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MAKING SENSE OF THE FINANCIAL CRISIS OF 2008

**A PRESENTATION FOR
General Electric Optimization and Control**

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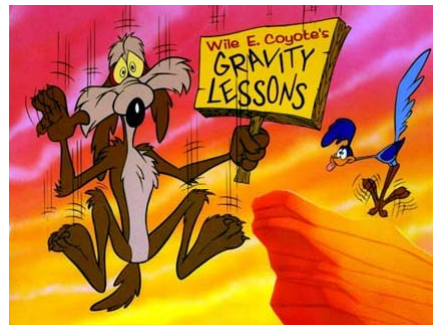
Walley's Hot Springs, Genoa, Nevada

October 28, 2008

1

What is going on?

- The U.S. economy seems to have reached what Paul Krugman calls a "Wile E. Coyote" moment, when investors at home and abroad decide that our current economic trajectory is unsustainable.
- The current focus is on banks, credit, mortgages, and employment, but we also saw a dramatic fall in the dollar, rising national debt due to expanding budget deficits, rising trade deficits, and a big jump in oil prices, commodity prices, and food prices.

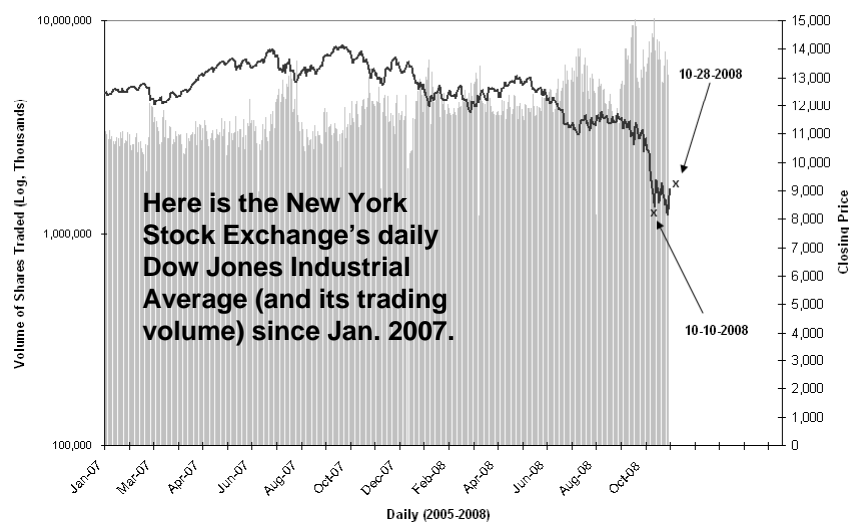


Some of the Disturbing News...

- In 2007, Roughly 1% of ALL U.S. homeowners had received a notice of foreclosure.
 - In Detroit and Stockton, this rate was 5%; in Vegas 4%.
- In August of 2008, this national rate rose to 1 out of 416 homeowners, an *annual* rate of almost 3%.
- In September, the two giant government-sponsored mortgage firms, Fannie Mae and Freddie Mac, were put into federal conservatorship, and \$200 billion in guarantees were made for their bonds.
- In October, Congress passed a \$700 billion plan to support financial markets affected by these foreclosures, but it has already changed.
- The DJIA index fell from a high of 14,164 on Oct. 9, 2007, to a low of 8,451 on Oct. 10, 2008 – a 40% drop!
- The crisis has spread across the major economies of the world, and even some of the minor ones.

3

NYSE Dow Jones Industrial Average

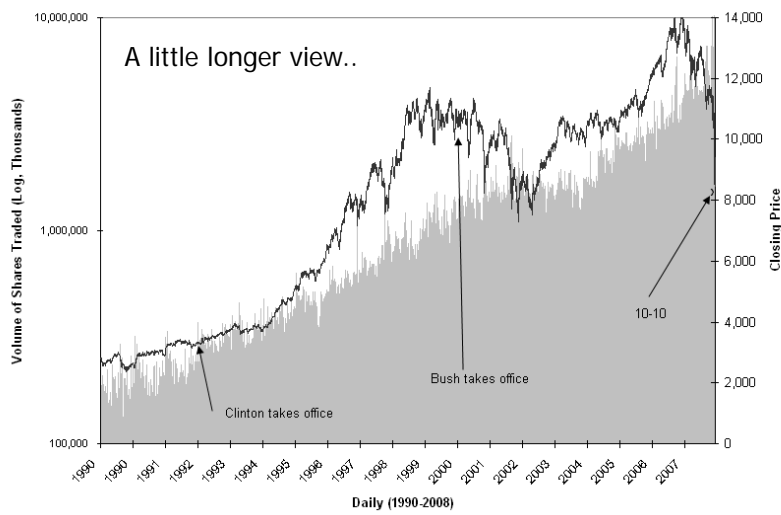


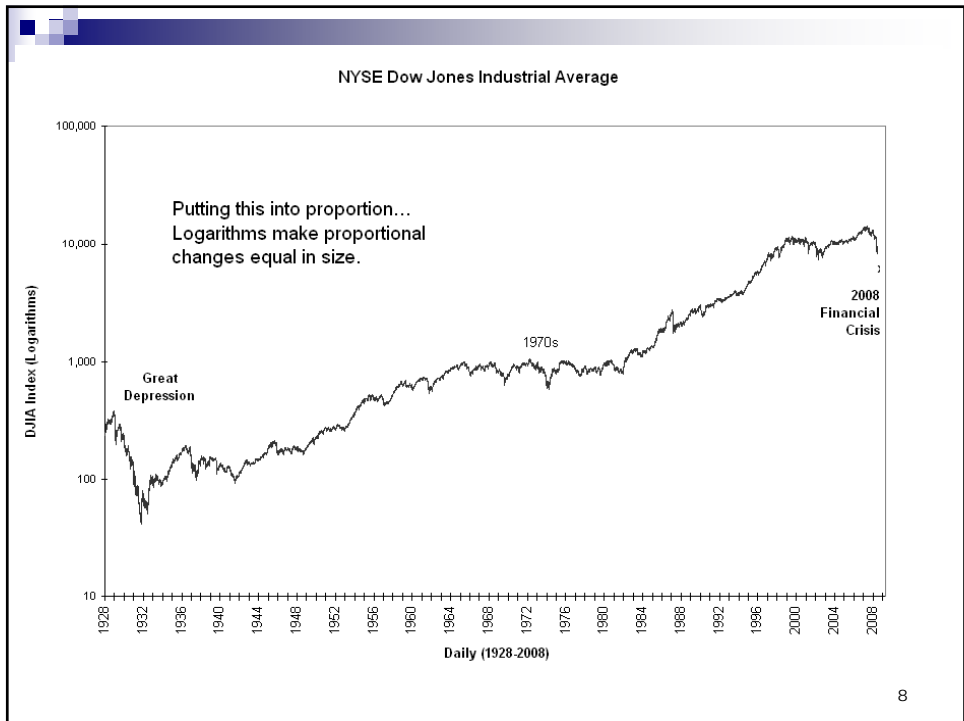
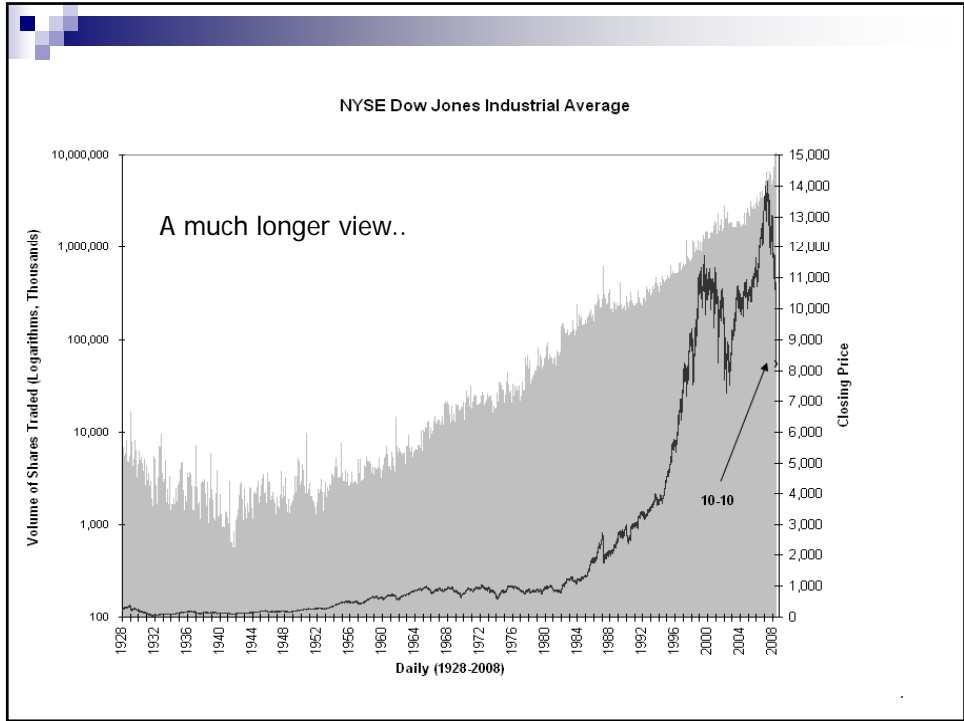
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It is hard to believe the market is acting rationally.



