

The U.S. Housing and Financial Meltdown: What Happened and What Has Been the Response

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“Any real estate investment is a good investment ... ”



“Any real estate investment is a good investment ... ”



... Really?!

Subprime mortgage meltdown timeline

December 2006–October 2008

Dow Jones U.S. Financial Index

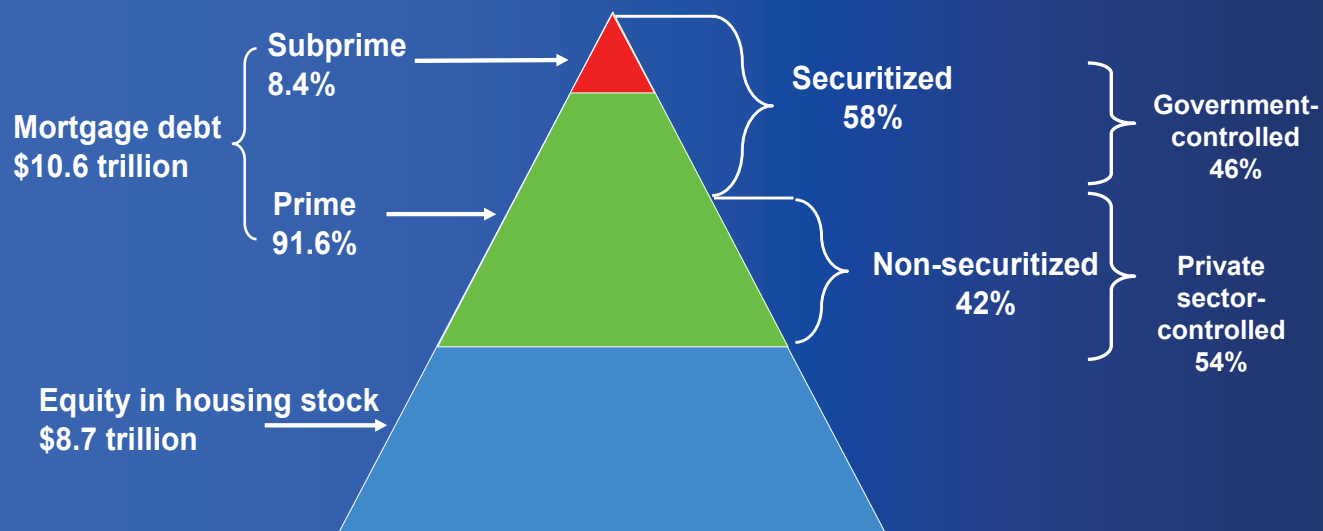


Sources: BusinessWeek, S&P, Global Insight, Milken Institute.

Overview

Home mortgages: Who borrows, how much has been borrowed, and who funds them?

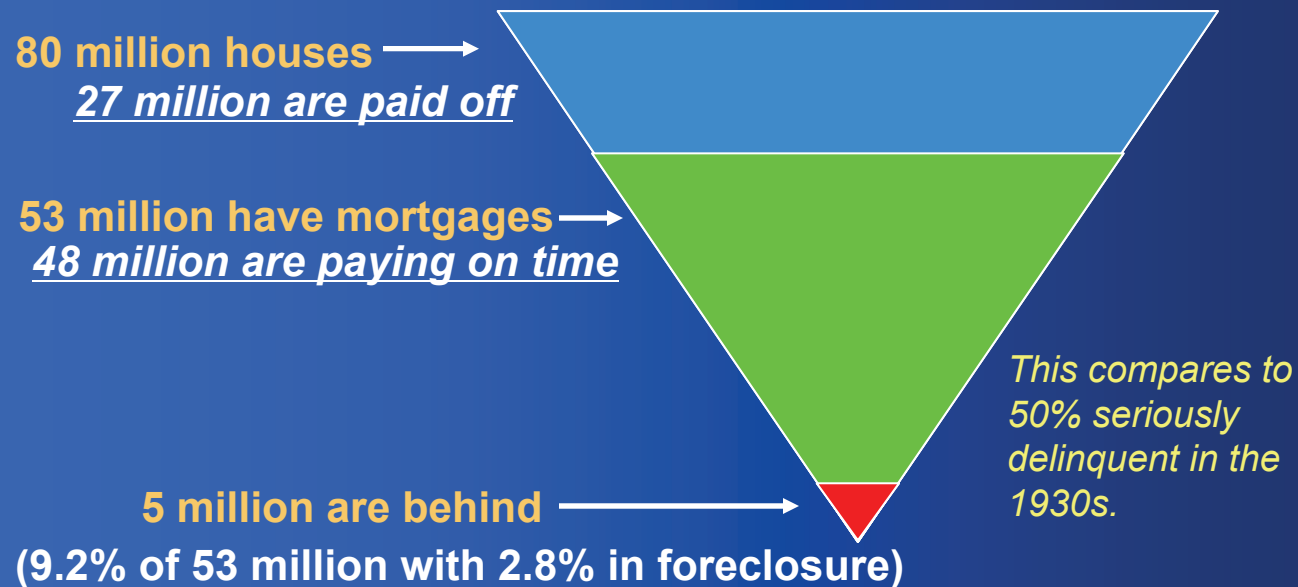
Total value of housing stock = \$19.3 trillion



Note: total residential and commercial mortgages = \$14.7 trillion; 5 percent = \$700 billion

Sources: Federal Reserve, Milken Institute.

The mortgage problem in perspective

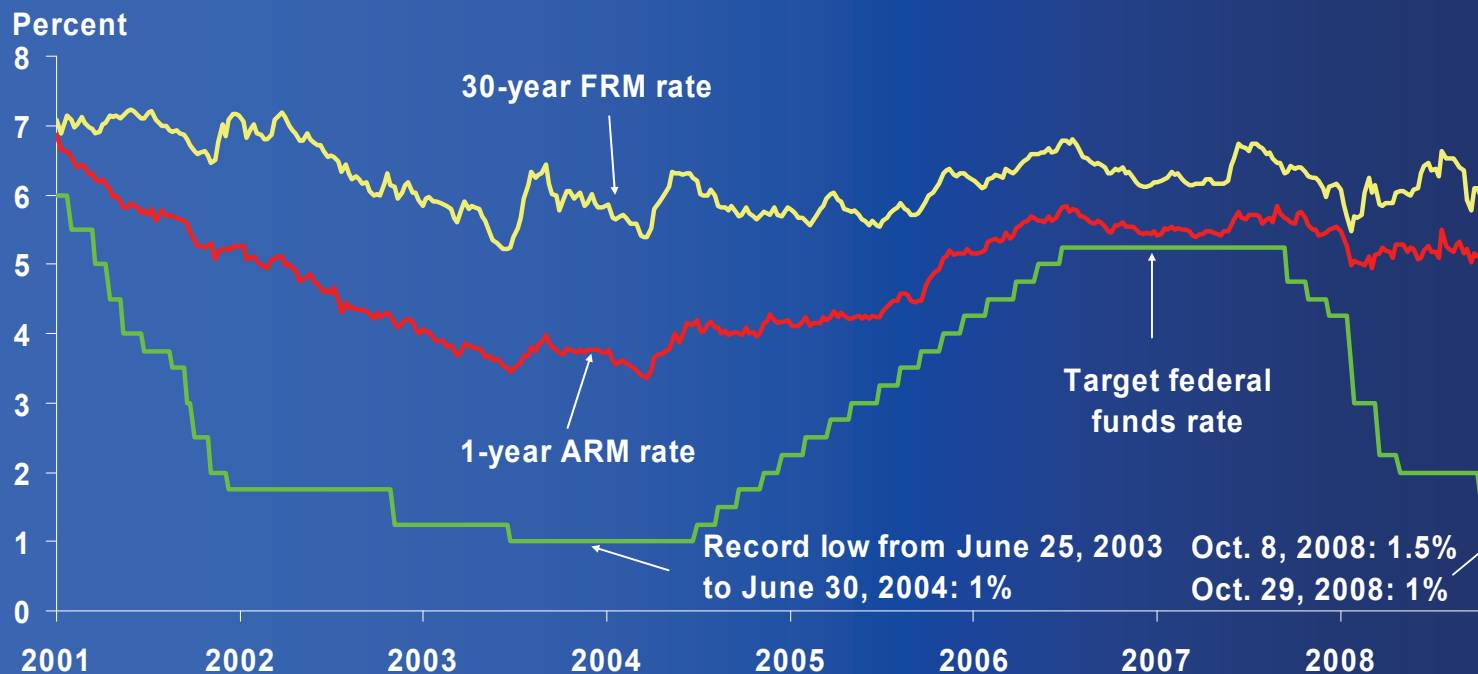


Sources: U.S. Treasury, Milken Institute.

I. Low interest rates and a lending boom

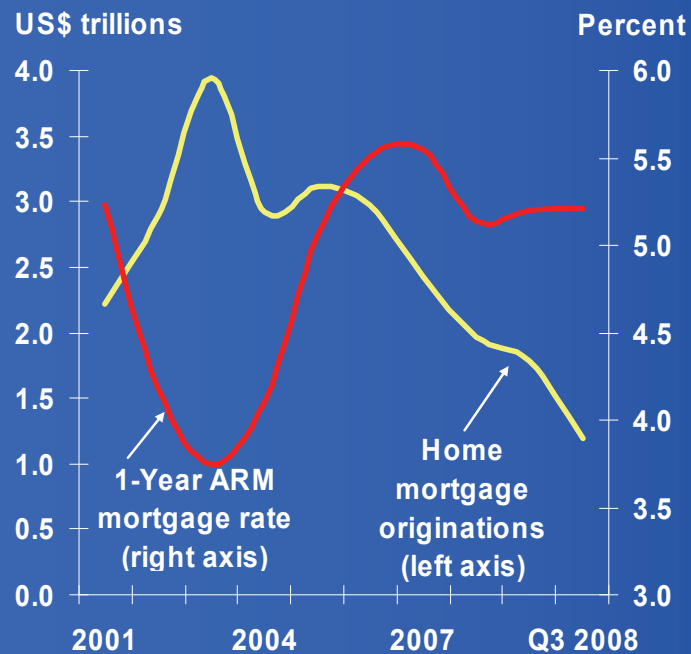
Did the Fed lower interest rates too much and for too long?

Federal funds rate vs. rates on FRMs and ARMs

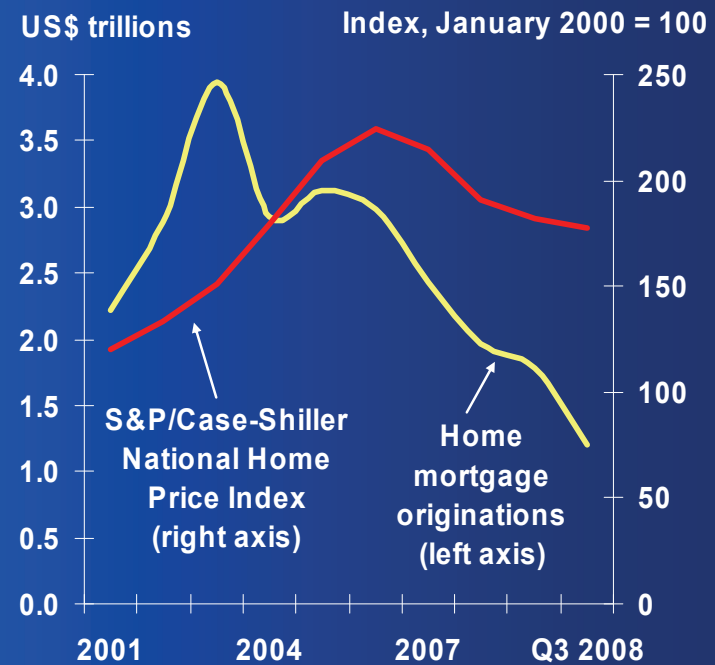


Sources: Federal Reserve, Mortgage Bankers Association, Moody's Economy.com, Milken Institute.

Low interest rates and credit boom



Home price bubble and credit boom

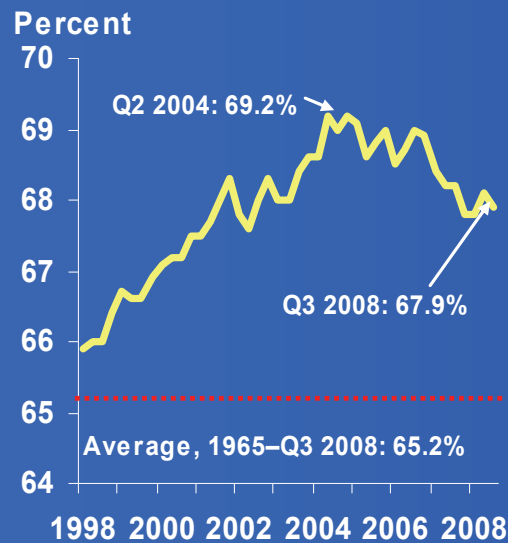


Note: Data for Q1-Q3 2008 are annualized.

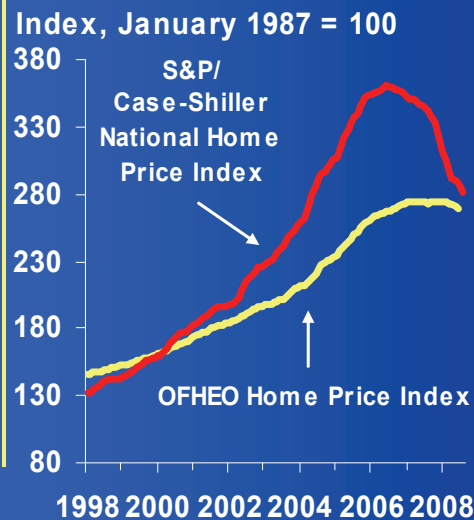
Sources: Inside Mortgage Finance, Mortgage Bankers Association, Moody's Economy.com, S&P/Case-Shiller, Milken Institute.

II. Homeownership, prices, starts and sales take off

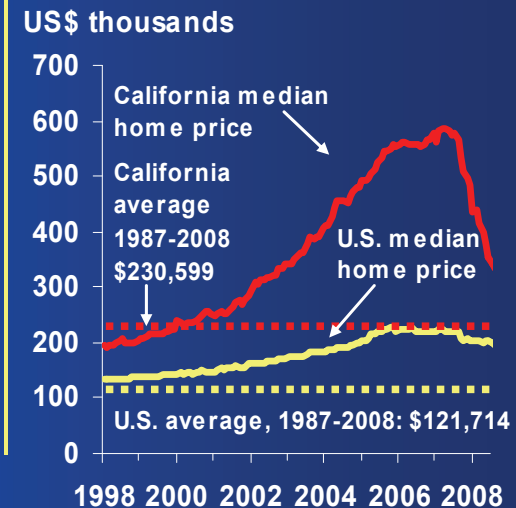
Credit boom pushes homeownership rate to historic high



Home price bubble peaks in 2006

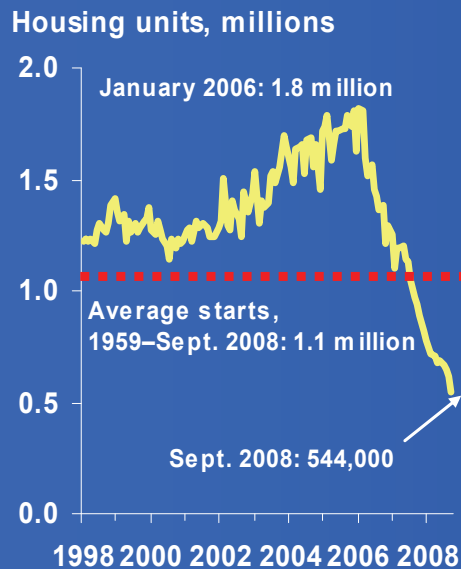


California and national home prices reach record highs



Sources: U.S. Census Bureau, OFHEO, Moody's Economy.com, S&P/Case-Shiller, California Association of Realtors, Milken Institute.

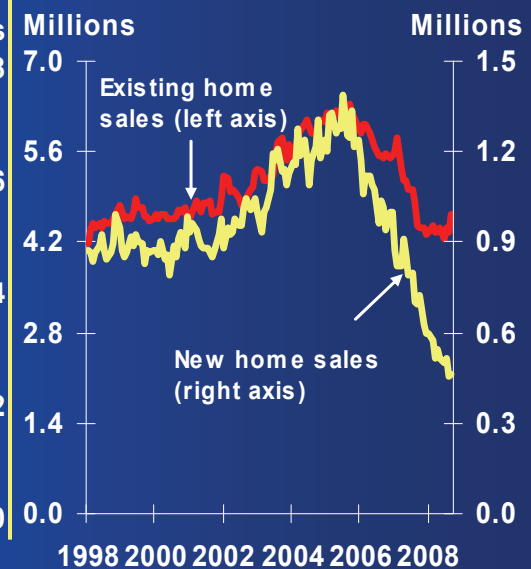
Housing starts hit a record in 2005



Homes for sale



Homes sales reach a new high

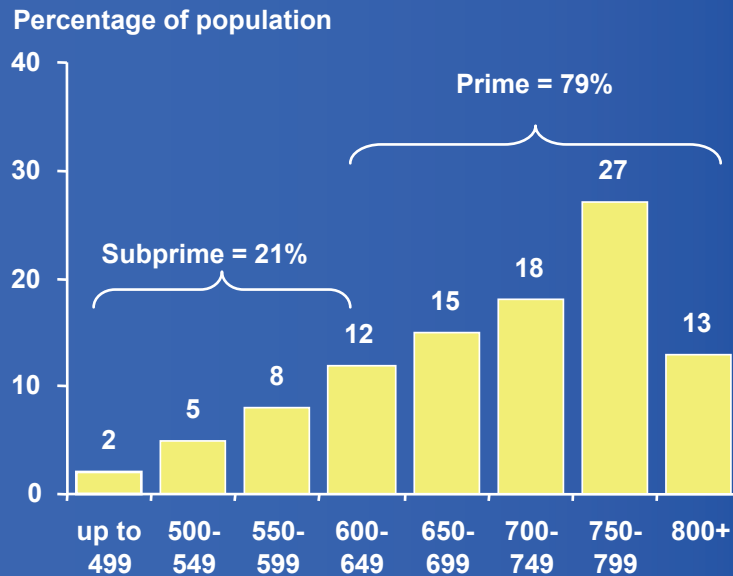


Sources: U.S. Census Bureau, OFHEO, Moody's Economy.com, Milken Institute.

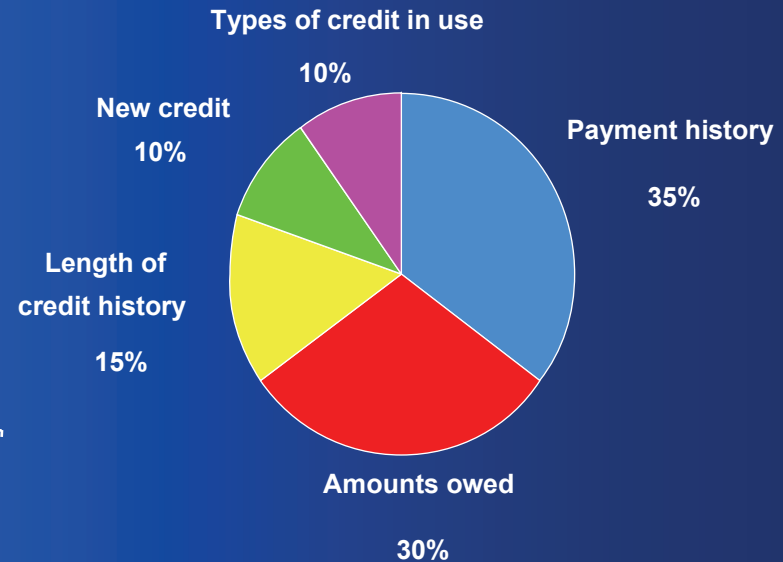
III. Subprime borrowers and subprime mortgages

Who is a subprime borrower?

National FICO scores display wide distribution



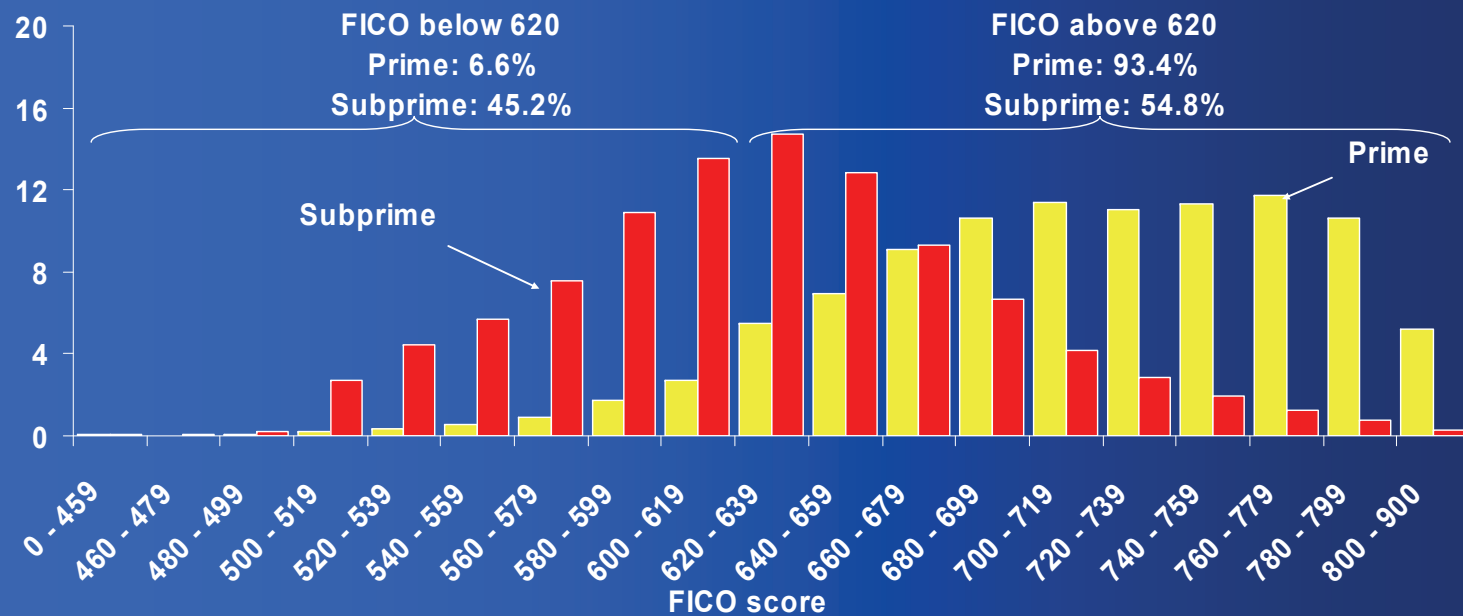
What goes into a FICO score?



Sources: myFICO.com, Milken Institute.

Prime and subprime mortgage originations by FICO score reveal substantial overlaps

Percent of total originations



Sources: LoanPerformance, Milken Institute.

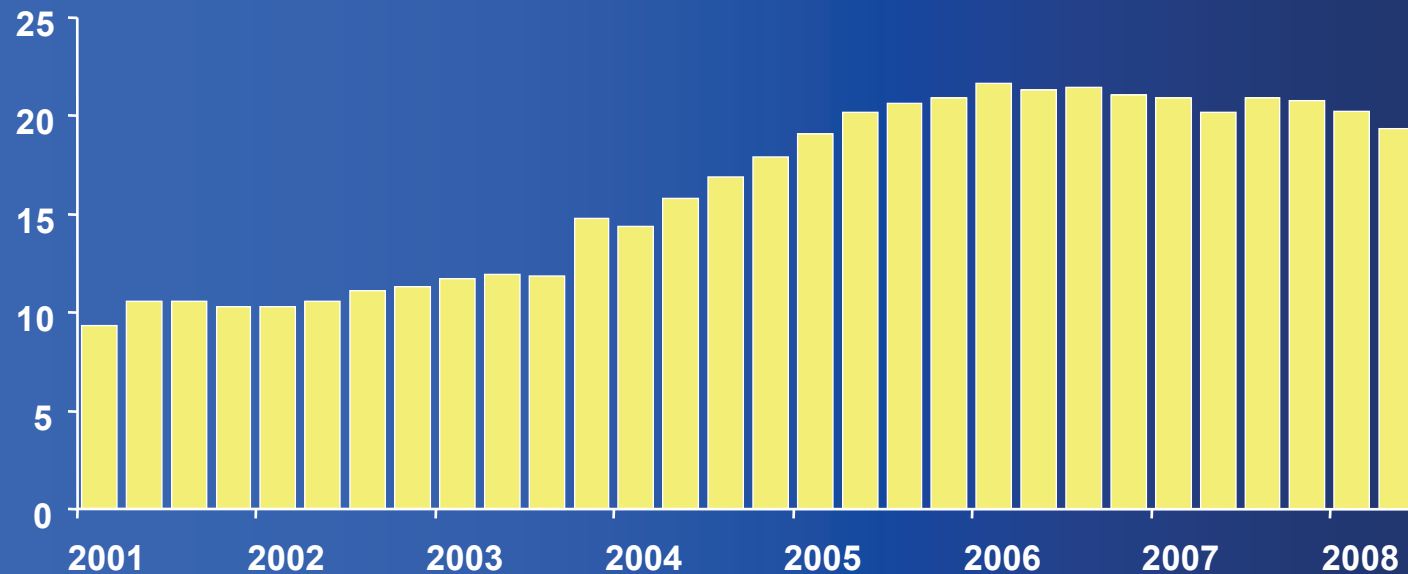
ARMs look attractive to many borrowers



Sources: Mortgage Bankers Association, Moody's Economy.com, Milken Institute.

