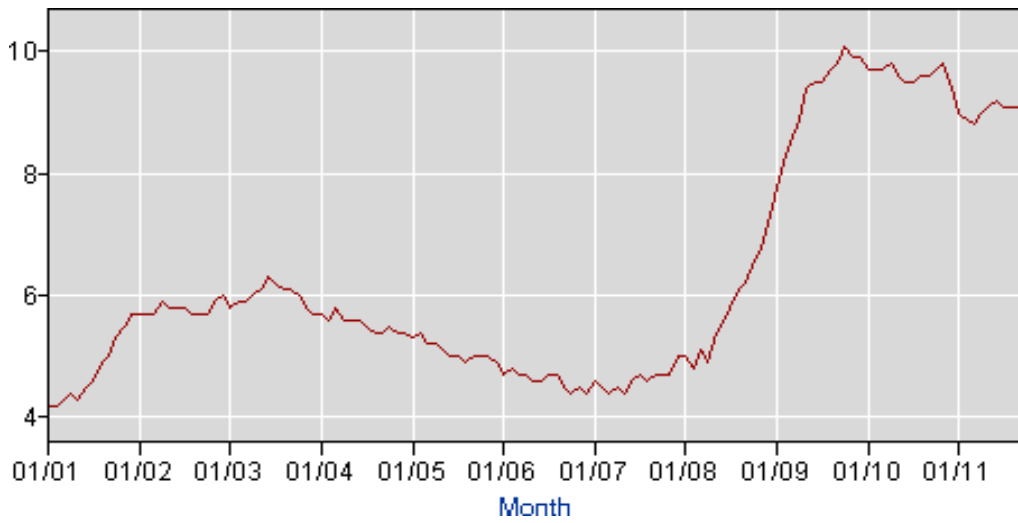
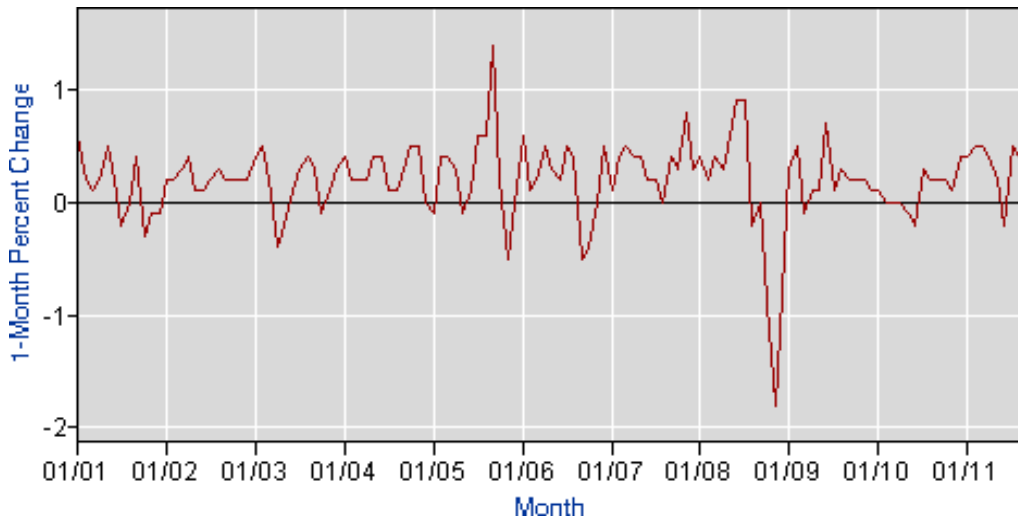