NYSE Dow Jones Industrial Average





Putting things in Proportion: How Big is the U.S. Financial Market?

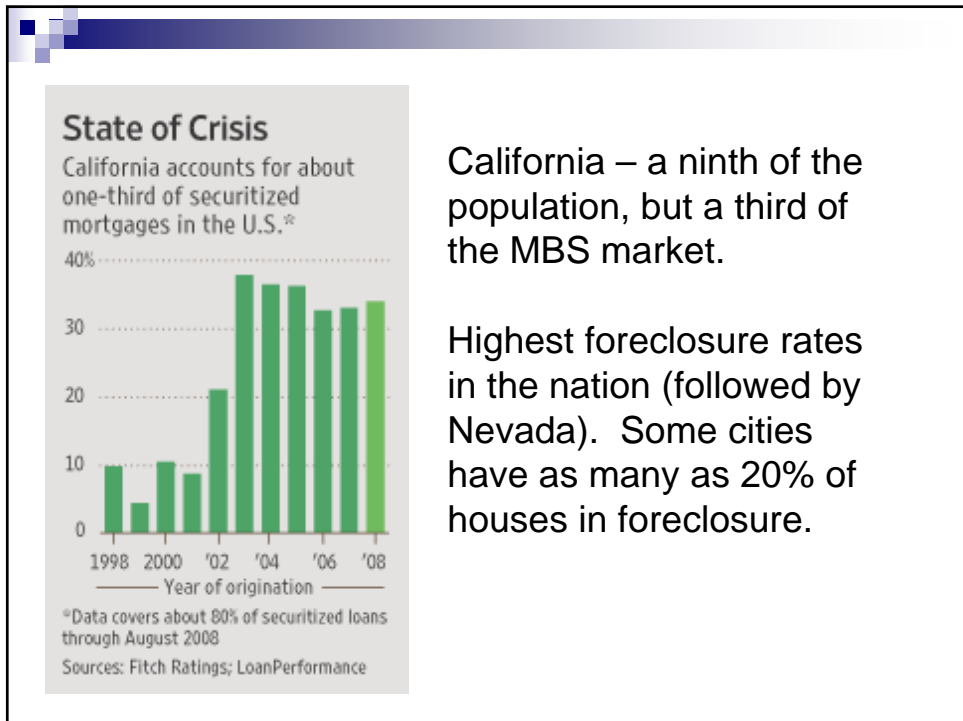
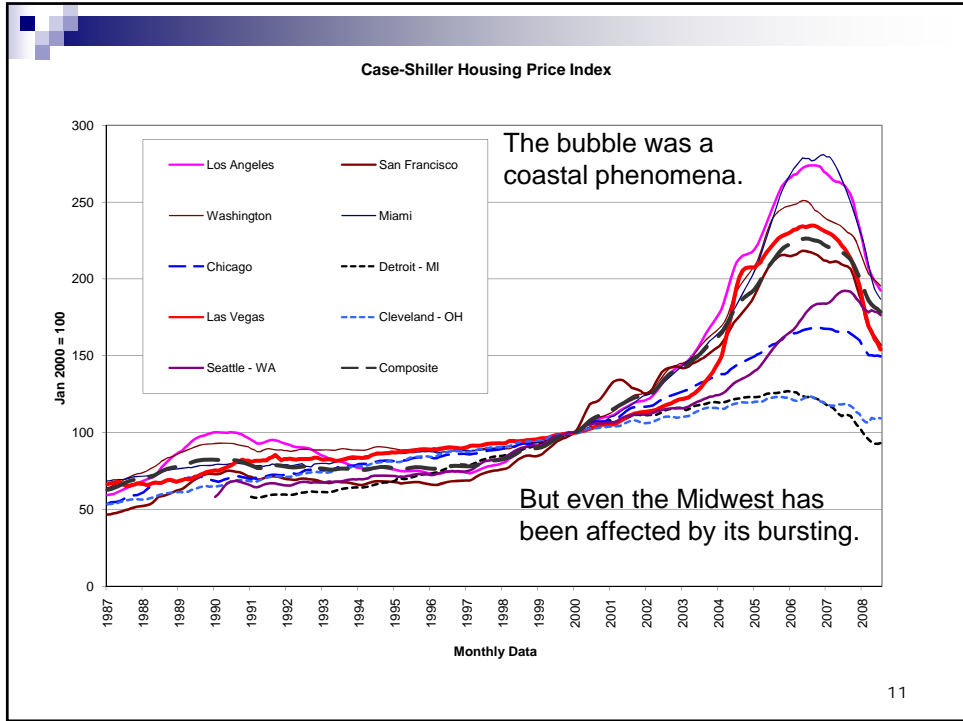
- Total US GDP: \$15 trillion per year (world \$50-70 trillion).
- US Currency: \$800 billion.
- Money Supply (M2): \$8 trillion.
- Institutional Money Funds: \$2.2 trillion.
- Commercial Paper outstanding: \$1.7 trillion.
- Total Assets of FDIC-insured institutions: \$11.8 trillion.
- Bank Industrial and Commercial Loans: \$1.5 trillion.
- Total federal debt: \$9-10 trillion
 - More than half held by government agencies.
 - More than half of remainder held by foreigners.

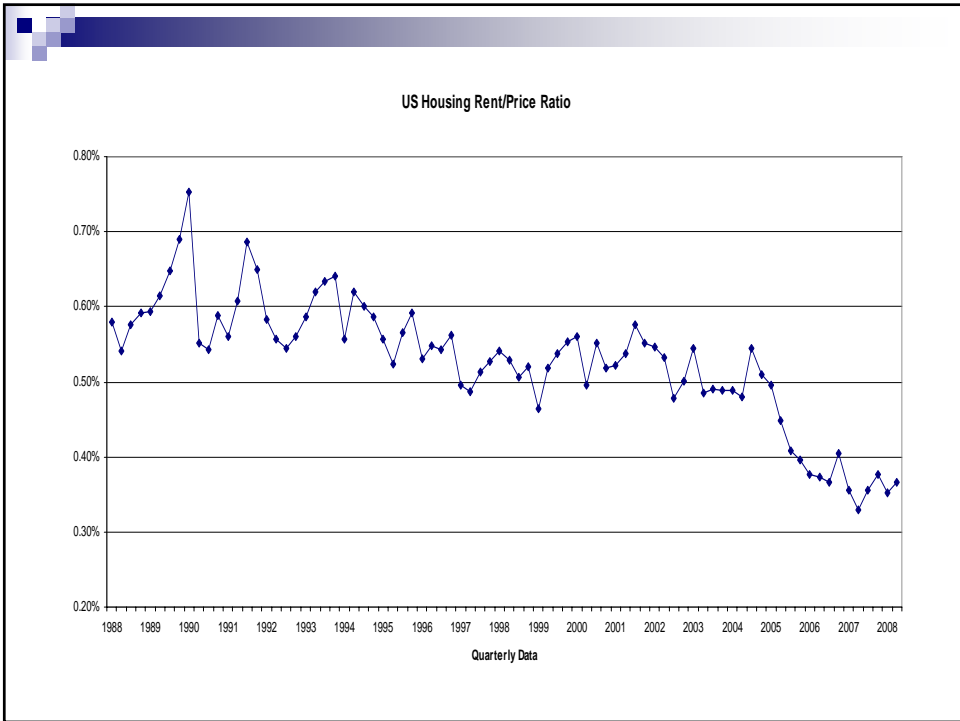
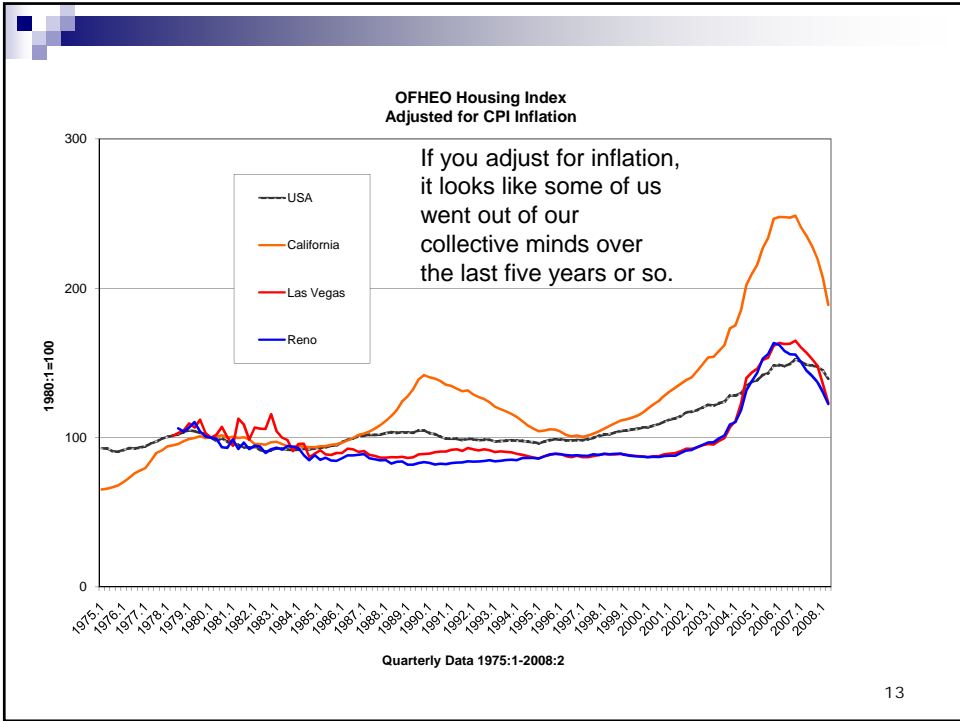
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More on Size of Financial Markets?

