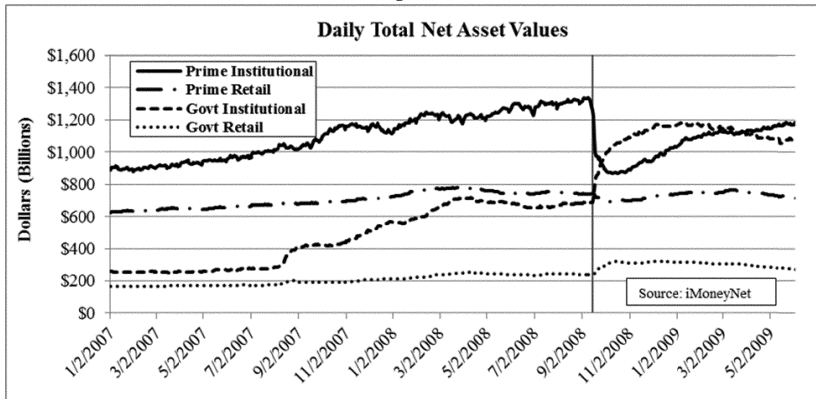
Sources: Board of Governors of the Federal Reserve System; Bloomberg L.P.

Note: The chart shows the spread between the one-month commercial paper rate and the overnight index swap rate.

2008 Run on Money Market Mutual Funds (MMFs)

- On September 16, 2008, the Reserve Primary Fund, the oldest Money Market Fund, “broke the buck”
- This means its shares went below \$1, which means that investors in the fund lost money
- Upset financial markets because MMFs thought to be ultra safe investments
- Caused a run on MMFs
- Run on MMFs cut off important supply of lending to banks and other businesses

Figure 1



The Primary Fund Run

The money fund suffered a torrent of investor redemptions in mid-September. Cumulative redemption requests, in billions



Note: Reserve redeemed \$10.83 billion at full value on Sept. 15; since then, about 80% of investors' money has been returned.
Source: Reserve Management Co.

Credit crunch

- Financial institutions cut back on loans to preserve capital
- Now hard for business to get loans to financing investment or for consumers to borrow to finance consumption
- 2008-2008:
 - Run on MMFs cut off important supply of lending to banks and other businesses
 - Also, banks need to preserve capital, so cut off lending but tightening standards and charging higher rates

Commercial Paper Outstanding (COMPOUT)

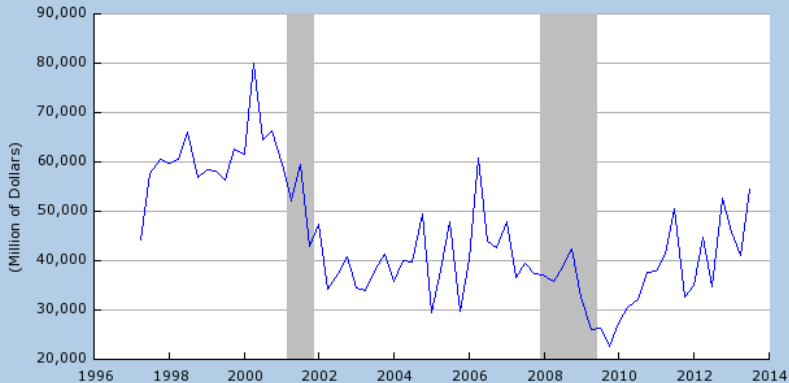
Source: Board of Governors of the Federal Reserve System



Shaded areas indicate US recessions.
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Total Value of Loans for All C&I Loans, Large Domestic Banks (EVAXSLNQ)

Source: Board of Governors of the Federal Reserve System



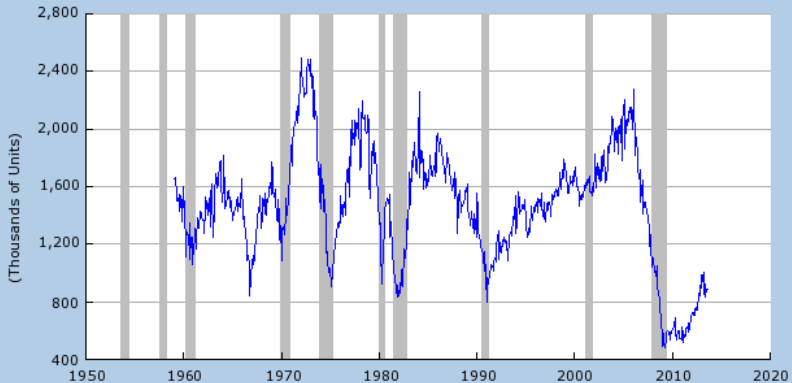
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5. Recession

