

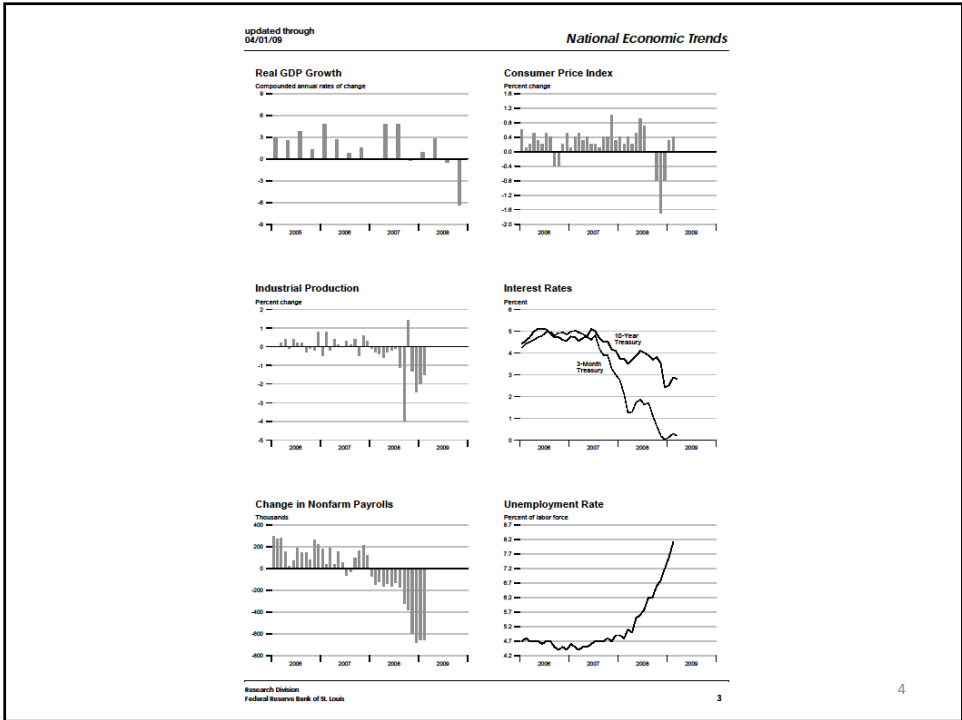
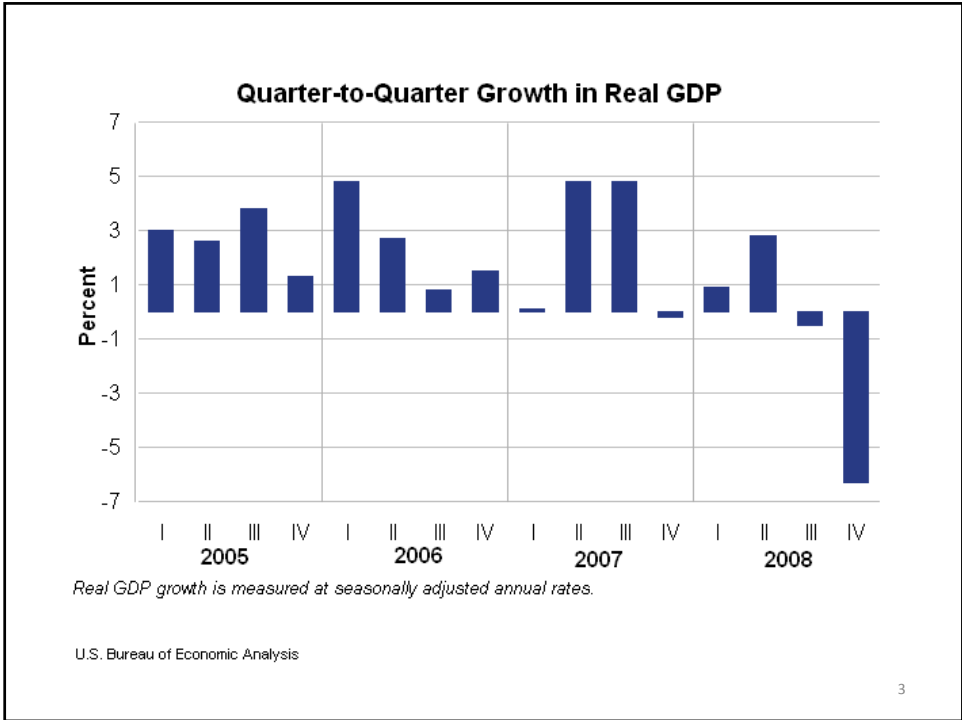
Crisis and response in the USA

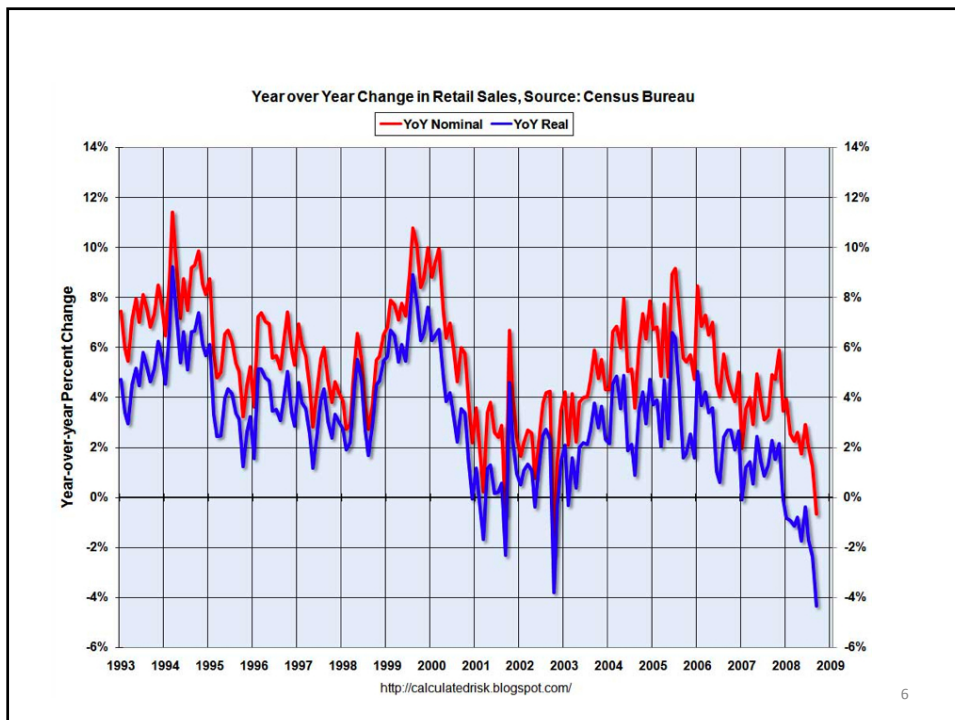
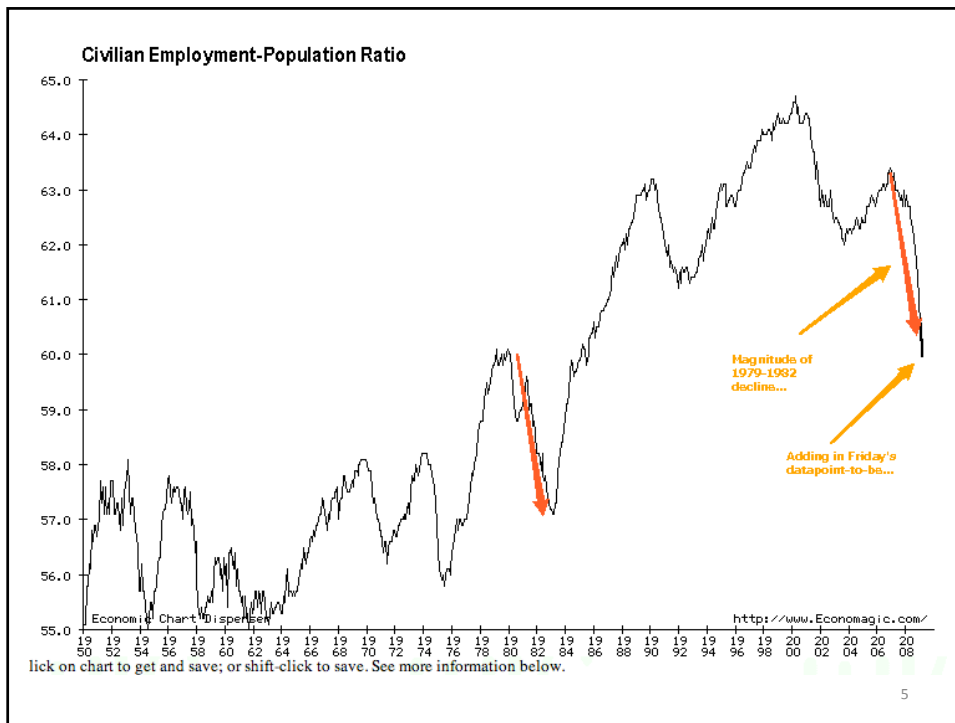
Frank R. Lichtenberg