- Total US Stock Market Value: \$15-20 trillion, depending on the day.
- Total Outstanding Mortgages: \$13.3 trillion in 2006, plus \$2.3 trillion in new originations.
- Residential Mortgages in 2008, Q2: \$12.1 trillion.
- \$3.8 trillion outstanding held by banks.
- \$3.7 trillion repackaged by GSEs into MBSs, \$1.5 trillion more held by GSEs.
- Mortgages backed by FHA, VA, RHS: \$600 billion.

10





Where did it all go?

- Real assets – houses, factories, equipment – do not disappear in a financial crisis, but their market value does. A decline in the markets makes us all poorer, at least in money terms.
 - Housing values have declined by an estimated \$1 trillion.
- Of course, if the market declines and then rises back up, those who bought at the bottom will emerge richer.
- One of the places the wealth has gone is into excess consumption.
- For the last decade, Americans have been spending too much, and they have been letting their assets – first stocks, then houses – do their savings for them instead.
- Some of us may save, but others of us love to borrow.

15



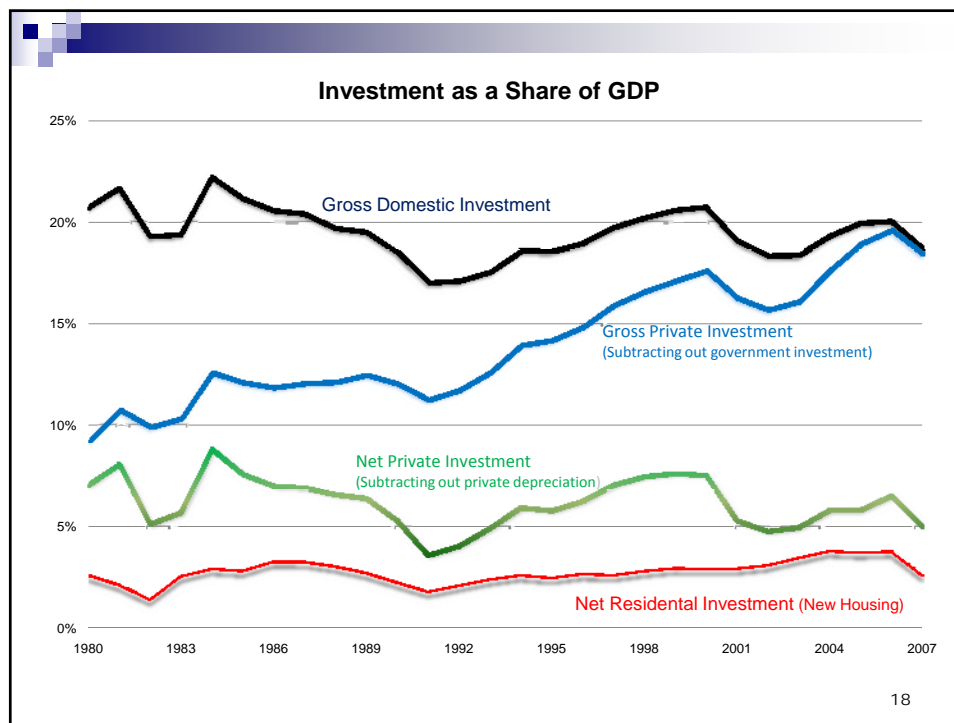
“ ‘Thou Shalt Not Use the Equity in Thy Home as an ATM Machine.’
Great, NOW you tell me.”

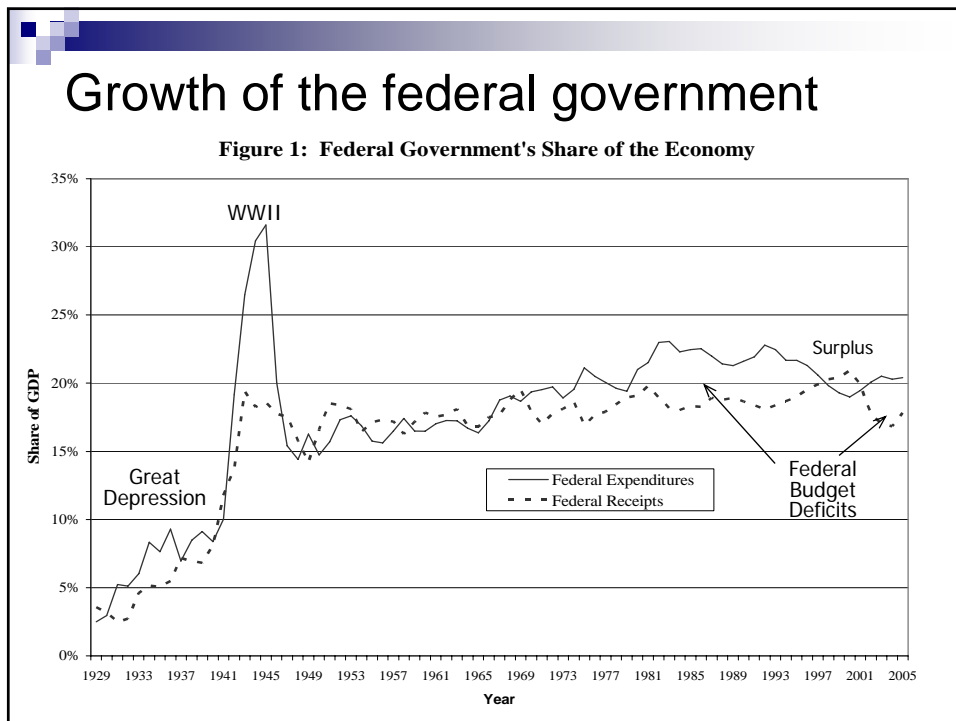
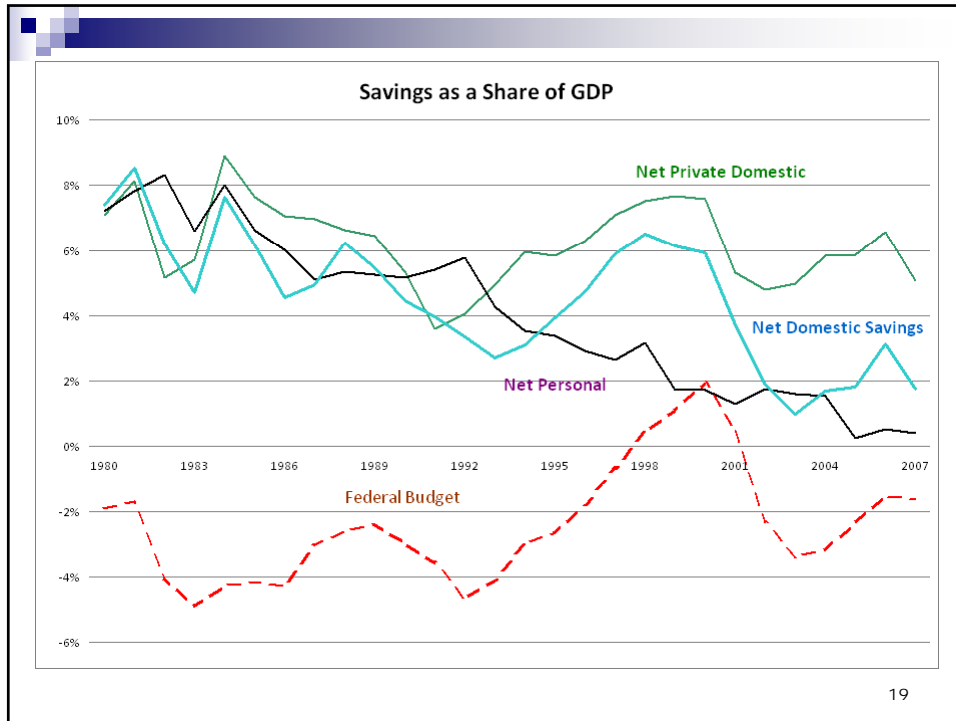
16

How did we spend so much?

