

Recent Economic and Financial Crises

Lecture 5
Part 1
The Great Financial Crisis, 2007-09

Recent Economic and Financial Crises

- **The Great Financial Crisis, 2007-09**
- The Euro Crisis

"Insanity: doing the same thing over and over again and expecting different results", Albert Einstein

"Emancipate our minds, seek truth from facts, proceed from reality in everything", Deng Xiaoping

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Financial crises 1900-2008

- In the 109 years studied by Reinhard&Rogoff, the highest incidence of banking crises took place during the worldwide Great Depression of 1930s
- From the late 1940s to the early 1970s there was a period of relative calm explained partly by:
 - booming world growth
 - "repression" of domestic financial markets (to reduce the high debt/GDP ratios at end of WW2)
 - heavy handed use of capital controls
- Since the early 1970s, in coincidence with global rounds of financial and international capital account liberalization, banking and financial crises have picked up
- In the early 1980s, a collapse in global commodity prices, combined with (if not generated by) high and volatile interest rates in the US, led to a spate of banking and sovereign debt crises in EM, especially LatAM
- Beginning in 1984, US experienced the savings and loan (S&L) industry crisis, also generated by the strong rise in interest rates that raised the cost of the (mainly short-term) funding of these banks, whose assets were long term, fixed-rate loans and mortgages [asset vs liabilities mismatch, unwinding of "carry trade"]
- During the late 1980s and early 1990s, the Nordic countries experienced a very serious banking crisis following a surge in capital flows and soaring real estate prices
- In 1994, Mexico (and then Argentina) had a fresh round of banking crises followed by the famous Asian crisis of 1997-98 that extended to other EM like Russia and Colombia
- Before the brief tranquil period that came to a halt in the summer of 2007, Argentina in 2001 and Uruguay in 2002 experienced the latest rounds of financial crises

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The Great Recession of 2007-08 (GFC)

- In most advanced economies the second half of the 20th century was a period of relative, if uncharacteristic, calm – the few and mild crises being well handled by policymakers and monetary authorities – culminating in a period of low inflation/high growth dubbed **"The Great Moderation"**.
- Crises were seen as symptom of troubles in less developed economic systems
- The GFC, that brought this period to a sudden halt, is thought to have started in the US – **the first financial crisis since WW2 to start at the heart of world's financial centre** (as was instead common in the financial crises of the XIX century) - and subsequently quickly spread to the rest of the world
- Many academic, politicians and policymakers claimed that (using Vice President Dick Cheney's words) **"Nobody, anywhere, was smart enough to figure it out ... nobody saw: it coming"**
- As late as April 2007 the IMF (International Monetary Fund) was affirming that risks to the global economy were extremely low and that there were no issues of great concern. The world was seen as robust and global imbalances were considered sustainable
- But the Great Financial Crisis instead had deep structural origins, shared by both US and most of the other countries in the world:
 - > **The wealth effect from the housing bubble and from financial innovations that sprung up under lax supervision supported excessive household consumption**

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The Great Recession of 2007-08 (GFC)

The roots of the GFC can be traced back to the **piling up of five major bubbles** that preceded it:

- the **"new economy" ICT bubble** starting in the mid-1990s and ending with the crash of 2000
 - the **real-estate bubble**, in large part fuelled by easy access to large amounts of liquidity provided by the active monetary policy of the US Fed (that lowered the Fed rate from 6.5% in 2000 to 1% in 2003-04 in a successful attempt to alleviate the consequence of the 2000 "new economy" crash)
 - the **innovations in financial engineering** with the CDOs and other derivatives of debts and loan instruments issued by banks and eagerly bought by the market, accompanying and fuelling the real-estate bubble
 - the commodity bubble(s) on food, metals and energy
 - the stock market bubble peaking in October 2007
- As with other past crises, the **warning signs** should have been clearly visible:
 - Large Trade & Current Account (CA) Deficits**
 - Sustained debt build-ups**
 - Markedly rising asset prices**

when coupled with slowing real economic activity are a clear signal of increasing risks of a financial crisis unravelling

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1. US Large Trade & CA Deficits



Source: US, Bureau of Economic Analysis, US, Bureau of the Census
Shaded areas indicate US recessions - 2015 research.stlouisfed.org

The trajectory of the US current account deficit has been far larger and more persistent than typical in other crises. The fact that **the US\$ remained the world's reserve currency** during a period in which many central banks were amassing record amounts of foreign exchange reserves certainly increased the foreign capital available to finance the record US Current Account deficits (through US Capital Account surplus). **The US was able to finance the large-scale imbalances for so long only because the dollar is the main world reserve currency**.

