

## Econ 113: April 16, 2015

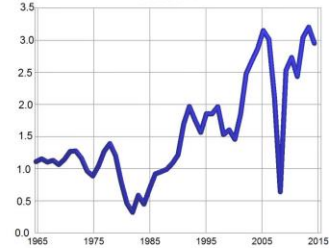
- Banking before and after about 1970
- Leveraged Buyouts, 1980s
- Savings & Loan (S&L) Crisis, 1980s & 1990s
- Subprime Lending Crisis, 2000s
  - Housing Boom & Bust
- HELOCs and consumer spending (Mian & Sufi)

*Term Paper due at beginning of class  
Last Class is Thursday April 30*

Rise of Services    Money Effect    Productivity Growth Slowdown    Recession    Banking Developments

## Financial Institutions Profits Vary

Financial Institutions Profit as % of GDP  
1965-2014



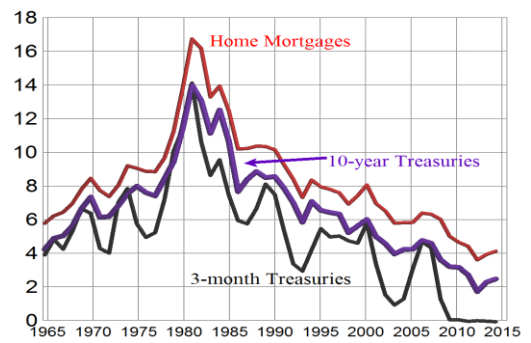
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## Post-1970 Changes

- A series of forces led to change
  - Costs of banking rose
  - Technological developments
  - Regulatory & legislative actions
- Key to story: Rising interest rates
  - Increased to fight inflation that began late 1960s



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## Interest Rates, 1965-2014




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## Money Market Mutual Funds

- Early 1970s
- Pool lots of people's smaller amounts of money
- Buy U.S. Treasuries with that pool of money
- Pay out (most of) the interest earned on Treasuries
- Let people withdraw funds easily (maybe with an "order of withdrawal" which looks a lot like a check)
-  Very happy customers
-  Very unhappy bankers

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## Paying Interest on Deposits

- 1933 Banking Act: "no member bank shall, directly or indirectly, by any device whatsoever, pay any interest on any deposit which is payable on demand"
- Fed's "Regulation Q" formalized this rule
- Interest rates rising → depositor's opportunity cost rises
  - Toasters, steak knives, and other goodies
  -  What if the deposit isn't "payable on demand"?!?  
"Negotiable Order of Withdrawal" 1970s New England; 1980 throughout the U.S.; limit removed 1986
- Regulation Q fully repealed July 2011

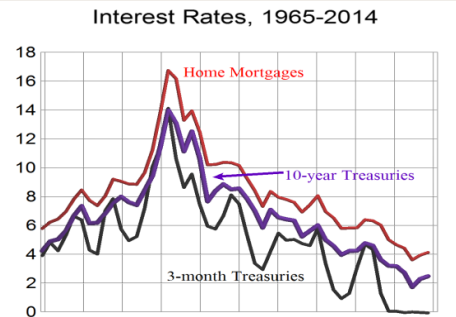
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## Adjustable Rate Mortgages (ARMs)

- So much for 3/6/3 banking
  - Banks now paying much higher interest rates on deposits
  - Banks need some way to earn better rate on assets
- ARMs developed 1960s; popularity begins 1980s
- Standard loan: 30-year fixed rate fully amortized loan with 20% down payment
  - Buy \$125,000 house. Borrow \$100,000 @ 6%
  - Pay \$599.55 each month
    - Part of \$599.55 is for interest on outstanding balance
    - Rest of \$599.55 is for principal, reducing the outstanding balance
  - At end of 30 years, loan fully paid

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## But interest rates very high 1980s



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## Adjustable Rate Mortgages

- Adjustable Rate Mortgage:
  - Borrow \$100,000 today at 16%
  - Initial payment \$1,344.76 per month
    - Part is interest; rest is principal payment, reducing outstanding balance
  - Periodically, interest rate adjusted
  - Suppose: After 5 years, interest rate dropped to 10%
    - Then monthly payment falls to \$899.42
- When rates are falling, good deal for borrower
- When rates are rising, good deal for lender

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## Banks needed high return assets

- Leveraged Buyouts popular 1980s
- Borrow money (leverage) to finance buyout of firms
- If firm undervalued, then LBOs generate gains

$$P_{firm} = \frac{\sum (Revenue - Costs)}{(1+r)^T}$$

- Issue bonds to those who lend \$ for LBOs
  - High return (but high risk)
  - "Junk bonds"

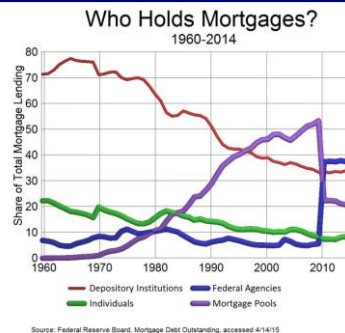
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## S&L Crisis

- 1980 Depository Institutions Deregulation and Monetary Control Act
  - NOW accounts nationwide; remove Reg. Q limits
  - Liabilities (Deposits) becoming more expensive
- 1982 Garn-St Germain Depository Institutions Act
  - Allows ARMs
- Mismatch between asset returns & liability costs
  - S&Ls buy *lots* of junk bonds (and other assets)
- Uh oh.
  - Lots of S&Ls fail. FSLIC fails. Government bailouts.