RECESSION - US 2007-11

	Unempl	Infl .	GDP Growth	FF Rate	Other Events
Mar 07	4.4	0.5	+0.9%	5.25%	Subprime crisis begins
Apr 07	4.5	0.4			
May 07	4.4	0.4			
Jun 07	4.6	0.2	+3.2%		
Jul 07	4.6	0.2			credit crunch begins
Aug 07	4.6	0.0			
Sep 07	4.7	0.4	+2.3%	4.75% (-0.50)	
Oct 07	4.7	0.3		4.50% (-0.25)	
Nov 07	4.7	0.8	← cycle peak		Recession begins
Dec 07	5.0	0.3	+1.7%	4.25% (-0.25)	Term Auction Facility (TAF)
2008					
Jan 08	5.0	0.4		3.00% (-1.25)	Martin Luther King Day Massacre
Feb 08	4.8	0.2			
Mar 08	5.1	0.4	-1.8%	2.25% (-0.75)	Primary Dealer Credit Fac. (PDCF)
Apr 08	5.0	0.3		2.00% (-0.25)	
May 08	5.4	0.6			
Jun 08	5.5	0.9	1.3%		Tax rebate checks mailed
Jul 08	5.8	0.9			
Aug 08	6.1	-0.2	← Depression?		
Sep 08	6.2	0.0	-3.7%		Lehman collapse, Bank meltdown
Oct 08	6.6	-0.9		1.00% (-1.00)	Federal Bailout (TARP)
Nov 08	6.9	-1.8			
Dec 08	7.4	-0.8	-8.9%	0.00% (-1.00)	
2009					
Jan 09	7.7	0.3			Obama takes office
Feb 09	8.2	0.5			\$800 bn Econ Stimulus Package
Mar 09	8.6	-0.1	-6.7%		
Apr 09	8.9	-0.1			
May 09	9.4	0.1			
Jun 09	9.5	0.7	-0.7%		
Jul 09	9.4	0.1	← cycle trough		Recovery begins, Cash for Clunkers
Aug 09	9.7	0.3			
Sep 09	9.8	0.2	+1.7%		
Oct 09	10.1	0.2	← unemp. high		Commodity boom restarts
Nov 09	10	0.2			
Dec 09	10	0.1	+3.8%		
2010					
Jan 10	9.7	0.1			
Feb 10	9.7	0.0			Euro sovereign crisis begins
Mar 10	9.7	0.0	+3.9%		
Apr 10	9.9	0.0			
May 10	9.7	-0.1			
Jun 10	9.5	-0.2	+3.8%		
Jul 10	9.5	0.3			
Aug 10	9.6	0.2			Quantitative Easing II
Sep 10	9.6	0.2	+2.5%		
Oct 10	9.6	0.2			
Nov 10	9.8	0.1			
Dec 10	9.4	0.4	+2.3%		
2011					
Jan 11	9.0	0.4			
Feb 11	8.9	0.5			
Mar 11	8.8	0.5	+0.4%		
Apr 11	9.0	0.4			
May 11	9.1	0.2			
Jun 11	9.2	-0.2	+1.3%		
Jul 11	9.1	0.5			Near-default on US federal debt
Aug 11	9.1	0.4			
Sep 11	9.1	0.3	+2.5%		
Oct 11	9.0	?			



Unemployment Rate



Inflation Rate

US spending by category 2007-11

(Total Spending = C + I + G + Exp - Imp)

Consumption:

2007: 1.9%

2008: -0.6%

2009: -1.9%

2010: 2%

latest (2011, Q2 = 0.7%)

Firm Investment:

2007: -3.1%

2008: -10.2%

2009: -25.0%

2010: 17.9%

Latest 2011, Q2 = +6.4% [negative since 07, turned positive late 09]

Government spending:

2007: 1.3%

2008: 2.6%

2009: 1.7%

2010: 0.7%

latest 2011, Q2 = -0.9%

Exports:

2007: 9.3%

2008: 6.1%

2009: -9.4%

2010: 11.3%

latest 2011, Q.2: +3.6%

Imports:

2007: 2.7%

2008: -2.6%

2009: -13.8%

2010: 12.4%

latest 2011, Q.2: +1.4%

HISTORY OF THE WORLD, 1990-2010
(very summarized)

Story of rich country savings chasing a narrow set of assets.