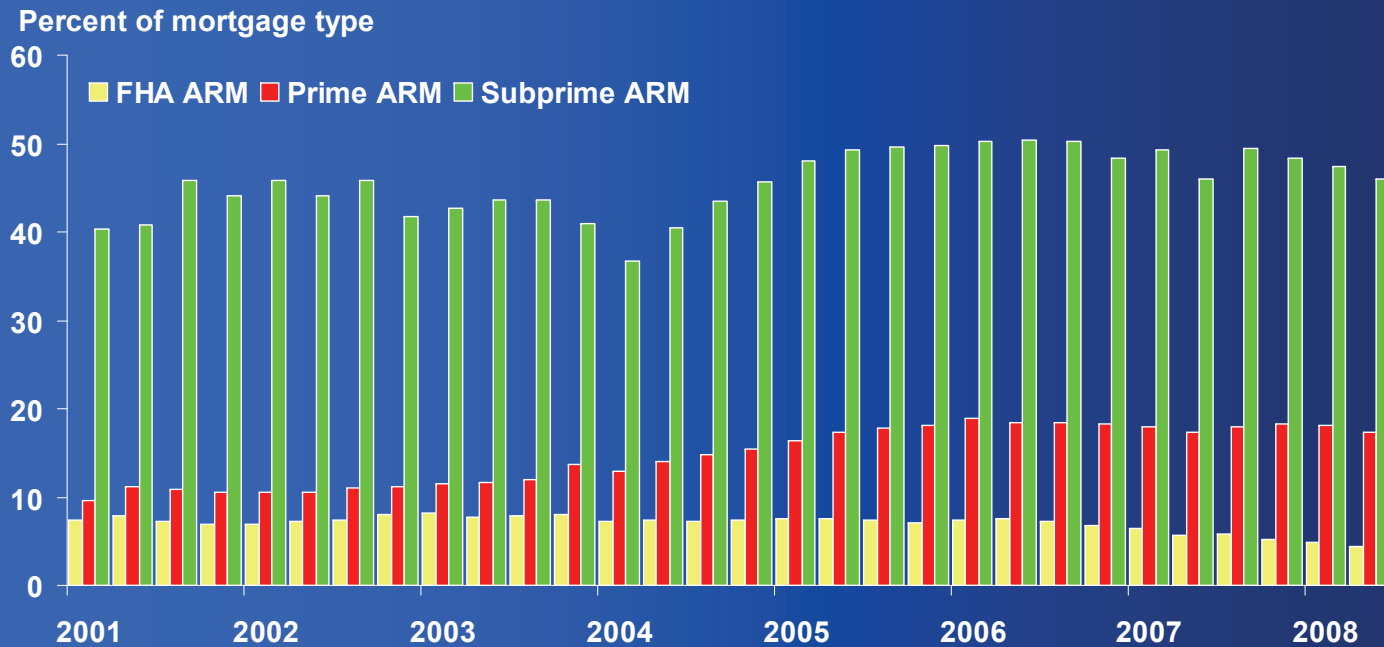
ARM share grows, following low interest rates

Percent of all outstanding home mortgages



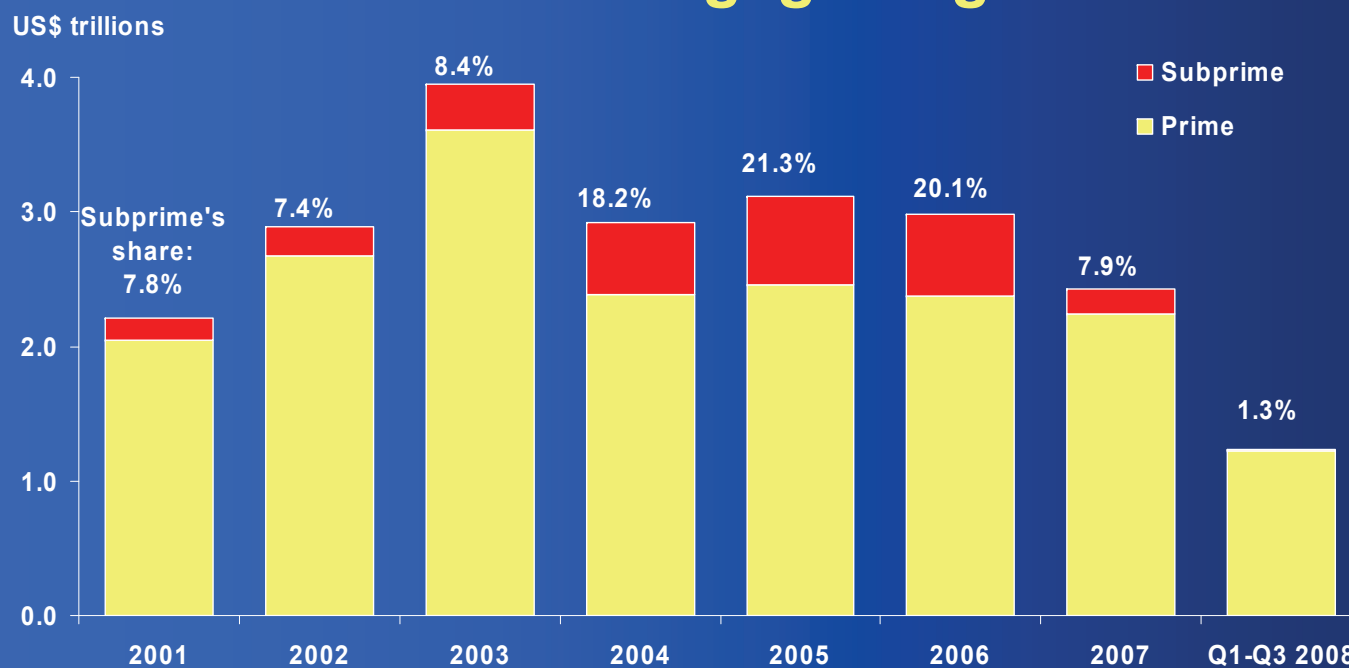
Sources: Mortgage Bankers Association, Moody's Economy.com, Milken Institute.

Largest share of ARMs go to subprime borrowers



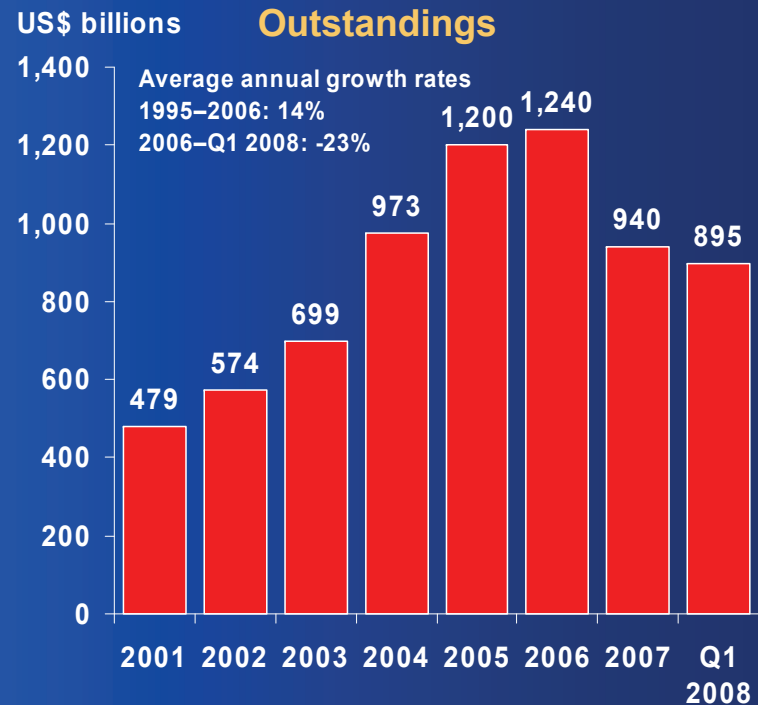
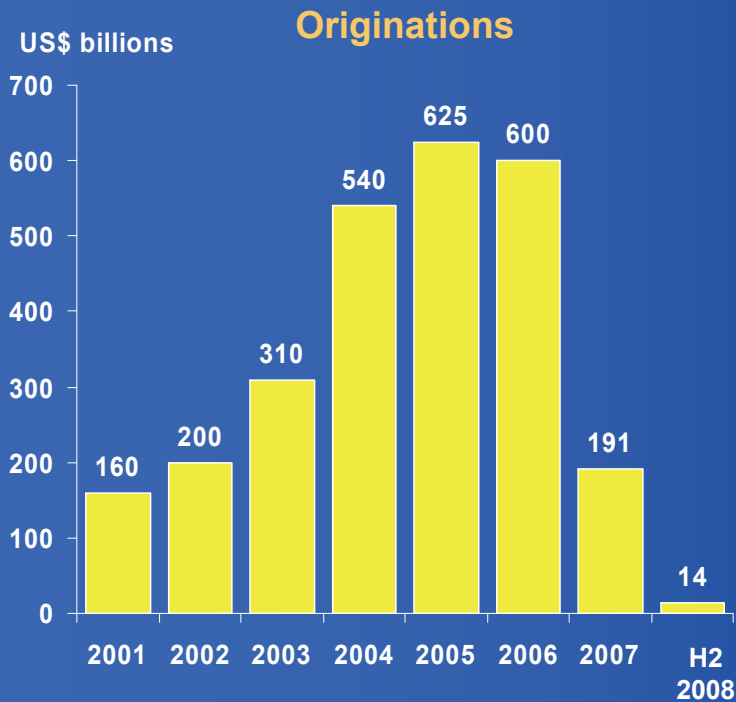
Sources: Mortgage Bankers Association, Moody's Economy.com, Milken Institute.

Subprimes take an increasing share of all home mortgage originations



Sources: Inside Mortgage Finance, Milken Institute.

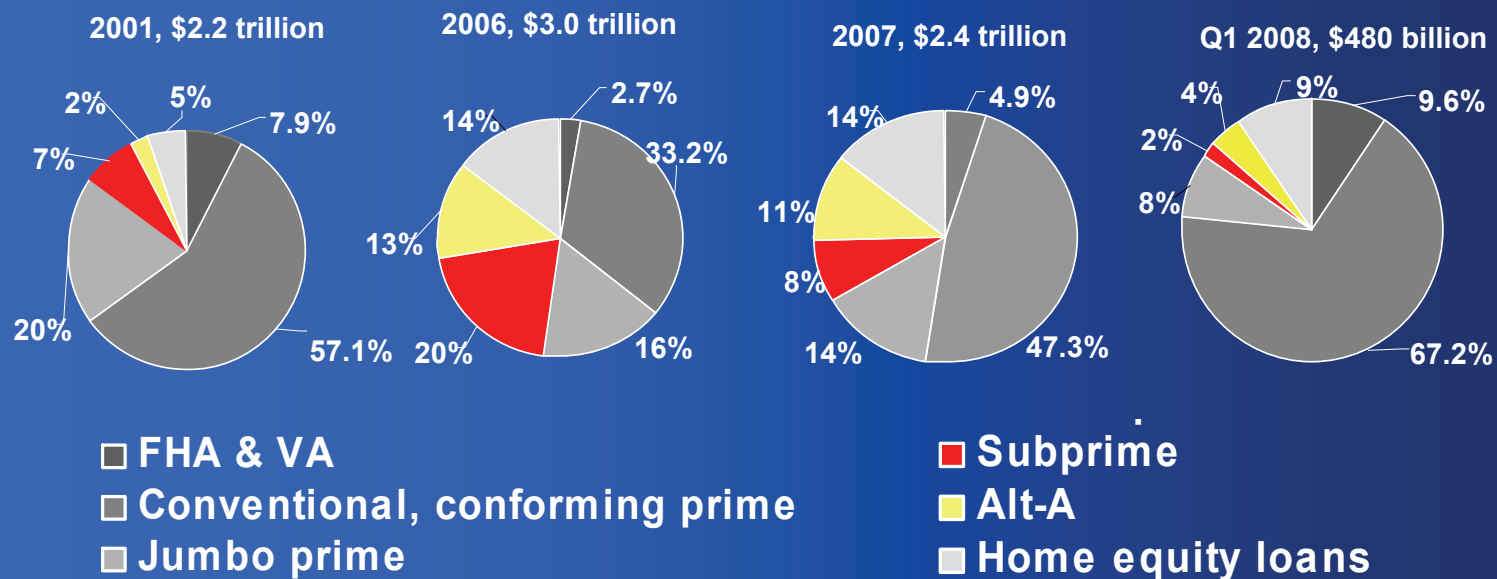
Subprime mortgages increase rapidly before big decline



Sources: Inside Mortgage Finance, Milken Institute.

IV. Mortgage product innovation

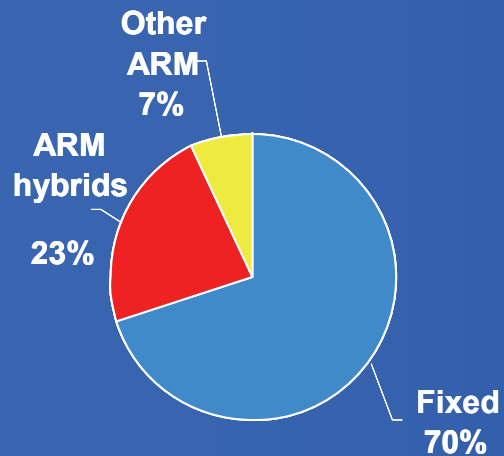
Subprime and Alt-A shares quadruple between 2001 and 2006, then fall in 2007



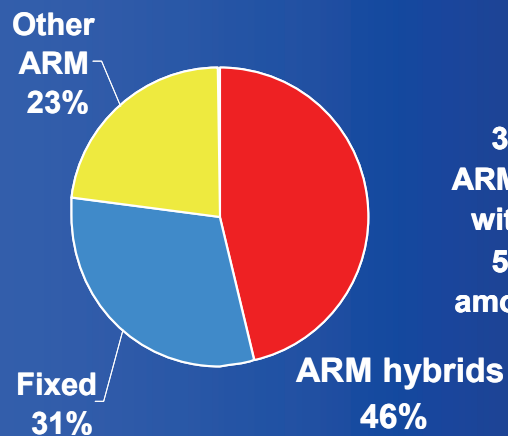
Sources: Inside Mortgage Finance, Milken Institute.

ARM hybrids dominate subprime originations (2006)

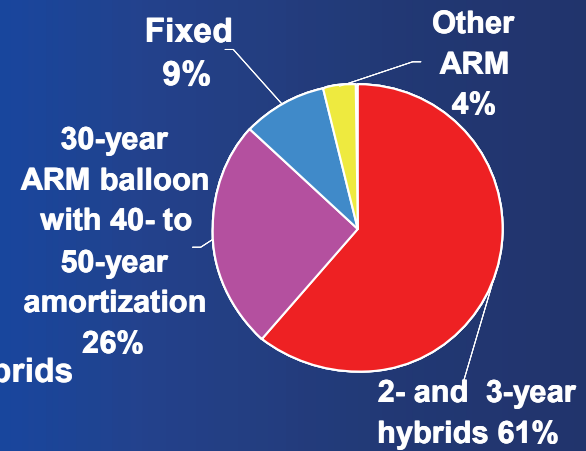
Prime conventional



Alt-A



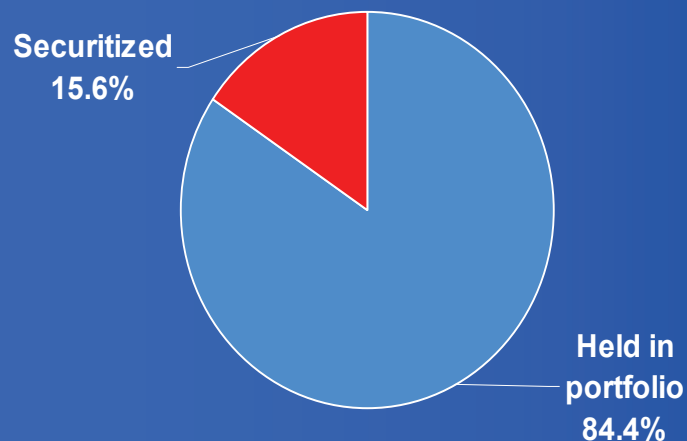
Subprime



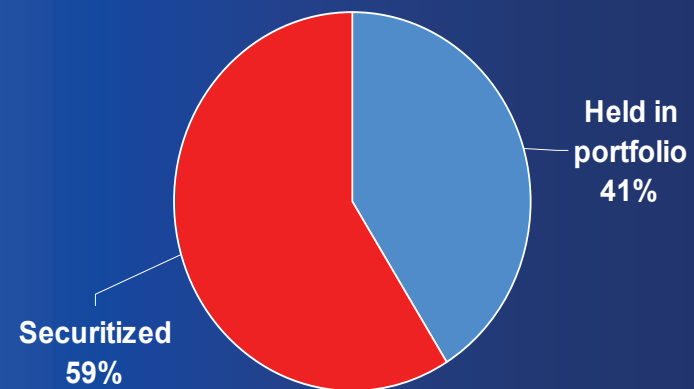
V. Securitization

The mortgage model switches from originate-to-hold to originate-to-distribute

**Residential mortgage loans
1980: Total = \$958 billion**



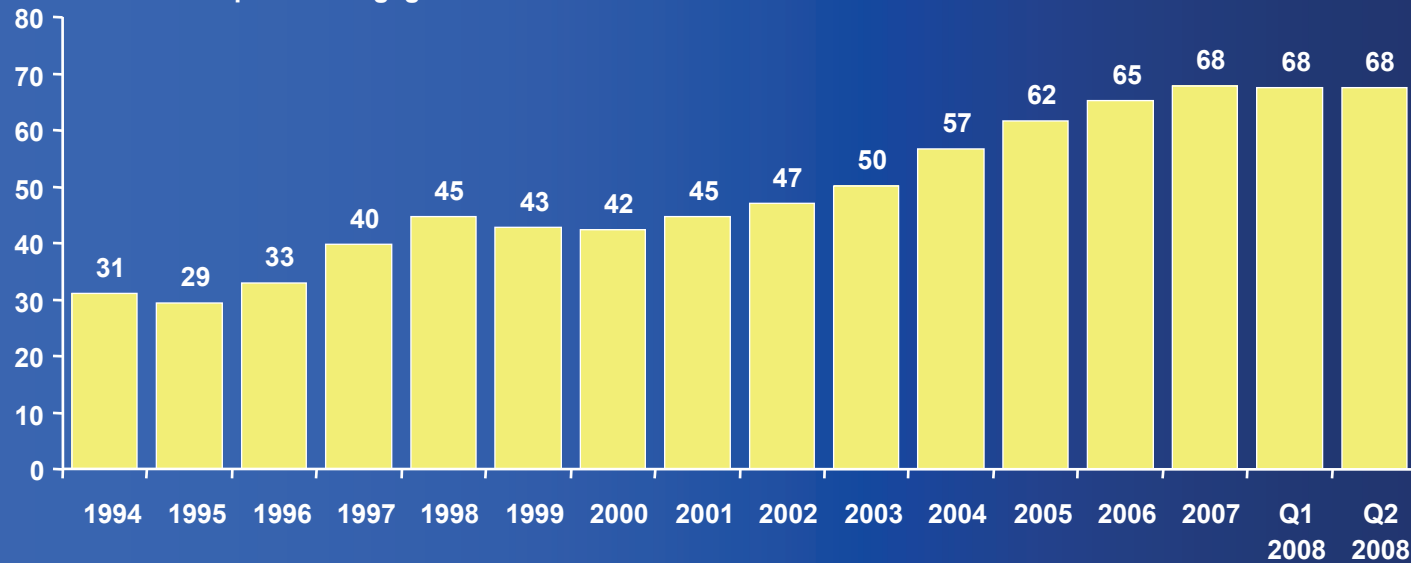
**Residential mortgage loans
Q2 2008: Total = \$11.3 trillion**



Sources: Federal Reserve, Milken Institute.

Securitization becomes the dominant funding source for subprime mortgages

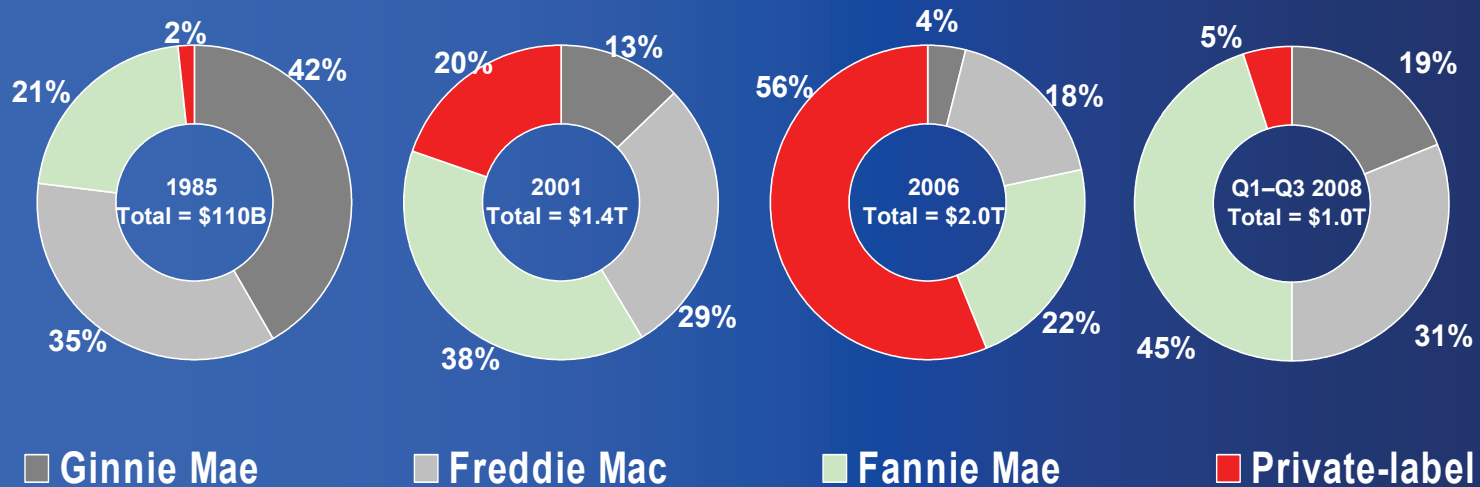
Percent of all subprime mortgages securitized since 1994



Sources: Inside Mortgage Finance, Milken Institute.

The rise and fall of private-label securitizers

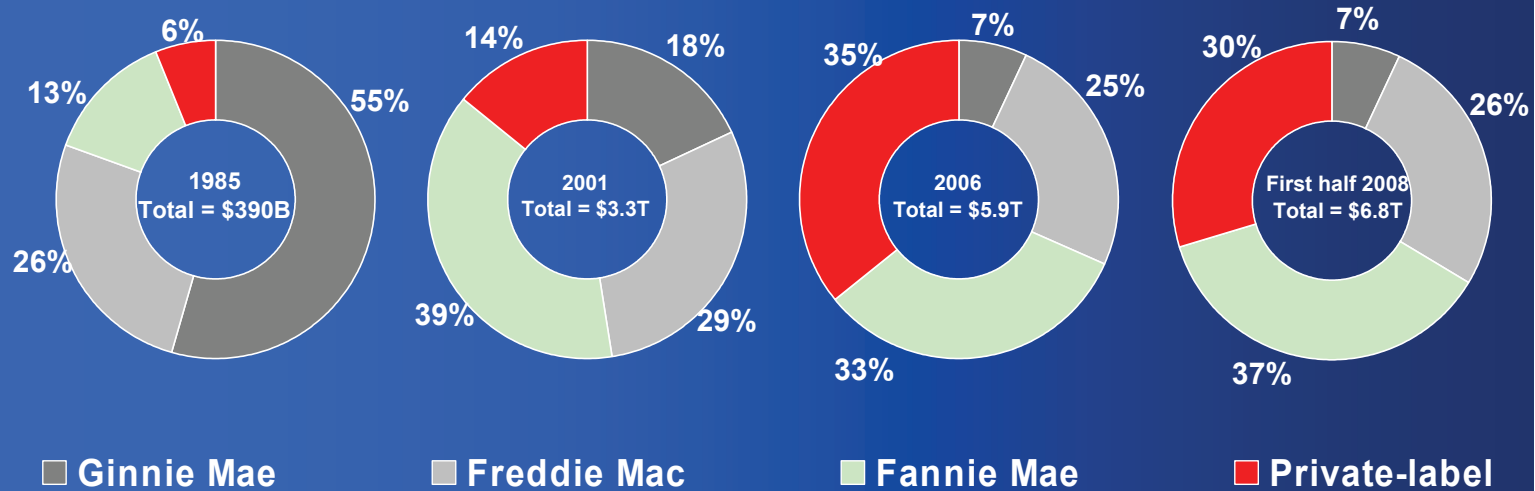
New securities issuance



Sources: Inside Mortgage Finance, Milken Institute.