- Net private investment – once capital depreciation is deducted – has slowed during the past decade, and residential housing construction is a rising share of it.
- Net domestic savings – the sum of net personal savings, net corporate savings, and government savings – has fallen even more, because of government budget deficits and disappearing personal savings.
- There is thus a growing savings gap between net investment and net investment.
- This savings gap must be financed by borrowing from foreigners. This causes us to run trade deficits because they are lending us money instead of buying our exports.

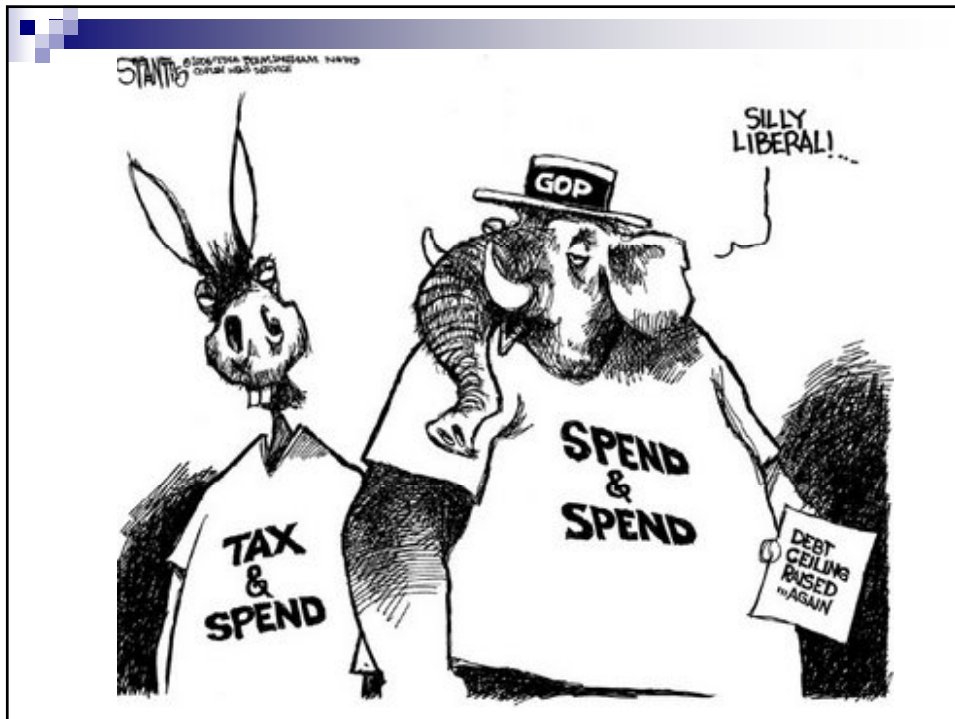
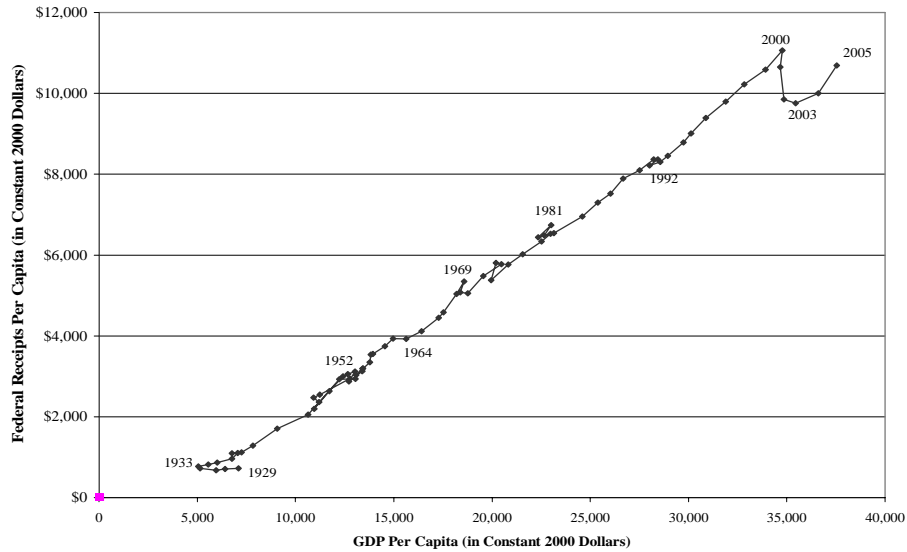
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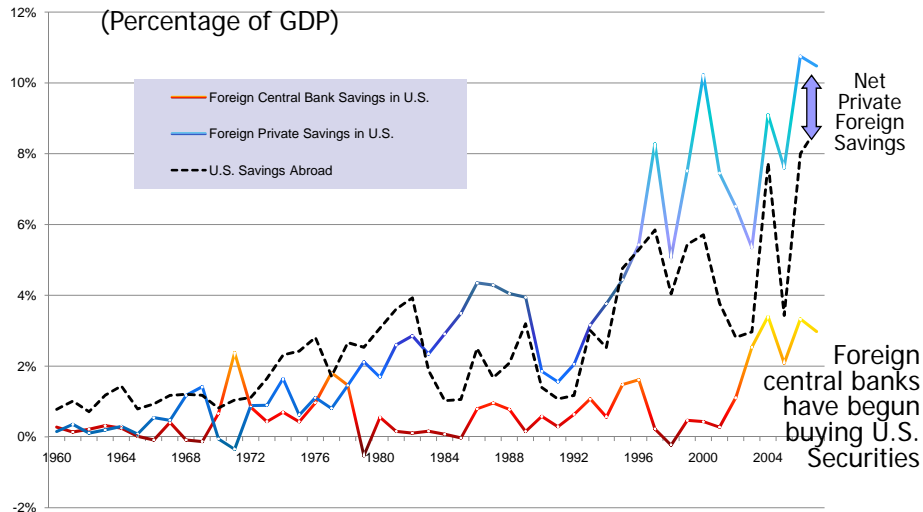


Taxes have risen with income (until just recently)

Figure 2: The Relationship between Income and Taxes



Net foreign savings has to make up the difference



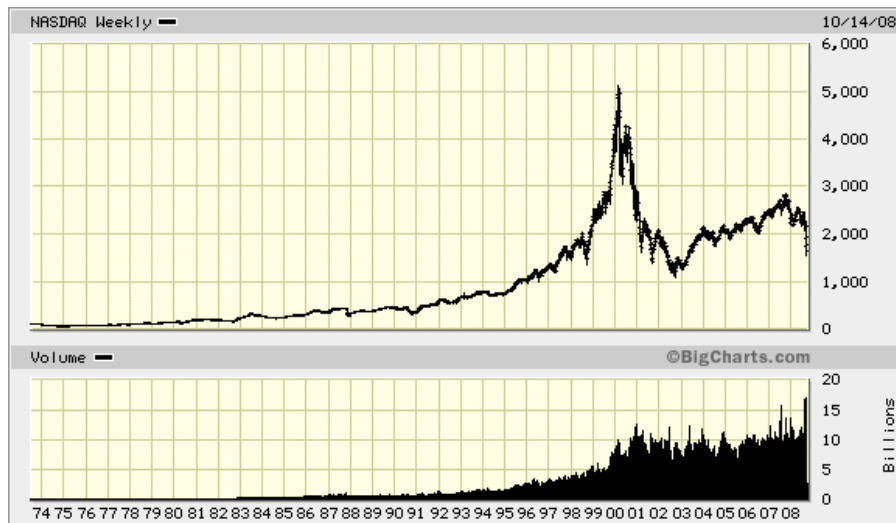
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Why did all the private borrowing happen?