Global imbalances and the "savings glut"

- Global imbalances expanded substantially during the 15 years preceding the GFC

Year	Value (%)
2004	-4.7
2005	-5.3
2006	-6.5
2007	-6.1
2008	-4.7
2009	-2.7
2010	-3.2
2011	-3.1
2012	-3

- Some economists viewed the imbalances as a serious threat to world economic stability
- Many other economists, amongst which the two latest Chairmen of the Fed, Greenspan and Bernanke, branded as alarmist those worried excessively about the burgeoning US current account deficit, arguing that:
 - This gaping deficit, which reached more than 6.5% of GDP in 2006 (over US\$ 800 bn), was simply a reflection of a broader trend toward global financial deepening that was allowing countries to sustain much larger CA deficits (and surplus) than in the past [this argument was also used to justify the sustainability of increasing CA deficits in Europe's "periphery"]
 - The imbalances were the natural outcome of a "global savings glut", caused by:
 - The strong desire of many emerging countries to insure themselves against future exchange rate crises that led them to amass much higher official reserves than in the past
 - The increase in reserves in oil and commodity producing countries (given the strong improvement in their terms of trade), in Japan and Germany (to prepare for a rapidly aging population) and in China

This "savings glut" prompted growing demand for US-denominated financial assets and justified the strong inflows in the world's largest, more liquid and apparently highest "expected return" capital market (the US)

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The great "bull market" in Fixed Income

Shaded areas indicate US recessions - 2015 research.stlouisfed.org

After hitting an high of more than 15% in 1980, interest rates, both long (10Y, blue line) and short (2y, red line) have been on a steady downtrend:

- After the 2001-02 recession, the Fed aggressively eased, fearing "deflation", and the 2y yield dropped for the first time in 40 years below 2%
- Since 2003, many economists accused the Fed of being too late and too slow in raising rates, keeping them too low for too long a time and then raising them in tiny, predictable increments of 25bp every 6 weeks, thus fuelling the housing boom

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Too loose monetary policy

Source: Board of Governors of the Federal Reserve System (US)
Shaded areas indicate US recessions - 2015 research.stlouisfed.org

The Fed's conventional policy tool is to target the federal funds rate, the overnight interest rate at which banks lend to each other

The Fed adopts a policy of interest rate targeting to achieve its dual goal of

- max employment
- price stability

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A rule-based approach to Monetary Policy

- Economist John Taylor – following Friedman's recommendation that monetary authorities should **adopt a simple, predictable, rules-based approach to monetary policy** - suggested the Fed should use the following rule to set interest rates that balance the goals of maintaining economic stability and price stability:

$$FFR = (R + I) + 0.5 \times (\text{output gap}) + 0.5 \times (I - IT)$$

where:
 FFR = federal funds rate
 R = equilibrium real interest rate (generally assumed to equal 2%)
 output gap = percentage difference between actual GDP and potential GDP
 I = inflation rate
 IT = inflation target (generally assumed to equal 2%)

- If:
- actual GDP is equal to potential GDP (GDP "on target")
 - inflation is equal to its target
- the rule calls for an **inflation-adjusted federal funds rate of 2%**, or an **actual federal funds rate equal to 2% plus the current inflation rate** (= inflation target = 2%), therefore = 4%

This is often called the "neutral" interest rate, at which monetary policy is neither stimulative nor contractionary

- **The Taylor rule is a simple monetary policy rule linking mechanically the level of the policy rate to deviations of output from its potential (the output gap) and of inflation from its target**

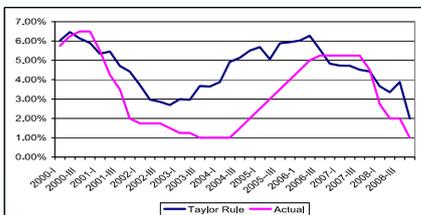
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The "Taylor Rule"