Early 1990s - **First World doldrums**

- 1991 S & L Crisis in the United States, US recession
- 1991 German reunification, German recession
- 1992 Speculative attacks on European exchange rates
- 1993 Japanese real-estate bubble burst, Japanese depression begins.

Conclusion: First World is lame. Let's put our money in emerging markets!

Late 1990s: **Emerging markets crisis**

- 1994 Tequila Crisis (Mexico)
- 1997 Asian Crisis (Thailand, Indonesia, Korea, Malaysia, Taiwan, Singapore)
- 1998 Russia default (provokes LTCM crisis)
- 1999 Brazil crisis
- 2000 Turkey crisis
- 2001 Argentina crisis

Conclusion: Emerging markets scary. Let's put our money back in the First World.!

Turn-of-Century: **Tech Boom**

- 1994 Tech boom begins. Stock market rises.
- (1994 Community Reinvestment Act (CRA) creates sub-prime mortgage market)
- 1998 Dot-Com bubble mounts
- 1999 Euro introduced, brief EU recovery
- (1999 Financial deregulation, repeal of Glass-Steagall).
- 2001 US stock market crash, recession.

Conclusion: Enough virtual nonsense. Let's put our money in real stuff, bricks-and-mortar!

2000s **Real asset boom**

- 2002 US real estate bubble begins
- 2002 China takes off, commodity prices boom begins.
- 2003 Boomlets in European peripheries (Ireland, Spain, E. Europe)
- 2007 US real estate bubble crashes
- 2008 US subprime crisis turns into global financial crisis

Conclusion: Now what?

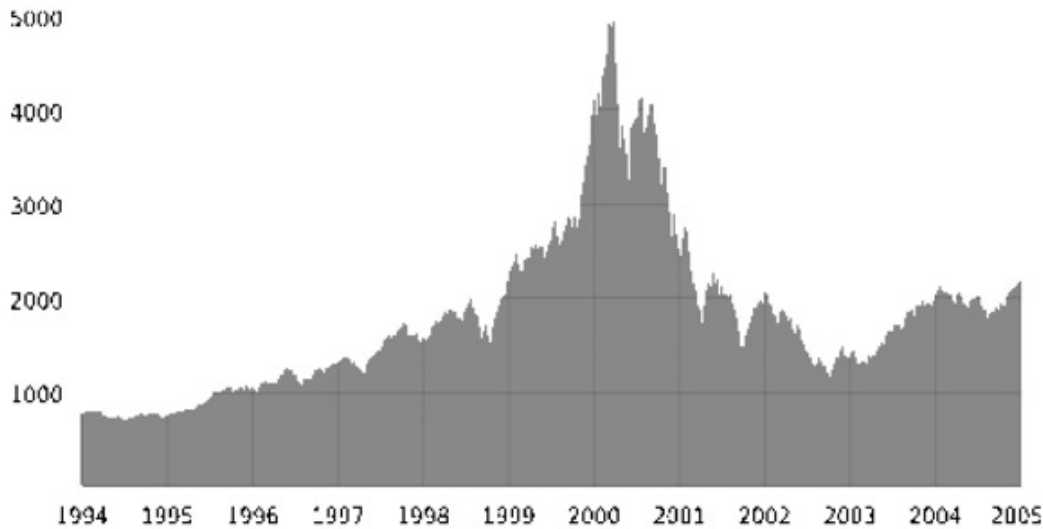


Fig - The Tech Boom - NASDAQ stock market composite index (1994-2005)

2007

Early 2007 – Crisis begins. Real Estate prices begin to collapse, default rates increase (US unemployment = 4.5% inflation = 0.5%, FF interest rates = 5.25%)

June 2007 – Bear Stearns Hedge funds collapse

Summer 2007 – Summer of Unwinding, credit crunch begins. German banks (Sachsen LB, IKB Industriebank) collapse, Northern Rock (UK) collapses, Countrywide collapses (to B of A).