- What is a bubble?
 - Asset fundamentals: a projection of future net earnings (e.g., dividends, implied rents) discounted by a risk-adjusted interest rate.
 - The “animal spirits” of investment – future asset values depend on what others think it will be.
 - Past prices contain information, but past price changes are misleading... the famous “biggest fool” theory.
- The Tech bubble
- The Housing bubble
 - The Center versus the Coasts
 - Easy credit – a self-fulfilling prophecy.
 - Speculators vs. homeowners.

24

Tech Stocks: The Last Big Bubble



25

What Went Wrong with the Mortgage Industry?

- Commercial Banks
- Subprime Loans
- Mortgage Brokers
- Mortgage-Backed Securities
- Investment Banks
- Underwriters
- Fannie Mae and Freddie Mac

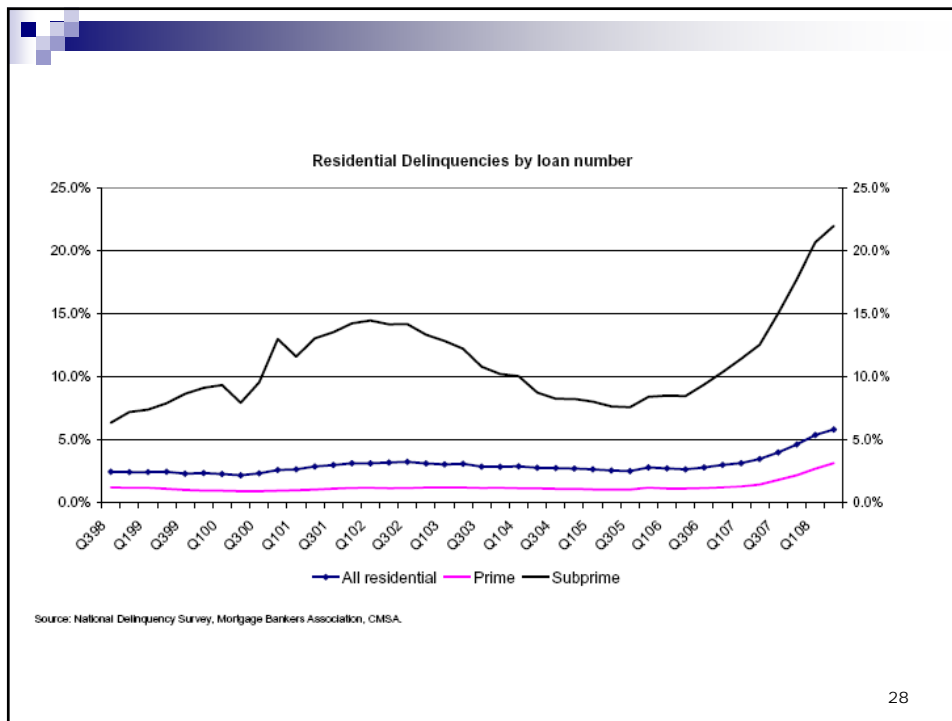
26

Hey, Big Lender!

(Who are they?)

Top Originators in Q2 07				
(Dollars in Millions)				
Rank	Company	Location	Origination Volume	
			Q2 07	Q2 06
1	Countrywide Financial	Calabasas, CA	\$130,163	\$118,509
2	Wells Fargo Home Mtg.	San Francisco, CA	\$79,957	\$116,040
3	CitiMortgage, Inc.	O'Fallon, MO	\$61,252	\$48,330
4	Chase Home Finance	Iselin, NJ	\$59,561	\$45,743
5	Bank of America	Charlotte, NC	\$51,918	\$44,702
6	Washington Mutual	Seattle, WA	\$42,514	\$52,592
7	Wachovia	Charlotte, NC	\$28,440	\$31,003
8	IndyMac Bancorp, Inc.	Pasadena, CA	\$22,505	\$20,060
9	GMAC ResCap	Minneapolis, MN	\$22,263	\$28,266
10	SunTrust Mortgage, Inc.	Richmond, VA	\$18,261	\$15,331

27



28

Who Lends in the Subprime?

Top Subprime Originators in Q2 07

(Dollars in Millions)

Rank	Company	Location	Subprime Volume	
			Q2 07	Q2 06
1	Countrywide Financial	Calabasas, CA	\$5,721	\$11,206
2	First Franklin Financial	San Jose, CA	\$5,304	\$6,711
3	HSBC Finance	Prospect Heights, IL	\$4,707	\$8,463
4	Option One Mortgage (E)	Irvine, CA	\$4,500	\$8,273
5	Wells Fargo Home Mortgage	San Francisco, CA	\$4,106	\$6,844
6	Chase Home Finance	Woodcliff Lake, NJ	\$3,305	\$2,884
7	Washington Mutual (E)	Seattle, WA	\$3,280	\$7,280
8	CitiFinancial (E)	Baltimore, MD	\$3,000	\$6,500
9	EMC Mortgage	Irving, TX	\$2,560	\$1,749
10	WMC Mortgage Corp.	Burbank, CA	\$1,501	\$8,380

29

Who are Fannie Mae and Freddie Mac?

Federal National Mortgage Administration (FNMA), created by FDR in 1938, privatized by LBJ in 1968. Buys conforming loans from banks to bundle into Mortgage-Backed Securities (MBSs) to resell to investors. Bank can then finance more mortgages without needing more deposits.

Federal Home Loan Mortgage Corporation (FHLMC) was created in 1970 because the market was too big for one.

- Government sponsored, privately owned by shareholders.
- Two firms share the “conforming” secondary mortgage market, and government guarantees lead to lower interest.
- Combined size of roughly \$5 trillion in mortgages, either held or mortgage-backed securities sold and guaranteed.

30

Risk, Return, and the Essentials of Leveraging

- It is a fundamental argument of economic theory that higher average returns can only come from higher risk.
- Risk-taking can increase the long-run growth of the economy, and is thus (usually) more efficient.
- Risk can be hedged and pooled, but not eliminated.
- Insurance against risk creates a moral hazard.
- Leveraging is the use of debt to increase the expected return (and thus the risk) of equity.
- Leveraging, however, makes the lender's fate contingent on that of the borrower.
- Lots of leveraging makes us very interdependent, and financial problems are very contagious.

The Downside of Leveraging

- Individuals bear more risk in return for their higher average returns.
- There is a contagion problem, however:
 - Bank runs are a classic example
 - Margin calls forcing stock sales
 - Resetting ARMs due to risk premium forcing more foreclosures
 - Panic due to a lack of transparency
- Because the consequences of a downward spiral can be grave, government becomes the insurer of last resort – but usually receives no premium from the financial markets for providing it.
- There is a moral hazard problem. If financial markets know the government will bail them out, they are more likely to keep taking excessive risks or making unwise decisions. Wise decision makers see inequity.

Derivatives

- Most financial assets are rights to real assets & income.
- A derivative is a financial asset whose value is derived from *other* financial assets, such as:
 - Wheat futures
 - Stock options
 - Libor swaps to convert floating to fixed rates
- In essence, a derivative is a way of buying or selling financial insurance against price changes.
- Some derivatives can get very complicated, especially when they are derivatives of derivatives (e.g., the so-called exotics).
- A mortgage-backed security can be thought of as a first generation derivative.

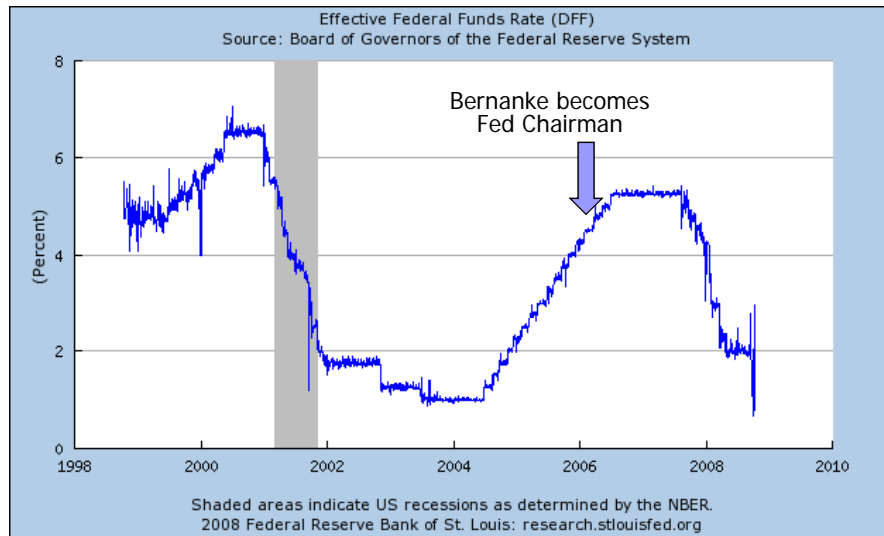
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Why are Derivatives a Problem?