- **The goal of maintaining economic stability** is represented by the factor [0.5 x (output gap)], which **raises interest rates when actual GDP is greater than potential GDP and lowers rates when it is below potential**. The output gap is the difference between actual and potential GDP. Potential GDP is the level of output that would be produced if all of the economy's labour and capital resources were being utilized
- **Changes in inflation** enter the Taylor rule in two places:
 - First, the **nominal neutral rate rises when inflation rises** in order to keep the inflation-adjusted neutral rate constant.
 - Second, the goal of maintaining price stability is represented by the factor [0.5 x (I-IT)], which states that **inflation-adjusted interest rates are to be raised when inflation (I) is above its target (IT) and lowered when inflation is below its target**. Unlike the output gap, the inflation target can be any rate that policymakers desire. A 2% inflation target is the rate specified by the Fed as its longer-term goal for inflation
- Taylor rules are widely used by researchers to evaluate monetary policy and by central bankers as one tool to help inform their policy decisions
- From a historical perspective, the Taylor rule has been a useful yardstick for assessing monetary policy performance. Specifically, in some major advanced economies, policy rates were below the level implied by the Taylor rule during the "Great Inflation" of the 1970s. In contrast, policy rates were broadly consistent with the Taylor rule during the "**Great Moderation**" between the mid-1980s and early 2000s, a period characterised by low inflation and low macroeconomic volatility

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Federal Funds Rates, actual and prescribed by Taylor rule

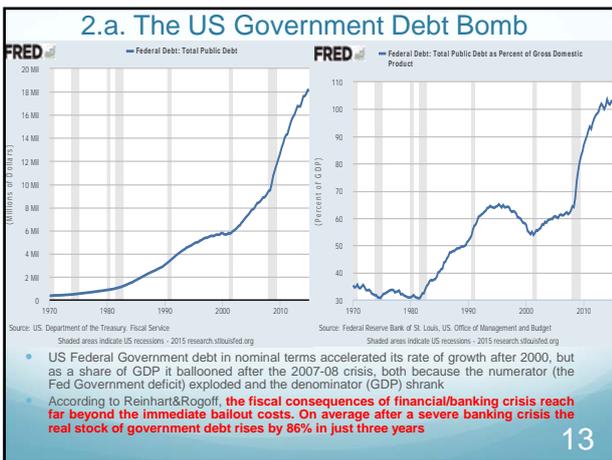


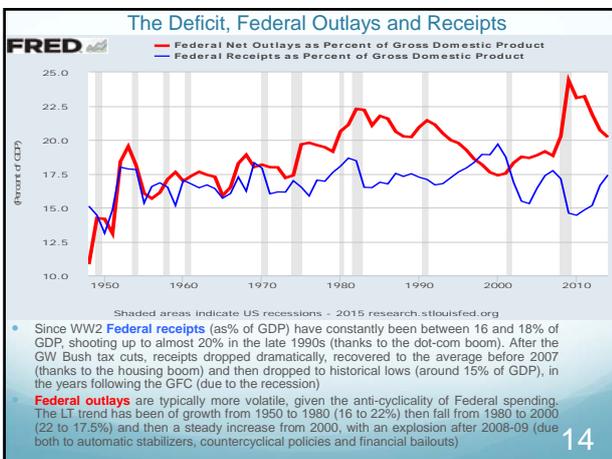
- Based on his approach, Taylor argues that the Fed followed the Taylor rule quite closely until around 2003. After that, he argues that **the Fed abandoned the Taylor rule around 2003 and moved to a more discretionary monetary policy**
- Since there is no direct way to measure potential GDP, it must be inferred: presumably, after the jobless recovery of 2002-03, **the Fed started adopting the unemployment level as a proxy of potential GDP**, which led to an easier monetary policy than would have been implied by following the "traditional" Taylor rule