The rise and fall of private-label securitizers

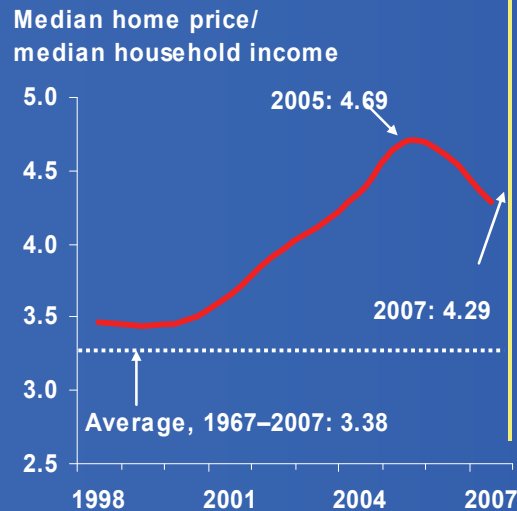
Outstanding securities



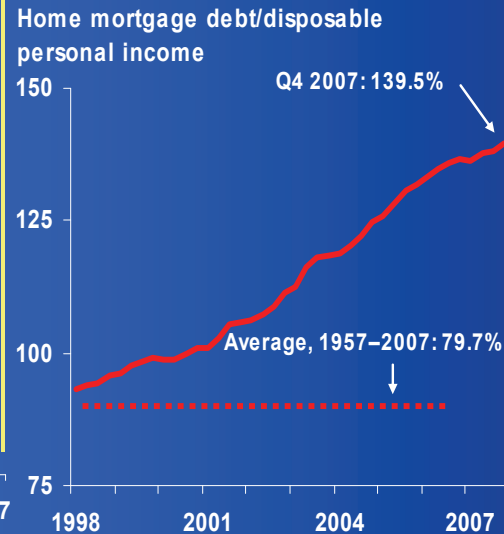
Sources: Inside Mortgage Finance, Milken Institute.

VI. Affordability

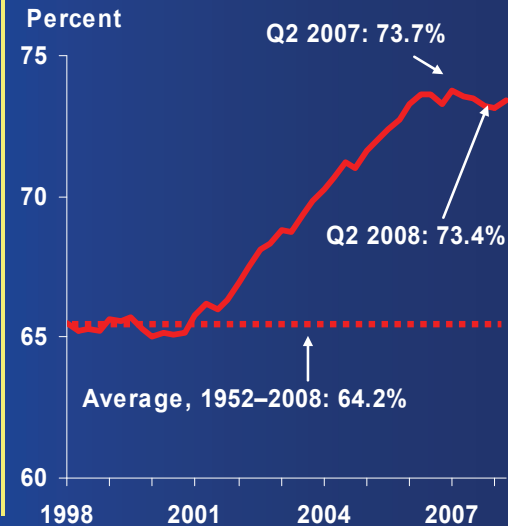
Ratio of home price to household income surges



Debt-to-income ratio of households has increased rapidly



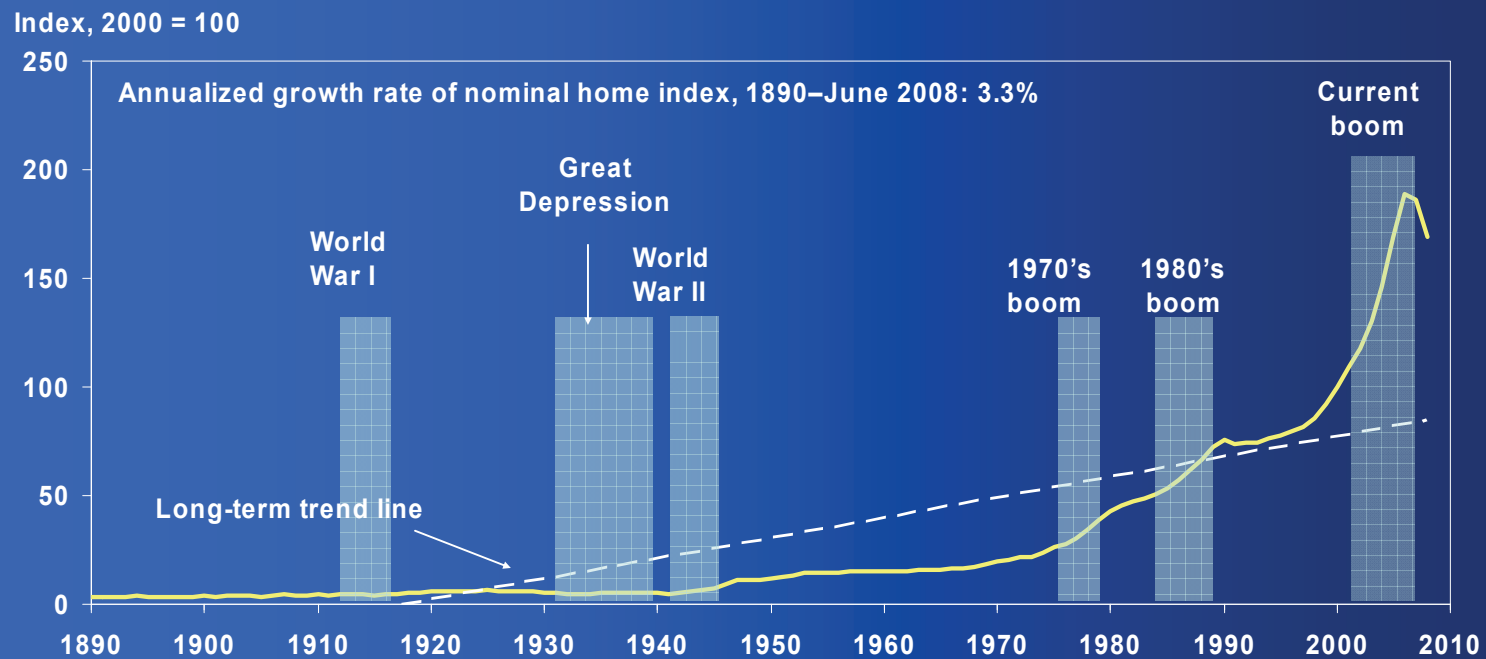
Home mortgage share of household debts reaches a new high in 2007



Sources: U.S. Census Bureau, OFHEO, Federal Reserve, Moody's Economy.com, Milken Institute.

VII. Collapse

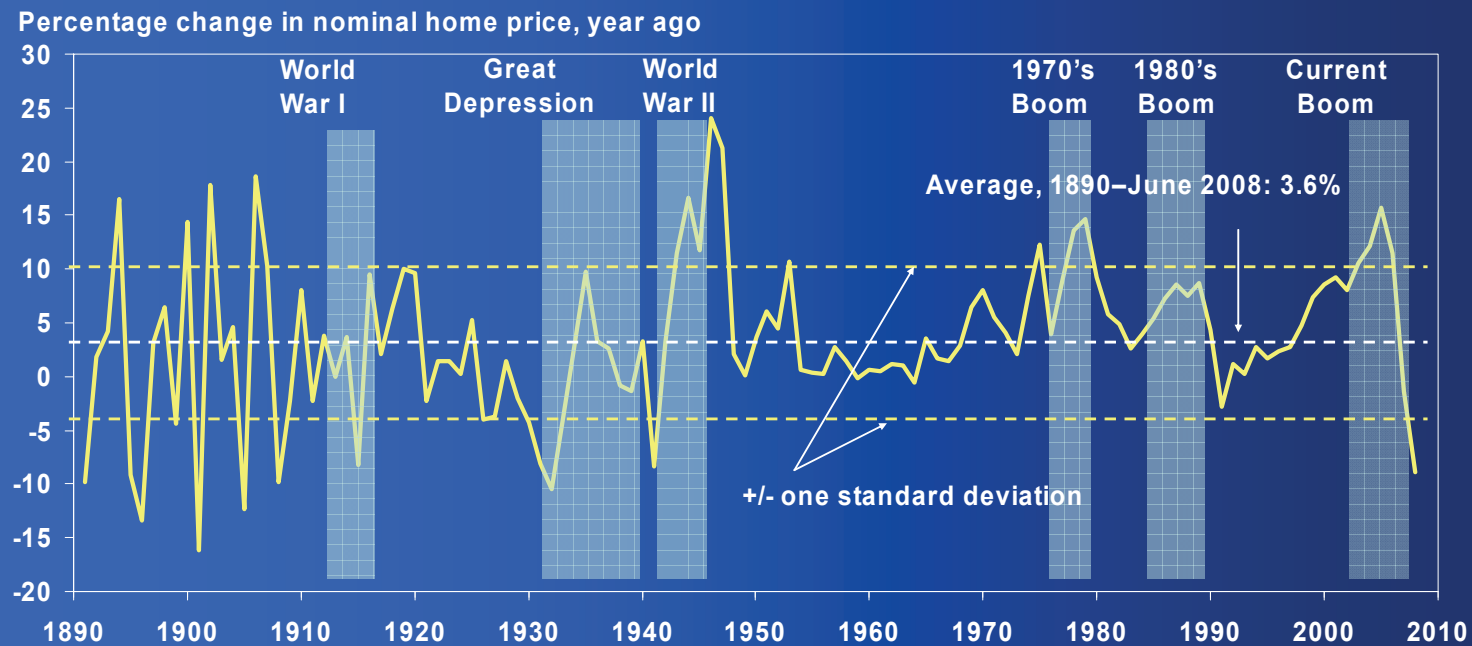
The recent run-up of home prices was extraordinary



Sources: Robert Shiller, Milken Institute.

Home prices don't go up forever

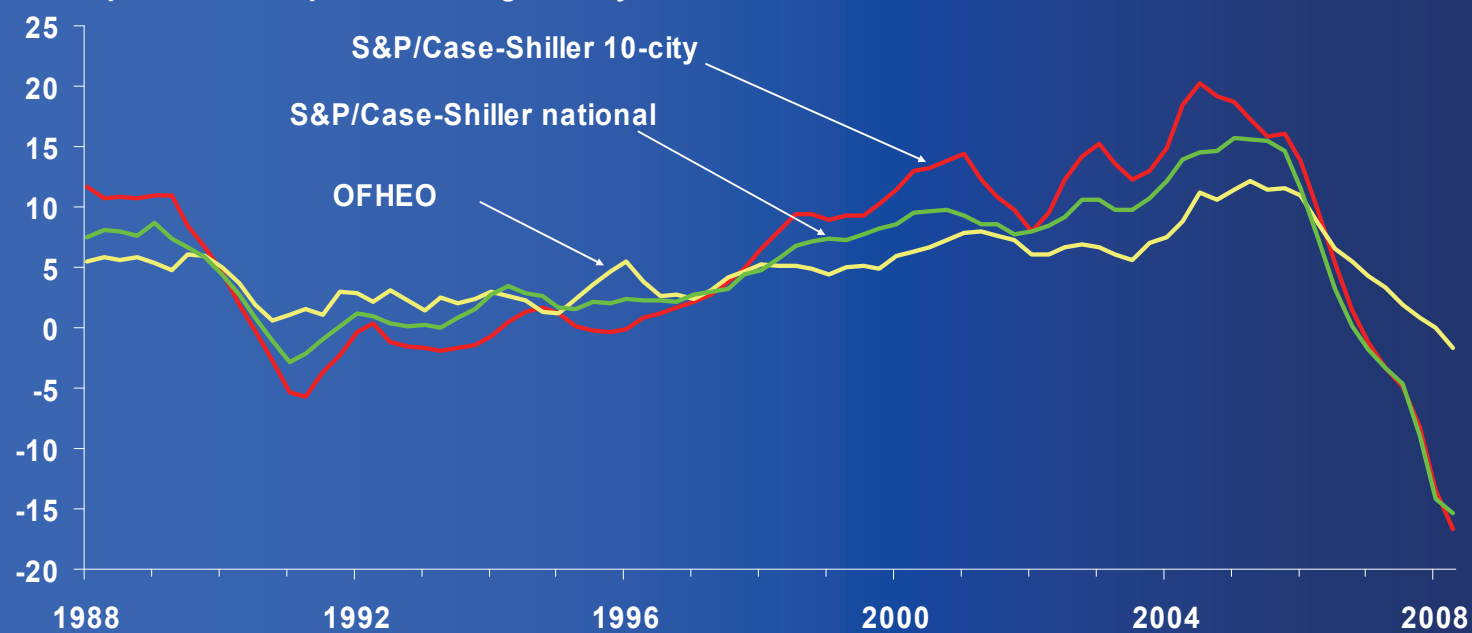
Change in home prices in 100-plus years



Sources: Robert Shiller, Milken Institute.

2005: The collapse begins

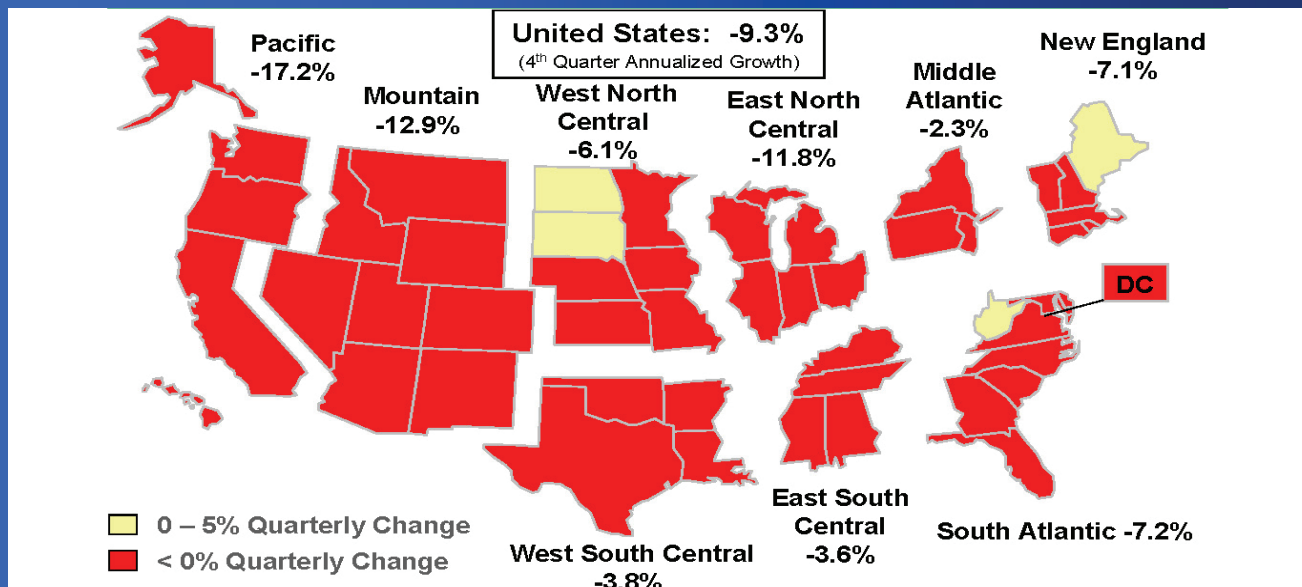
Home price indices, percent change on a year earlier



Sources: S&P/Case-Shiller, OFHEO, Moody's Economy.com, Milken Institute.

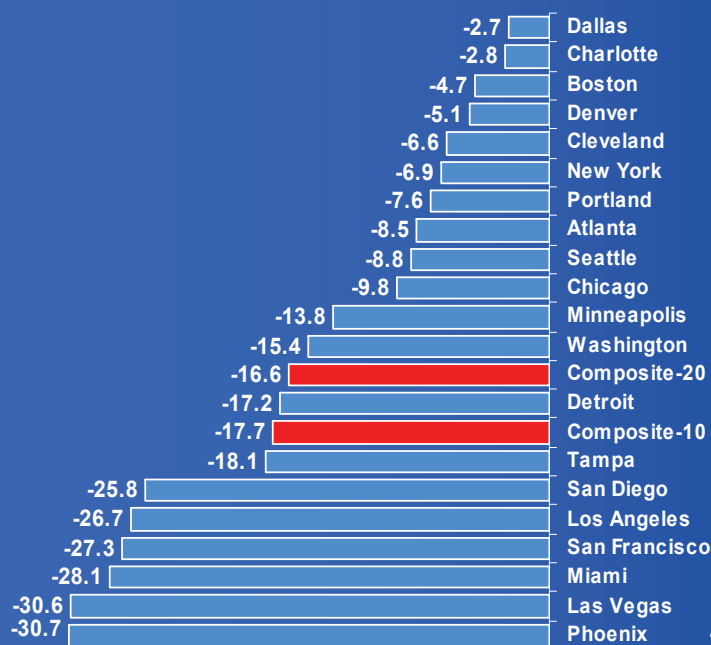
Forty-six states had falling prices in the fourth quarter 2007

United States: - 9.3% (fourth-quarter annualized growth)



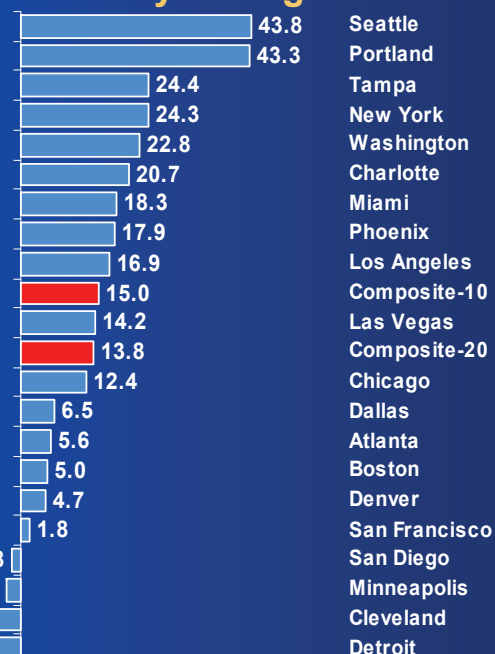
If you bought your house...

One year ago...



% change in price, August 07-08

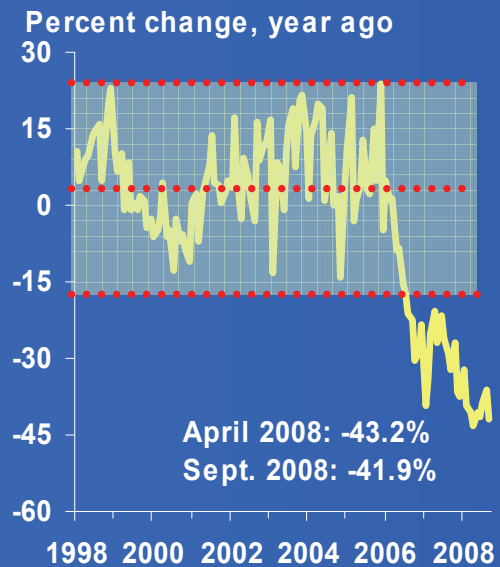
Five years ago...



% change in price, August 03-08

Sources: S&P/Case-Shiller, Milken Institute.

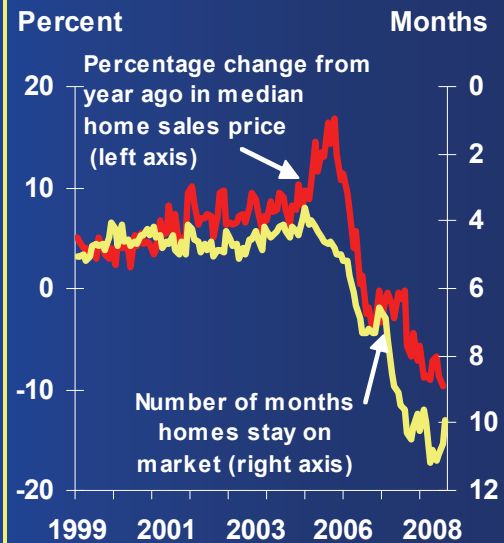
Housing starts sharply decline



Homes sit longer on the market ...



... as home appreciation slows



Note: Shaded area represents fluctuation within one standard deviation from mean (1.15%)

Sources: Mortgage Bankers Association, OFHEO, Moody's Economy.com, Milken Institute.

VIII. Delinquencies and foreclosures

Foreclosures are nothing new, but ...



Sources: Mortgage Bankers Association, Milken Institute.

... their numbers have doubled

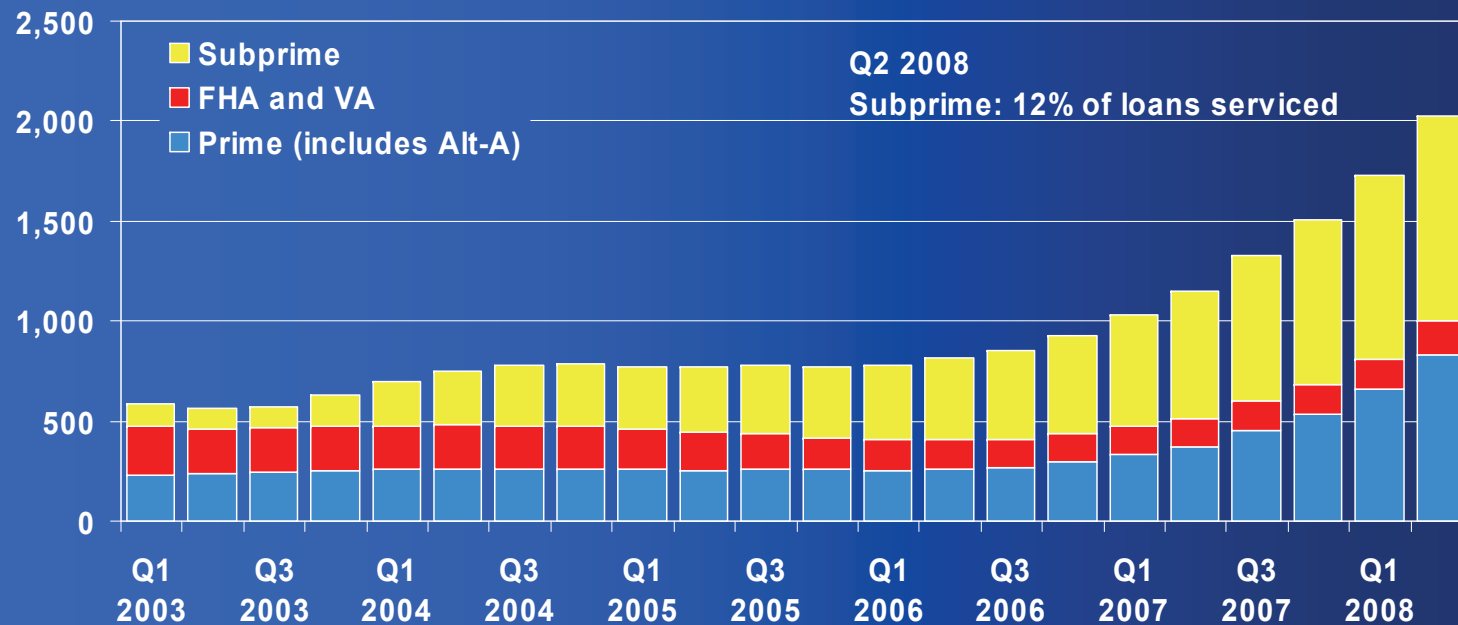
Thousands of foreclosures per year



Sources: Mortgage Bankers Association, Milken Institute.