- In theory, financial insurance is a good thing. Risk averse folks can trade it to those better able to bear it (in return for a higher income), and both benefit.
- But insurance markets are regulated to make sure the insurer has adequate capital in case of a hurricane. Derivative markets are not, and depend on the wise judgment of the buyer, the reputation of the seller.
- Derivative markets can be complex, and traders on both sides may not realize what they are doing. When events happen, consequences can be a surprise.
- Derivatives are not transparent, and often off-book.
- Derivative market > 500 **Trillion** Dollars (BIS est.).

34

Greenspan and the Fed helped fuel the bubble, and then helped to pop it.

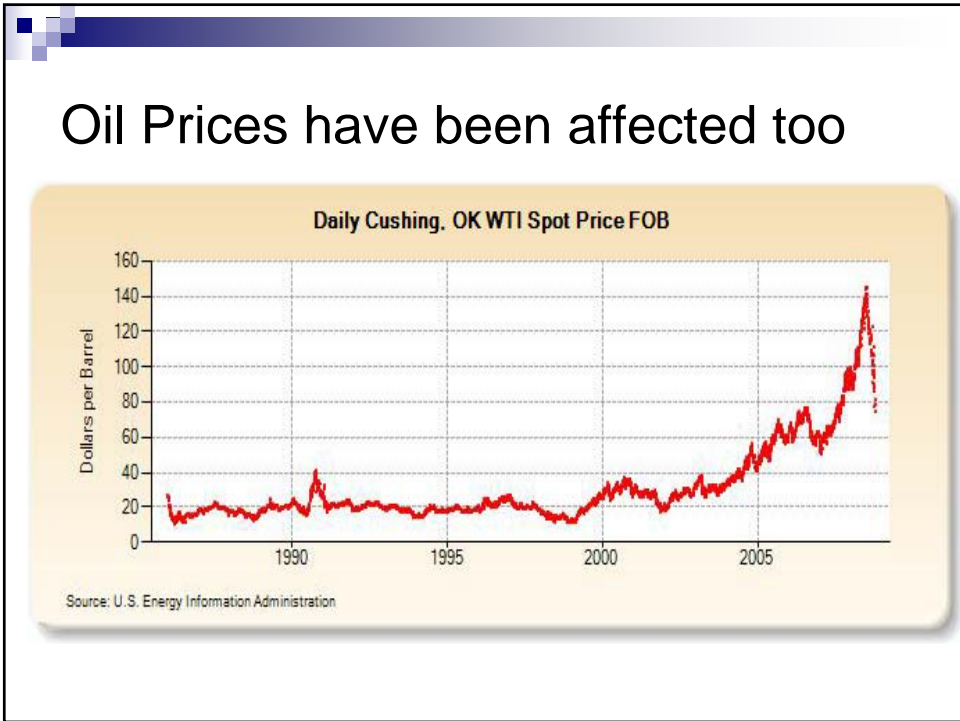
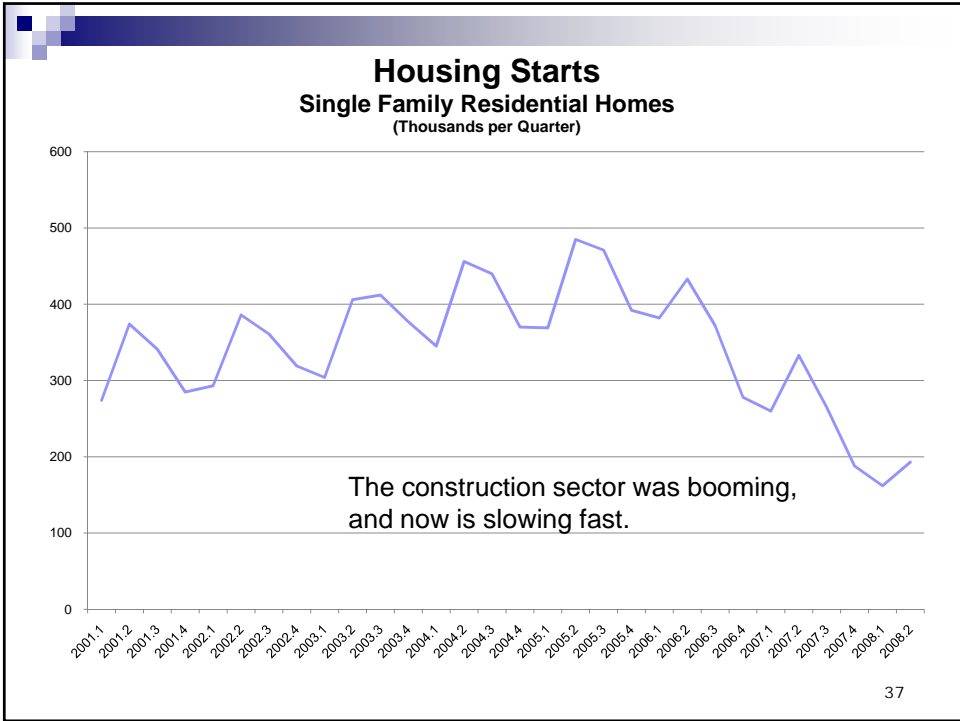


This affects the Real Economy too!

In 2006, as a share of U.S. Gross Domestic Product:

- Construction accounted for \$630 billion, or 5% of GDP.
- Finance and insurance produced \$1.1 trillion in income, or 8% of GDP.
- Real estate accounted for \$1.4 trillion, or 12% of GDP.
- These three sectors alone are a quarter of our economy.
- Their combined income exceeds the entire federal budget! (*At least before 2008.*)
- And of course, when banks stop lending, the rest of the economy slows to a halt too.
- More people have retirement savings in stocks and housing, so this affects their ability to retire short-term.

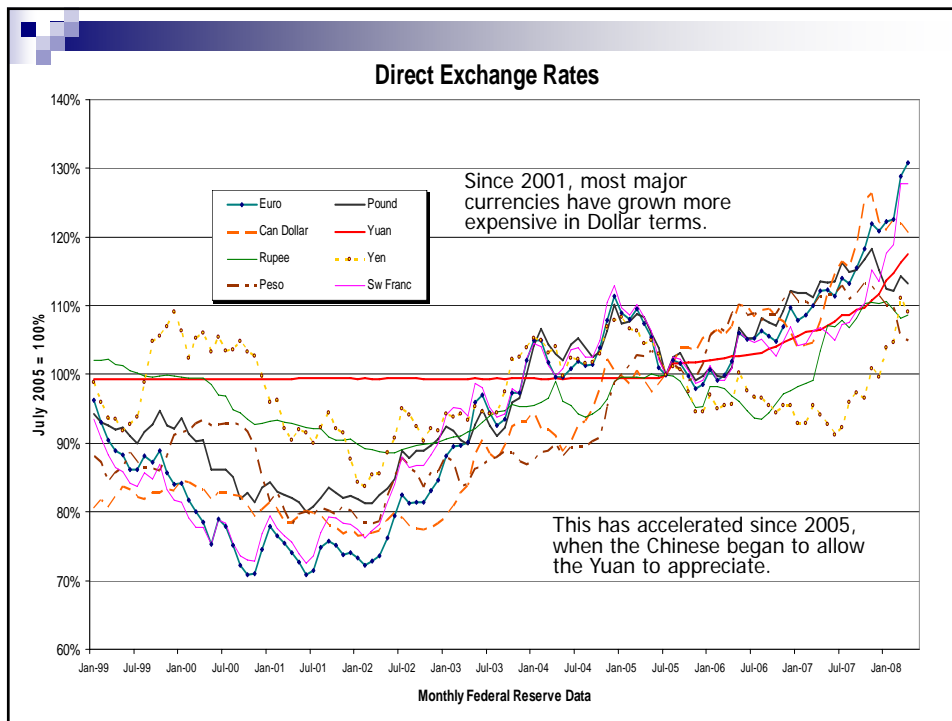
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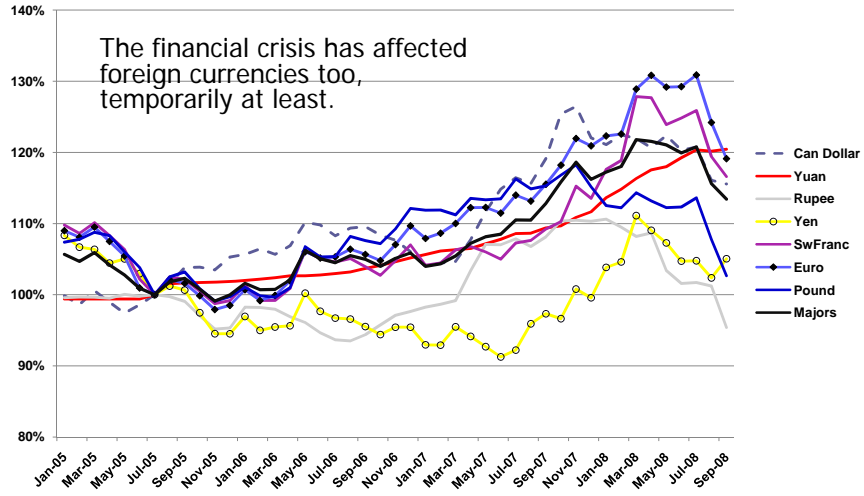
What about the Rest of the World?