Sep 2007 Fed finally lowers interest from 5.25% to 4.75%

Oct 2007 First Quarterly Reports of banks since crisis; massive losses reported.

Nov-Dec 2007 Reviews of QR double & triple losses; American banks cut back lending even more, seek out capital infusions from sovereign funds (Abu Dhabi, Singapore, Oman, China, etc.)

Dec, 2007 US enters economic **recession** (un. = 5%, inf. = 0.3%) Credit crunch solidifies. Fed cuts FFrate to 4.25%, but liquidity trap (banks stockpile cash, commercial interest rates stay stubborn high); Fed introduces "Term Auction Facility" (TAF) to try to bend long-run rates down.

2008

Jan 2008 Martin Luther King Day Massacre (global stock market sell-off, emergency Fed cut from 4.25% to 3.50%, then to 3% a week later; French bank Societe Generale blames rogue trader)

Feb 2008 Confusing signals. Oil prices rise to \$110. Fears of 'stagflation' (un. = 5.1%, infl. = 0.4%). Nonetheless Fed boosts TAF. Europe enters recession. Euro-area central banks coordinate of emergency financial infusions.

Mar 2008 Bear Stearns finally collapses (Fed arranges JP Morgan Chase shotgun wedding). FFrate cut to 2.25. Fed creates Primary Dealer Credit Facility (PDCF) to allow direct Fed lending to troubled investment banks. Focus turns on insurers in trouble (MBIA, AIG).

June 2008 Congress mails out stimulus tax rebate checks to public.

July 2008 Collapse of small US banks, e.g. Countrywide, Indymac, Silver State (US); in Europe, IKB, Dresdner (Ger), Alliance & Leicester (UK), Roskilde (DK).

Aug 2008 – Recession deepens. Consumer prices go from inflation to *deflation* (un = 6.1% , inf. = -0.1%) Depression phase. FFrate cut to 2%.

Sep 2008 US government takes over collapsing mortgage giants Fannie Mae & Freddie Mac.

Sep 12 2008 "**The Decision that Destroyed the World**" - Merrill Lynch shotgunned to B of A, but no one wants to hook up with Lehman brothers. US government refuses to rescue Lehman Bros themselves. Lehman is allowed to collapse.

Sep 14-17 2008 Meltdown of Financial System

- Reserve Primary Fund (PRF) collapses.
- Insurance giant AIG collapses, nationalized by US government (\$80 bn)
- Scottish banking giant HBOS collapses, rescued by British government.
- Numerous other banks on verge of collapse.
- US government tab thus far: \$900 bn and no end in sight. Financial sector in free-fall.

Sep 18 - US Treasury Sec. Paulson and Fed chairman Bernanke meet with Congress and ask for bailout. "If we don't do this, we may not have an economy on Monday." - Ben TARP I proposed (Treasury blank cheque to buy toxic assets).

Sep 20-28 Haemorrhaging continues. On verge of collapse, investment banks Goldman Sachs & Morgan Stanley convert to commercial banks in order to borrow from Fed. Washington Mutual collapses, in Europe Bradford & Bingley, Dexia, Hypo Real collapse.

Sep 29 - Congress rejects TARP I. Stock market collapses in aftermath, biggest point loss in history.

Oct 3 - Congress passes TARP II to provide \$700 bn in capital infusions (bailouts). Ffrate cut to 1.5%.

Oct 8 - UK institutes bailout program similar to TARP II.

Oct 12 - **Capital Infusions** - Paulson forces banks to take \$250 bn in TARP II bailout money in return for giving US government shares in the banks. Half of it goes to nine largest banks (Citigroup, JP Morgan Chase, B of A + Merrill Lynch, Wells Fargo, Goldman Sachs, Morgan Stanley, Bank of New York and State Street) Banks not allowed to refuse the money.

Oct -Nov. 2008 Wave of collapses & bailouts continue, Ffrate cut to 1%.