- Economic downturn
- Less lending means lower C and I which means a shift inward of IS curve, which means a shift inward of the AD curve which means lower GDP
- 2008-2009:
 - Declines in consumption and investment spending result from credit rationing

Housing Starts: Total: New Privately Owned Housing Units Started (HOUST)

Source: U.S. Department of Commerce: Census Bureau



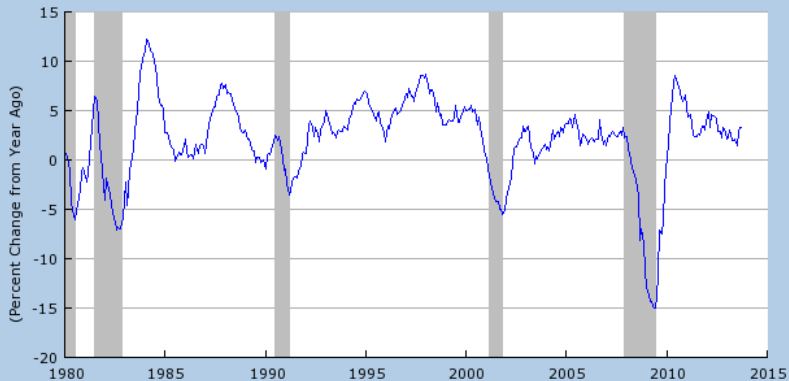
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Industrial Production Index (INDPRO)

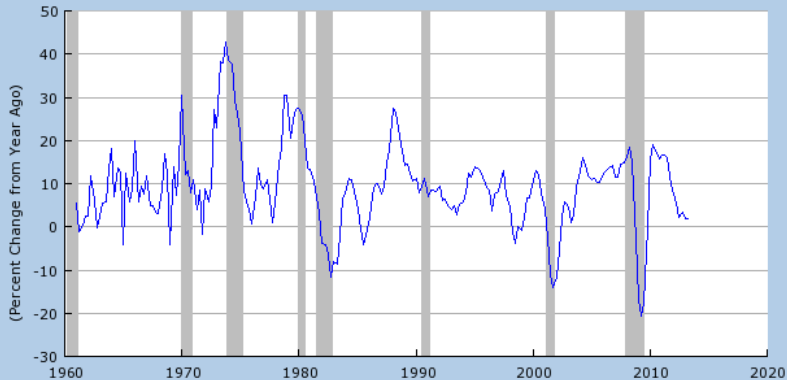
Source: Board of Governors of the Federal Reserve System



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Exports of Goods and Services (BOPXGS)

Source: U.S. Department of Commerce: Bureau of Economic Analysis



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6. Vicious cycle

- The recession further depresses asset prices and reduces business profits
- \Rightarrow more insolvencies, back to step 1 and 2
- 2008-2009:
 - Some of this, but largely curtailed by aggressive fiscal and monetary policy and “bailout” programs

Policy responses to a financial crisis:

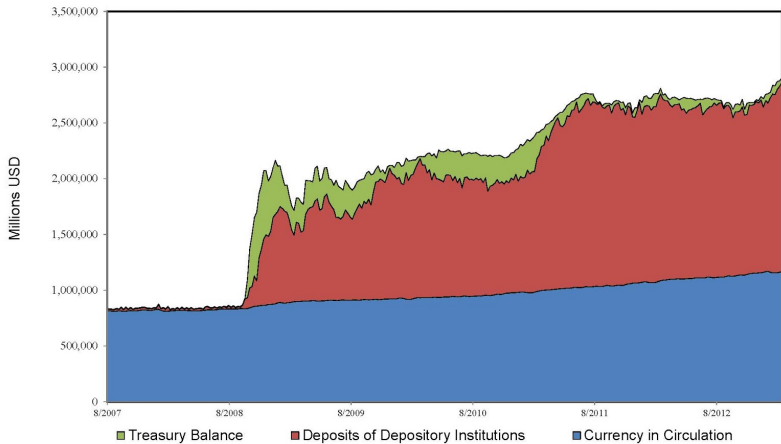
1. Conventional monetary and fiscal policy
2. Lender of last resort functions
 - The Federal Reserve or the Federal Government step in to lend money to businesses (usually financial institutions) in credit crunch
3. Injections of government funds
 - The Federal Reserve or the Federal Government step in to buy assets or invest capital in businesses (usually financial institutions) that are near insolvency
 - Usually only want to do this if assets being sold at “fire sale” prices (i.e., prices that are low due to panic, but will recover in the longer run)