- Trade deficits caused by savings gap.
- Dollar has fallen as this has become obviously unsustainable.
- Globalization has led to a dramatic increase in financial interdependence, lending, and leveraging.
- Derivatives market knows no borders.
- Many foreign banks made similar choices following the U.S. lead.
- A slowdown in U.S. economy affects exports from foreign countries, helping to slow the rest of the world too.

39



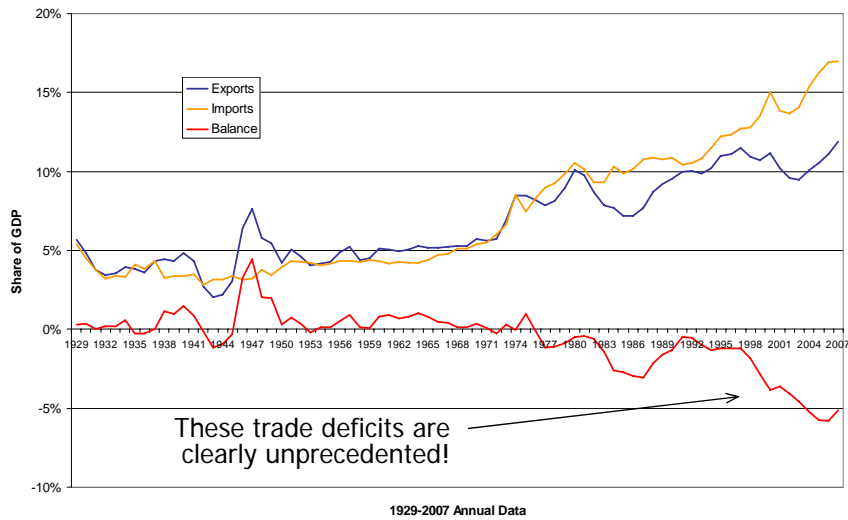
Currency Movements since 2005



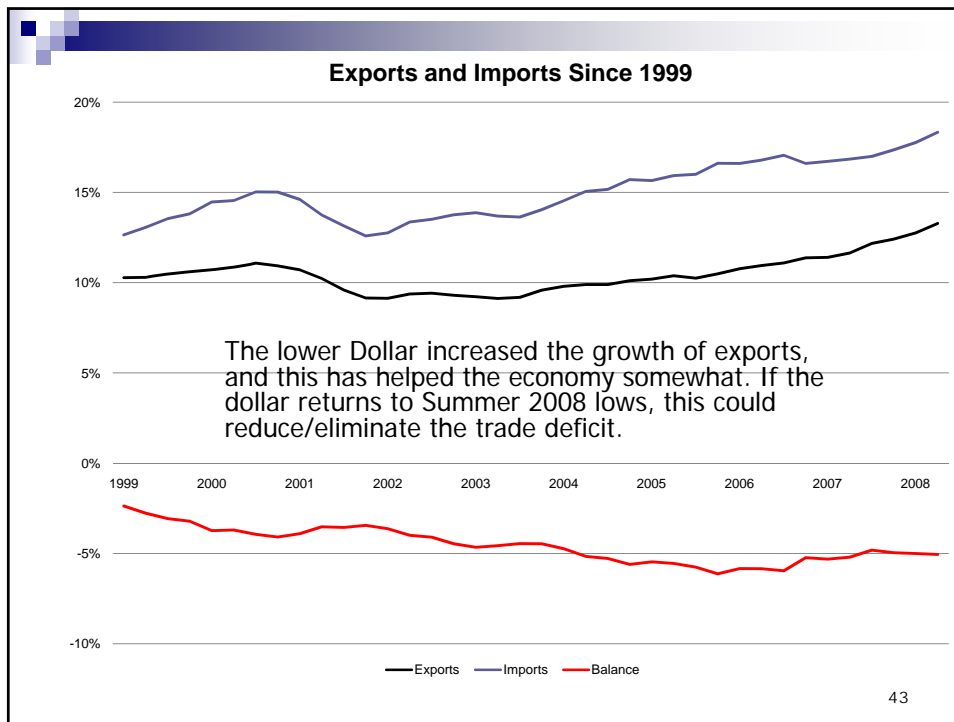
41

What about our trade deficits?

International Trade in the United States



42



- ## Comparisons to the Great Depression
- DJIA lost 46% of its value from 10/10/1929 to 10/9/1930.
 - In 1929, 1.4% of homeowners lost home to foreclosure.
 - In first ten months of decline alone, 744 banks failed. Then it got worse through Spring 1933.
 - Overall, depositors lost \$140 billion. 1929 GDP was \$103 billion, so a comparable loss today would be more than \$20 trillion.
 - GDP declined by 1/3, unemployment rose to 25%.
 - Depression spread from here to the rest of the world.
 - The result was a tectonic shift in the political structure.
- 44

Attitudes in 1929

Andrew W. Mellon, Hoover's Treasury Secretary:

- "Liquidate labor, liquidate stocks, liquidate the farmers, liquidate real estate."
- "It will purge the rottenness out of the system. High costs of living and high living will come down. People will work harder, live a more moral life. Values will be adjusted, and enterprising people will pick up the wrecks from less competent people."

Is another Great Depression likely?

Short Answer: No. Why Not?

- During the Hoover Administration, not only was any desire or effort to intervene inadequate, the Federal Reserve responded by *tightening* the money supply and made it much worse. It also failed to act as lender of last resort for solvent banks with cash flow problems.
- Deflation resulted. Loans got harder to repay.
- The Gold Standard forced foreign central banks to reduce their money supplies in response.
- The U.S. and other economies raised tariffs and world trade shrunk, leading to a downward spiral.

Trying to keep it all from burning down this time...

- Bear Stearns investment bank collapsed in March, government gave guarantees to JP Morgan Chase to buy it.
- Housing and Economic Recovery Act, July 2008: \$300 billion in guarantees for subprime borrowers.
- Lehman Brothers investment bank collapsed (Nomura Holdings). Merrill Lynch bought by Bank of America, WaMu had bank run and collapsed, parts sold to JPMorgan Chase.
- Goldman Sachs, Morgan Stanley converted from invest. banks to bank holding companies.
- Feds lent AIG up to \$85 billion for 80% share.
- Fannie Mae, Freddie Mac taken over by federal government.
- Emergency Economic Stabilization Act, Oct. 2008: initial focus on purchase of NPL assets, but switched recently to recapitalization.

Assigning Blame? Lots of Choices

- **Federal government** – for encouraging more people to buy homes they could not afford and socializing insurance.
 - Fair Housing Act of 1968, Community Reinvestment Act (CRA) of 1977. Congressman Barney Frank is seen as an advocate of this policy, and since 2007 chairs House Financial Services Committee.
- **Federal government** – for removing regulations on derivative markets, and easing regulations on mergers and bank lending practices.
 - Senator Phil Gramm, Gramm-Leach-Bliley Act of 1999.
- **Federal Reserve System** – for trusting markets to regulate themselves.
- **Mortgage brokers and lenders** – for making bad loans and selling them off to others.
- **Fannie Mae and Freddie Mac** – for using implicit government guarantees to securitize bad loans, and for lobbying federal government to let them do so.

More people to blame...