Columbia University (New York),
Victoria University (Melbourne), and
National Bureau of Economic Research (Cambridge, MA)

Outline

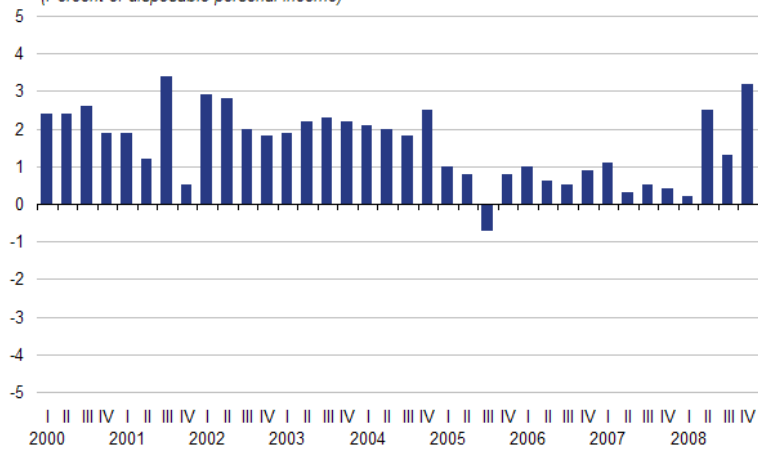
- The current U.S. economic situation and outlook
- Interpretation of this situation from the perspective of macroeconomic theory: a large negative aggregate demand shock
- Subprime credit crisis as the primary cause of the demand shock
- Challenges confronted by policies to accelerate recovery from the demand shock





Personal Saving Rate

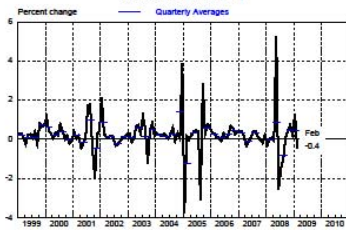
(Percent of disposable personal income)



U.S. Bureau of Economic Analysis

REAL DISPOSABLE INCOME

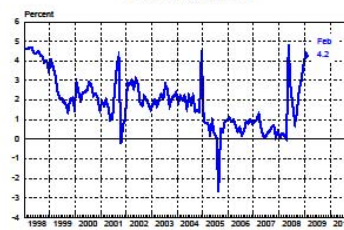
Seasonally Adjusted



Source: Bureau of Economic Analysis.

PERSONAL SAVING RATE

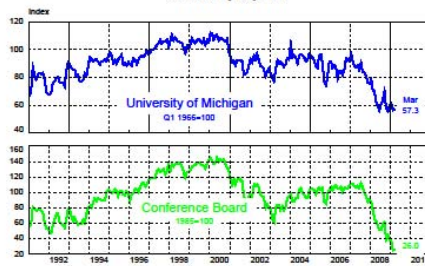
Seasonally Adjusted



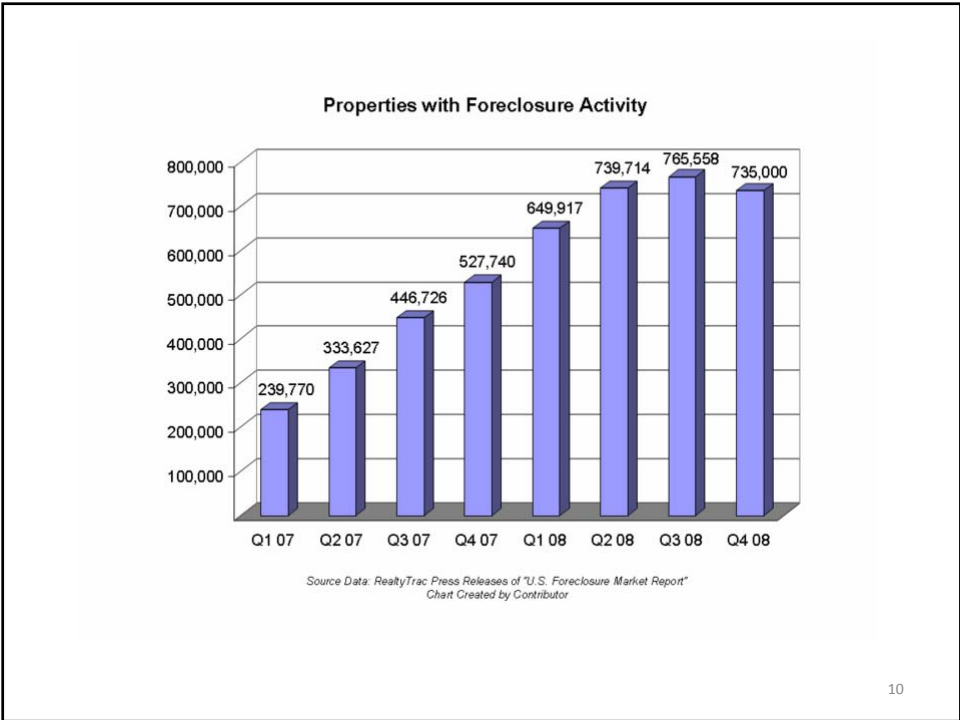
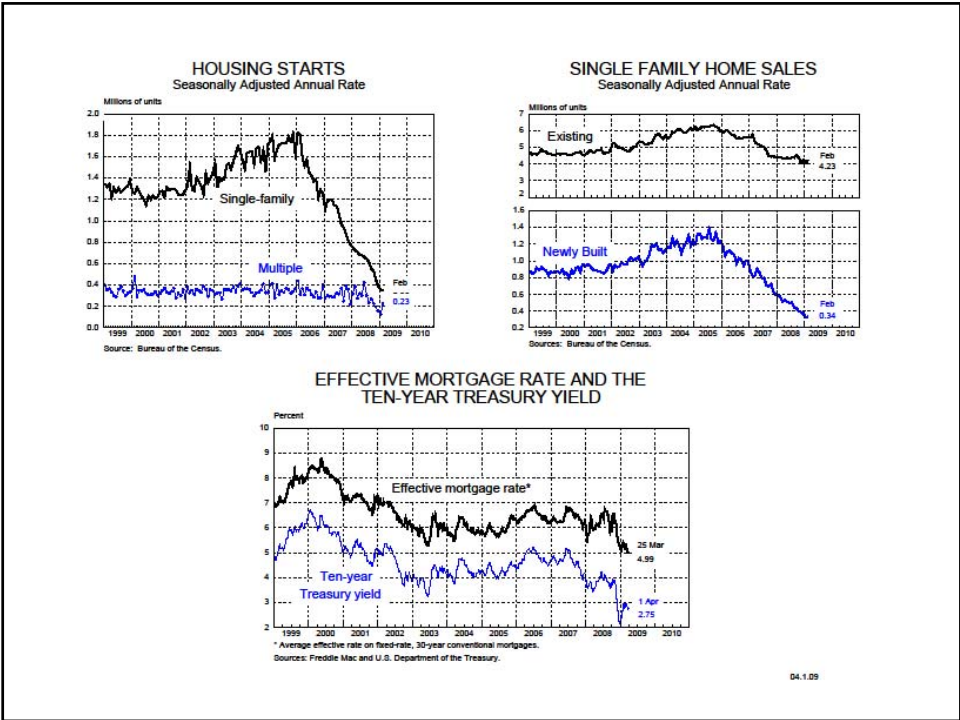
Source: Bureau of Economic Analysis.