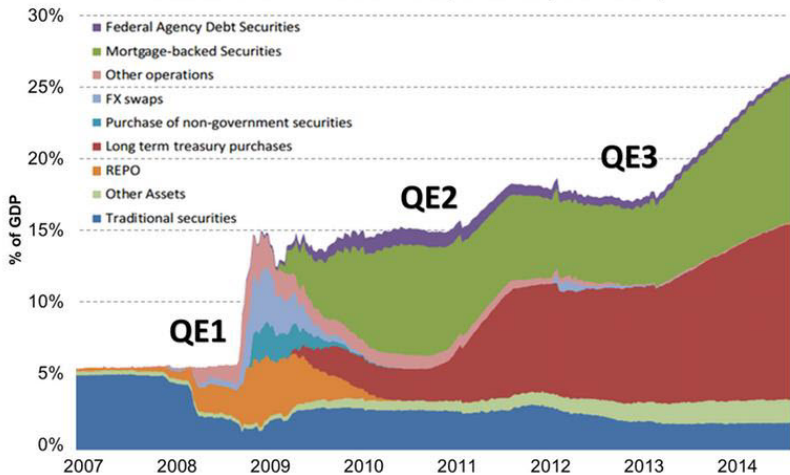
Policy responses to the 2008-2009 financial crisis:

1. Conventional monetary and fiscal policy

- Fiscal
 - Bush stimulus checks: \$168 billion
 - Obama stimulus: \$787 billion
- Monetary
 - Federal Reserve lowered the Fed Funds rate from 5% to 0.25%

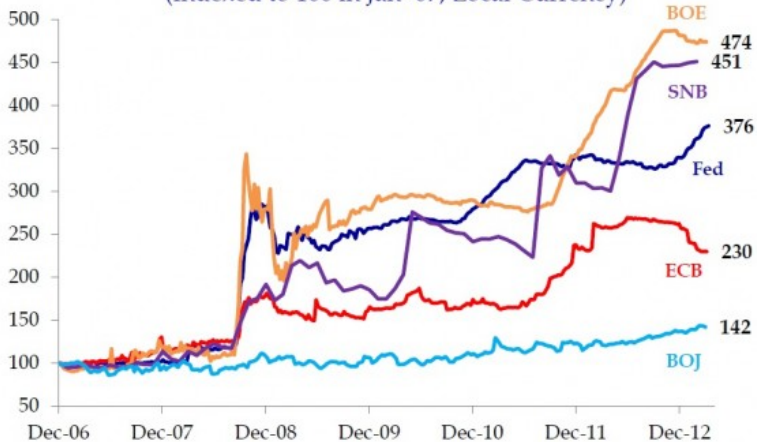


Federal Reserve Asset Composition (% of GDP)



Source: Federal Reserve

Assets on Central Bank Balance Sheets (Indexed to 100 in Jan-'07, Local Currency)



Central Bank Balance Sheet Assets as % GDP

	Assets (BN, local)	GDP (BN, local)	Assets % GDP
Switzerland	504.2	595.6	85%
Japan	164,312.3	471,463.8	35%
Eurozone	2,647.1	9,485.6	28%
England	403.8	1,553.4	26%
United States	3,225.2	15,864.1	20%

Policy responses to the 2008-2009 financial crisis:

2. Lender of last resort functions

- The Federal Reserve sets up a bunch of lending facilities (TALF, CPFF, AMLF, MMIFF)
- Focus on “shadow banking”

3. Injections of government funds

- The FDIC limit on deposit insurance raised from \$100k to \$250k
- The Troubled Asset Relief Program (TARP) - \$430 billion to buy assets of, or inject capital into, financial institutions
 - Money also extended to GM and Chrysler
- Guarantees on the portfolios of some of banks that were purchased in private sales (e.g. Bear Stearns) by Fed or Government
- Federal reserve starts to purchases MBS and other risky assets (traditionally they only held Treasuries)

Problems with the 2008-2009 response?

- Injections of government funds:
 - Not too much government money actually lost
 - Real problem is that we may be sowing the seeds of future crises
 - Do large banks now have an increased perception they will be bailed out?
 - If so, this will increase moral hazard
 - i.e., since these banks don't bear all the risk of failure, they will take larger risks and so financial crisis more likely
- Fiscal policy
 - How much did it help? Economy did not recover quickly.
- Monetary policy
 - How will the Fed shrink its portfolio back to normal range?
 - Can it control inflation going forward?
 - Is it creating another asset price bubble with these years of very low interest rates?