Subprime mortgages accounted for half or more of foreclosures since 2006

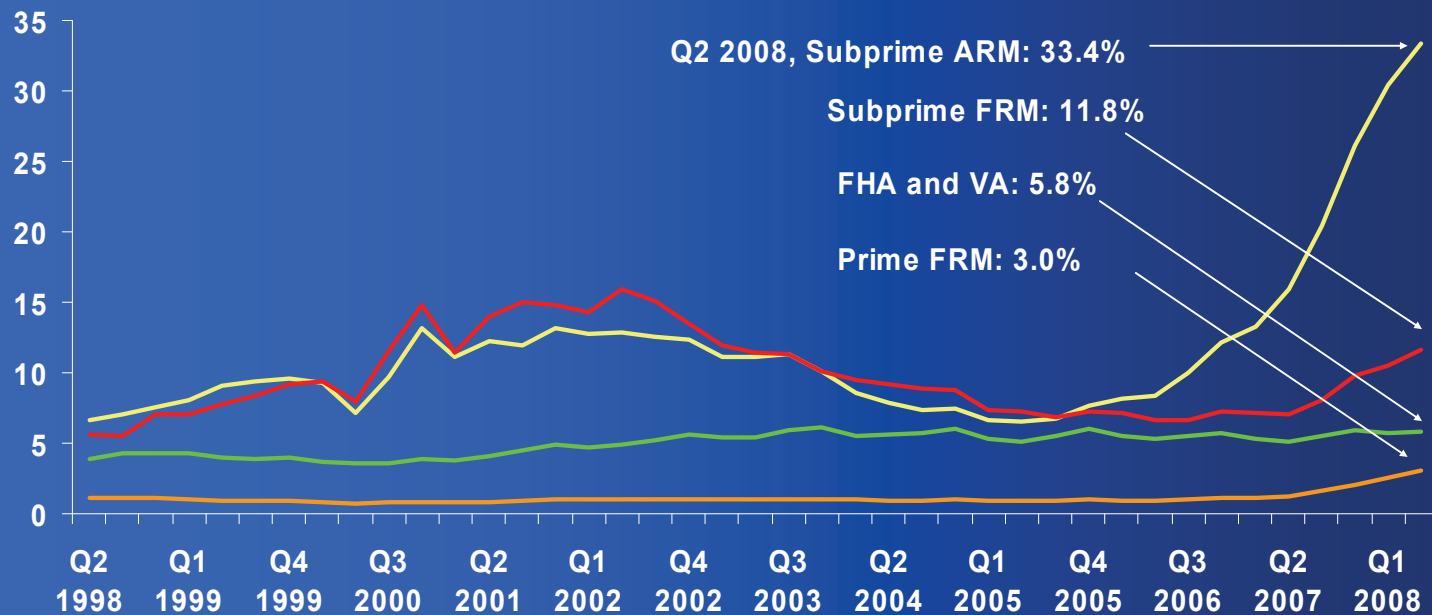
Number of home mortgage loan foreclosures started (annualized rate in thousands)



Sources: Mortgage Bankers Association, Milken Institute.

Subprime ARMs have the worst default record

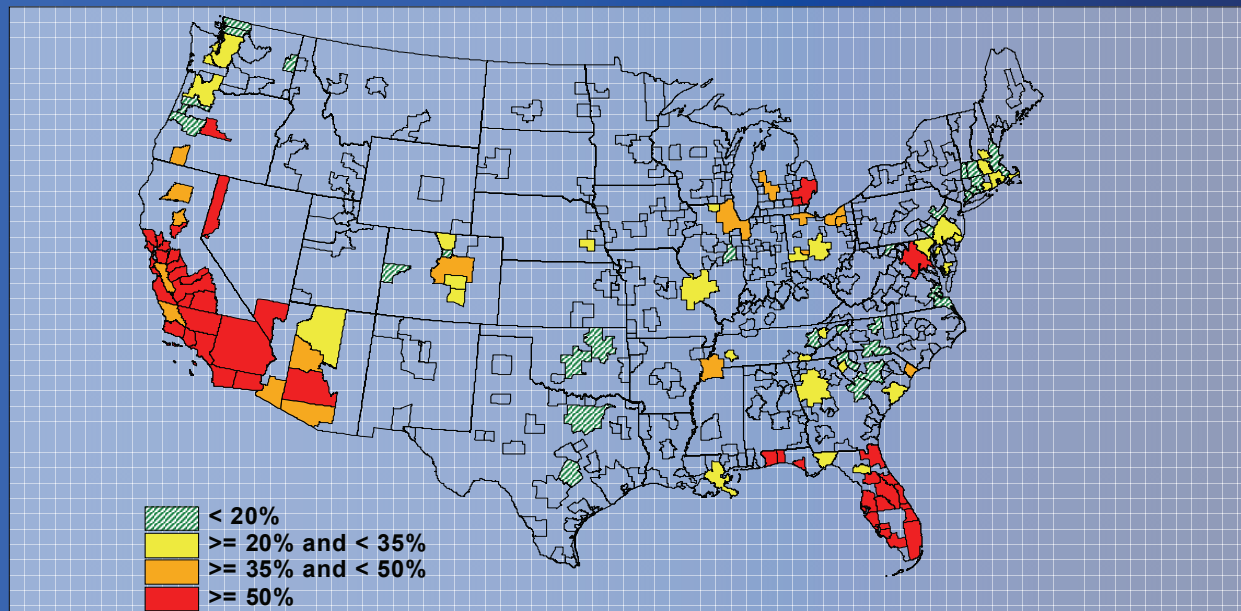
Home mortgages delinquent or in foreclosure (percent of number)



Sources: Mortgage Bankers Association, Milken Institute.

Percentage of homes purchased in Q2 2008 that now have negative equity

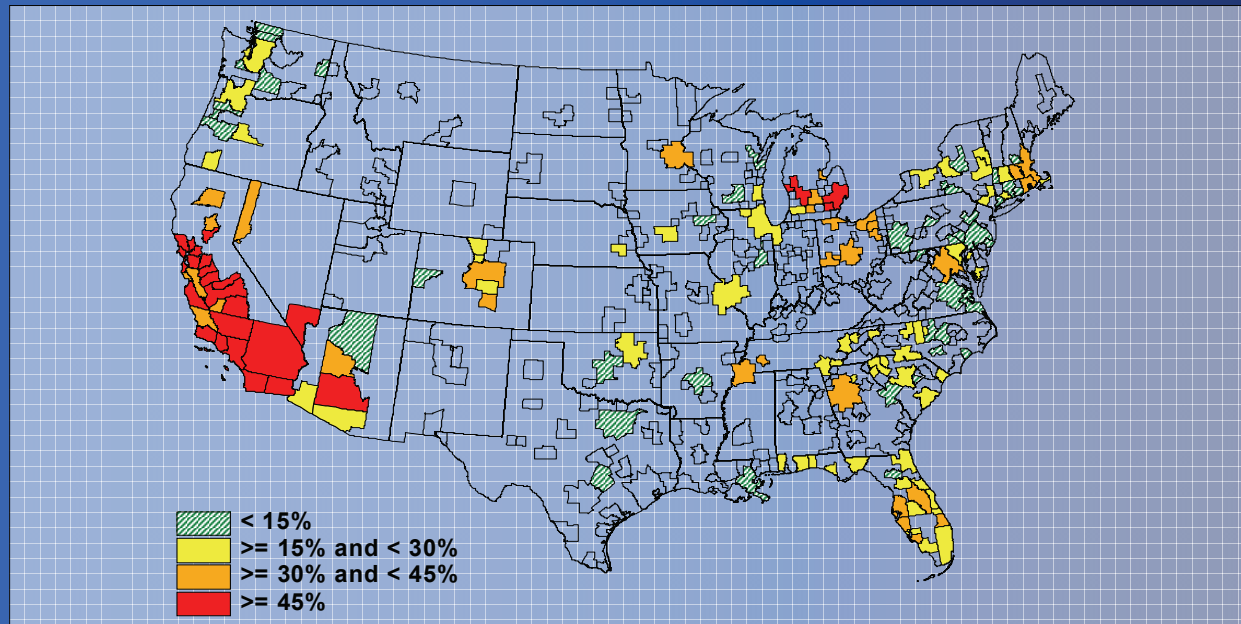
United States = 44.8%



Sources: Zillow.com, Milken Institute.

Percentage of homes sold for a loss (Q2 2008)

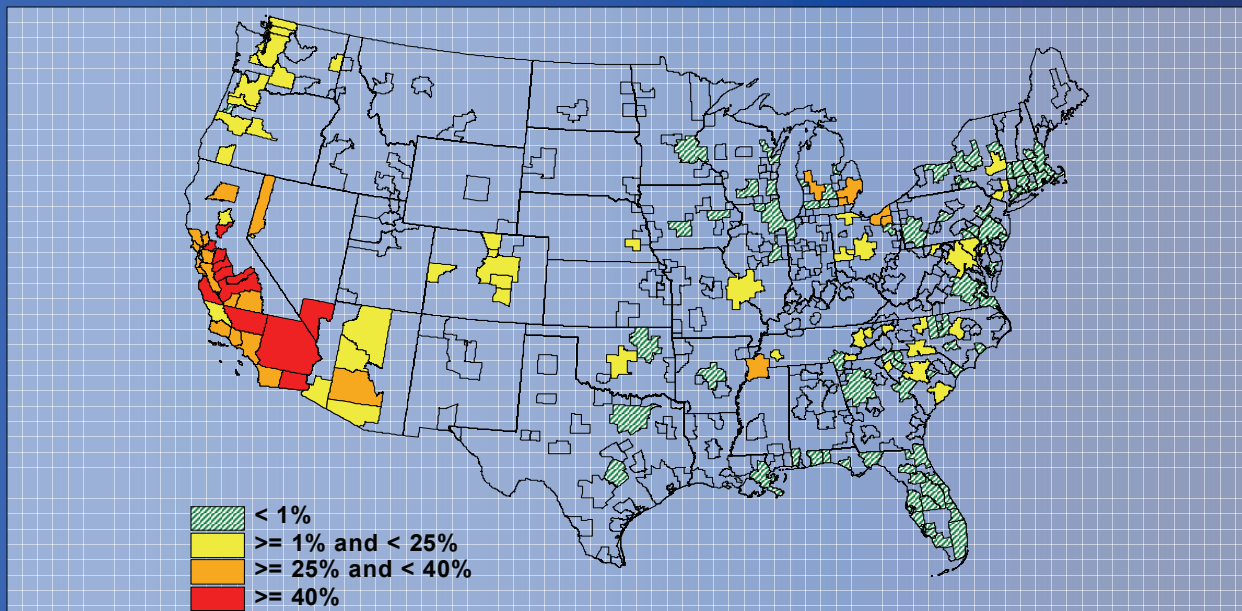
United States = 32.7%



Sources: Zillow.com, Milken Institute.

Percentage of homes sold that were in foreclosure (Q2 2008)

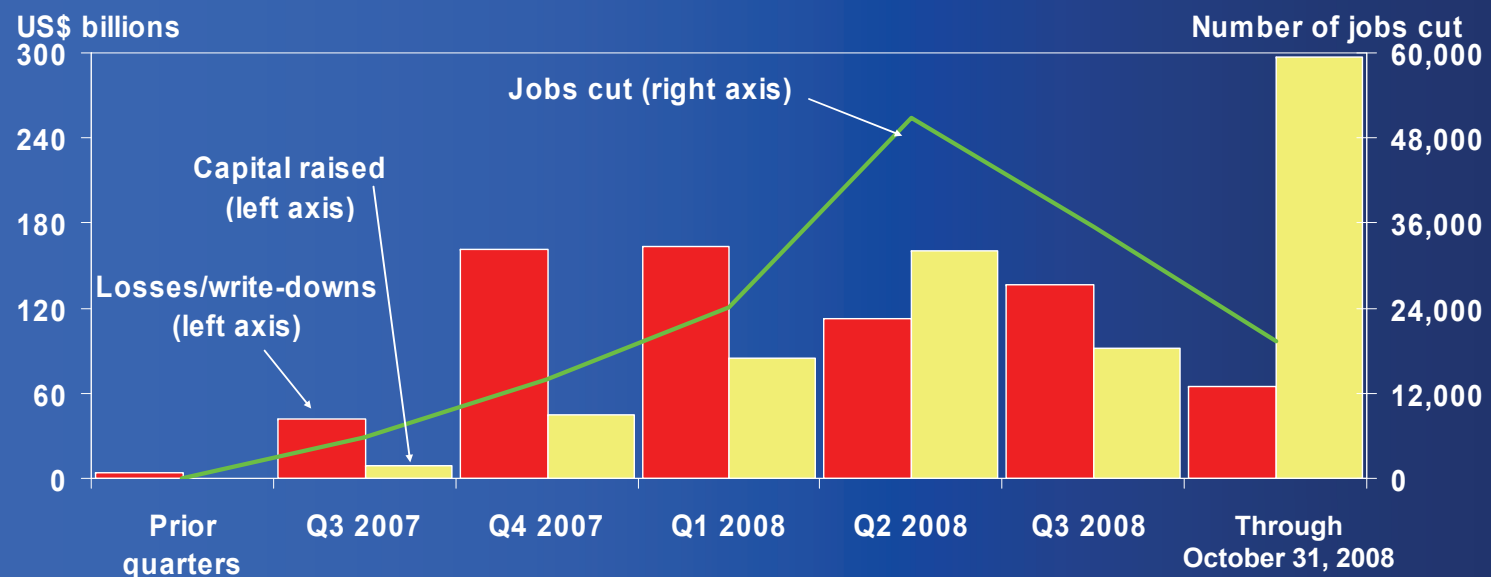
United States = 18.6%



Sources: Zillow.com, Milken Institute.

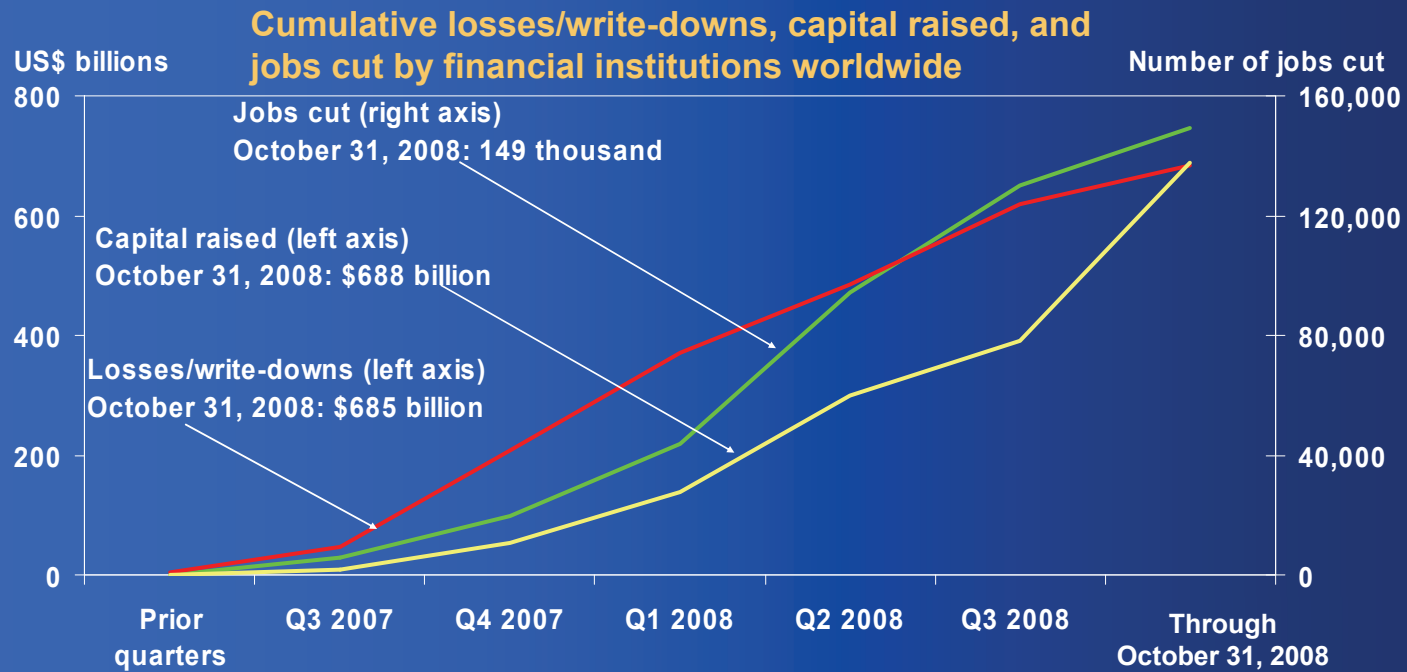
IX. Damages scorecard

Losses/write-downs, capital raised, and jobs cut by financial institutions worldwide



Sources: Bloomberg, Milken Institute.

What is the cumulative damage?



Sources: Bloomberg, Milken Institute.

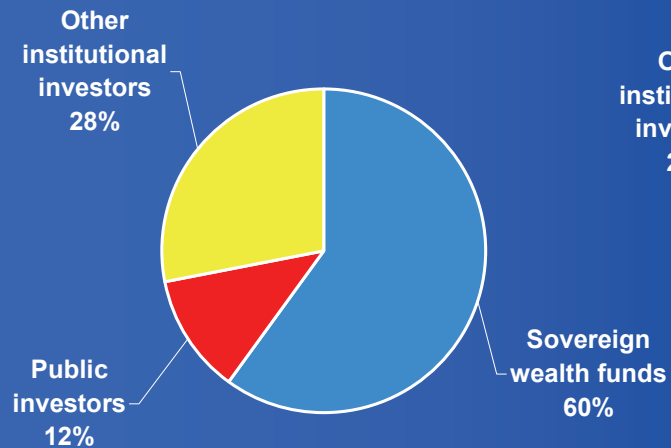
Recent losses/write-downs and capital raised by selected financial institutions

US\$ billions, through October 31, 2008	Losses /write-downs	Capital raised
Wachovia , United States	96.5	11.0
Citigroup, United States	68.1	74.0
Merrill Lynch , United States	58.1	29.9
Washington Mutual , United States	45.6	12.1
UBS, Switzerland	44.2	31.6
HSBC, United Kingdom	27.4	5.0
Bank of America, United States	27.4	55.7
National City, United States	26.2	8.9
JPMorgan Chase & Co., United States	20.5	44.7
Wells Fargo, United States	17.7	30.8
Others	253.1	384.6
Grand total	684.8	688.3

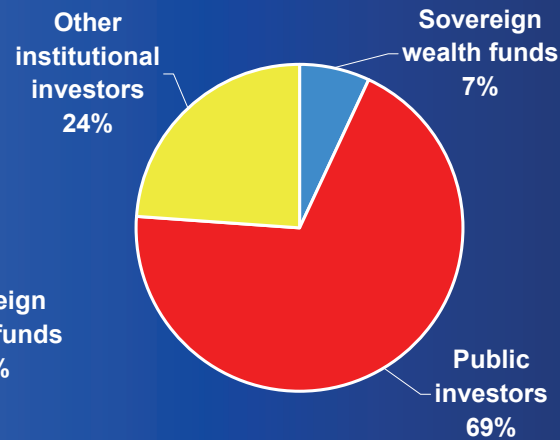
Sources: Bloomberg, Milken Institute.

Worldwide capital raised by source *July 2007–July 2008*

July 2007–December 2007
Total = \$56 billion



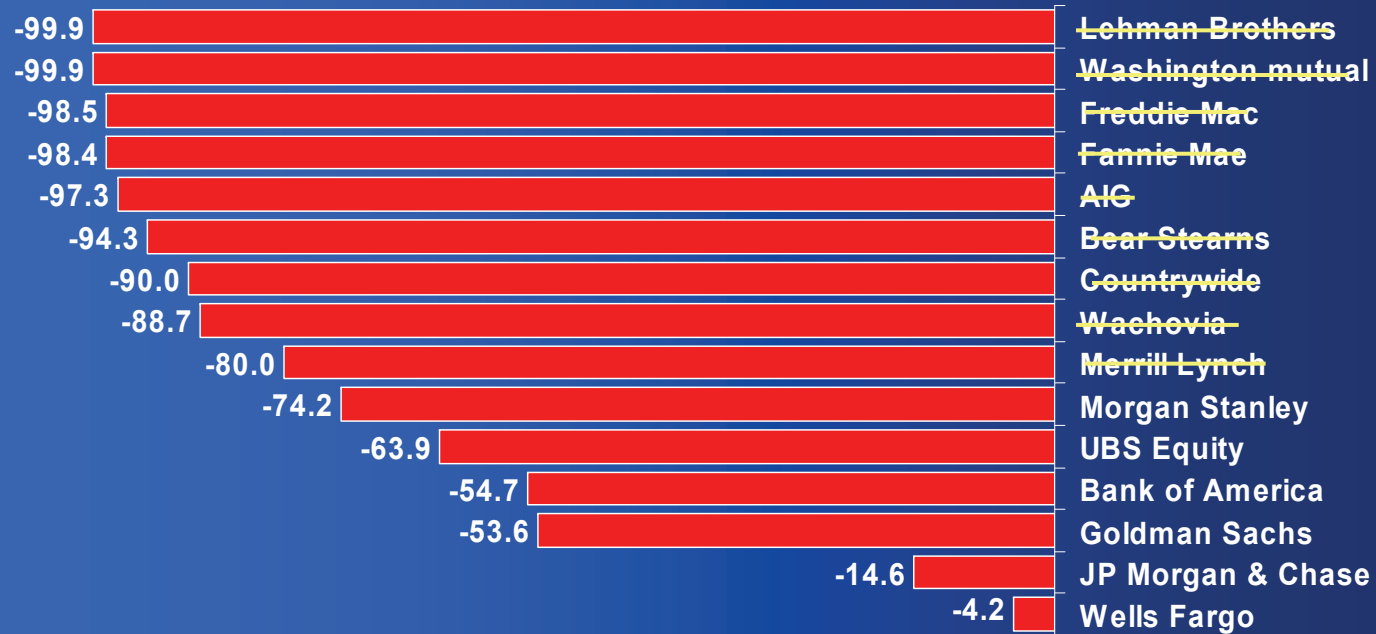
January 2008–July 2008
Total = \$300 billion



Source: International Monetary Fund.

Financial stock prices take big hits

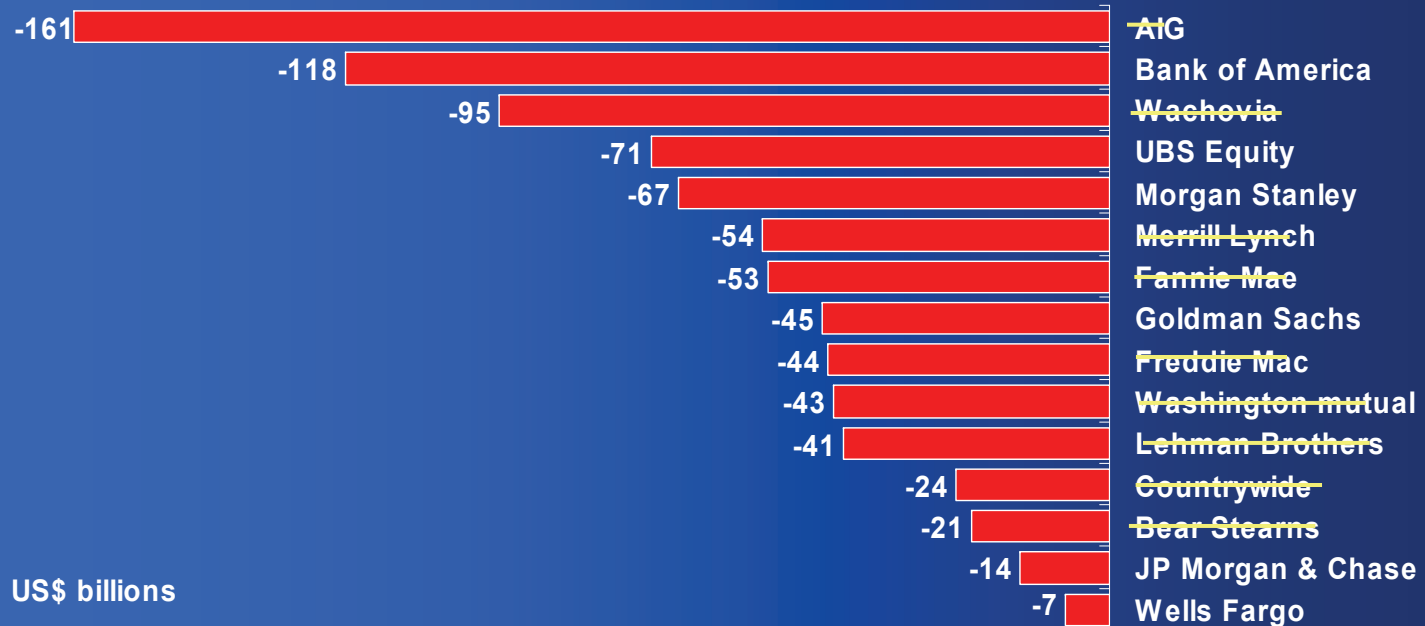
Percentage change in stock price, December 2006–October 2008



Note: Bear Stearns stock price is to May 2008. Countrywide stock price is to June 2008.
Sources: Bloomberg, Milken Institute.