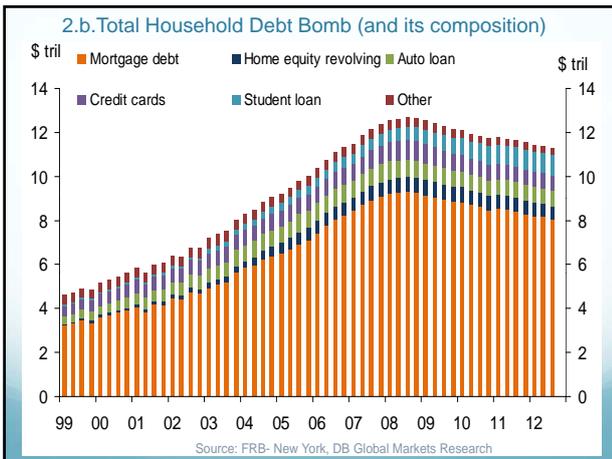
Many observers see the large deviation from the Taylor rule between 2003 and 2006 as a policy mistake that contributed to the build-up of financial imbalances and the subsequent crisis

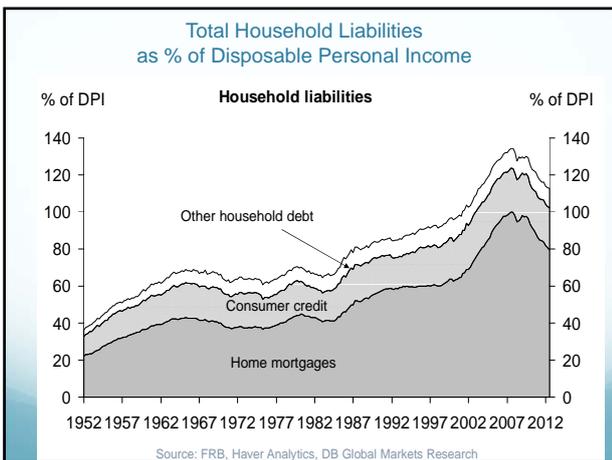
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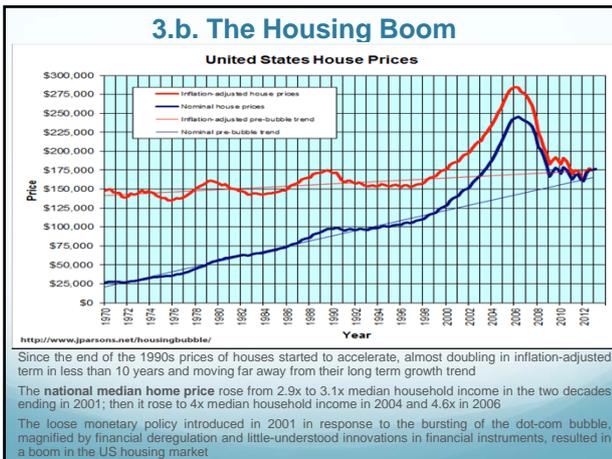