Policies to prevent financial crises:

- Restrictions on bank size
 - Don't want a single bank so big that its failure causes a large disruption to the economy
 - Goal is to limit the impact of a failure
 - Problems:
 - Economies of scale in banking
 - Larger banks may be able to diversity risk better and provide lower rates to borrowers, higher rates to depositors

Policies to prevent financial crises:

- Restrictions on bank risk taking
 - Try to limit what assets banks can invest in
 - Goal is to limit the likelihood of failure
 - Problems:
 - How measure risk? People thought MBS very safe - AAA ratings on many
 - Will banks be more complex to hide true risk but look safe on financial reports?

Policies to prevent financial crises:

- Better regulatory structure
 - Currently have FDIC, OCC, Fed, SEC, state regulators
 - Lots of groups, layers, not all working together
 - Would it be better to have one group look over all financial institutions?
 - Problems:
 - Who? How? What would they look at?

The Future:

- There certainly will be another financial crisis
- While they share commonalities, usually cause is slightly different - it won't be housing next time
- Will it be sovereign debt?
 - Europe makes this look likely
 - Banks like that gov't debt is usually given very safe rating so doesn't affect reported risk much
 - But some countries at/near default
 - Solutions? These countries/banks bigger - maybe "too big to fail", but also "too big to save"

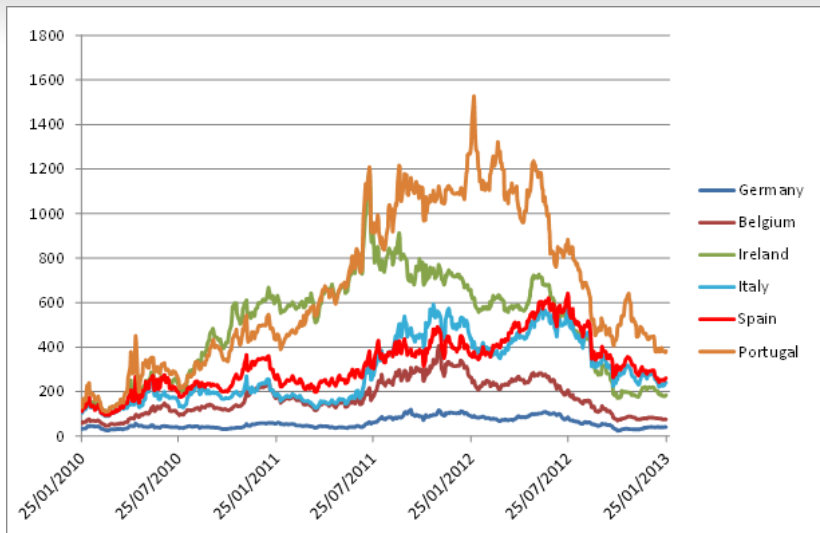
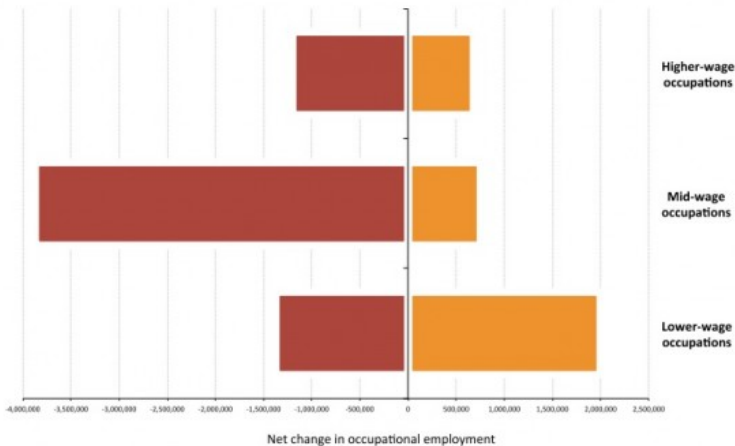


Figure 1

Jobs lost in the recession Jobs gained in the recovery



Source: NELP analysis of Current Population Survey.
Recession is 2008 Q1 to 2010 Q1; recovery is 2010 Q1 to 2012 Q1.

Table 1. Real Income Growth by Groups

	Average Income Real Growth	Top 1% Incomes Real Growth	Bottom 99% Incomes Real Growth	Fraction of total growth (or loss) captured by top 1%
	(1)	(2)	(3)	(4)
Full period 1993-2012	17.9%	86.1%	6.6%	68%
Clinton Expansion 1993-2000	31.5%	98.7%	20.3%	45%
2001 Recession 2000-2002	-11.7%	-30.8%	-6.5%	57%
Bush Expansion 2002-2007	16.1%	61.8%	6.8%	65%
Great Recession 2007- 2009	-17.4%	-36.3%	-11.6%	49%
Recovery 2009-2012	6.0%	31.4%	0.4%	95%