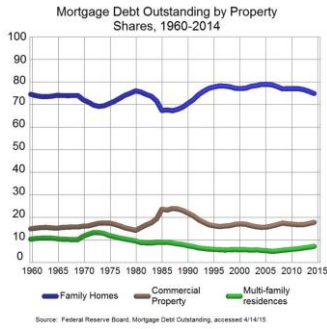
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## Mortgages no longer held by banks



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## Family Homes are #1 mortgage type



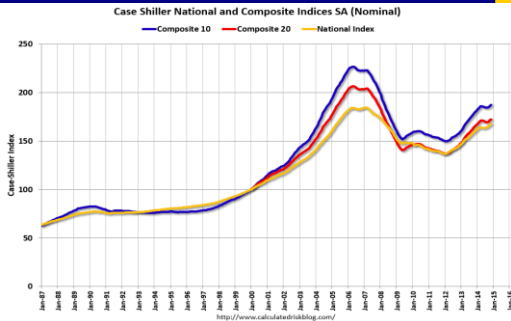
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## Housing prices soar with easy credit



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## Housing Prices



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## Subprime Crisis

- Begins with subprime, spreads to all mortgages
- 2/28 at teaser rate
  - Borrow \$400,000 for 30 years, interest only for 2 years, at 4% teaser
  - Reset after 2 years to market rate of 8%
    - Monthly payment rises from \$1,333 to \$2,987
- Then what?
  - If house price has risen 25%, refinance at lower rate: Win!!
  - If house price didn't rise fast enough, can't refinance: Lose...
- Can't refinance, can't afford re-set
  - Default
  - Foreclosure
- Financial institutions fail

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## Mortgage Backed Securities (MBS)

- Bundle together 1,000 (or so) mortgages
- Chop bundle into 1,000 (or so) pieces
- Sell each piece
- Idea: diversified asset (1/1000<sup>th</sup> of 1,000 different mortgages) so should be very low risk
  - Ratings agency's (Moody's, etc) gave them good rating
- Reality: ha ha ha

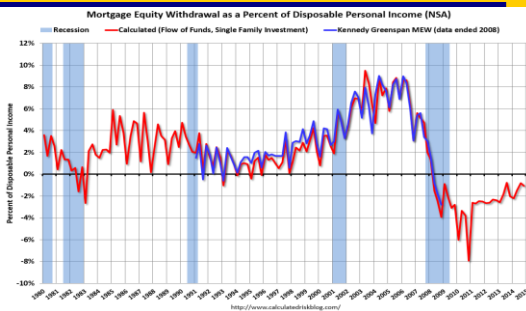
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## There are real effects of financial changes

- Equity in house = Current price of comparable homes – outstanding mortgage balance
- Home Equity Line of Credit (HELOC)
  - Bank gives homeowner "line of credit"
  - Can use money for whatever you want, whenever you want
  - Repay eventually but often interest only for first 10 years

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## How much use of home equity? LOTS



MEW = Borrowing against equity (HELOCs) – principal repayments – debt cancellation. If principal repayments + debt cancellation > borrowing, MEW < 0.

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## There are real effects of financial changes

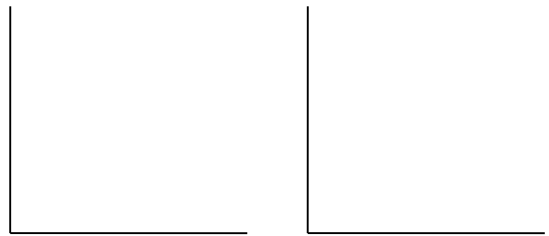
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  - Can use money for whatever you want, whenever you want
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- Mian and Sufi article
  - County, zip-code, or MSA level data to study effect of HELOCs
  - To protect borrower identity, each observation = 5 borrowers

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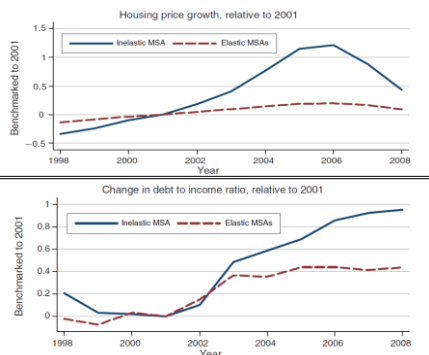
### Boom in borrowing