CONSUMER SURVEYS

Seasonally Adjusted

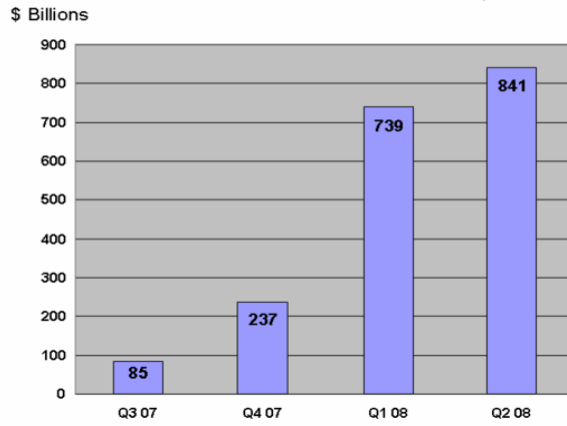


Sources: University of Michigan; NFO Research Inc. and The Conference Board.



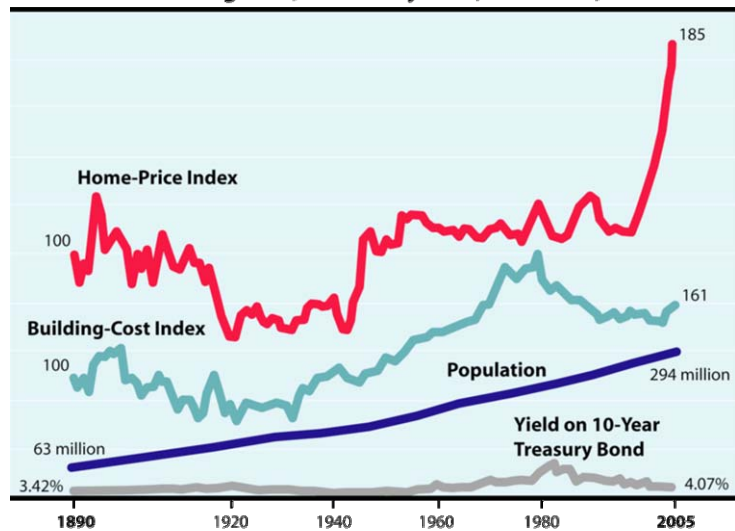
Mortgage-Backed Securities (MBS) Downgrades

Rating agencies (e.g., S&P and Moody's) have downgraded the credit ratings on nearly \$1.9 trillion in MBS. This places pressure on financial institutions holding these securities to write down their value, potentially requiring banks to acquire additional capital.

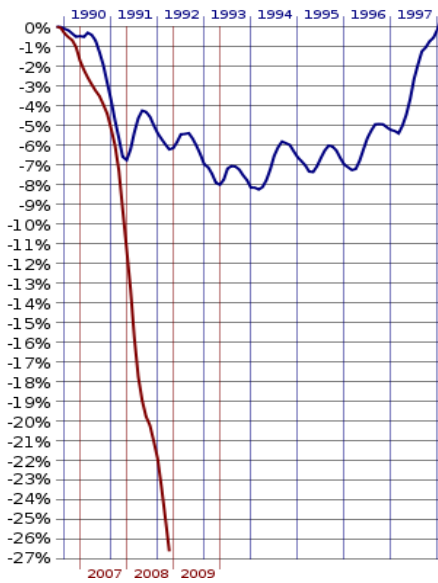
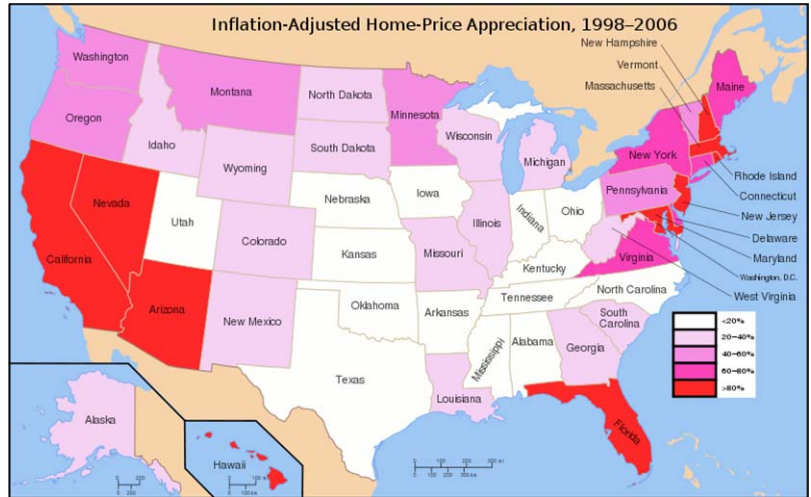


Source data: Fortune Magazine, 8/4/08

Inflation-adjusted U.S. home prices, Population, Building costs, and Bond yields (1890–2005)

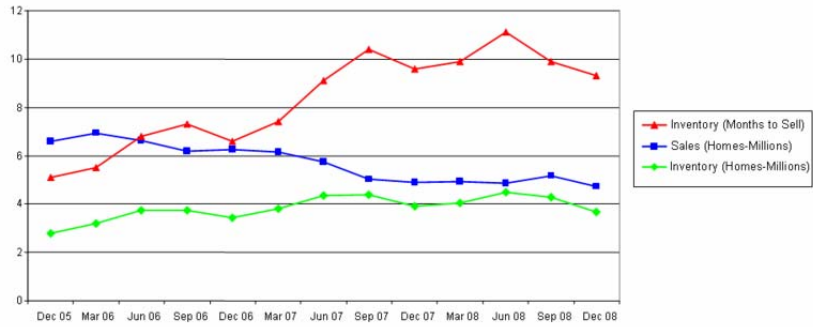


Source: *Institutional Esuberance*, 2d ed. (Fig. 2.1)



Comparison of the percentage change in the Case-Shiller Home Price Index for the housing corrections in the periods beginning in 2005 (red) and the 1980s-1990s (blue), comparing monthly CSI values with the peak values immediately prior to the first month of decline all the way through the downturn and the full recovery of home prices.