- US: Wachovia, National City, Commerce, Sovereign, Citibank, Chevy Chase, CIT
- UK: RBS, HBOS, Lloyds TSB
- Germany: West LB, HSH Nordbank, Bayern LB, Commerzbank
- Other Europe: UBS, Societe Generale, Anglo-Irish, Icelandic banks (Landsbanki, etc.)
- Governments of Iceland and Hungary appeals to IMF for rescue. First sovereign countries.

Nov 2008 US Presidential election. Obama wins. Washington Summit of G20 to coordinate gov't policy reactions. Everyone promises not to try to get out of recessions at each others' expense (tariffs, ex-rates). China unveils \$586 bn stimulus plan. IMF rescues Latvia, Ukraine, Belarus.

Dec. 2008

- Unemployment 7.4%, Inflation = -1.8% (deflation). Fed lowers ffrate to historic **0%**.
- GDP in last quarter of 2008 has collapsed by a horrific 6.8%.

2009

Jan-Feb 2009

- B of A in trouble. 'Blue Monday' stock market crash in London. Worldwide stock sell-off.

Feb. 2009

- Obama gov. takes office. Unemployment = 8.2%,
- \$800 bn Economic Stimulus package (government spending)
- New Treasury sec. Geithner scraps TARP II, returns to TARP I (buying bad assets)
- Bank CEOs chastised before Congress. Announces 'stress test' to begin.

March 2009

- More Sovereign Crises: IMF rescue of Romania, Serbia, Bosnia.

Apr. 2009

- Stress results announced. Banks allowed to begin paying back TARP money.

June 2009

- US recession officially ends. **Recovery begins.**

July 2009

- GM and Chrysler collapse. Nationalized by US government.
- 'Cash for clunkers' program begins. Ends in August.

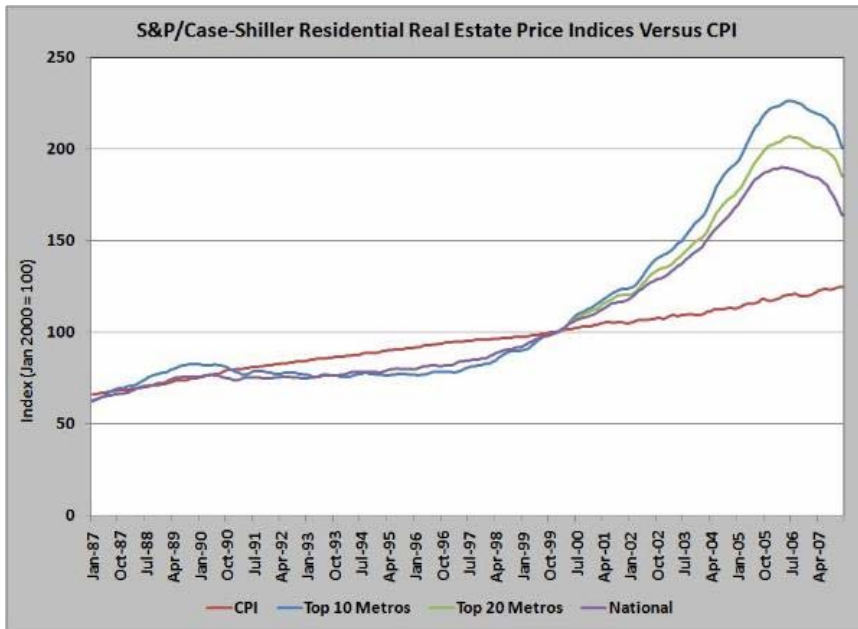
October, 2009 - US unemployment rate reaches its peak, 10.1%