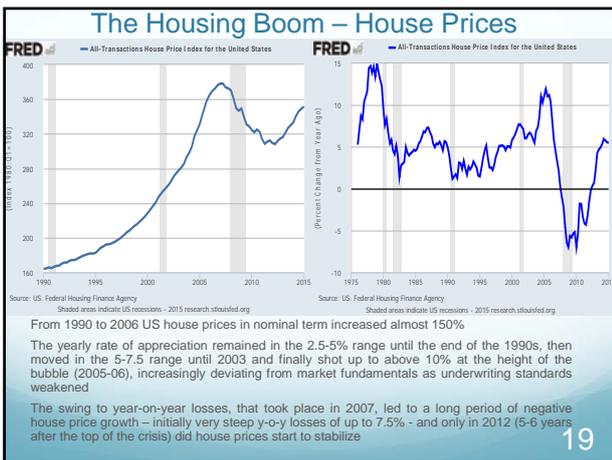


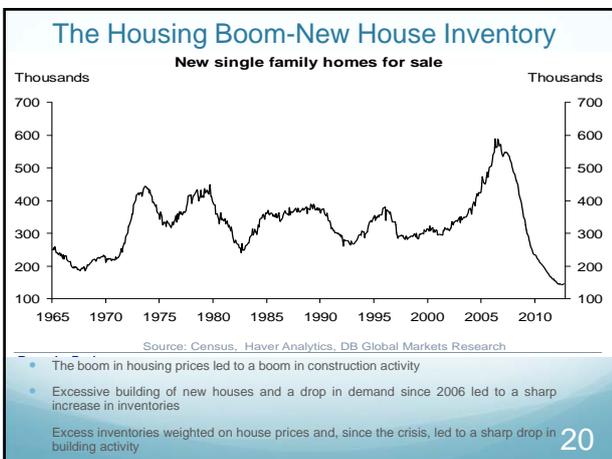












The making of the housing boom

- **2000:** Lenders originating \$160 bn worth of subprime, up from \$40 bn in 1994. Fannie Mae buys \$600 mln of subprime mortgages, primarily on a flow basis. Freddie Mac, in that same year, purchases \$18.6 bn worth of subprime loans, mostly Alt A and A- mortgages. Freddie Mac guarantees another \$7.7 bn worth of subprime mortgages in structured transactions. Fannie Mae commits to purchase and securitize \$2 bn of CRA eligible loans and in November it announces that the Department of Housing and Urban Development will soon require it to dedicate 50% of its business to low- and moderate-income families* and its goal is to finance over \$500 bn in CRA related business by 2010
- **2003-2007:** U.S. subprime mortgages increased 292%, from \$332 bn to \$1.3 tr, due primarily to the private sector entering the mortgage bond market. Many financial institutions issued large amounts of debt and invested in MBS, believing that house prices would continue to rise and households would keep up on mortgage payments
- **2004: U.S. homeownership rate peaks with an all time high of 69.2%**
- **2005:** Head CDO trader at Deutsche Bank, Greg Lippman, calls the CDO market a 'ponzi scheme'. With knowledge of management, he bets \$5 billion against the housing market, while other desks at DB continue to sell mortgage securities to investors]
- Robert Shiller gives talks warning about a housing bubble to the OCC and the FIDC. That same year, his second edition of "Irrational Exuberance" warns that the housing bubble might lead to a worldwide recession:
- June: At Lehman Brothers, Mike Gelband & friends make a push to get out of the mortgage market and start shooting it. They are ignored and later fired. Dr Madelyn Antonic, 2006 risk manager of the year*, is shut out of meetings by CEO Dick Fuld and Joe Gregory; she is fired in 2007
- August: Raghuram Rajan delivers his paper "Has Financial Development Made the World Riskier?"; warning about credit default swaps and financial system fragility, at the Jackson Hole Economic Symposium. His arguments are rejected by attendees, including Alan Greenspan, Donald Kohn, and Lawrence Summers

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Real estate prices stop growing

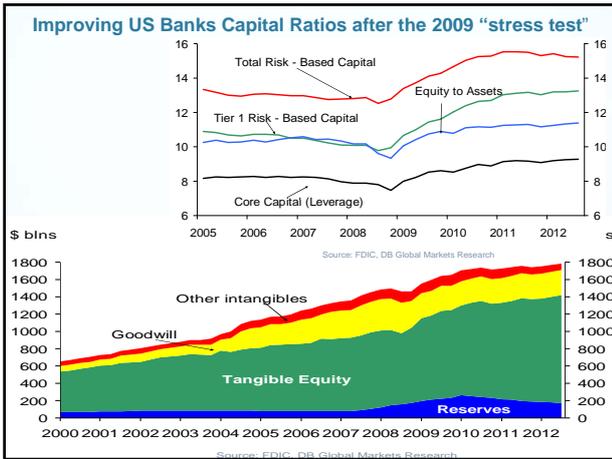
- **Fall 2005:** Booming housing market halts abruptly; from the fourth quarter of 2005 to the first quarter of 2006, median prices nationwide drop 3.3%
- **2006:** AIG gets scared and stops selling credit protection against CDOs, whilst the "Monolines" insurers (AMBAC, MBIA) continue to sell
- May: The subprime lender Ameriquest announces it will cut 3,800 Jobs, close its 229 retail branches and rely instead on the Web
- **May: Merit Financial Inc.**, based in Kirkland, WA, **files for bankruptcy**
- Middle: Merrill Lynch CDO sales department has trouble selling the super senior tranche of its CDOs: it sets up a group within Merrill to buy the tranches, so that the sales group can keep making bonuses
- Middle: Magnetar Capital starts creating CDOs to fail on purpose, so that it can profit from the insurance (credit default swaps) it has bought against their failure. Their program is so large that it helps extend the credit bubble into 2007, thus making the crash worse
- August: U.S. Home Construction Index is down over 40% as of mid-August 2006 compared to a year earlier
- September 7: Nouriel Roubini warns the International Monetary Fund about a coming US housing bust, mortgage-backed securities failures, bank failures, and a recession. His work was based partly on his study of recent economic crises in Russia (1998), Argentina (2000), Mexico (1994), and Asia (1997)
- Fall 2006: J.P. Morgan CEO Jamie Dimon directs the firm to reduce its exposure to subprime mortgages
- December: Goldman-Sachs claims (after the fact) that it began reducing its exposure to subprime mortgages at this point. It also begins betting against the housing market, while continuing to sell CDOs to its clients. Others claim these risk decisions were made in the spring and summer 2007