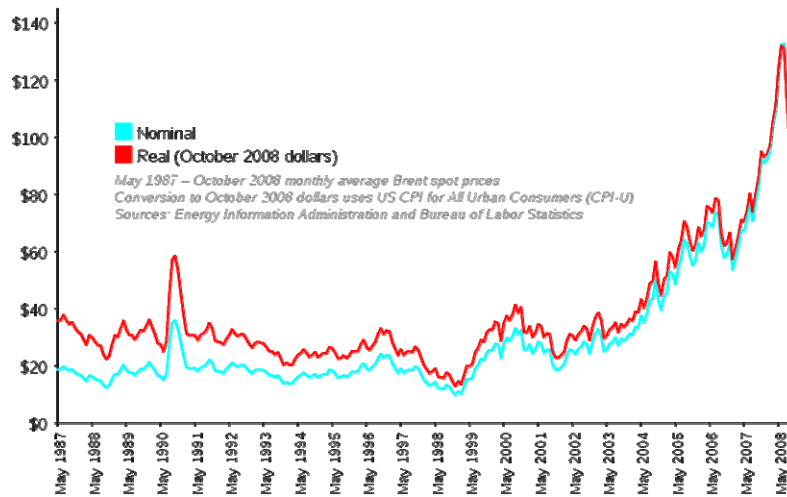
U.S. Existing Home Sales, Inventory, and Months Supply December 2005 – December 2008



Each sales data point (blue line) is annualized based on the most recent month's rate of sale.
The inventory figure (green line) represents the number of homes for sale at a point in time.
The inventory months to sell (red line) is how many months it would take to sell the existing inventory.

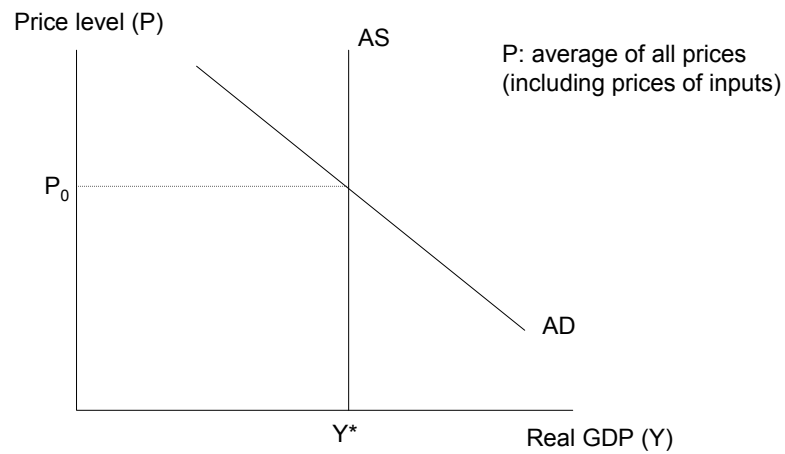
Source Data: National Association of Realtors (NAR)
Chart Created by Contributor

Brent Spot monthly



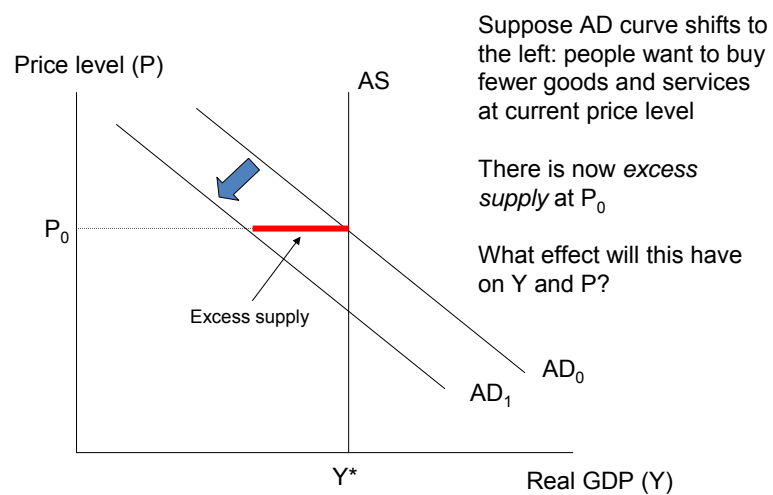
May 1987 – October 2008 monthly average Brent spot prices
Conversion to October 2008 dollars uses US CPI for All Urban Consumers (CPI-U)
Sources: Energy Information Administration and Bureau of Labor Statistics

Aggregate Supply-Aggregate Demand interpretation



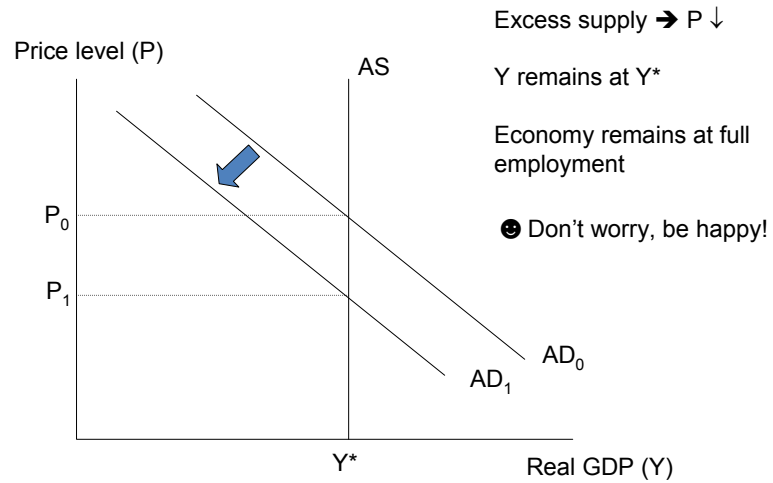
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Effect of a demand shift



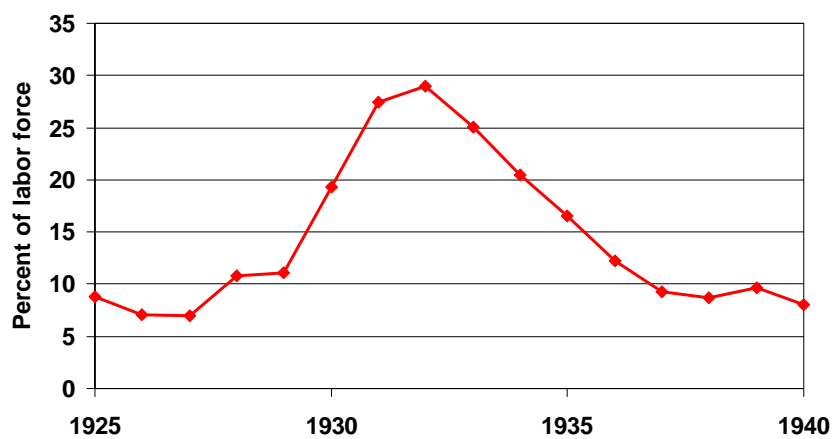
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Classical (“invisible hand”) view



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Unemployment rate in Australia, 1925 to 1940



