

Making sense of the subprime crisis

Paul Willen

Federal Reserve Bank of Boston

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Disclaimer

- I am speaking today as a researcher and as a concerned citizen
- not as a representative of:
 - The Boston Fed
 - or the Federal Reserve System



- When I say “we”, I don't mean Ben and me.

Caveat

- Everything I'm about to say could be wrong:

No one who cannot rejoice in the discovery of his own mistakes deserves to be called a scholar.

–Donald Foster

- Details can be found in three papers available at www.bos.frb.org
 - ① Subprime Facts: What (we think) we know about the subprime crisis and what we don't (PPDP 08-02)
 - ② Negative Equity and Foreclosure: Theory and Evidence (PPDP 08-03)
 - ③ Subprime Outcomes: Risky Mortgages, Homeownership and Foreclosure (WP 07-15)
- Mortgages are a bit personal for me right now
- Subprime is my life

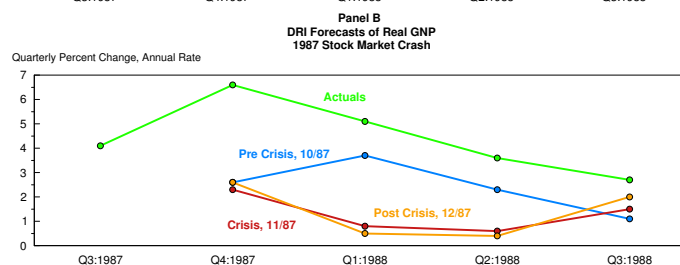
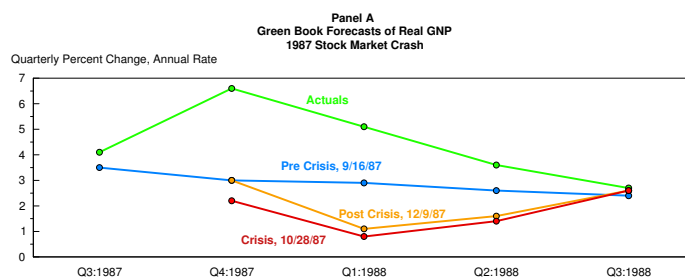


The macroeconomy

- Forecasts show growth in Q3 a small negative amount.
- Expectation is for significant contraction in Q4
 - Macro Advisors shows -2.3%
- No good news
- Consumption is expected to fall at a 2% annualized rate.
- International side (exports minus imports) has added about 1% to growth for the last year
 - Many of our trading partners doing worse than we are.

Financial crises and the Macroeconomy

- We have a history of *overestimating* the impact of a financial crisis
- Forecasting experience with the 1987 stock market crash.



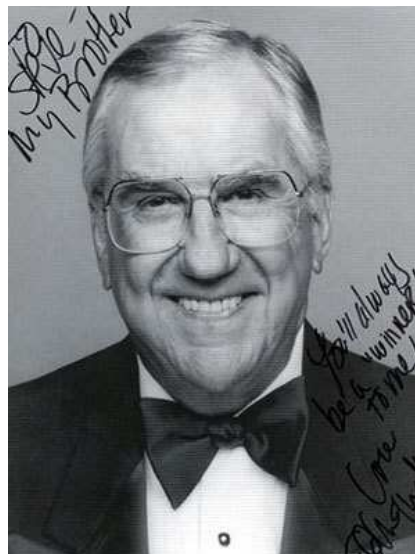
What causes foreclosure?

- Negative equity is necessary for default to make sense
 - If house is worth more than outstanding balance on mortgage
 - Sell!
 - In fact, servicers will usually force you to sell.
- But most people with negative equity don't default
 - IN 1991 in MA, we estimate that about 100,000 people had negative equity
 - Over the next three years, only about 7 percent lost their homes
- Irrational?
 - No!
- Negative equity is not sufficient for optimal default!
 - Even in a completely frictionless world.

What do these two men have in common?



Eric Rosengren



Ed McMahon

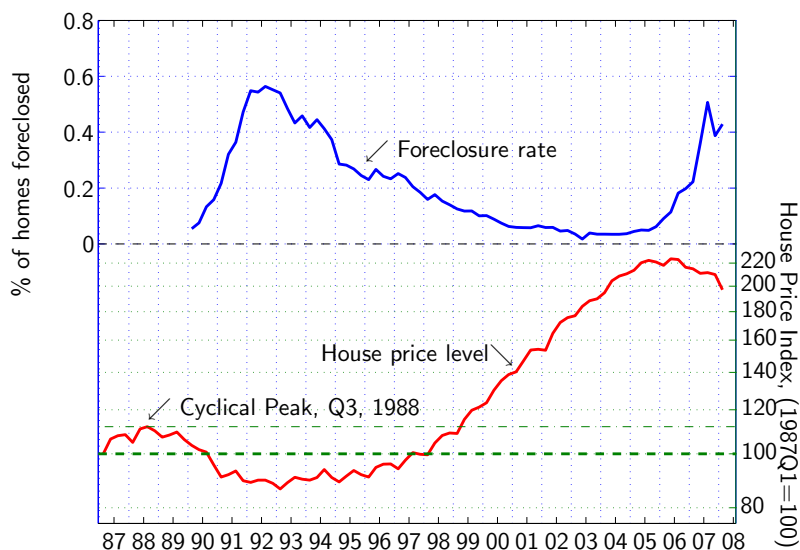
Ed and Eric

	Eric Rosengren	Ed McMahon
Booming voice	✓	✓
Memorable laugh	✓	✓
Silver hair	✓	✓
Negative Equity	in 1993	in 2008
Foreclosure	No	Yes

- Why the different outcome?
 - Different stochastic discount factor
 - Ed values consumption today relative to future more than Eric

Outlook

Figure: Foreclosures and house prices in Mass., 1989-present. Source: Boston Fed and The Warren Group.