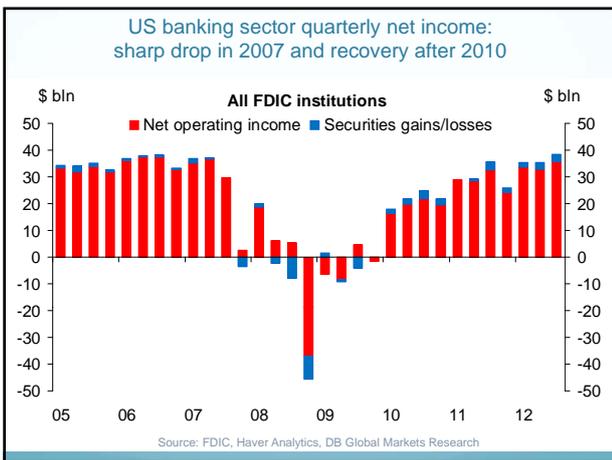
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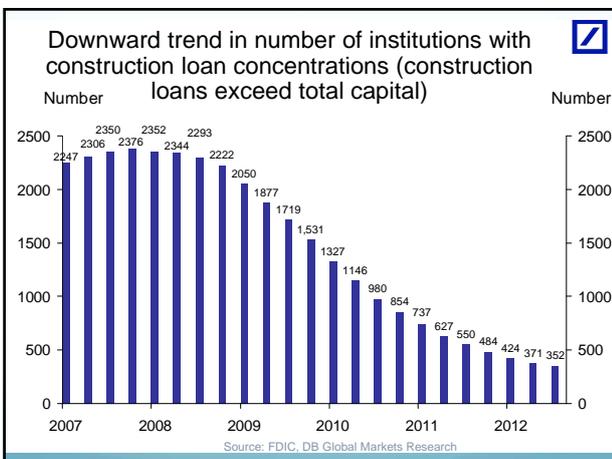
The housing boom turns to bust

- **2007:** Home sales continue to fall. The plunge in existing-home sales is the steepest since 1989. In Q1/2007, S&P/Case-Shiller house price index records first year-over-year decline in nationwide house prices since 1991
- February-March: Subprime industry collapses: a surge of foreclosure activity (twice as bad as in 2006) and rising interest rates threaten to depress prices further as problems in the subprime markets spread to the near-prime and prime mortgage markets. Several subprime lenders declaring bankruptcy, announcing significant losses, or putting themselves up for sale. These include: Ownit Mortgage Solutions, American Freedom Mortgage, Network USA, Accredited Home Lenders, New Century Financial, DR Horton and Countrywide Financial
- Lehman Brothers leaders Dick Fuld and Joe Gregory double down: they fire their internal critics and spend billions of dollars on real estate investments that will, within a year, become worthless, including Archstone-Smith and McAllister Ranch
- HSBC (who had bought Household International in 2004) warns that bad debt provisions for 2006 would be 20% higher than expected to roughly \$10.5bn
- March: The value of USA subprime mortgages is estimated to top \$1.3 trillion
- March 6: Ben Bernanke, quoting Alan Greenspan, warns that the GSEs, Fannie&Freddie, were becoming a source of "systemic risk", suggesting legislation to head off possible crisis
- April 2: New Century Financial, largest U.S. subprime lender, files for chapter 11 bankruptcy
- **June 7: Bear Stearns & Co informs investors in two of its CDO hedge funds** - the High-Grade Structured Credit Strategies Enhanced Leverage Fund and the High-Grade Structured Credit Fund - **that it was halting redemptions**. These two funds were highly leveraged, with debt-to-equity ratios up to 20 to 1. Banks that lent billions to the two funds made margin calls and threatened to sell the collateral, thus discovering that the market prices of many structured products, especially CDOs, were much lower than the prices at which they were carried on the books of most financial institutions!