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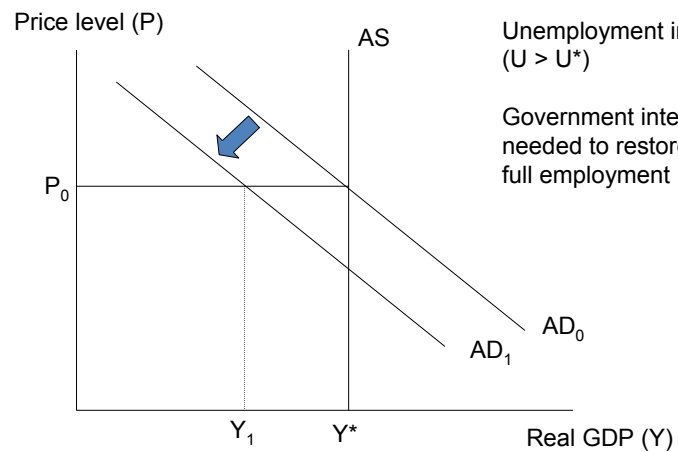
Keynesian view

Despite excess supply, P remains stuck at P_0

Y falls to Y_1

Unemployment increases ($U > U^*$)

Government intervention is needed to restore quickly full employment



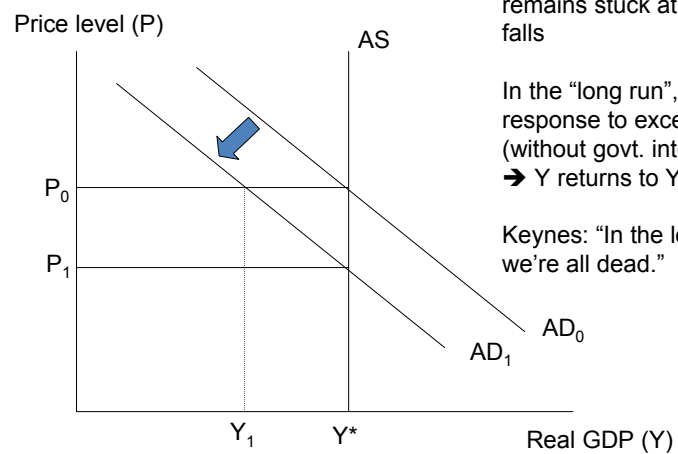
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Sticky price hypothesis

In the "short run", P remains stuck at $P_0 \rightarrow Y$ falls

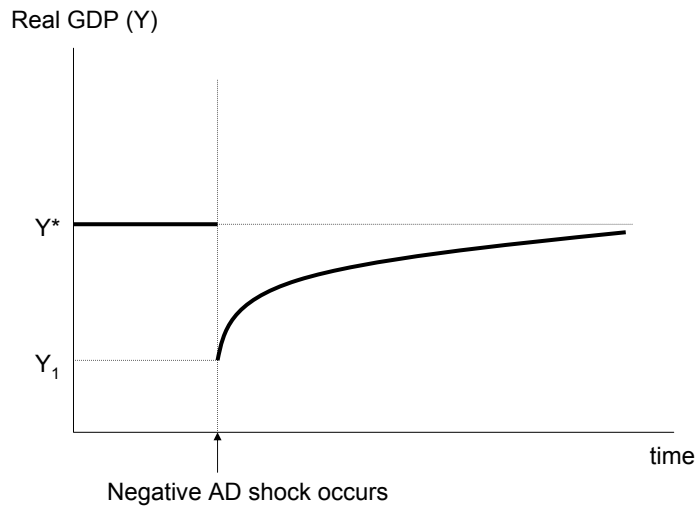
In the "long run", P falls in response to excess supply (without govt. intervention) $\rightarrow Y$ returns to Y^*

Keynes: "In the long run, we're all dead."



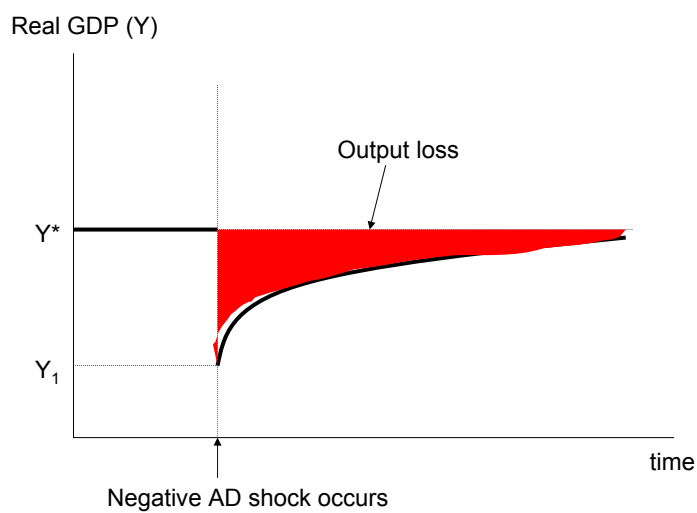
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Effect of negative AD shock on GDP with sticky prices



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Output loss



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Subprime credit crisis

- Financial innovation: from “originate and hold” to “originate and distribute”
- Growth in financial sector
- Change in borrowing arrangements
- Potential benefits
- Potential risks
 - Uninformed (or “dynamically inconsistent”) borrowers
 - Uninformed investors
 - Credit agency conflicts of interest
- Potential remedies
 - Financial education
 - Financial regulation (e.g. ban teaser rates)

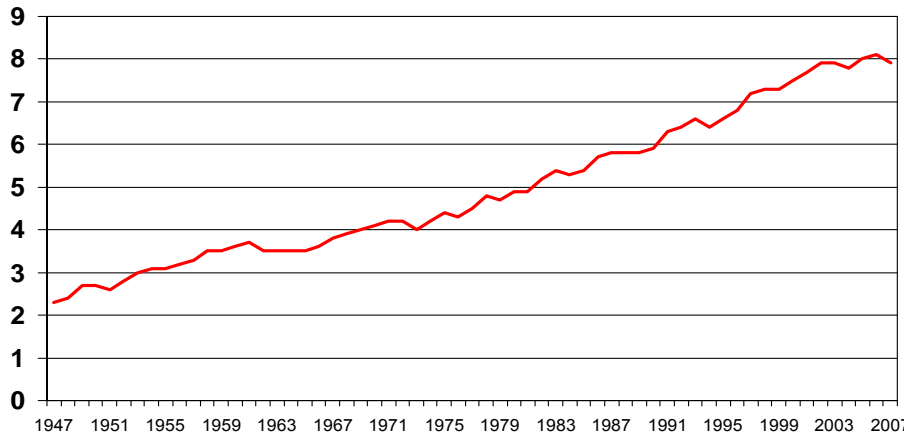
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Financial sector growth

- Even during the “go-go years,” the bull market of the 1960s, finance and insurance together accounted for less than 4 percent of G.D.P. The relative unimportance of finance was reflected in the list of stocks making up the Dow Jones Industrial Average, which until 1982 contained not a single financial company.
- It all sounds primitive by today’s standards. Yet that boring, primitive financial system serviced an economy that doubled living standards over the course of a generation.
- After 1980, of course, a very different financial system emerged. In the deregulation-minded Reagan era, old-fashioned banking was increasingly replaced by wheeling and dealing on a grand scale. The new system was much bigger than the old regime: On the eve of the current crisis, finance and insurance accounted for 8 percent of G.D.P., more than twice their share in the 1960s. By early last year, the Dow contained five financial companies — giants like A.I.G., Citigroup and Bank of America.