Financial market capitalization takes big hit

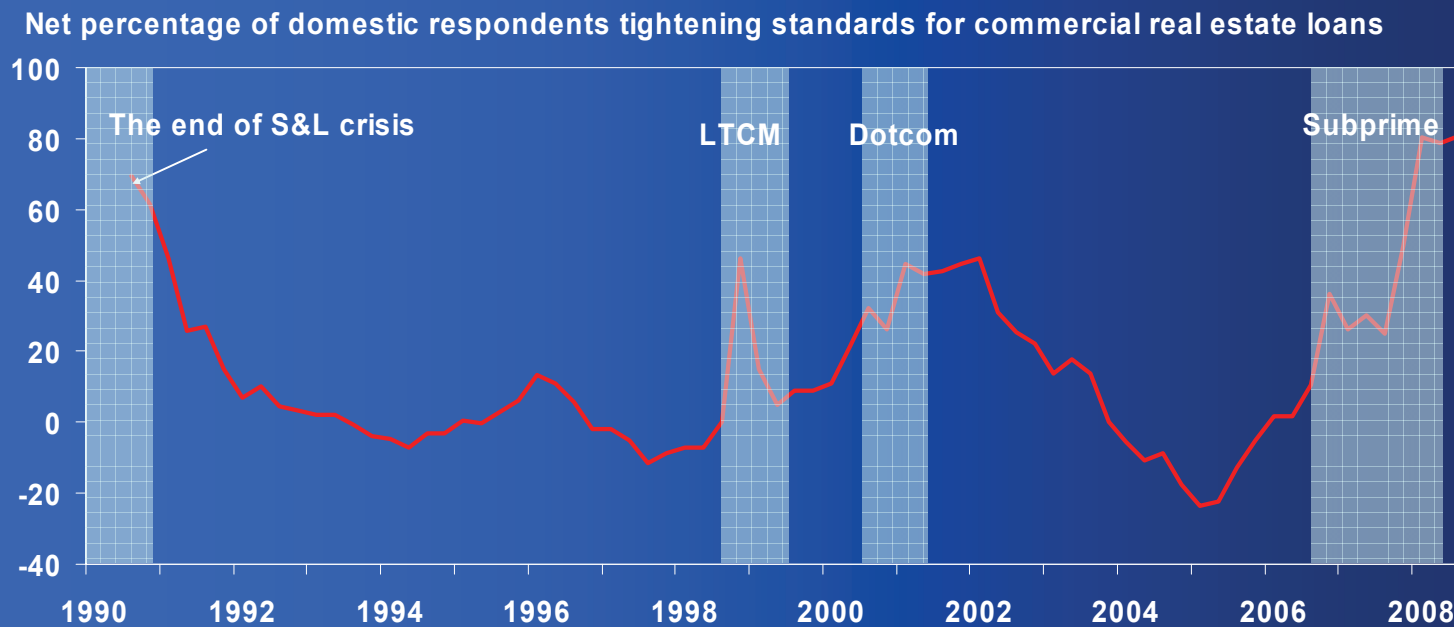
Total loss in market value: \$857 billion, December 2006–October 2008



Note: Bear Stearns stock price is to May 2008. Countrywide stock price is to June 2008.
Sources: Bloomberg, Milken Institute.

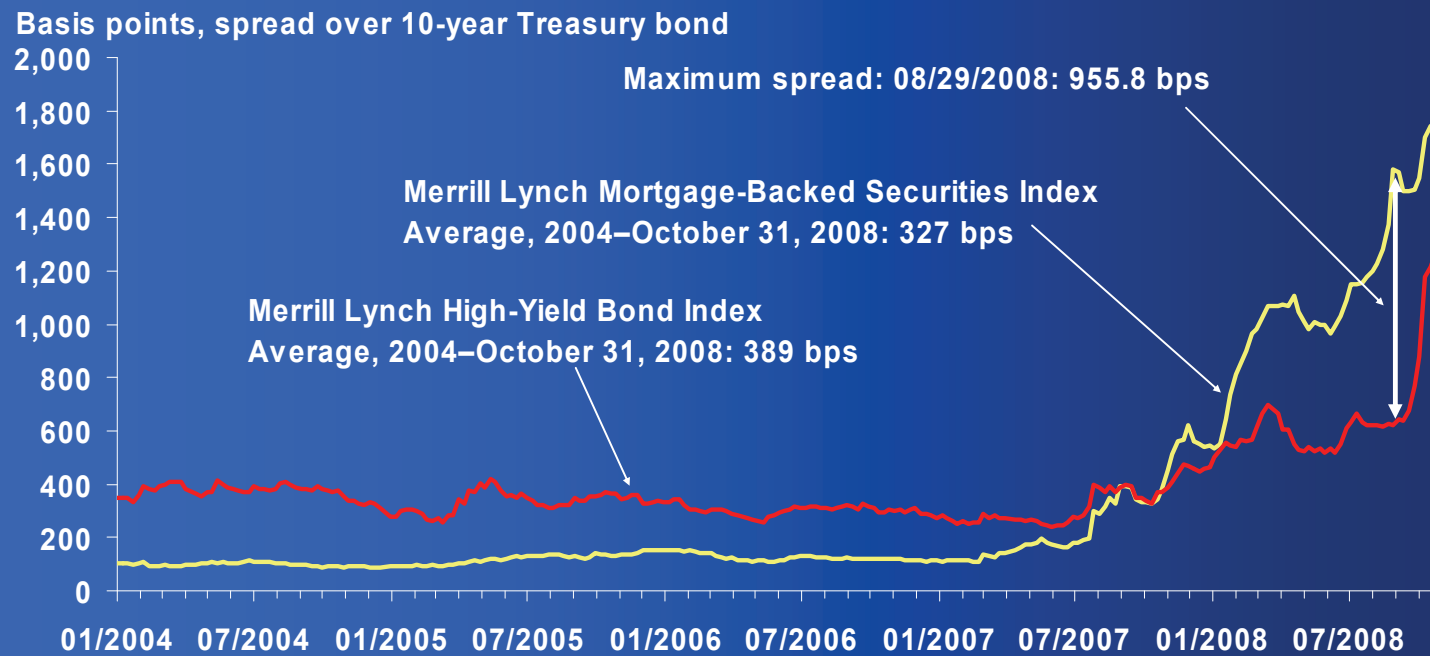
X. Credit crunch and liquidity freeze

Tightened standards for real estate loans



Sources: Federal Reserve, Milken Institute.

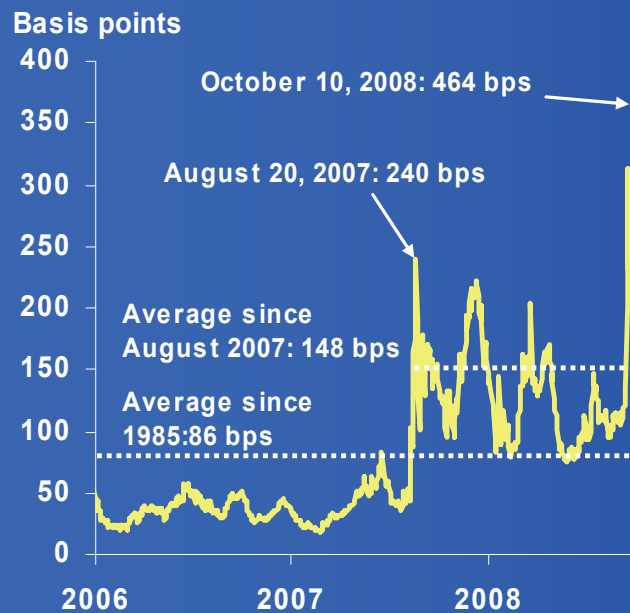
Widening spreads between mortgage-backed and high-yield bonds



Sources: Merrill Lynch, Bloomberg, Milken Institute.

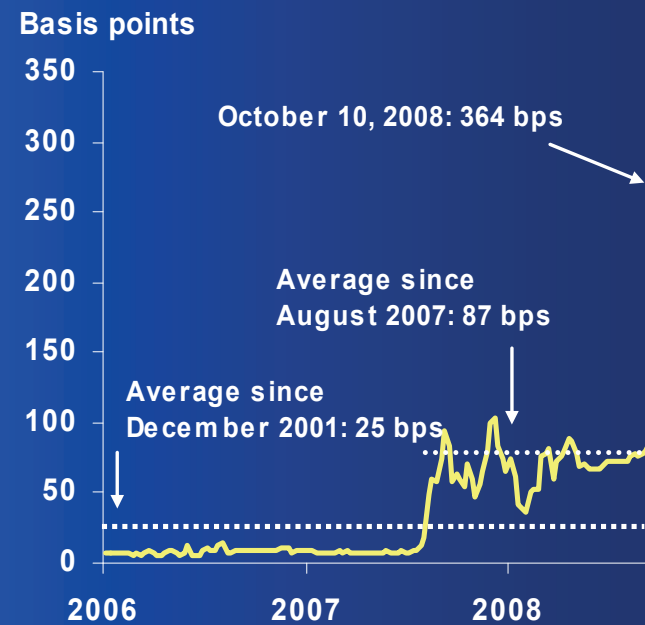
Liquidity freeze

Spread between 3-month LIBOR and T-bill rate

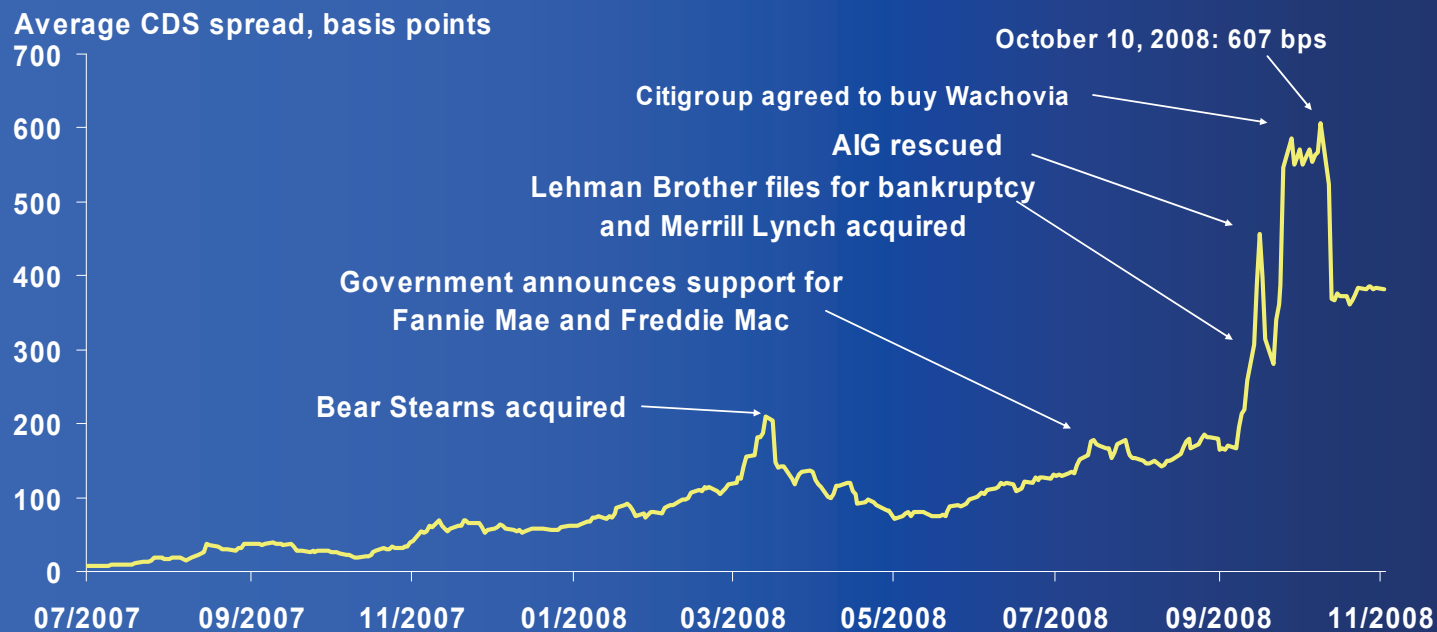


Sources: Bloomberg, Milken Institute.

Spread between 3-month LIBOR and overnight index swap rate



Counterparty risk increases

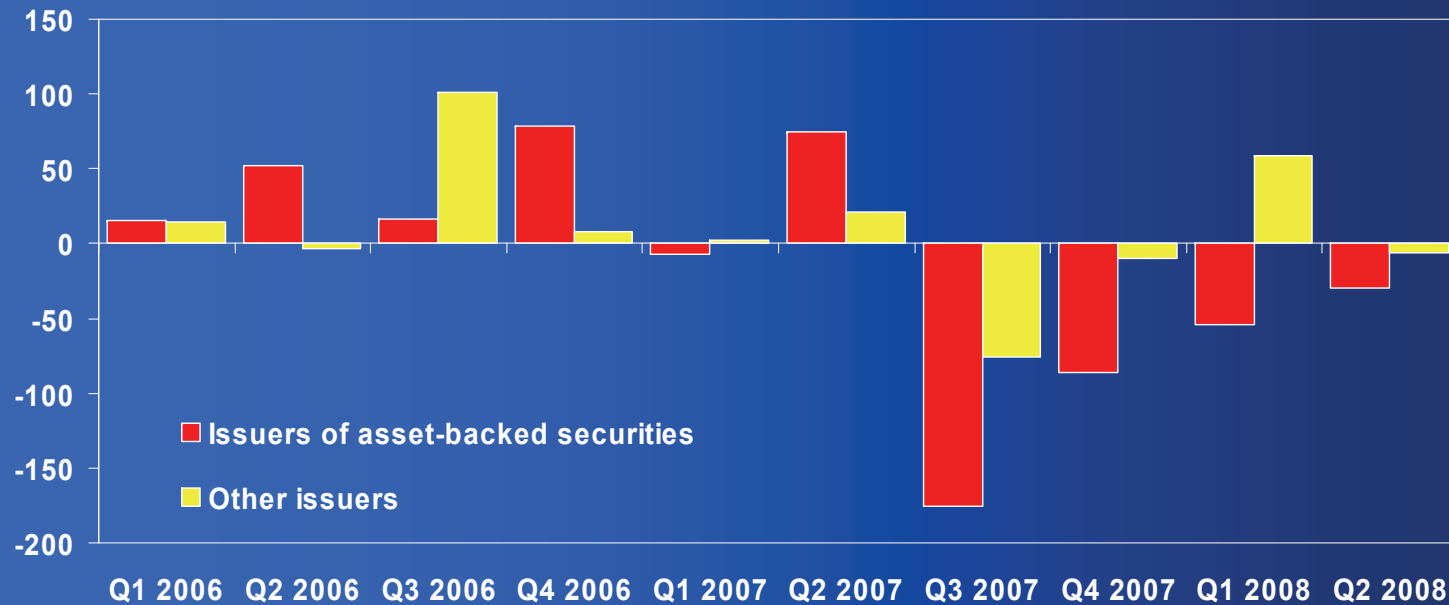


Note: Counterparty Risk index averages the market spreads of the credit default swaps (CDS) of fifteen major credit derivatives dealers, including ABN Amro, Bank of America, BNP Paribas, Barclays Bank, Citigroup, Credit Suisse, Deutsche Bank, Goldman Sachs Group, HSBC, Lehman Brothers, JPMorgan Chase, Merrill Lynch, Morgan Stanley, UBS, and Wachovia.

Sources: Datastream, Milken Institute.

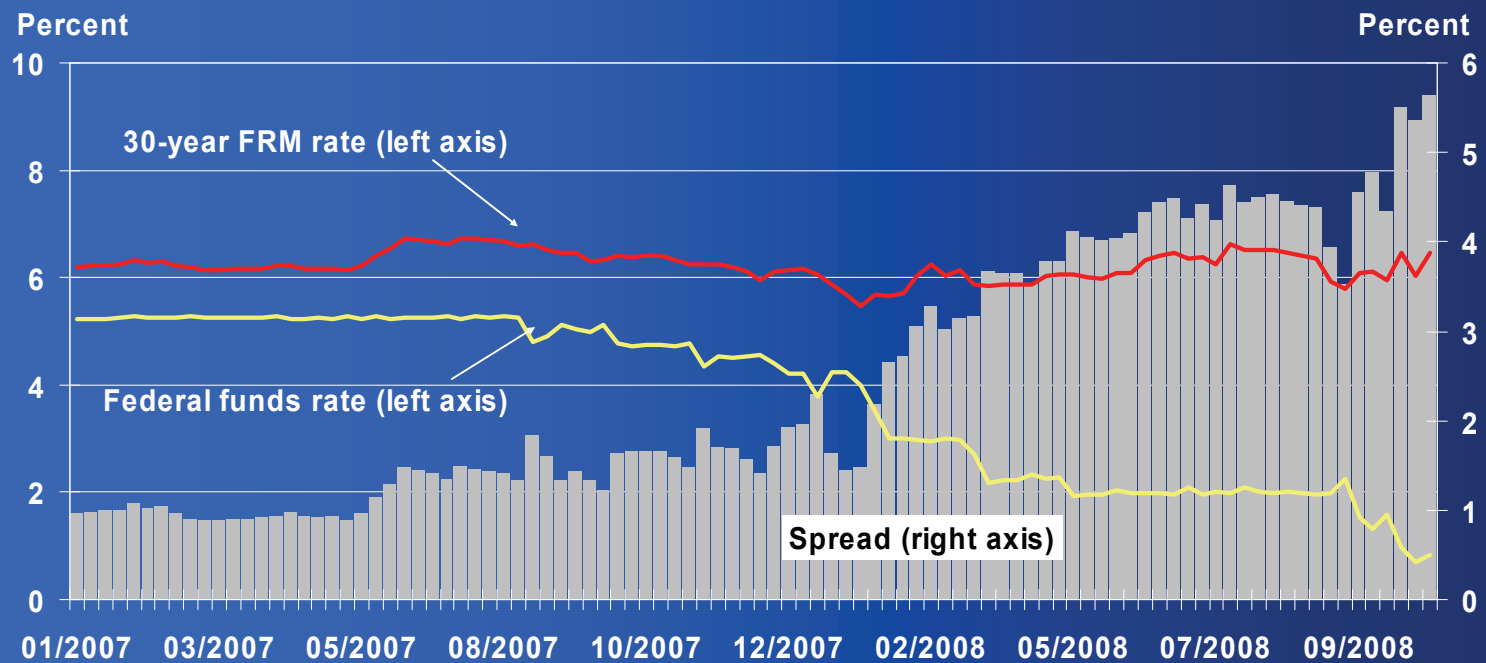
Commercial paper issuance dries up

Quarterly change in outstanding amount, US\$ billions



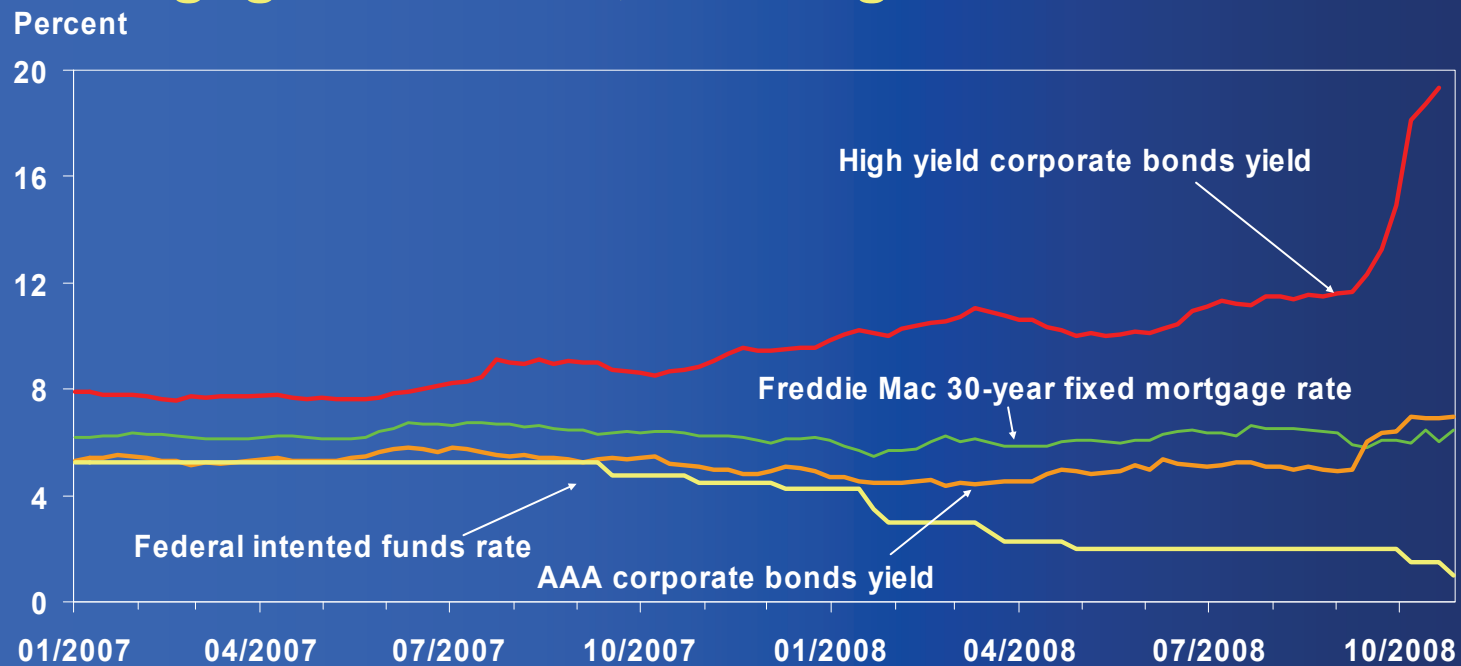
Sources: Federal Reserve, Milken Institute.

Federal Reserve responds by cutting Fed funds rate, but mortgage rates remain relatively flat



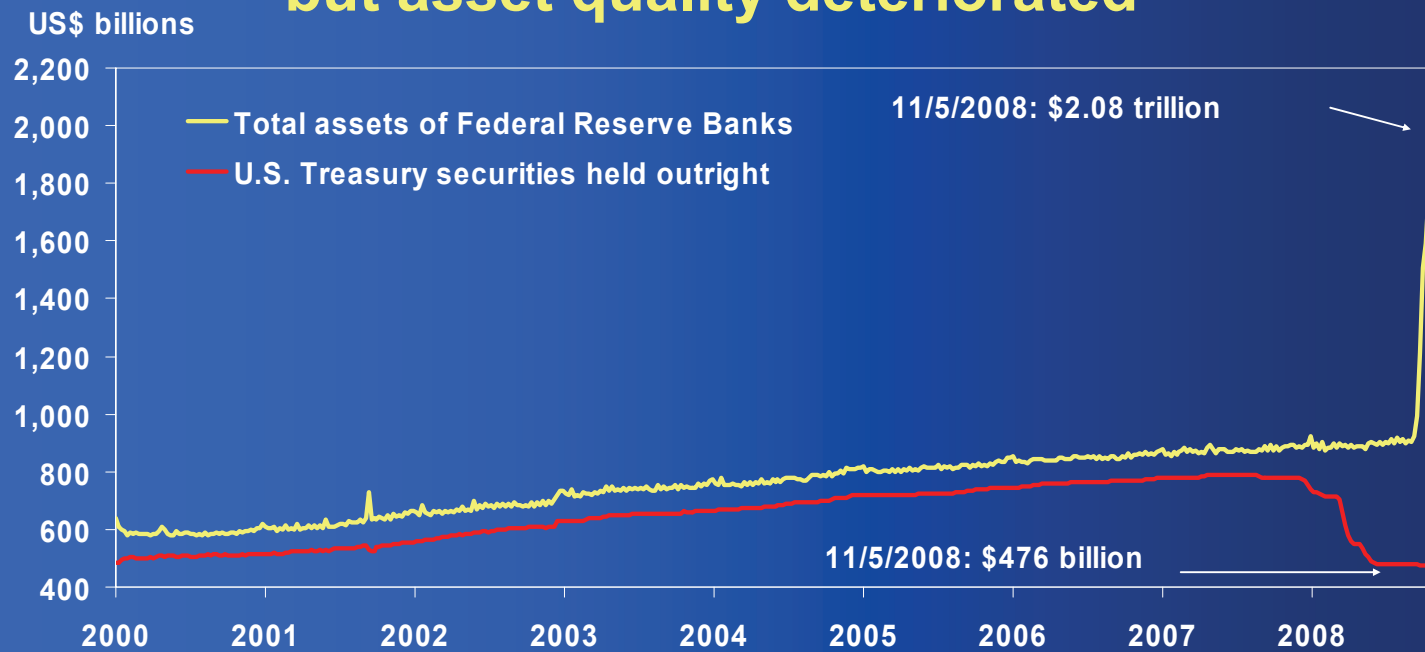
Sources: Freddie Mac, Federal Reserve, Moody's Economy.com, Milken Institute.