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Rising Income Inequality

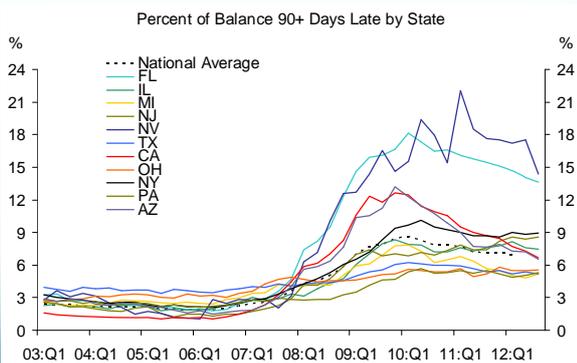
There are many catalysts of growing income disparity in the US. Some of them include:

- **Lower wage paying jobs:** As the US economy has shifted away from being an economy led by manufacturing to one increasingly reliant on services, lower wage paying jobs have come to dominate the labor market. The result is a consistent slowdown in inflation-adjusted wage growth since the 1940s.
- **Demographics:** As the burgeoning Baby Boomer generation moved into the prime working years associated with peak income, inequality has been skewed for a time simply due to this cohort's substantial share of the overall population. In addition, recent research has suggested that a growing share of "like marrying like", that is, a tendency to marry someone with a similar educational and professional background, has driven inequality since the 1960s.
- **Educational Attainment:** A growing wage premium has helped drive a wedge between the "haves" and the "have nots."
- **Tax policies:** Though tax policies are still largely supportive of lower income groups, they have become less progressive over time.

As income inequality grew, the average American household took on more and more debt to supplement the lack of income growth.

By late 2007, debt as a share of disposable income peaked at an eye-popping 135%. Outstanding balances on credit cards, for example, increased in perpetuity since 1968 (when tracking credit card usage began) until 2009 when the full brunt of the financial crisis hit home. But the final straw that broke the back of America's average household was the housing market boom that added trillions of dollars in debt to balance sheets, and when it burst, stripped homeowners of equity.

New Seriously Delinquent Balances by State: the boom of "bad debt" was unevenly distributed



Source: FRB-New York, DB Global Markets Research

Total Housing Wealth Destruction: US Homeowners lost on average \$ 50,000 during the housing bust

Total housing wealth destruction between Q2 2006 and Q2 2010					
State	Total housing value Q2 2006	Total housing value Q2 2010	Actual wealth loss	Loss per homeowner (in \$)	Loss as a % of total as of Q2 2006
California	\$6.0trn	\$3.7trn	\$2.3trn	231,320	39%
Arizona	\$0.7trn	\$0.3trn	\$0.3trn	157,404	50%
Florida	\$1.8trn	\$1.0trn	\$0.8trn	146,815	46%
New York	\$1.3trn	\$1.1trn	\$0.2trn	76,165	18%
Illinois	\$0.9trn	\$0.6trn	\$0.2trn	74,689	27%
U.S.	\$28.6trn	\$23.1trn	\$5.5trn	49,417	19%

Source: Loan performance/core logic, Freddie Mac, S&P/ Case- Shiller, DB Global Markets Research

The increase in housing prices contributed to the US consumption boom, and the housing bust weighted heavily on households' income and spending. A study by Shiller using micro-data to estimate the elasticity of consumption to housing and financial wealth from 1989 to 2001 found empirical evidence of a link between housing, wealth and consumption in the US, with a substantially larger marginal propensity to consume from housing wealth than from financial wealth.