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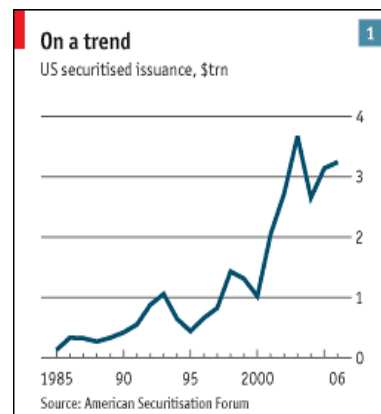
Value added by finance and insurance industry as a percentage of Gross Domestic Product



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From “originate and hold” to “originate and distribute”

- Until the early 1980s, finance hewed to an “originate and hold” model. Banks generally held loans on their balance sheets to maturity; some debts were sold on loan-by-loan, but this market was small and lumpy.
- This began to give way to an “originate and distribute” model after America’s government-sponsored mortgage giants issued the first bonds with payments tied to the cash flows from large pools of loans.
- Around 56% of America’s outstanding residential mortgages were packaged in this way, including more than two-thirds of the subprime loans issued in 2006. Thanks largely to securitisation, global private-debt securities are now far bigger than stock markets.
- “Securitisation: When it goes wrong...,” *The Economist*, Sep 20th 2007



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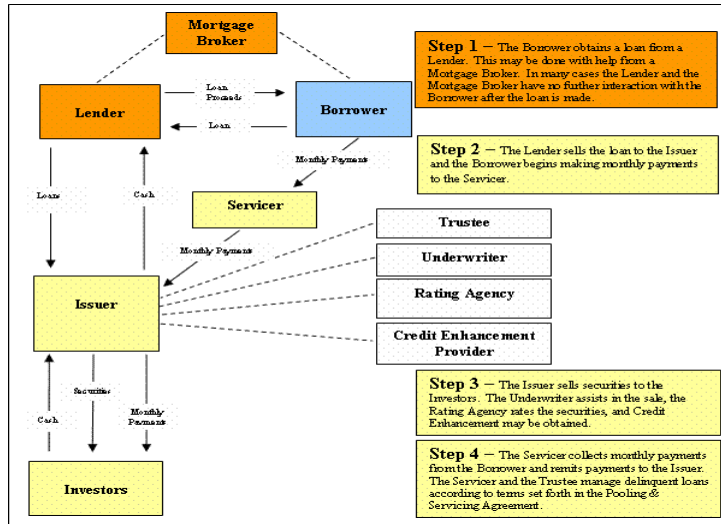
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Traditional lending relationship



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Borrowing Under a Securitization Structure



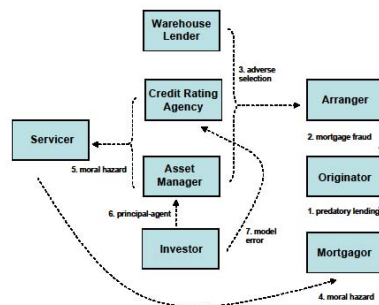
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balance sheet of lenders and transformed into debt securities purchased by investors is called securitization.

2.1. The seven key frictions

The securitization of mortgage loans is a complex process that involves a number of different players. Figure 1 provides an overview of the players, their responsibilities, the important frictions that exist between the players, and the mechanisms used in order to mitigate these frictions. An overarching friction which plagues every step in the process is asymmetric information: usually one party has more information about the asset than another. We think that understanding these frictions and evaluating the mechanisms designed to mitigate their importance is essential to understanding how the securitization of subprime loans could generate bad outcomes.³

Figure 1: Key Players and Frictions in Subprime Mortgage Credit Securitization



³ A recent piece in *The Economist* (September 20, 2007) provides a nice description of some of the frictions described here.

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Potential benefits of securitization

- Studies suggest that the explosion of the “secondary” market for bank debt has helped to push down borrowing costs for consumers and companies alike.
- Subjecting bank loans to valuation by capital markets encourages the efficient use of capital.
- The broad distribution of credit risk reduces the risk of any one holder going bust.

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Risks of securitization

- Complexity and confusion
- Fragmentation of responsibility
- Gaming of the regulatory system

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Financial weapons of mass destruction?

- CDOs have been criticized as being highly complex instruments that are difficult to value.
- Warren Buffet is on record for calling CDOs financial weapons of mass destruction -- since he believes, contrary to the philosophy behind CDOs, that default risk is correlated and cannot be diversified away.
- CDOs and other such debt-related derivatives have been blamed for making the 2007 credit crisis a lot more severe than it should have been and have led to the failure of institutions such as Lehman Brothers, MBIA and AIG.

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Seven key frictions in the securitization process

All involve asymmetric information

1. *Frictions between the mortgagor and the originator: Predatory lending.* Subprime borrowers can be financially unsophisticated
2. *Frictions between the originator and the arranger: Predatory borrowing and lending.* The originator has an information advantage over the arranger with regard to the quality of the borrower.
3. *Frictions between the arranger and third-parties: Adverse selection.* The arranger has more information about the quality of the mortgage loans which creates an adverse selection problem: the arranger can securitize bad loans (the lemons) and keep the good ones. This third friction in the securitization of subprime loans affects the relationship that the arranger has with the warehouse lender, the credit rating agency (CRA), and the asset manager.
4. *Frictions between the servicer and the mortgagor: Moral hazard.* In order to maintain the value of the underlying asset (the house), the mortgagor (borrower) has to pay insurance and taxes on and generally maintain the property. In the approach to and during delinquency, the mortgagor has little incentive to do all that.

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Seven key frictions in the securitization process (cont'd)

5. *Frictions between the servicer and third-parties: Moral hazard.* The income of the servicer is increasing in the amount of time that the loan is serviced. Thus the servicer would prefer to keep the loan on its books for as long as possible and therefore has a strong preference to modify the terms of a delinquent loan and to delay foreclosure. In the event of delinquency, the servicer has a natural incentive to inflate expenses for which it is reimbursed by the investors, especially in good times when recovery rates on foreclosed property are high.
6. *Frictions between the asset manager and investor: Principal-agent.* The investor provides the funding for the MBS purchase but is typically not financially sophisticated enough to formulate an investment strategy, conduct due diligence on potential investments, and find the best price for trades. This service is provided by an asset manager (agent) who may not invest sufficient effort on behalf of the investor (principal).
7. *Frictions between the investor and the credit rating agencies: Model error.* The rating agencies are paid by the arranger and not investors for their opinion, which creates a potential conflict of interest. The opinion is arrived at in part through the use of models (about which the rating agency naturally knows more than the investor) which are susceptible to both honest and dishonest errors.

Understanding the Securitization of Subprime Mortgage Credit, by Adam B. Ashcraft and Til Schuermann, Federal Reserve Bank of New York Staff Report no. 318, March 2008

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Understanding the Securitization of Subprime Mortgage Credit

Adam B. Ashcraft

Til Schuermann

Federal Reserve Bank of New York Staff Report no. 318

March 2008

Five frictions caused the subprime crisis

- Friction #1: Many products offered to sub-prime borrowers are very complex and subject to misunderstanding and/or misrepresentation.
- Friction #6: Existing investment mandates do not adequately distinguish between structured and corporate ratings. Asset managers had an incentive to reach for yield by purchasing structured debt issues with the same credit rating but higher coupons as corporate debt issues.
- Friction #3: Without **due diligence** of the asset manager, the arranger's incentives to conduct its own due diligence are reduced. Moreover, as the market for credit derivatives developed, including but not limited to the ABX, the arranger was able to limit its funded exposure to securitizations of risky loans.
- Friction #2: Together, frictions 1, 2 and 6 worsened the friction between the originator and arranger, opening the door for predatory borrowing and lending.
- Friction #7: Credit ratings were assigned to subprime MBS with significant error. Even though the rating agencies publicly disclosed their rating criteria for subprime, investors lacked the ability to evaluate the efficacy of these models.