Increasing spreads between corporate bonds, mortgage securities, and target federal funds rate



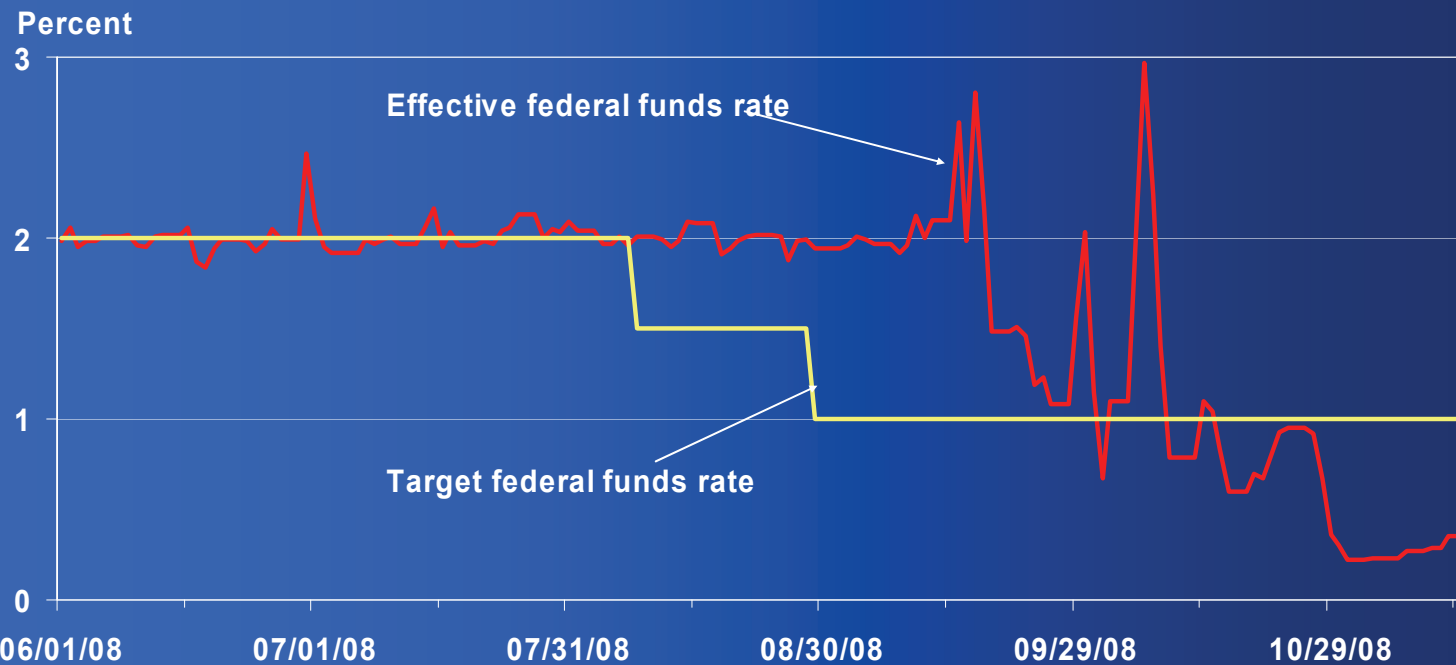
Sources: Federal Reserve, Freddie Mac, Merrill Lynch, Bloomberg, Milken Institute.

Federal Reserve assets increased but asset quality deteriorated



Sources: Federal Reserve, Milken Institute.

Federal Reserve has little maneuvering room



Sources: Federal Reserve, Milken Institute.

Federal Government Comes to the Rescue of Main Street and Wall Street

- Federal Reserve Programs
- Congress and the Bush administration
- Federal Deposit Insurance Corporation
- Treasury, Federal Deposit Insurance Corporation and Federal Reserve

Upper limit to total funds provided/cost under these programs...\$7.5 trillion plus ?

Federal Reserve programs

Program	Funding	Date announced	What it was meant to accomplish
Term Discount Window Program (TDWP)	\$111 billion as of 10/29/2008	10/17/07	Extends the term of discount window loans from overnight to up to 90 days.
Term Auction Facility (TAF)	\$301 billion as of 10/29/2008	12/12/07	The Fed auctions off loans under the TAF every Thursday for a term of 28 days. It may expand TAF lending to \$900 billion by the end of 2008.
Term Securities Lending Facility (TSLF)	\$198 billion as of 10/29/2008	3/11/08	Establishes term swaps between the Fed and primary dealers. Collateral can be Treasury securities, federal agency securities and other highly rated debt securities.
Bear Stearns	Up to \$29 billion	3/14/2008	The Fed acquired \$29 billion in mortgage-backed securities from JPMorgan Chase to fund its purchase of Bear Stearns. As of October 29, the market value of these mortgage-backed securities was \$26.8 billion.

Federal Reserve programs

Program	Funding	Date announced	What it was meant to accomplish
Primary Dealer Credit Facility (PDCF)	\$80 billion as of 10/29/2008	3/16/08	Extends overnight borrowing from the Federal Reserve to primary dealers.
AIG	\$85 billion as of 10/29/2008	9/16/2008	AIG received an \$85 billion, two-year secured loan on September 16, 2008, in exchange for warrants for a 79.9 percent equity stake in AIG. The firm was given an additional \$37.8 billion on October 8, and another \$20.9 billion credit line under CPFF on October 30, 2008. On November 10, Treasury purchased \$40 billion of newly issued AIG preferred stock under the TARP (potentially reducing the original loan from \$85 billion to \$60 billion).

Federal Reserve programs

Program	Funding	Date announced	What it was meant to accomplish
Asset Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF)	\$96 billion as of 10/29/2008	9/19/2008	Loans to banks so that they can buy asset-backed commercial paper from money market funds.
Expansion of the Federal Open Market's temporary reciprocal currency arrangements (swap lines)	Up to \$620 billion	9/29/2008	The Federal Open Market Committee authorized a \$330 billion expansion of its swap lines for U.S. dollar liquidity operations by the other central banks, raising the total cap to \$620 billion (up to \$30 billion by the Bank of Canada, \$80 billion by the Bank of England, \$120 billion by the Bank of Japan, \$15 billion by Danmarks Nationalbank, \$240 billion by the ECB, \$15 billion by the Norges Bank, \$30 billion by the Reserve Bank of Australia, \$30 billion by the Sveriges Riksbank, and \$60 billion by the Swiss National Bank).

Federal Reserve programs

Program	Funding	Date announced	What it was meant to accomplish
Commercial Paper Funding Facility (CPFF)	Up to \$1.8 trillion	10/7/08	<p>The CPFF will be structured as a credit facility to a special purpose vehicle (SPV). The SPV will purchase from eligible issuers three-month U.S. dollar-denominated commercial paper through the New York Fed's primary dealers. Eligible issuers are U.S. issuers of commercial paper, including U.S. issuers with a foreign parent company.</p> <p>The SPV will only purchase U.S. dollar-denominated commercial paper (including asset-backed commercial paper (ABCP)) that is rated at least A-1/P-1/F1 by a major nationally recognized statistical rating organization (NRSRO) and, if rated by multiple major NRSROs, is rated at least A-1/P-1/F1 by two or more major NRSROs.</p> <p>The maximum amount of a single issuer's commercial paper the SPV may own at any time will be the greatest amount of U.S. dollar-denominated commercial paper the issuer had outstanding on any day between January 1 and August 31, 2008. The SPV will not purchase additional commercial paper from an issuer whose total commercial paper outstanding to all investors (including the SPV) equals or exceeds the issuer's limit.</p> <p>This includes the \$37.8 billion loan and the \$20.9 billion credit line extended to AIG. As of 10/29/2008, \$145 billion was outstanding.</p>

Federal Reserve programs

Program	Funding	Date announced	What it was meant to accomplish
Money Market Investor Funding Facility (MMIFF)	Up to \$540 billion	10/21/08	The MMIFF provides assurance that money market mutual funds can liquidate their investments if cash is needed to cover withdrawals from customers.
Term Asset-Backed Securities Loan Facility (TALF)	Up to \$200 billion	11/25/2008	TALF loans will have a one-year term, will be non-recourse to the borrower, and will be fully secured by eligible ABS. Treasury will provide \$20 billion of credit protection to the Fed in connection with the TALF. Eligible collateral will include U.S. dollar-denominated cash (that is, not synthetic) ABS that have a long-term credit rating in the highest investment-grade rating category (for example, AAA) from two or more major nationally recognized statistical rating organizations (NRSROs) and do not have a long-term credit rating of below the highest investment-grade rating category from a major NRSRO. The underlying credit exposures of eligible ABS initially must be auto loans, student loans, credit card loans, or small business loans guaranteed by the U.S. Small Business Administration. All U.S. persons that own eligible collateral may participate in the TALF. Collateral haircuts will be established by the FRBNY for each class of eligible collateral. Haircuts will be determined based on the price volatility of each class of eligible collateral.

Federal Reserve programs

Program	Funding	Date announced	What it was meant to accomplish
Purchase of GSE direct obligations and MBS	Up to \$600 billion	11/25/2008	Purchases of up to \$100 billion in GSE direct obligations under the program will be conducted with the Fed's primary dealers through a series of competitive auctions and will begin in the first week of December. Purchases of up to \$500 billion in MBS will be conducted by asset managers selected via a competitive process with a goal of beginning these purchases before year-end 2008. Purchases of both direct obligations and MBS are expected to take place over several quarters.

Congress and the Bush administration

Program	Funding	Date announced	What it was meant to accomplish
FHA Secure	\$50 billion	08/31/2007	Guarantees \$50 billion in mortgages.
Economic Stimulus Act	\$124 billion	2/13/2008	Provided tax rebates in 2008. Most taxpayers below the income limit received rebates of \$300–\$600. Also gave businesses a one-time depreciation tax deduction on specific new investment and raised the limits on the value of new productive capital that may be classified as business expenses during 2008. The Congressional Budget Office (CBO) estimates the net cost of the stimulus to be \$124 billion.
Housing and Economic Recovery Act of 2008	\$24.9 billion	7/30/2008	The CBO estimates that the Act will increase budget deficits by about \$24.9 billion over the 2008 to 2018 period.
<i>Purchase of GSE debt and equity</i>	\$25 billion	7/30/2008	Designed to shore up Fannie Mae and Freddie Mac.
<i>Hope for Homeowners</i>	<i>Up to \$300 billion</i>	7/30/2008	This voluntary program encourages lenders to write down the loan balances of borrowers in exchange for FHA-guaranteed loans up to 90 percent of the newly appraised home value. Program runs through September 2011.

Congress and the Bush administration

Program	Funding	Date announced	What it was meant to accomplish
Conservatorship of Fannie Mae and Freddie Mac	Up to \$200 billion	9/7/2008	<p>Treasury and FHFA established contractual agreements to ensure that each company maintains a positive net worth. They are indefinite in duration and have a capacity of \$100 billion each.</p> <p>Treasury also established a new secured lending credit facility, available to Fannie Mae, Freddie Mac, and the Federal Home Loan Banks. Funding is provided directly by Treasury in exchange for eligible collateral from the GSEs (guaranteed mortgage backed securities issued by Freddie Mac and Fannie Mae as well as advances made by the Federal Home Loan Banks).</p> <p>To further support the availability of mortgage financing, Treasury is initiating a temporary program to purchase GSE mortgage backed securities, with size and timing subject to the discretion of the Treasury Secretary.</p>
Guaranty Program for Money Market Funds	Up to \$50 billion	9/19/2008	To restore confidence in money market funds, Treasury made available up to \$50 billion from the Exchange Stabilization Fund.

Congress and the Bush administration

Program	Funding	Date announced	What it was meant to accomplish
IRS Notice 2008-83	?	9/30/2008	Allows banks to offset their profits with losses from the loan portfolio of banks they acquire. Initial media reports indicate that Wells Fargo alone may be able to claim more than \$70 billion in losses from its acquisition of Wachovia, obtaining tax savings that exceed the market value of Wachovia as of November 7, 2008.
Emergency Economic Stabilization Act (EESA)	Up to \$700 billion	10/3/2008	Empowers Treasury to use up to \$700 billion to inject capital into financial institutions, to purchase or insure mortgage assets, and to purchase any other troubled assets necessary to promote financial market stability.
<i>Troubled Assets Relief Program (TARP)</i>	<i>\$179 billion as of November 7, 2008</i>	10/14/2008	Part of the EESA, TARP allows Treasury to purchase up to \$250 billion of senior preferred shares in selected banks. The first \$125 billion was allocated to nine of the nation's largest financial institutions on October 28, 2008. An additional \$34 billion was allocated to twenty-one banks as of October 29, 2008. On November 23, 2008, Treasury purchased an additional \$20 billion of preferred shares from Citigroup.

Federal Deposit Insurance Corporation

Program	Funding	Date announced	What it was meant to accomplish
Increased FDIC insurance coverage	?	10/3/2008	A provision of the EESA temporarily raised the basic limit on federal deposit insurance coverage from \$100,000 to \$250,000 per depositor. Limits are scheduled to \$100,000 after December 31, 2009.

Federal Deposit Insurance Corporation

Program	Funding	Date announced	What it was meant to accomplish
Temporary Liquidity Guarantee Program	\$1.5 trillion plus?	10/14/2008	<p>Temporarily guarantees the senior debt of all FDIC-insured institutions and their holding companies, as well as deposits in non-interest bearing deposit transaction accounts. Certain newly issued senior unsecured debt issued on or before June 30, 2009, would be fully protected in the event the issuing institution subsequently fails, or its holding company files for bankruptcy. This includes promissory notes, commercial paper, interbank funding, and any unsecured portion of secured debt. Coverage would be limited to June 30, 2012.</p> <p>The other part of the program provides for a temporary unlimited guarantee of funds in noninterest-bearing transactions accounts (the Transaction Account Guarantee Program, or TAG)</p> <p>On November 21, 2008, FDIC strengthened TLGP. Chief among the changes is that the debt guarantee will be triggered by payment default rather than bankruptcy or receivership. Another change is that short-term debt issued for one month or less will not be included in the TLGP. Eligible entities will have until December 5, 2008 to opt out of TLGP.</p>

Treasury, Federal Deposit Insurance Corporation and Federal Reserve

Program	Funding	Date announced	What it was meant to accomplish
Guarantee a portion of an asset pool of loans and securities backed by residential and commercial real estate and other such assets on Citigroup's balance sheet	\$249 billion (with \$5 billion via TARP)	11/23/2008	Treasury (via TARP) takes the second loss up to \$5 billion, while FDIC takes the third loss up to \$10 billion. The Federal Reserve funds the remaining pool of assets with a non-recourse loan, subject to Citigroup's 10 percent loss sharing, at a floating rate of overnight interest swap plus 300 basis points.

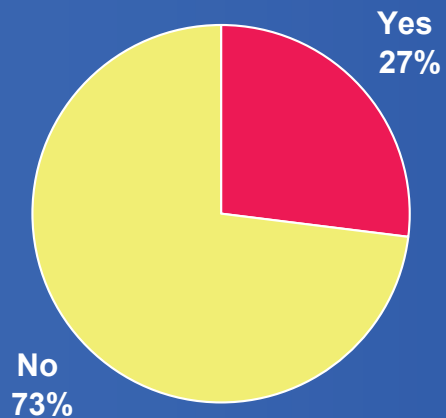
XI. When will we hit bottom?



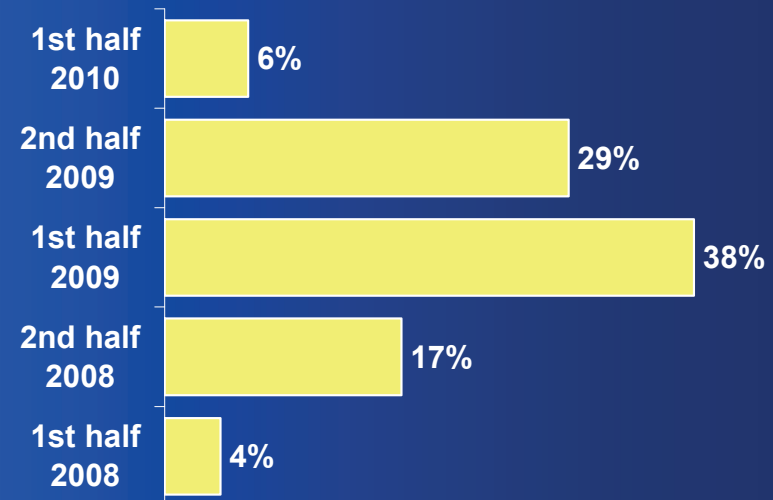
Looking for a bottom?

Economists say the economy isn't at its low point yet, and house prices likely won't get there until 2009

Does this feel like the bottom to a downturn?



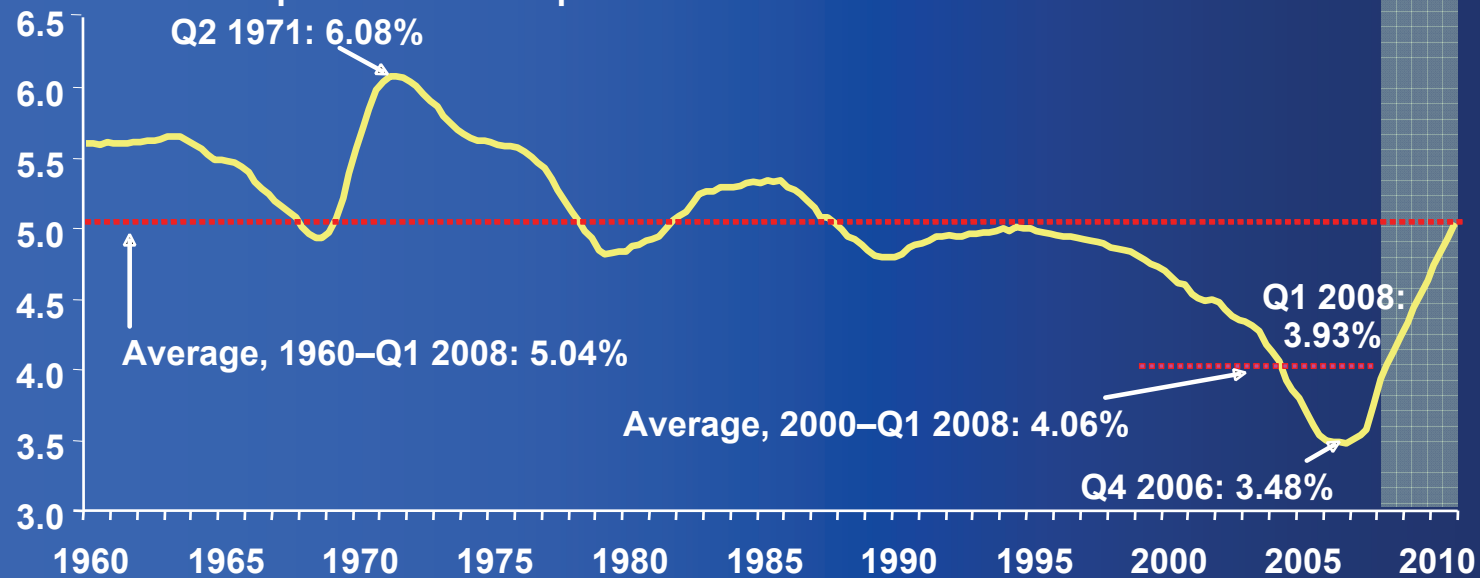
When will home prices hit bottom?



Source: Wall Street Journal.

How far do home prices have to fall?

Annual rents as percent of home prices



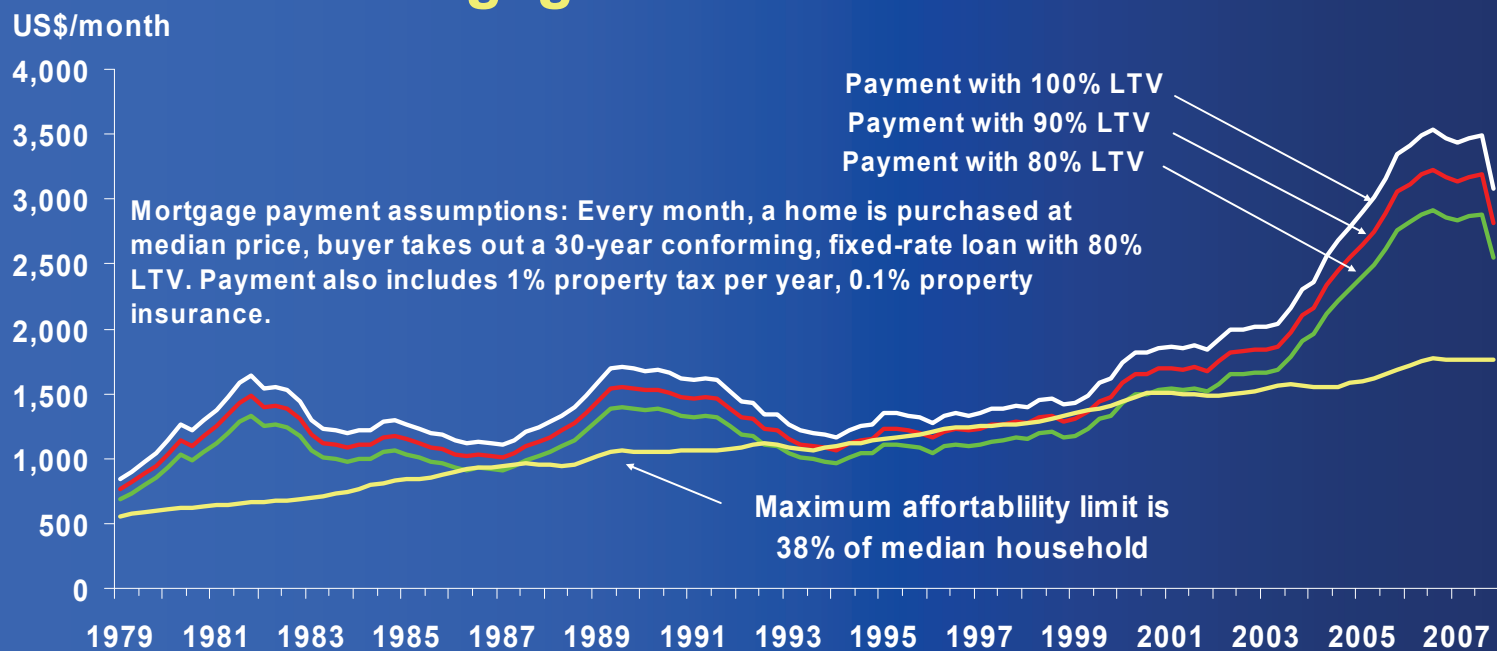
Sources: Davis, Lehnert, Martin (2007), Milken Institute.

Declines in home prices and the time it takes to get the rent-to-price ratio to a targeted value (5.04 is the longer-run average ratio)

		Annual home price decline required				
		-2.0%	-5.0%	-10.0%	-15.0%	-20.0%
Rent-to-price ratio	3.80%	2010 Q3	2008 Q4	2008 Q2	2008 Q2	2008 Q2
	4.00%	2013 Q1	2009 Q4	2008 Q3	2008 Q2	2008 Q2
	5.00%	2024 Q1	2014 Q1	2010 Q4	2009 Q3	2009 Q1
	5.04% average	2024 Q3	2014 Q2	2010 Q4	2009 Q3	2009 Q1
	6.00%	2026 Q4	2017 Q3	2012 Q3	2010 Q4	2009 Q4

Sources: Davisa, Lehnertb, Martin (2007), Milken Institute.

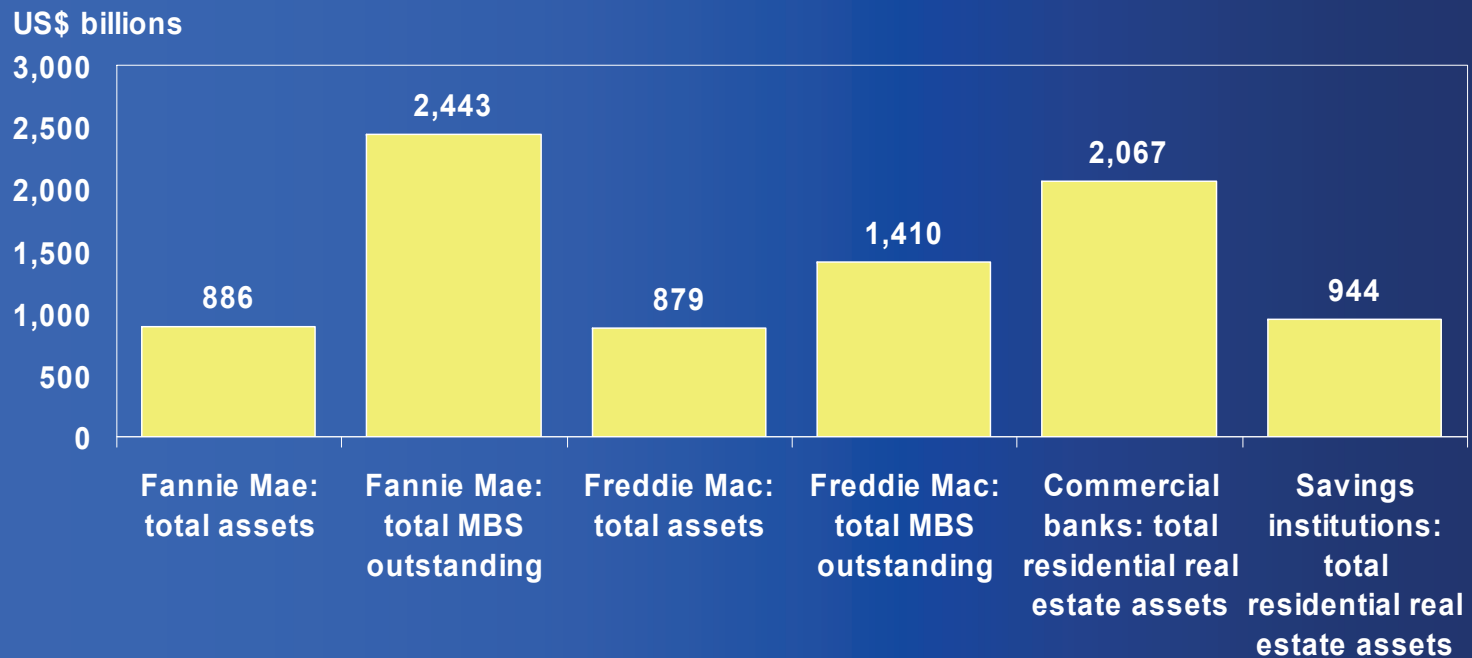
Alternative measures of the affordability of mortgage debt for California



Sources: Moody's Economy.com, Milken Institute.