### Price increase depends on slope of S



### Higher prices, higher $\frac{\text{debt}}{\text{income}}$



### People borrowed against home equity

- Mian & Sufi estimate (Table 3) that homeowners borrowed 25 cents of every dollar of additional home equity value
  - Example: Home price goes up by \$100,000
  - Homeowner borrows an additional \$25,000
- More borrowing by people who already do a lot of credit-financed spending
  - Those with high credit card use
  - and low FICO scores

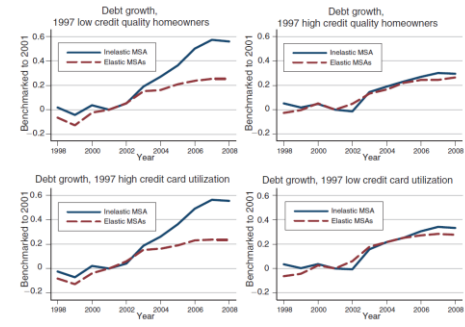
### Mian & Sufi, Table 3

Table 1. Effect of House Prices on Household Borrowing for 1997 Homeowners

	Change in total debt, 2002-2006 (thousands \$)			
$\Delta$ Home Value, 2002-06	0.245*** (0.050)	0.271*** (0.056)	0.253*** (0.056)	0.246*** (0.065)
Median home value, 2002	0.020 (0.039)	-0.014 (0.044)	-0.010 (0.037)	-0.076 (0.079)
Controls for credit score, HH income, debt/income, age		✓		
Male (0/1)		✓	✓	✓
Individual dummy variables			✓	✓
Census & Income variables				✓
Observations (n)	13,328	13,199	13,199	12,497

Notes: Unit of observation = groups of 5-9 reasonably homogeneous homeowners. Standard errors clustered at MSA level. \*\*\*Significant at 1% level. \*\*Significant at 5% level. \*Significant at 1% level. Source: Mian & Sufi, "House Prices, Home Equity-Based Borrowing, and the US Household Leverage Crisis," AER 101 (2132-56). Table 3.

### Heavy credit users use HELOCs



Low & High credit quality are bottom & top quartile of FICO; Low/High credit card utilization is also end quartiles

### And they used that \$ to buy stuff

- Not a direct conclusion, but by process of elimination
- Table 6 tells us . . .
  - Panel A: House Price (HP) growth not determining likelihood of moving to a new zip code
  - Panel B: House Price (HP) growth not associated with buying mortgage-financed investment properties
  - Panel C: House Price (HP) growth not associated with paying off credit card balances
- What else is possible?
  - Home improvements (recorded in Residential Investment) & Consumption spending!

### Mian & Sufi, Table 6

Table 2. What Did People Do With Borrowed Money?

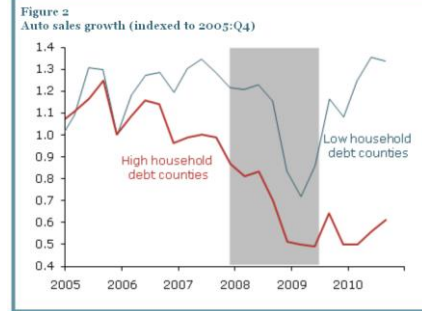
	Coefficient on $\Delta$ Home Price (HP), 2002-06				
	Probability of Moving	Change in # of mortgages	Credit card balance	Credit card balance / income	
Actual HP growth	0.046 (0.036)	-0.011 (0.021)			
Instrumented HP growth <sup>2</sup>	0.010 (0.076)	-0.109** (0.047)	0.084 (0.143)	0.017 (0.022)	
Observations (n)	68	13,196	12,772	12,772	3,233

Notes: <sup>2</sup>Instrumented house price (HP) growth uses MSA housing supply inelasticity as an instrument for house price growth. \*\*\*Significant at 1% level. \*\*Significant at 5% level. \*Significant at 1% level. For credit card analysis (n=3,233), sample restricted to those in top quartile of credit card utilization distribution, 1997. Source: Mian & Sufi, "House Prices, Home Equity-Based Borrowing, and the US Household Leverage Crisis," AER 101 (2132-56). Table 6.

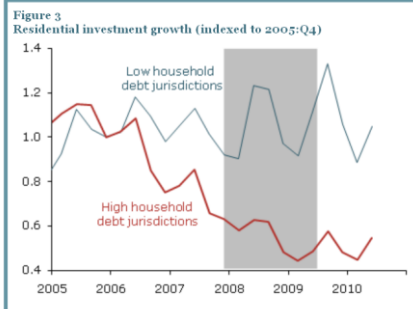
## Other evidence supports conclusion

- Mian & Sufi, FRB-SF Newsletter, January 2011
- County-level data
- Measure 2002-2006 increase in debt:income ratio
  - “high-household debt” = counties with top 10% of increases
    - Lots of increase in HELOC debt
    - Probably lots of HELOC-financed additional spending
  - “low-household debt” = counties with bottom 10% of increases
- How has recovery progressed in those two sets of counties?

## High-debt REALLY cut back on car purchases



## High-debt REALLY cut back on housing



## Employment fell especially where high debt