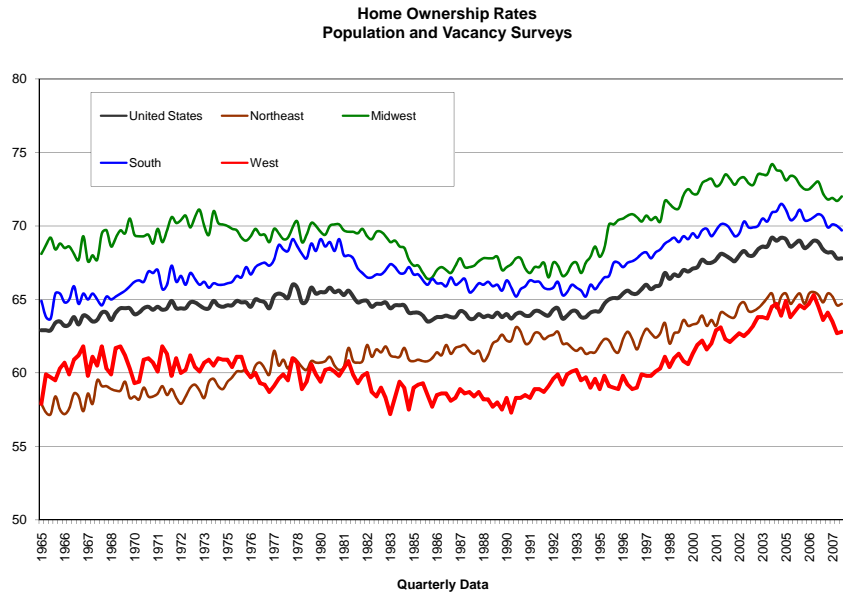
- **New homebuyers** – especially poor people, who bought houses they could not afford, or who lacked the resources to pay their mortgages if the economy turned sour.
- **Existing homeowners** – who used home equity loans to finance their own consumption.
- **Speculators** – who bought houses as investments, with the intent of renting them out and reselling them when prices rose.
- **Wall Street firms** – for underestimating and/or disguising actual risks, and not taking responsibility for bad decisions.
- **Derivative markets, investment banks, and hedge funds** – for selling insurance without capital requirements, in essence making bets that they would fail to make good.
- **Financial market consolidation** – for creating big firms that put others at greater risk from the effects of bad decisions.

49

Financial Crises Before and After the Great Depression

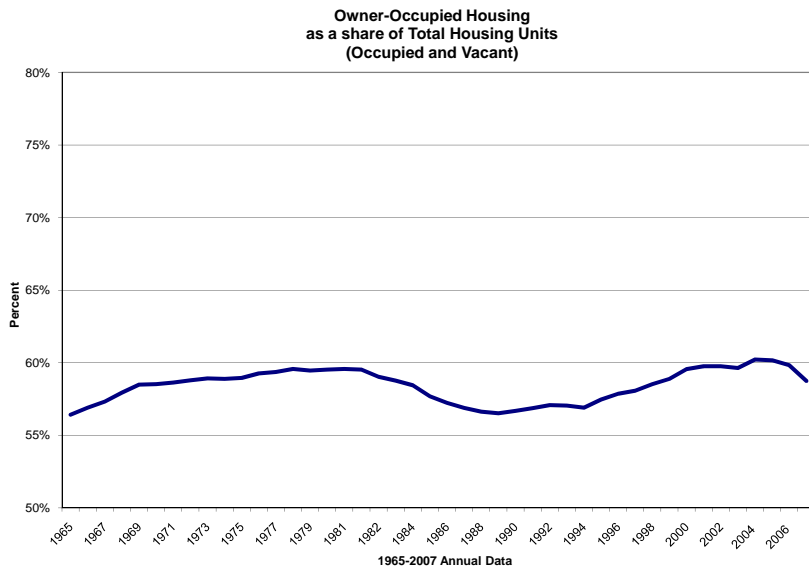
- There have been financial panics before: 1816-1819, 1825, 1837, 1857, 1873, 1893, and 1907. Not all resulted in recessions.
- Prior “depressions” included 1837, 1873, 1893, 1907, and 1920-21.
- Government intervention could not have been the sole cause of these, because government intervention was very limited – there was not even a central bank until 1913.
- Financial markets are particularly subject to market failures: information about risk and returns, external costs of contagion, and lack of competition.
- Insurance – whether private or public – creates a moral hazard.
- Financial markets are riskier than other markets, and the higher the expected return, the higher the risk.
- The problem is when we conveniently forget about this risk.

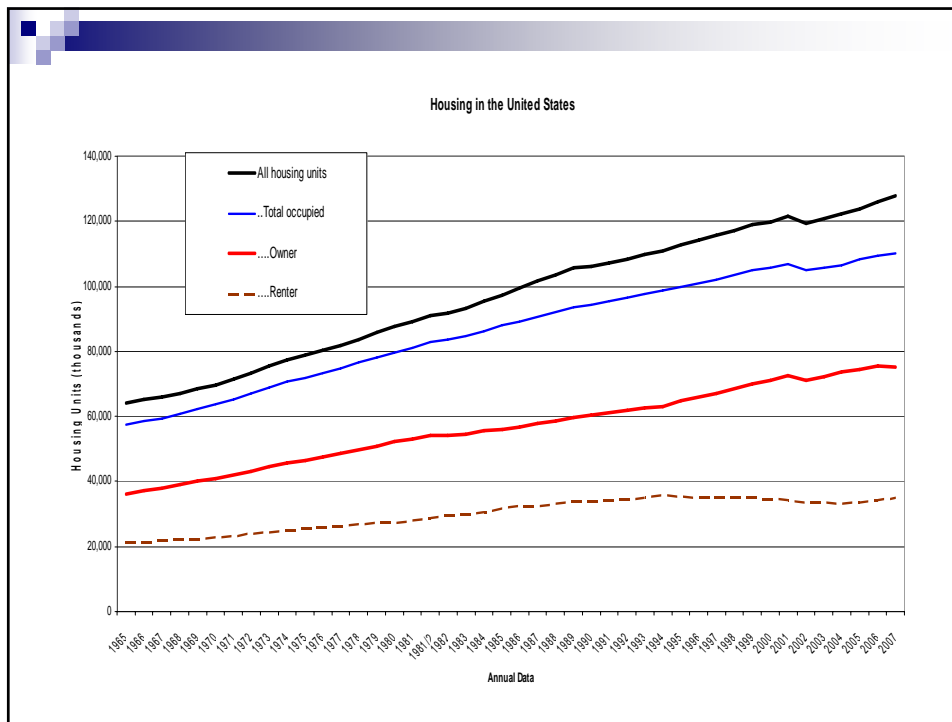
Survey data suggests that many new people became homeowners.



51

But if we include vacancies, the share of owner-occupied housing is not so high – but it did recover from the slump in the 1980s.





The Federal Reserve chose not to regulate derivatives or act to prevent bubbles

Alan Greenspan recently testified,

- "I made a mistake in presuming that the self-interests of organizations, specifically banks and others, were such as that they were best capable of protecting their own shareholders and their equity in the firms."

Congressman Waxman asked,

- "In other words, you found that your view of the world, your ideology, was not right, it was not working."
- "Absolutely, precisely," Mr. Greenspan replied. "You know, that's precisely the reason I was shocked, because I have been going for 40 years or more with very considerable evidence that it was working exceptionally well."

- Congressional testimony, October 22, 2008

54

Other views

- Markets require both buyers and sellers.
- Mortgage lenders were willing to lend to people, and people were willing to borrow, without serious consideration of the risk that the bubble could pop.
- As a result, Americans were able to stop saving to finance higher consumption.
- There are human limitations to our ability to see potential problem and analyze risk.
- Financial markets elsewhere fell for the same illusions.
- Be wary of simple answers or single causes (especially partisan ones). Be similarly wary of simple philosophies or ideologies that ignore complex interactions.

From David Brooks

“If you start thinking about our faulty perceptions, the first thing you realize is that markets are not perfectly efficient, people are not always good guardians of their own self-interest and there might be limited circumstances when government could usefully slant the decision-making architecture.

“... But the second thing you realize is that government officials are probably going to be even worse perceivers of reality than private business types. Their information feedback mechanism is more limited, and, being deeply politicized, they’re even more likely to filter inconvenient facts.

“This meltdown is not just a financial event, but also a cultural one. It’s a big, whopping reminder that the human mind is continually trying to perceive things that aren’t true, and not perceiving them takes enormous effort.”

New York Times, October 28, 2008

56



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- Any questions? Email me at:
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- This presentation is online at:
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Thank you.