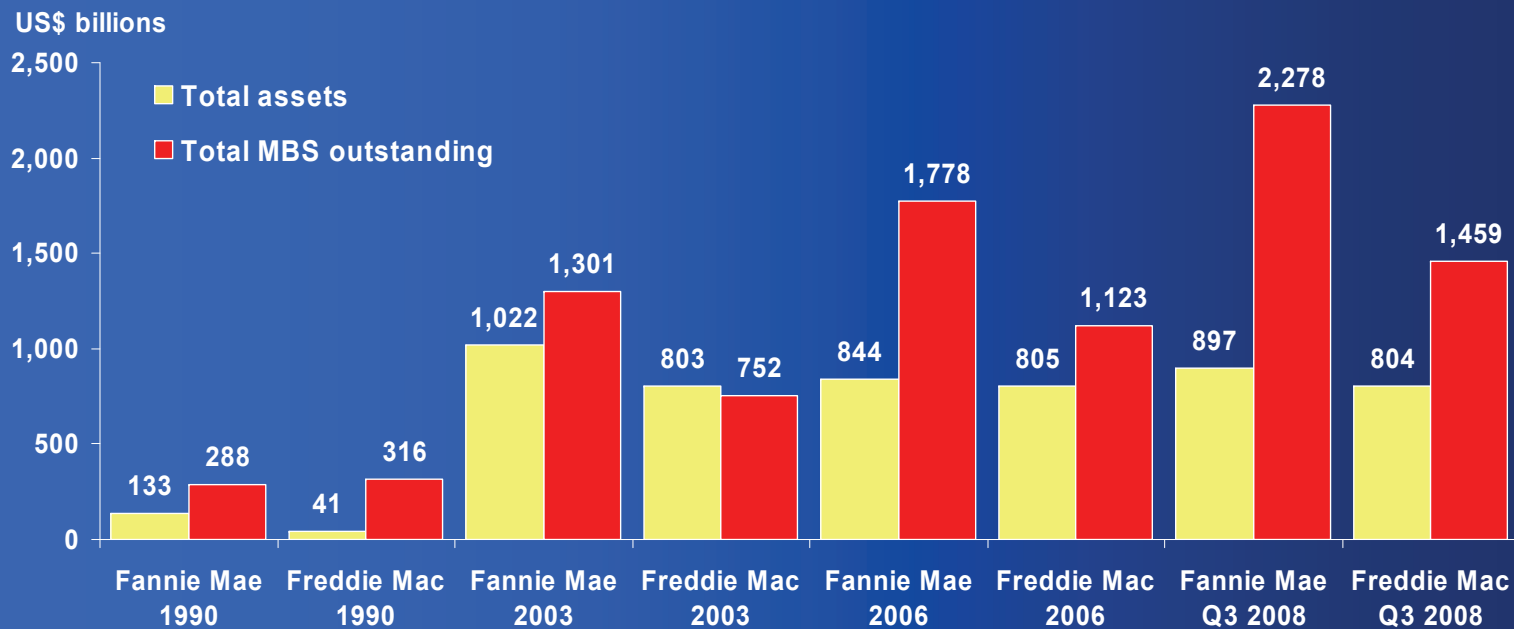
XII. What went wrong

The importance of Fannie Mae and Freddie Mac



Sources: Freddie Mac, Fannie Mae, FDIC, Milken Institute.

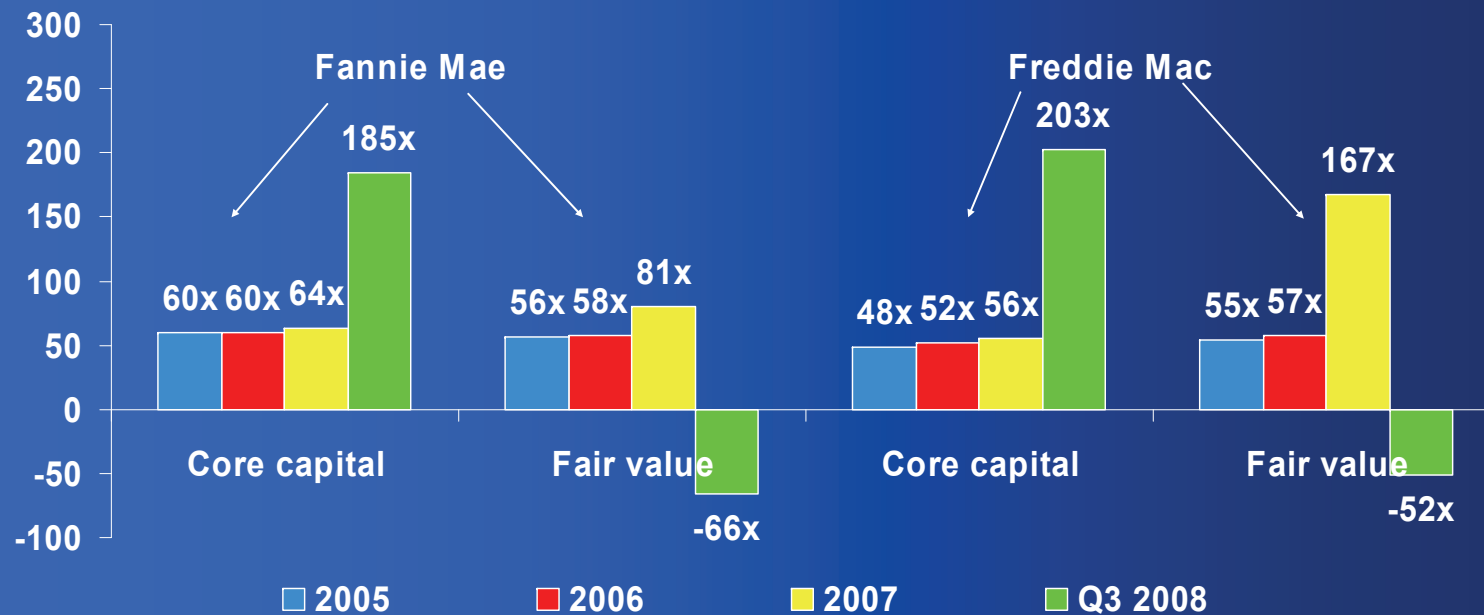
Fannie Mae and Freddie Mac: Too big with too little capital?



Sources: Freddie Mac, Fannie Mae, Milken Institute.

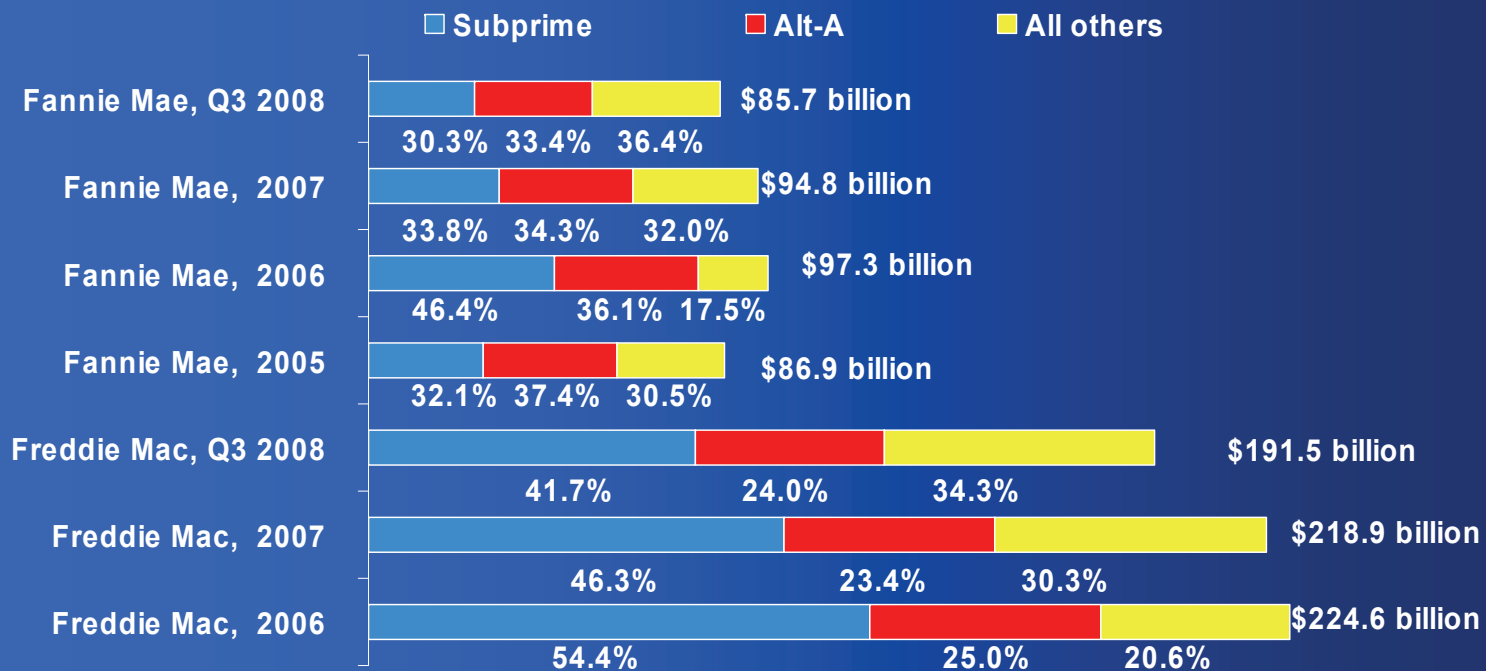
Fannie Mae and Freddie Mac are highly leveraged

Mortgage book of business over capital measures



Sources: Freddie Mac, Fannie Mae, FDIC, Milken Institute.

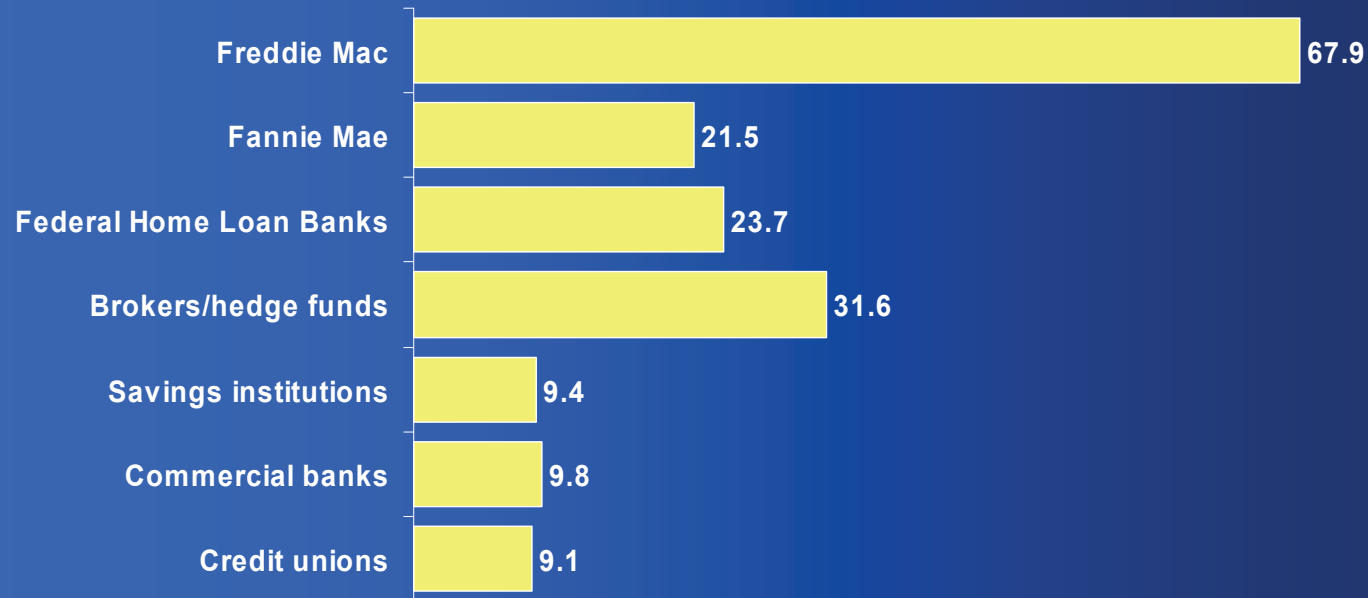
Freddie Mac's and Fannie Mae's retained private-label portfolios



Sources: Freddie Mac, Fannie Mae, FDIC, Milken Institute.

Leverage ratios of different types of financial firms (June 2008)

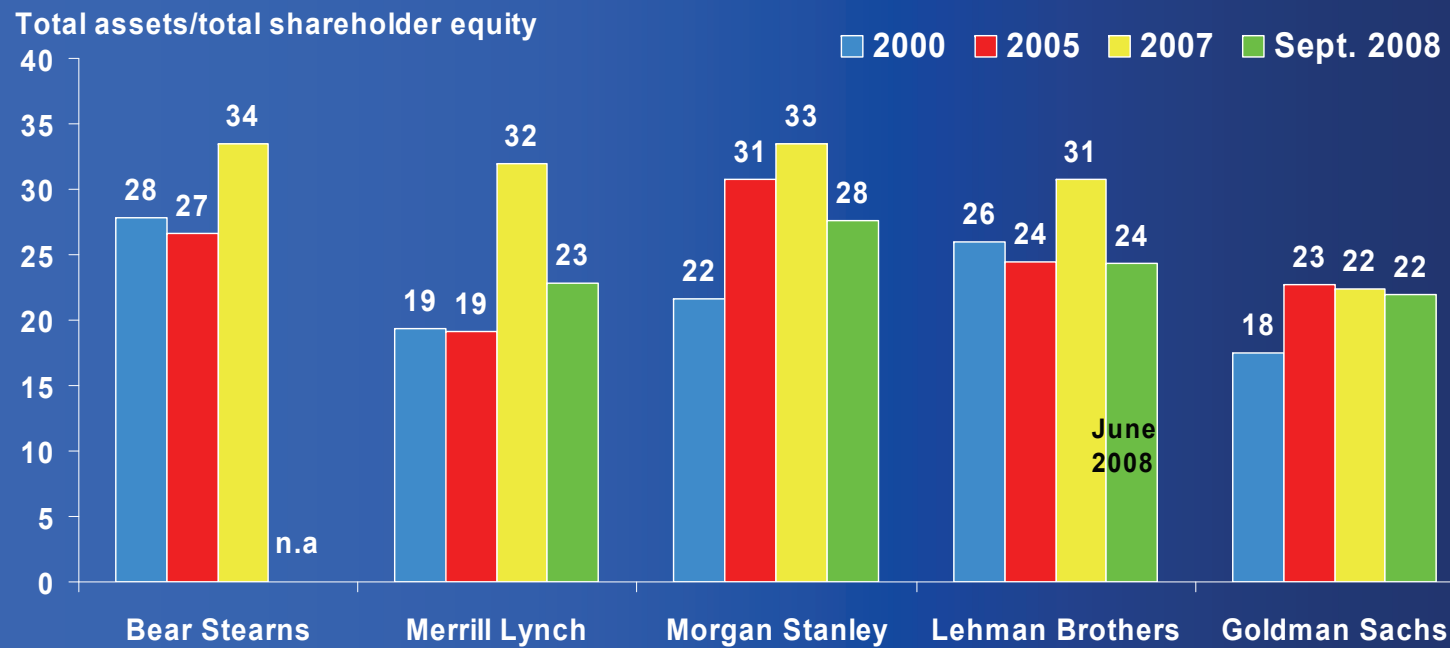
Leverage ratio, total assets/common equity



Sources: Federal Deposit Insurance Corporation, Office of Federal Housing Enterprise Oversight, National Credit Union Administration, Bloomberg, Google Finance, Milken Institute.

Too much dependence on debt?

Leverage ratios at biggest investment banks



Sources: Bloomberg, Milken Institute.

Standard & Poor's ratings

New issues: 1/1/2000 to 9/30/2008

Investment-grade securities		Non-investment-grade securities	
AAA	16,907	BB+	238
AA+	240	BB	313
AA	2,098	BB-	331
AA-	3,414	B+	339
A+	2,623	B	330
A	2,602	B-	1,189
A-	2,027	CCC+	293
BBB+	903	CCC	214
BBB	1,371	CCC-	104
BBB-	1,359	CC	36
		C	11
		D	303

Sources: Bloomberg, Milken Institute.

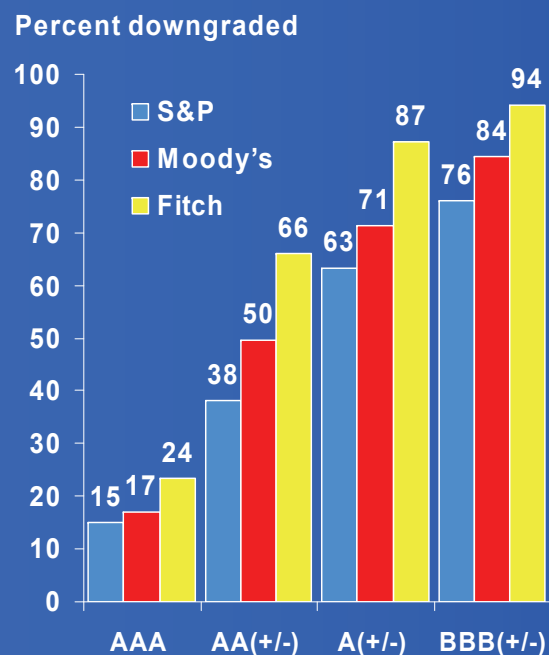
56 percent of MBS issued from 2005 to 2007 were eventually downgraded

S&P	Total	Downgraded	Downgraded/ Total
AAA	1,032	156	15.1%
AA(+/-)	3,495	1,330	38.1%
A(+/-)	2,983	1,886	63.2%
BBB(+/-)	2,954	2,248	76.1%
BB(+/-)	789	683	86.6%
B(+/-)	8	7	87.5%
Total	11,261	6,310	56.0%

Note: A bond is considered investment grade if its credit rating is BBB- or higher by S&P.

Sources: Inside Mortgage Finance, Milken Institute.

Subprime mortgage-backed securities downgrades 2005–2007 issuance



Sources: S&P, Datastream, Milken Institute.

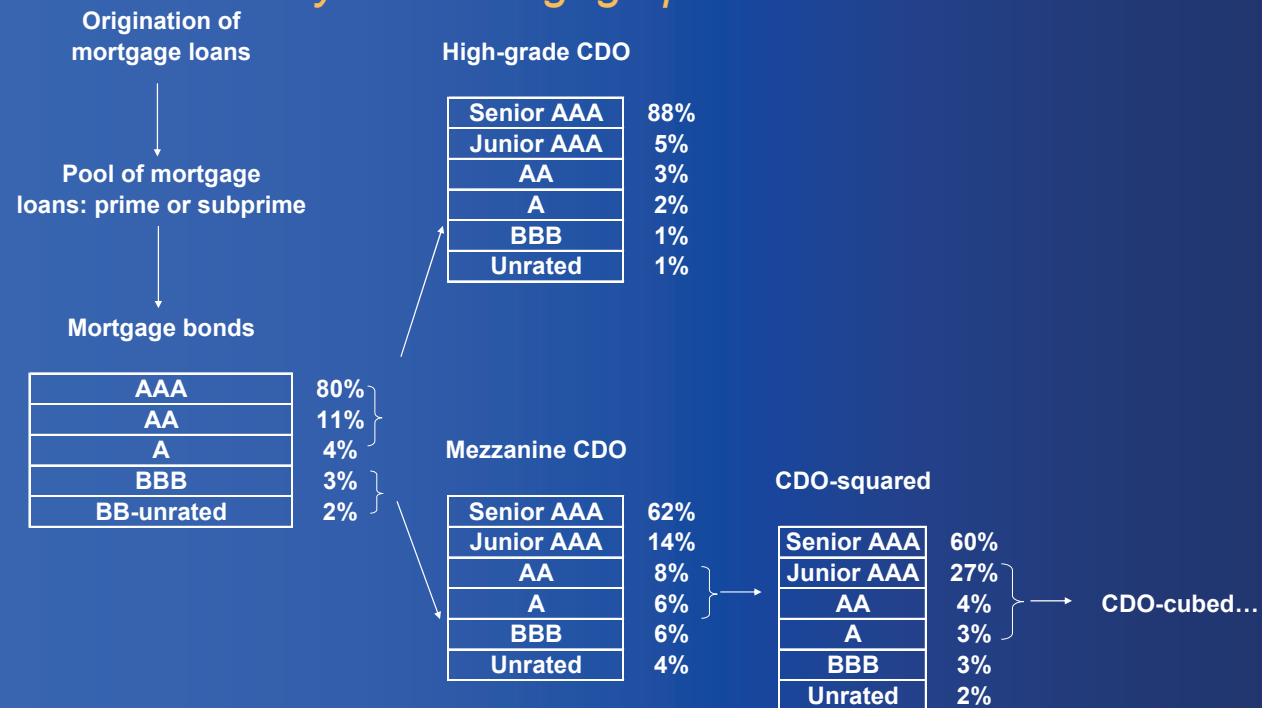
Investment grade S&P 500 companies' credit ratings and associated CDS spreads

S&P Rating	Number of companies	CDS spread		
		Highest	Lowest	Average
AAA	3	56	15	41
AA+	1	95	95	95
AA	5	86	49	74
AA-	9	265	54	118
A+	17	2,999	12	346
A	36	1,040	38	151
A-	34	2,557	51	427
BBB+	43	1,114	38	222
BBB	41	1,210	61	271
BBB-	17	1,235	89	359

Note: As of October 17, 2008.

When is a AAA not a AAA?

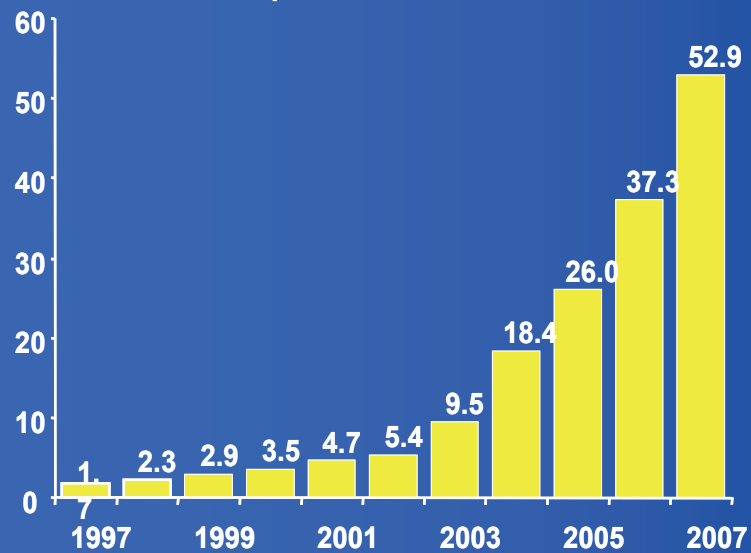
Multilayered mortgage products



Sources: International Monetary Fund, Milken Institute.