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Uninformed borrowers: Do Financial Counseling Mandates Improve Mortgage Choice and Performance?

- Agarwal et al explored the effects of mandatory third-party review of mortgage contracts on the terms, availability, and performance of mortgage credit.
- Their study is based on a natural experiment in which the State of Illinois required 'high-risk' mortgage applicants acquiring or refinancing properties in 10 specific zip codes to submit loan offers from state-licensed lenders to review by HUD-certified financial counselors.
- They document that the legislation led to declines in both the supply of and demand for credit, with state licensed lenders and lower-quality borrowers disproportionately exiting the affected area.
- Controlling for the salient characteristics of the remaining borrowers and lenders, they find that the legislation succeeded in reducing ex post default rates among counseled borrowers by close to 4 percentage points (about 35% decline).
- They attribute this result to actions of lenders responding to the presence of external review and, to a lesser extent, to counseled borrowers renegotiating their loan terms.
- They also find that the legislation nudged some borrowers to choose less risky loan products in order to eschew counseling

Do Financial Counseling Mandates Improve Mortgage Choice and Performance? Evidence from a Natural Experiment, by Sumit Agarwal, Gene Amromin, Itzhak Ben-David, Souphala Chomsisengphet, and Douglas D. Evanoff, March 2009

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Hyperbolic discounting

- In behavioral economics, hyperbolic discounting refers to the empirical finding that people generally prefer smaller, sooner payoffs to larger, later payoffs when the smaller payoffs would be imminent. However, when the same payoffs are distant in time, people tend to prefer the larger outcome, even though the time lag from the smaller to the larger would be the same as before.
- For instance, when offered the choice between \$50 now and \$100 a year from now, many people will choose the immediate \$50. However, given the choice between \$50 in five years or \$100 in six years, almost everyone will choose \$100 in six years, even though that is the same choice seen at five years' greater distance.
- This pattern of discounting is dynamically inconsistent, and therefore inconsistent with standard models of rational choice, since the rate of discount between time t and $t+1$ will be low at time $t-1$, when t is the near future, but high at time t when t is the present and time $t+1$ the near future. Nevertheless, it appears to be descriptively accurate

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The David Laibson plan for ending “mortgage teaser-rate insanity”

- To prevent lending institutions from offering misleading deals that trap borrowers, we should **require that all future mortgage loans be prepayable with no penalty**. This is an easy, simple rule. The rule will have the effect of leading banks to stop offering many of the teaser rates that serve as loss leaders (pay too little interest for the first 18 months but then pay extra on the back end). These loss leaders are often confusing and tempting for borrowers. Banks won't want to offer loss leaders if borrowers can get out of the loan without paying a penalty after the subsidized payment period -- the teaser period -- ends.
- This proposal would not discourage banks from offering sensible adjustable rate mortgages (those without a loss leader component). Borrowers should be allowed to take out a mortgage pegged to short-term rates. That's not a loss leader and such mortgages will still be offered if prepayment is made penalty-free. My proposal will only hit the mortgages with early loss leaders built into the payment stream.

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Uninformed investors

- The lack of transparency plagues the bundling of loans into securities, too. These days lenders are less likely to foreclose on defaulting borrowers: in America, less than a quarter of loans 90 days late or more are in foreclosure, compared with three-quarters in the late 1990s, points out Charles Calomiris, of Columbia University.
- When a late payer gets back on track his loan is once again labelled “current”, and his chequered history does not have to be fully disclosed when the loan goes into a securitised pool.
- So even the most diligent buyer would struggle to spot that some of the “prime” collateral of mortgage-backed bonds was, in fact, of questionable quality.

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Principal-agent problem

- The loan originator has little incentive to vet borrowers carefully because it knows the risk will soon be off its books.
- The ultimate holder of the risk, the investor, has more reason to care but owns a complex product and is too far down the chain for monitoring to work.
- For all its flaws, the old bank model resolved the incentives in a simple way.
- Because loans were kept in-house, banks had every reason both to underwrite cautiously and also to keep tabs on the borrower after the money left the vault.

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Rating agencies

- The agencies appear to have been too free in giving out prized AAA badges to structured products, especially CDOs.
 - their models were faulty, failing to pick up correlations between different markets
 - conflict of interest: theirs is one of few businesses where the appraiser is paid by the seller, not the buyer.
- This made it easier for the banks securitising and further repackaging debt to create the greatest possible number of securities with the lowest regulatory cost (that is, highest rating). Investors restricted to investment-grade paper assumed (or at least hoped) that the rating was a guarantee of strength. It might have helped if the agencies had properly monitored their ratings after issuing them. But with low fees per security there is little incentive to stay on the case.

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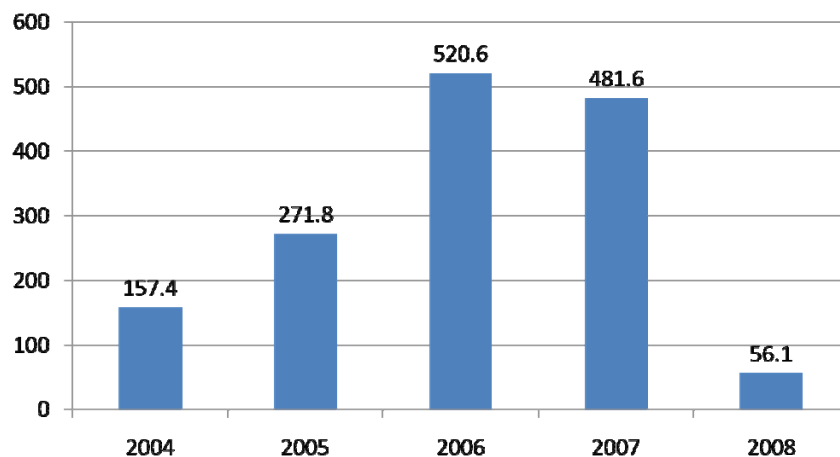
Stiglitz

- Banks got themselves, and our economy, into trouble by overleveraging — that is, using relatively little capital of their own, they borrowed heavily to buy extremely risky real estate assets. In the process, they used overly complex instruments like collateralized debt obligations.
- The prospect of high compensation gave managers incentives to be short-sighted and undertake excessive risk, rather than lend money prudently. Banks made all these mistakes without anyone knowing, partly because so much of what they were doing was “off balance sheet” financing.