2010

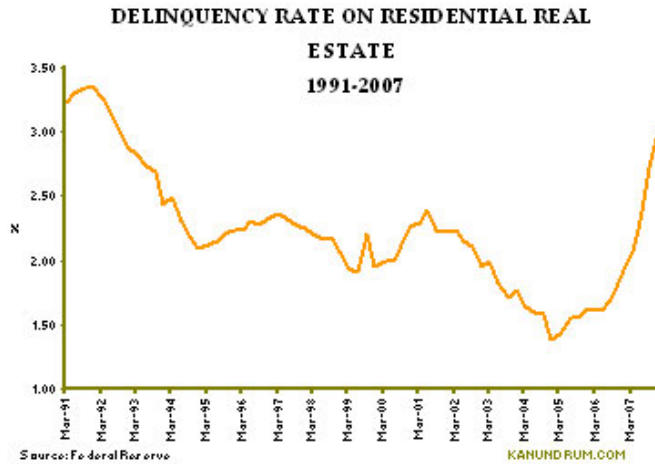
Early 2010 - Euro-area Sovereign crisis: Greece, Spain, Ireland, Italy, Portugal fiscal crisis.

Currently (Oct. 2010) ffrate = 0%, unemployment = 9.6%, inflation = 0.1%

Housing Market 2007-08



Real Estate Prices vs. General Prices (CPI)



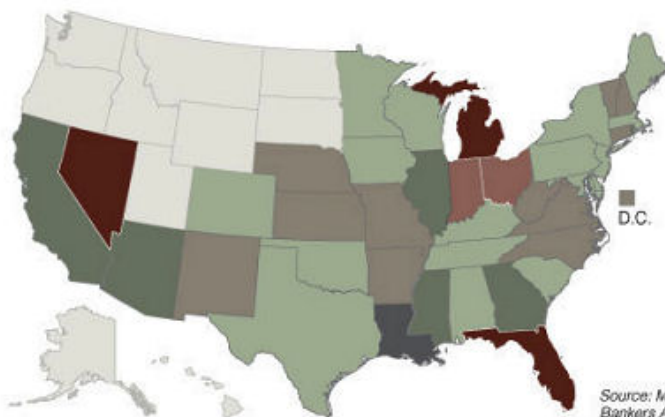
Mortgage Defaults

Where Homeowners Are in the Worst Trouble

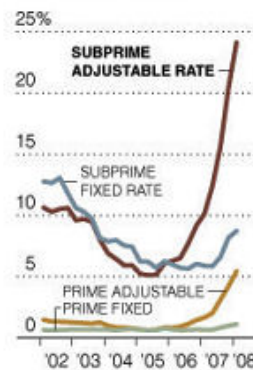
In the first quarter of 2008, the highest share of mortgages that were seriously delinquent — 90 days or more past due or in foreclosure — were concentrated in three areas of the country.