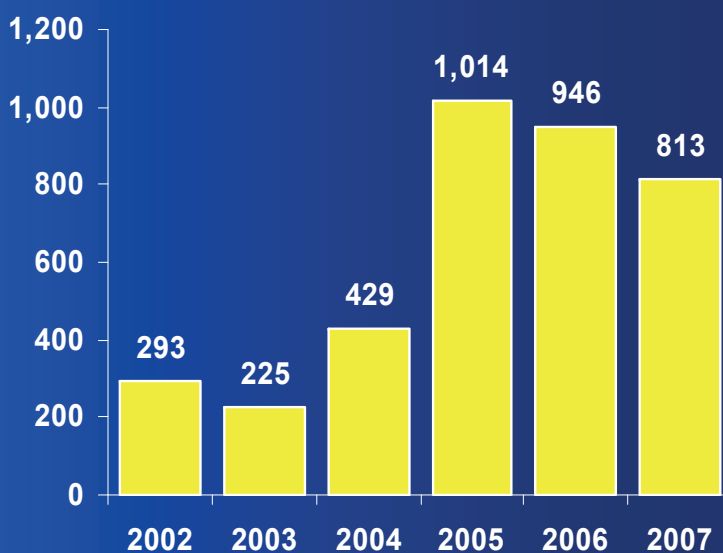
Mortgage loan fraud surges

Number of cases reported, thousands



Dollar losses in reported cases of mortgage fraud

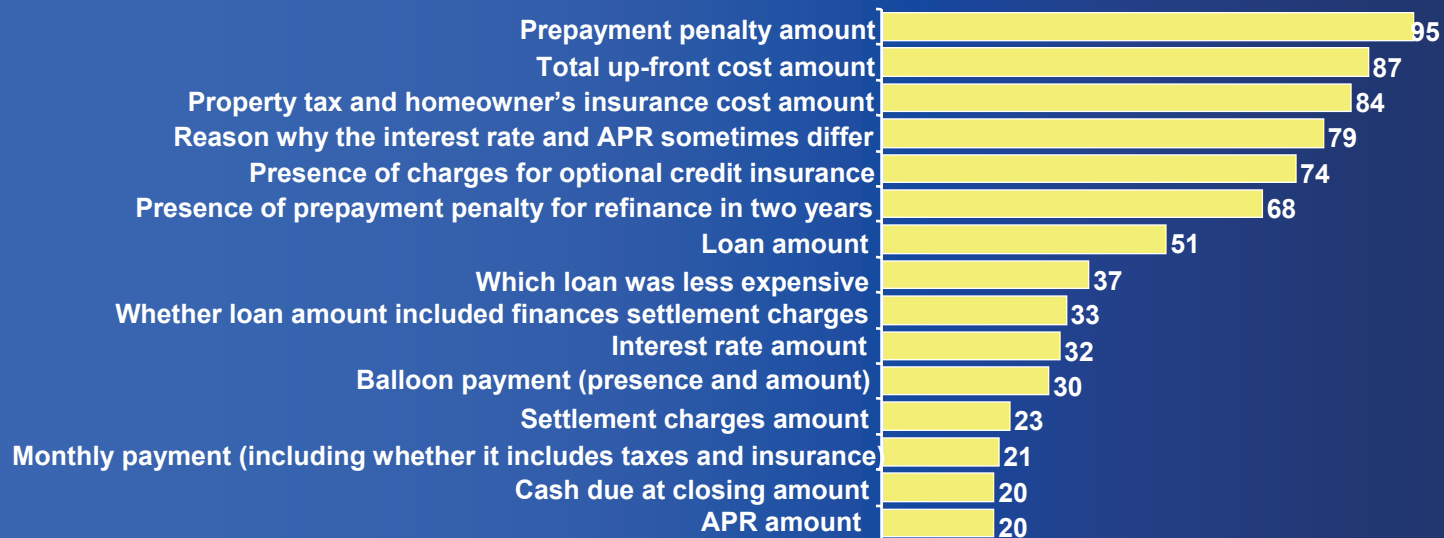
US\$ millions



Sources: Financial Crimes Enforcement Network, Federal Bureau of Investigation, Milken Institute.

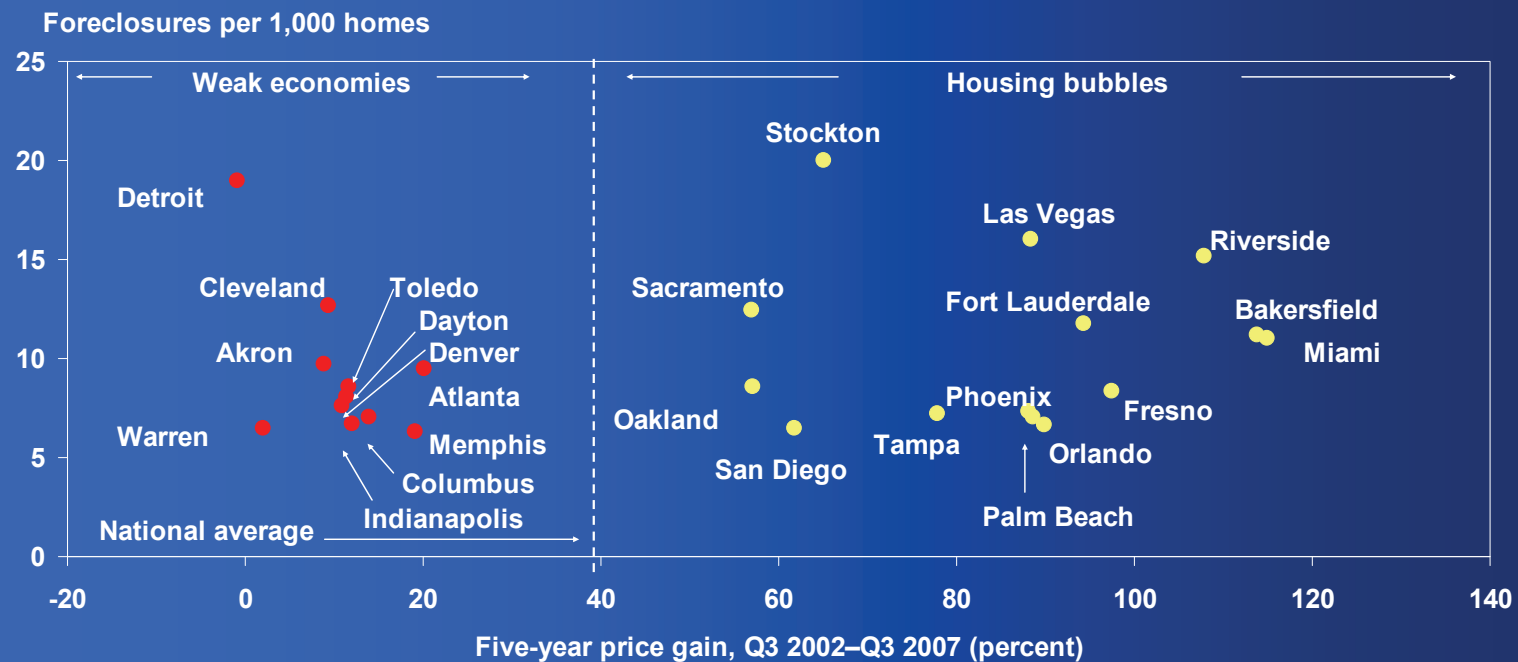
Is adequate information disclosed to consumers?

Percent of respondents who could not correctly identify various loan costs using current disclosure forms



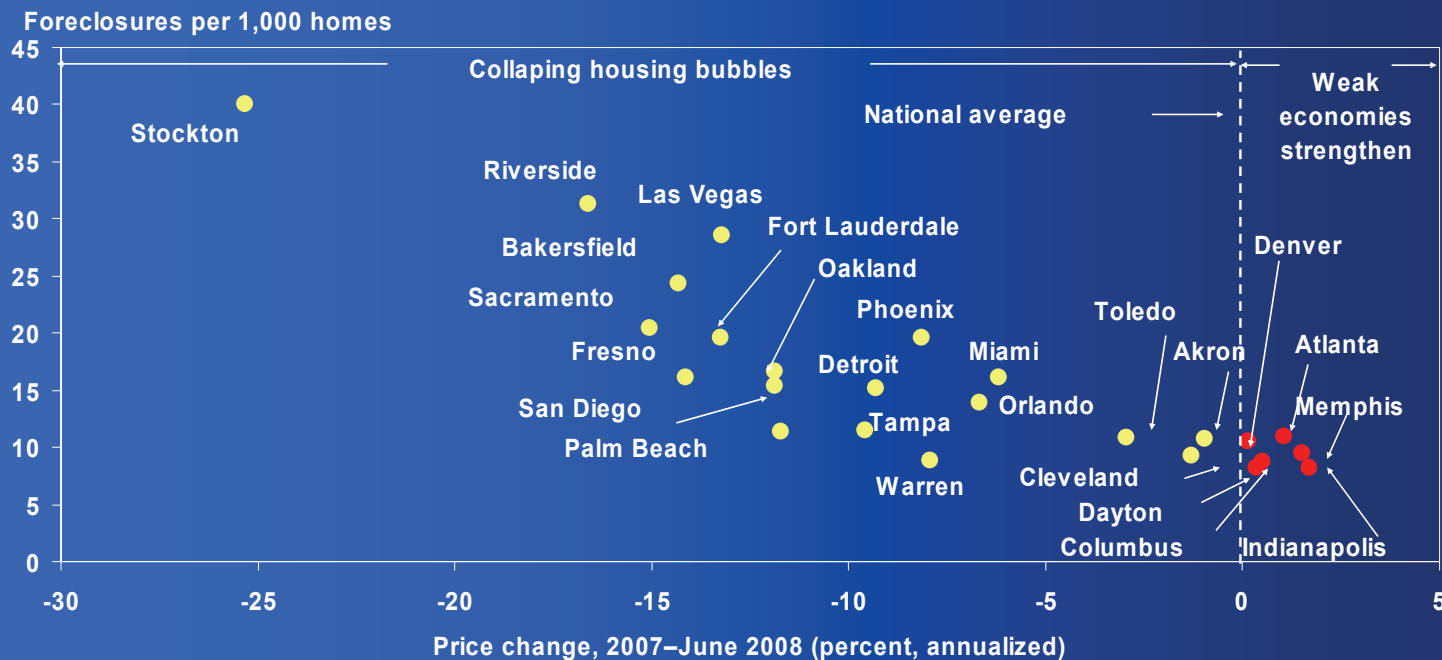
Sources: Federal Trade Commission, Milken Institute.

Drivers of foreclosures: Strong appreciation or weak economies?



Sources: U.S. Treasury Department, RealtyTrac, Office of Federal Housing Enterprise Oversight, Milken Institute.

After housing bubble burst in 2007: Foreclosures highest for areas with biggest price declines



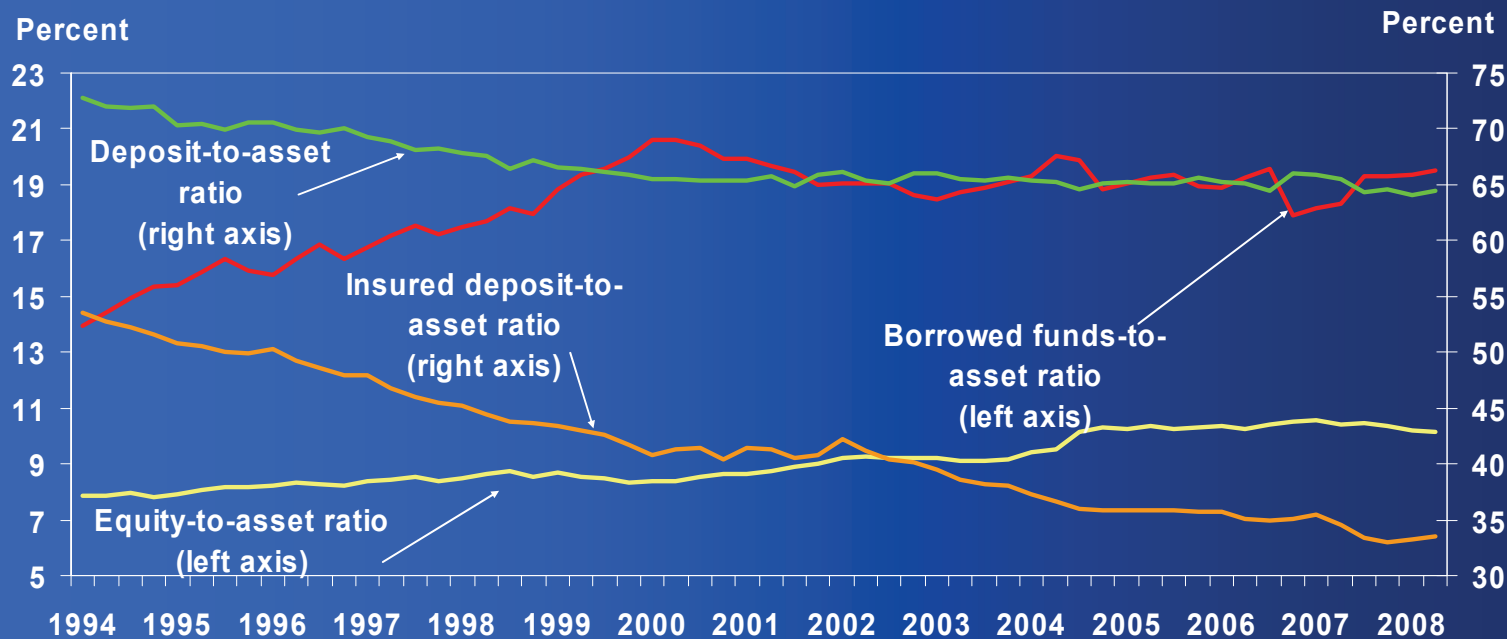
Sources: RealtyTrac, Office of Federal Housing Enterprise Oversight, Milken Institute.

XIII. Policy lessons from the current crisis and proposals for reform in regulatory oversight

Many different options and innovations...

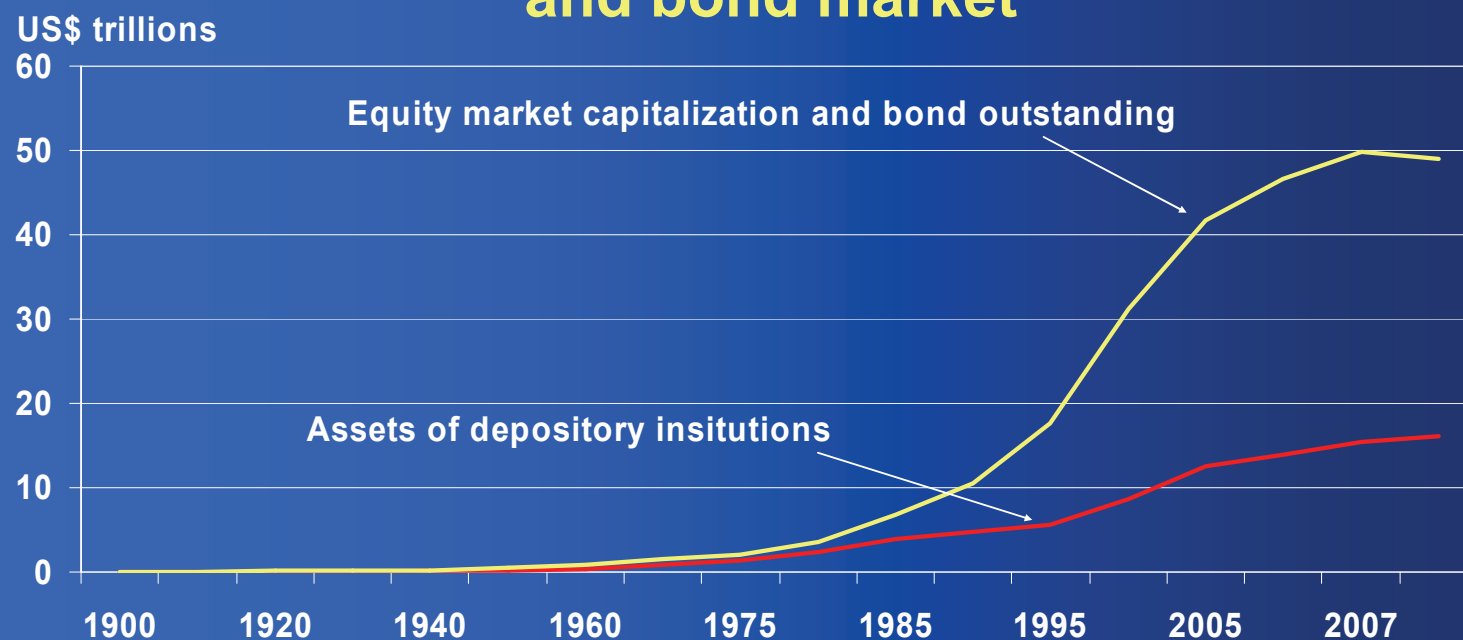
- **Covered bonds**
- **Debt-equity swaps**
- **Alternative mortgage products**
- **Shared equity mortgages**
- **Real estate derivatives**
- **Classical insurance products**
- **Making mortgages affordable**

Balance sheet information on FDIC-insured institutions



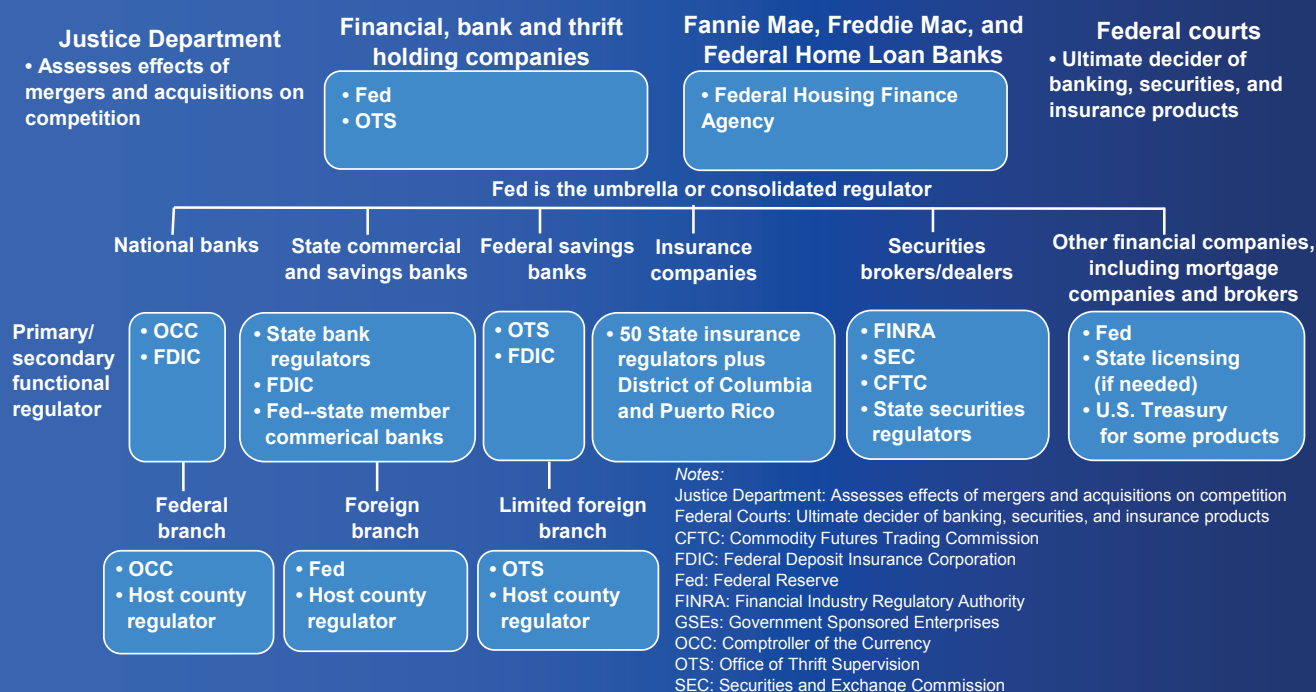
Sources: FDIC, Milken Institute.

Growth of bank deposits, equity market and bond market



Sources: New York Stock Exchange, Datastream, Milken Institute.

The U.S. regulatory regime: In need of reform?



Sources: Financial Services Roundtable (2007), Milken Institute.

Countries with the Central Bank as a supervisory authority

Income level	Central bank only (75 countries)					Central bank among multiple supervisors (7 countries)		Central bank not a supervisory authority (52 countries)			
High income	Anguilla	Estonia	Israel	Montserrat	Slovenia	Netherlands	South Korea	Australia	Denmark	Isle of Man	Norway
	Antigua and Barbuda	Germany	Italy	New Zealand	Spain	Saudi Arabia	United States	Bahrain	Finland	Japan	Sweden
	Austria	Greece	Kuwait	Portugal	Taiwan, China			Belgium	France	Luxembourg	Switzerland
	Cyprus	Hong Kong, China	Liechtenstein	Singapore	Trinidad & Tobago			Canada	Iceland	Macau, China	United Kingdom
	Czech Republic							Cayman Islands	Ireland	Malta	
Upper middle income	Argentina	Bulgaria	Lithuania	Russia	St. Kitts and Nevis	Malaysia		Chile	Gabon	Latvia	Panama
	Belize	Croatia	Mauritius	Seychelles	St. Lucia			Costa Rica	Hungary	Lebanon	Poland
	Botswana	Dominica	Oman	Slovak Republic	St. Vincent and the Grenadines			Equatorial Guinea	Kazakhstan	Mexico	
	Brazil	Grenada	Romania	South Africa	Uruguay						
	Algeria										
Lower middle income	Angola	Egypt	Jamaica	Maldives	Sri Lanka			Bolivia	China	Dominican Republic	Honduras
	Armenia	Fiji	Jordan	Moldova	Suriname			Bosnia and Herzegovina	Colombia	El Salvador	Nicaragua
	Belarus	Guyana	Lesotho	Morocco	Syrian			Cameroon	Congo	Guatemala	Peru
	Bhutan	Indonesia	Macedonia, FYR	Philippines	Thailand						
Low income	Bangladesh	Ghana	Kyrgyz Republic	Tajikistan	Pakistan	Nigeria	Zimbabwe	Benin	Chad	Mali	Senegal
	Burundi	India	Malawi	Tanzania	Uganda			Burkina Faso	Côte d'Ivoire	Niger	Togo
	Ethiopia	Kenya	Mozambique					Central African Republic	Guinea-Bissau		

Countries with single vs. multiple supervisory authorities

Income level	Single supervisor (127 countries)					Multiple supervisors (7 countries)	
High income	Anguilla Antigua and Barbuda Australia Austria Bahrain Belgium Canada Cayman Islands	Cyprus Czech Republic Denmark Estonia Finland France Germany Greece	Hong Kong, China Iceland Ireland Isle of Man Israel Italy Japan Kuwait	Liechtenstein Luxembourg Macau, China Malta Montserrat New Zealand Norway Portugal	Singapore Slovenia Spain Switzerland Taiwan, China Trinidad & Tobago United Kingdom Sweden	Netherlands South Korea	Saudi Arabia United States
Upper middle income	Argentina Belize Botswana Brazil Bulgaria Chile Panama	Costa Rica Croatia Dominica Equatorial Guinea Romania Gabon	Grenada Hungary Kazakhstan Latvia Lebanon South Africa	Lithuania Mauritius Mexico Oman Poland Russia	Seychelles Slovak Republic St. Kitts and Nevis St. Lucia St. Vincent and the Grenadines Uruguay	Malaysia	
Lower middle income	Guatemala Algeria Angola Armenia Belarus Bhutan Bolivia	Bosnia and Herzegovina Cameroon China Colombia Jordan Congo Dominican Republic	Egypt El Salvador Fiji Guyana Honduras Indonesia Jamaica	Lesotho Macedonia, FYR Maldives Moldova Morocco Nicaragua	Peru Philippines Sri Lanka Suriname Syrian Thailand		
Low income	Bangladesh Benin Burkina Faso Burundi Central African Republic	Chad Côte d'Ivoire Ethiopia Ghana Guinea-Bissau	India Kenya Kyrgyz Republic Malawi Mozambique	Pakistan Senegal Tajikistan Tanzania	Togo Uganda Mali Niger	Nigeria	Zimbabwe

Scope of supervisory authority for countries

Income level	Only banks (96 countries)				All of the main financial institutions (38 countries)			
High income	Anguilla	Greece	Luxembourg	Slovenia	Australia	Denmark	Japan	Singapore
	Antigua and Barbuda	Hong Kong, China	Montserrat	South Korea	Austria	Estonia	Liechtenstein	Sweden
	Canada	Isle of Man	Netherlands	Spain	Bahrain	Germany	Macau, China	Taiwan, China
	Cyprus	Israel	New Zealand	Switzerland	Belgium	Iceland	Malta	Trinidad & Tobago
	Finland	Italy	Portugal	United States	Cayman Islands	Ireland	Norway	United Kingdom
	France	Kuwait	Saudi Arabia		Czech Republic			
Upper middle income	Argentina	Croatia	Mauritius	Seychelles	Hungary	Kazakhstan	Latvia	Malaysia
	Belize	Dominica	Mexico	Slovak Republic	Uruguay			
	Botswana	Equatorial Guinea	Oman	South Africa				
	Brazil	Gabon	Panama	St. Kitts and Nevis				
	Bulgaria	Grenada	Poland	St. Lucia				
	Chile	Lebanon	Romania	St. Vincent and the Grenadines				
	Costa Rica	Lithuania	Russia					
Lower middle income	Algeria	Congo	Jamaica	Sri Lanka	Armenia	Colombia	Honduras	Nicaragua
	Angola	Dominican Republic	Jordan	Suriname	Bhutan	Fiji	Lesotho	Peru
	Belarus	Egypt	Macedonia, FYR	Syrian	Bosnia and Herzegovina	Guatemala	Maldives	
	Bolivia	El Salvador	Moldova	Thailand				
	Cameroon	Guyana	Morocco					
	China	Indonesia	Philippines					
Low income	Bangladesh	Côte d'Ivoire	Kyrgyz Republic	Senegal	Malawi			
	Benin	Ethiopia	Mali	Tajikistan				
	Burkina Faso	Ghana	Mozambique	Tanzania				
	Burundi	Guinea-Bissau	Niger	Togo				
	Central African Republic	India	Nigeria	Uganda				
	Chad	Kenya	Pakistan	Zimbabwe				