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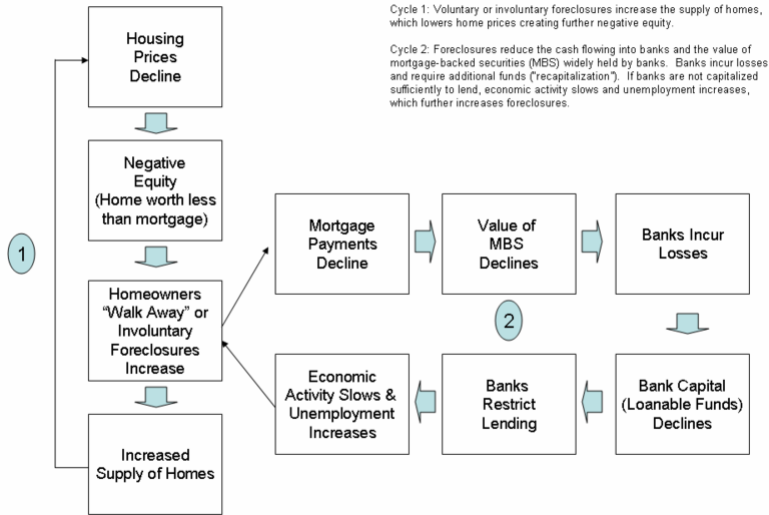
Global CDO Issuance Volume

(USD billions)

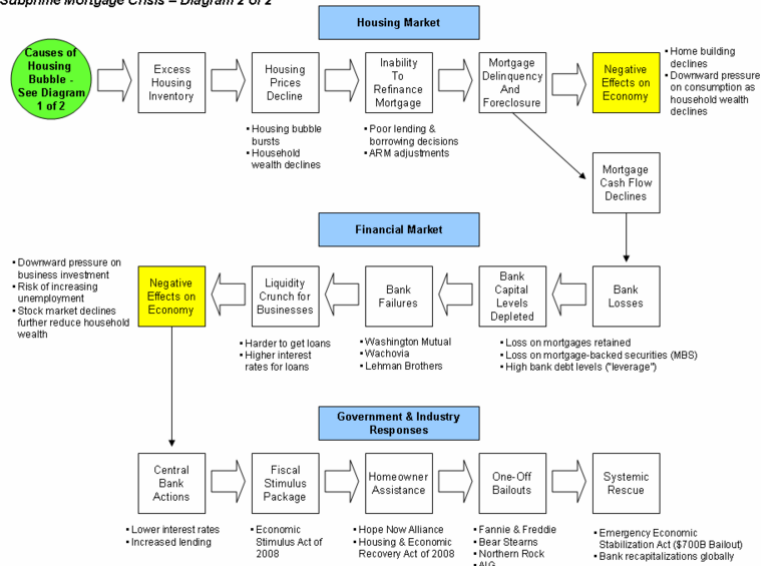


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Subprime Mortgage Crisis: "Vicious Cycles" of Foreclosure and Bank Instability



Subprime Mortgage Crisis – Diagram 2 of 2

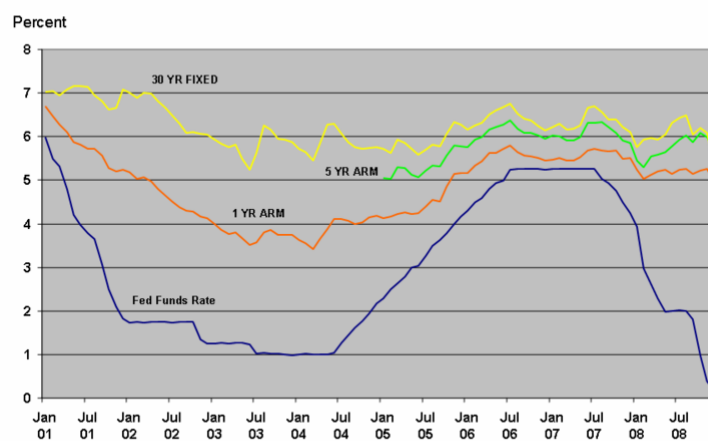


Policy challenges

- Monetary policy: liquidity trap
- Fiscal policy: deficits
- Bank bailout
 - Bank holding companies vs. banks

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Fed Funds Rate & Mortgage Rates 2001 - 2008

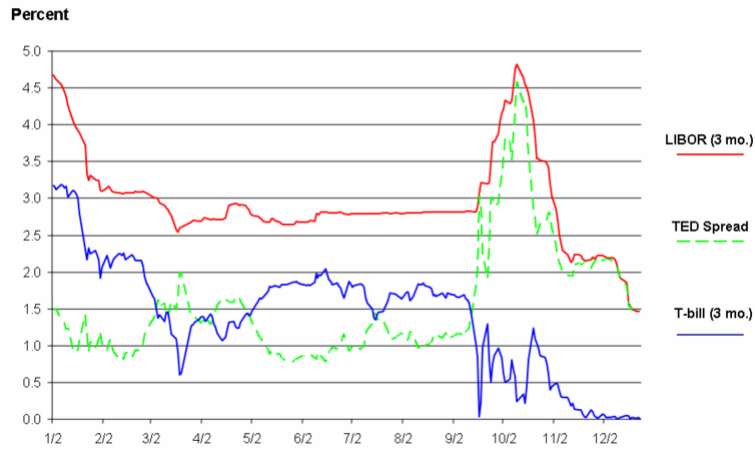


Source Data: U.S. Federal Reserve, Freddie Mac

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TED Spread & Components - 2008

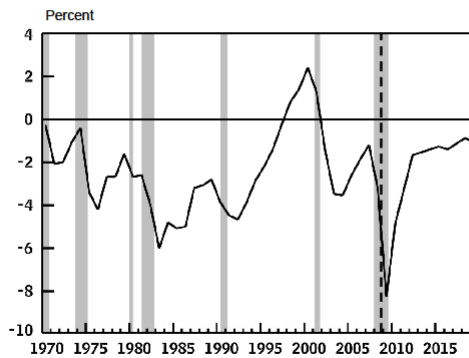
The "TED Spread" is a measure of credit risk for inter-bank lending. It is the difference between: 1) the three-month U.S. treasury bill rate, and 2) the three-month LIBOR rate, which represents the rate at which banks typically lend to each other. A higher spread indicates banks perceive each other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



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The Total Deficit or Surplus as a Share of GDP, 1970 to 2019



2

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CBO's Baseline Budget Projections

	Actual 2007	Actual 2008	2009	2010
In Billions of Dollars				
Revenues	2,568	2,524	2,357	2,533
Outlays	2,729	2,978	3,543	3,236
Deficit	-161	-455	-1,186	-703
Debt Held by the Public	5,035	5,803	7,193	7,829
Memorandum:				
Gross Domestic Product	13,642	14,224	14,257	14,452
As a Percentage of GDP				
Revenues	18.8	17.7	16.5	17.5
Outlays	20.0	20.9	24.9	22.4
Deficit	-1.2	-3.2	-8.3	-4.9
Debt Held by the Public	36.9	40.8	50.5	54.2

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What Accounts for the Change in CBO's Estimate of the Deficit for Fiscal Year 2009?

Billion of Dollars

	2009
Total Deficit Projected in September 2008	438
Changes	
Lower revenues (\$104 billion due to recent legislation)	362
Outlays for the Troubled Asset Relief Program	184
Outlays for recognizing the credit costs of Fannie Mae and Freddie Mac in the budget	218
Other changes in outlays	-16
Total Increase in the Deficit	748
Total Deficit Projected in January 2009	1,186

4

Stiglitz critique of bank bailout proposal

- In theory, the administration's plan is based on letting the market determine the prices of the banks' "toxic assets" — including outstanding house loans and securities based on those loans. The reality, though, is that the market will not be pricing the toxic assets themselves, but options on those assets.
- The two have little to do with each other. The government plan in effect involves insuring almost all losses. Since the private investors are spared most losses, then they primarily "value" their potential gains. This is exactly the same as being given an option.

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Review

- The current U.S. economic situation and outlook
- Interpretation of this situation from the perspective of macroeconomic theory: a large negative aggregate demand shock
- Subprime credit crisis as the primary cause of the demand shock
- Challenges confronted by policies to accelerate recovery from the demand shock

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