PERCENT OF MORTGAGES SERIOUSLY DELINQUENT

MONTANA 1.23% 2% 3% 4% 5% 6% 6.71% FLORIDA



SERIOUSLY DELINQUENT MORTGAGES BY TYPE



Mortgages by State

THE NEW YORK TIMES

On the Eve

Snapshot of banks in trouble in August 2008, before the meltdown in September

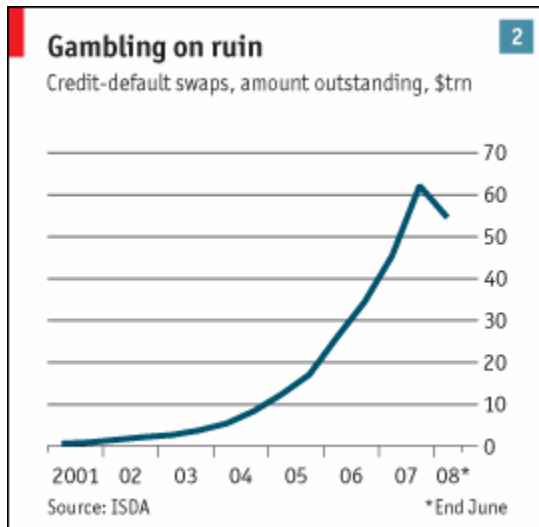
Institution	Country (if not US)		Writedown & losses (billions)	Institution		Writedown & loss (billions)
Citigroup		*	\$55.1	Nomura	Jap	\$3.3
Merrill Lynch		†	\$51.8	Natixis	Fr	\$3.3
UBS	Switz.	*	\$44.2	Bear Stearns		\$3.2
HSBC	UK		\$27.4	HSH Nordbank	Ger	\$2.8
Wachovia		†	\$22.5	Sachsen LB	Ger	\$2.8
Bank of America		*	\$21.2	UniCredit	Ita	\$2.6
IKB Deutsche	Ger	†	\$15.3	Commerzbank	Ger	\$2.4
Royal Bank of Scotland	UK	*	\$14.9	ABN Amro	Neth	\$2.3
Washington Mutual		†	\$14.8	DZ Bank	Ger	\$2
Morgan Stanley		‡	\$14.4	Bank of China	Chin	\$2
JP Morgan Chase			\$14.3	Fifth Third		\$1.9
Deutsche Bank	Ger		\$10.8	Rabobank	Neth	\$1.7
Credit Suisse	Switz		\$10.5	Bank Hapoalim	Isr	\$1.7
Wells Fargo		*	\$10	Mitsubishi UFJ	Jap	\$1.6
Barclays	UK		\$9.1	Royal Bank of Canada	Can	\$1.5
Lehman Brothers		†	\$8.2	Marshall & Ilsley		\$1.4
Credit Agricole	Fr	*	\$8	Alliance & Leicester	UK	\$1.4
Fortis	Bel-Neth	†	\$7.4	US Bancorp		\$1.3
HBOS	UK	†	\$7.1	Dexia	Bel-Fr	\$1.2
Societe Generale	Fr	*	\$6.8	Caisse d'Epargne	Fr	\$1.2
Bayerische LB	Ger	*	\$6.4	Keycorp		\$1.2
Canadian Imperial	Can		\$6.3	Sovereign Bancorp		\$1
Mizuho Financial	Jap		\$5.9	Hypo Real Estate	Ger	\$1
ING	Neth	*	\$5.8	Gulf International	Bahr	\$1
National City		†	\$5.4	Sumitomo Mitsui	Jap	\$0.9
Lloyds TSB	UK	*	\$5	Sumitomo Trust	Jap	\$0.7
IndyMac		†	\$4.9	DBS Group	Sing	\$0.2
West LB	Ger	*	\$4.7	Other European banks		\$7.2
Dresdner	Ger	†	\$4.1	Other Asian banks		\$4.6
BNP Paribas	Fr	*	\$4	Other US banks		\$2.9
LB Baden-Wurttemberg	Ger	*	\$3.8	Other Canadian banks		\$1.8
Goldman Sachs		‡	\$3.8			
E*trade			\$3.6	TOTAL		\$501.1

Ultimate fate after meltdown:

- * - Rescued/bailed out by government
- † - No longer in existence (bankrupt or taken over)
- ‡ - Special fate (e.g. convert to commercial bank to get bailout)

Note: private bailouts/capital injections not noted.

Credit-Default Swaps (CDS)



Size Comparison (2008)

Treasury bond market = \$4.4 trillion

Mortgage market = \$7.1 trillion

Stock market = \$22 trillion

CDS market = \$45 trillion

Credit Ratings (S&P)