Another study using panel data for 14 countries found that "changes in housing prices should be considered to have a larger and more important impact than changes in stock market prices in influencing household consumption in the US and in other developer countries"

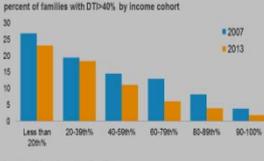
Yellen's Concerns About Inequality



- Wealth inequality has increased more than income inequality
 - Housing versus financial asset recovery
 - Average household is liquidity-constrained
 - Debt burden is great for lower income households

Debt Burden Weighing Down Average Household

percent of families with DTI>40% by income cohort



Income Cohort	2007 (%)	2013 (%)
Less than 20%	~25	~22
20-30%	~18	~15
40-50%	~12	~10
60-70%	~8	~7
80-90%	~5	~4
90-100%	~3	~2

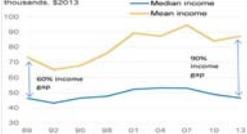
Source: Survey of Consumer Finances, Morgan Stanley Research

- An explosion in financial assets that has outpaced the growth in real estate assets is a major driver of the wealth gap. Since the start of the recovery in mid-2009, the S&P 500 composite stock index has more than doubled. Home values have risen as well, but the upward climb was quite lagged and has been less impressive, particularly if we exclude the price effects of distressed sales. The clawback in household wealth is illustrated in Exhibit 8 on the next page.
- While shareholder equity raced past its previous peak in 2012, housing equity remains far below its previous peak, underscoring that a substantial amount of negative equity remains (20% or so). Moreover, as shown in Exhibit 9, the amazing run-up in shareholder equity has gone to the benefit of only the top 10% income group, leaving the majority of households behind

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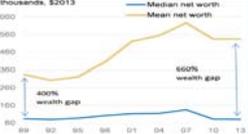
Rising income & wealth inequality

Exhibit 6: Growth in Mean and Median Family Income Reveals Widening Gap



Note: Mean income is the average income across all families regardless of how that income is distributed. Median income is the level at which 50% of families have lower income and 50% have higher incomes.

Exhibit 7: Growth in Mean and Median Wealth Reveals Widening Gap



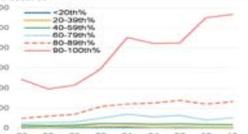
Note: Mean wealth is the average wealth across all families regardless of how that wealth is distributed. Median wealth is the level at which 50% of families have lower wealth and 50% have higher wealth. Source: Survey of Consumer Finances 2013.

Exhibit 8: Incredible Wealth Creation, But Housing Equity Lagging



Source: Federal Reserve Board, Morgan Stanley Research

Exhibit 9: Growth in Financial Assets Has Benefitted Top 10% of Income Earners



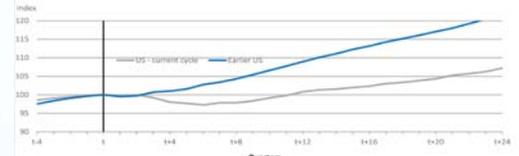
Source: Survey of Consumer Finances 2013, Morgan Stanley Research

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A problem for Consumption and Growth

- Consumer spending experienced the sharpest decline of any recession, and took the longest to reach its previous peak

Exhibit 1: Consumer Spending Around Recessions - Indexed to Start of Recession (t=100)



Note: Earlier US cycles include the past 7 recessions dating back to 1957. Source: Bureau of Economic Analysis, Morgan Stanley Research

- Despite the roughly \$25 trillion increase in wealth since the recovery from the financial crisis began, consumer spending remains anemic. Top income earners have benefited from wealth increases but middle and low income consumers continue to face structural liquidity constraints and unimpressive wage growth.
- To lift all boats, further increases in residential wealth and accelerating wage growth are needed.

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Required Readings

- Raghuram G. Rajan: **Fault Lines, How Hidden Fractures still Threaten the World Economy**, Princeton University Press, 2010, Chapter 5

Suggested Readings

- Nouriel Roubini, Steven Mihm: **Crisis Economics**, Penguin Books, 2011, Chapter 4, 5
- Carmen M. Reinhart, Kenneth S. Rogoff: **This Time is Different: Eight centuries of Financial Folly**, Princeton University Press, 2009, Part V: The US Subprime Crisis: An International and Historical Comparison