AAA ← highest quality, safest

AA

A

BBB

----- investment grade above, junk below

BB

B

CCC

CC

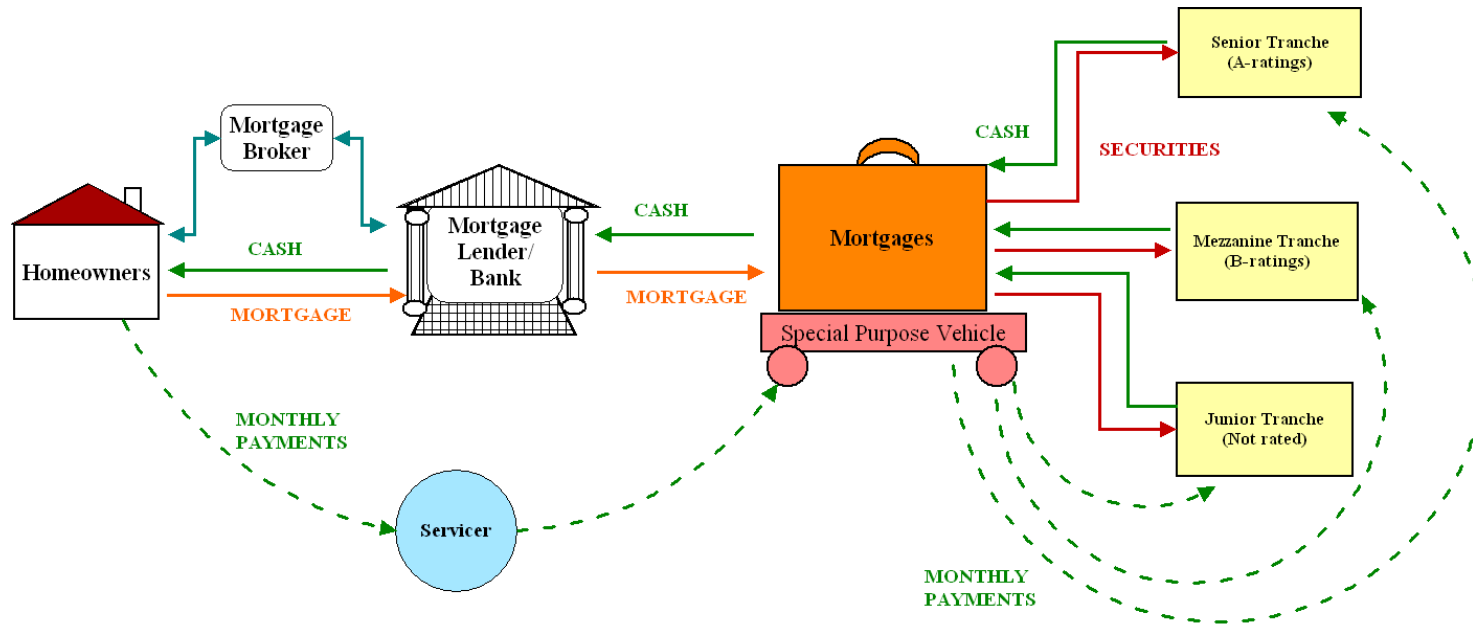
C ← lowest quality, high risk of default

US BAILOUTS - 2008-09

Notable Institutions Bail-out Notes

Citigroup	\$50bn	additional \$300 bn in gov guarantees
Bank of America	\$45 bn	additional \$118 bn in gov guarantees
AIG	\$40 bn	(insurance company)
JP Morgan Chase	\$25 bn	(repaid 2009)
Wells Fargo	\$25 bn	
General Motors	\$13.4 bn	(automobile company)
Goldman Sachs	\$10 bn	(ex-inv bank; repaid 2009)
Morgan Stanley	\$10 bn	(ex-inv bank; repaid 2009)
PNC Financial	\$7.5 bn	
US Bancorp	\$6.6 bn	(repaid 2009)
GMAC	\$5 bn	
Chrysler	\$4 bn	(automobile company)
Capital One	\$3.5 bn	(repaid 2009)
Regions Financial	\$3.5 bn	
American Express	\$3.4 bn	(repaid 2009)
BB & T	\$3.1 bn	(repaid 2009)
Bank of New York	\$2.5 bn	(repaid 2009)
State Street	\$2.5bn	(repaid 2009)
CIT	\$2.3bn	(bankrupt)
Discover	\$1.23 bn	

Mortgage Backed Security (MBS)



Collateralized Debt Obligation (CDO)