Two crises

- Foreclosure Crisis
 - 7143 people lost their homes in MA in 2007.
 - 6192 in the first two quarters of 2008.
 - 3559 in the second quarter alone – surpassing Q4, 1992 number of 2333.
 - More foreclosures in the Q208 than in the six years from 2000 to 2005 combined.
- Financial Crisis
 - Bear Stearns and Lehman fail.
 - Stock market drops by 30 percent
 - Banking system freezes up.
 - Boston Fed staff work long hours.

Causes of Foreclosure Crisis

- House prices have fallen dramatically across the country
 - Empirical relationship between foreclosures and house prices
 - Well grounded in economic theory.
- People who buy homes with subprime loans are
 - 10 times more likely to lose their home to foreclosure in a given month
 - 10 times more sensitive to falling house prices than prime buyers
 - So even though in MA house prices have fallen less this time than they did in 1988-1993, we have more foreclosures

Causes of Financial Crisis

- Huge credit losses on subprime loans
- ... will not necessarily cause financial firms to fail.
- Payday lenders recover less than 50 cents on every dollar they lend (on an annualized basis)
 - But they are profitable year-in, year-out
 - Because they price the loans right

Why didn't investors see this coming?

- “Making Sense of the Subprime Crisis”
- Forthcoming in *Brookings Papers on Economic Activity*
 - http://www.brookings.edu/economics/bpea/~media/Files/Programs/ES/BPEA/2008_fall_bpea_papers/2008_fall_bpea_gerardi_sherlund_lehnert_willen.pdf

Did lenders make crazy loans?



Willen (Boston Fed)

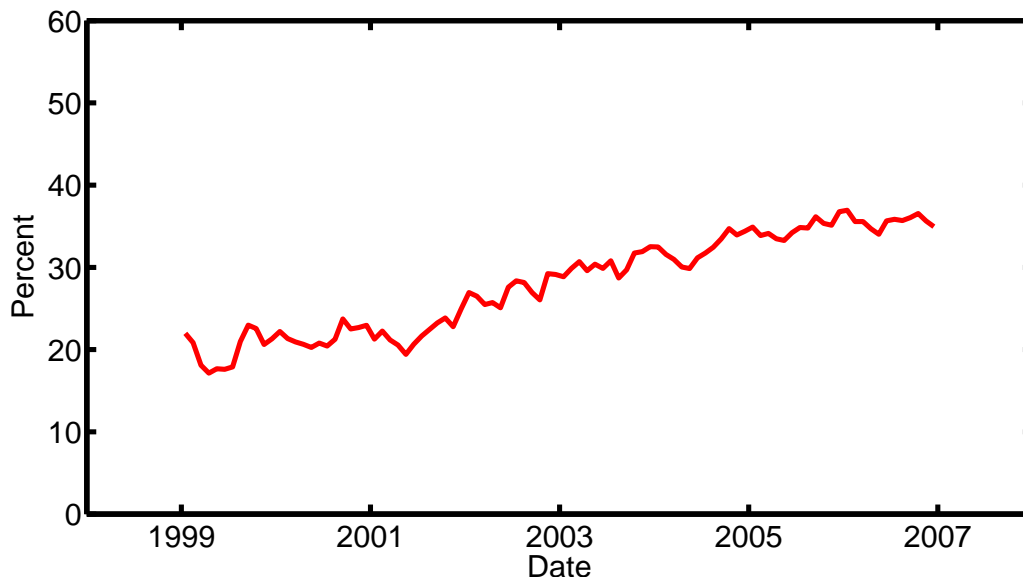
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Growth of Low-doc

- Evolving underwriting characteristics on subprime mortgages.
- Low Documentation



Willen (Boston Fed)

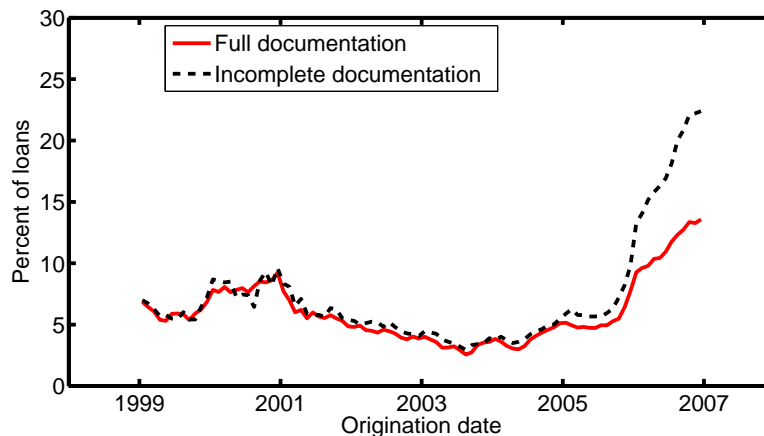
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Defaults on Low-Doc

- 12-month Defaults
- % Low Documentation



What did we get wrong?

- Focus on

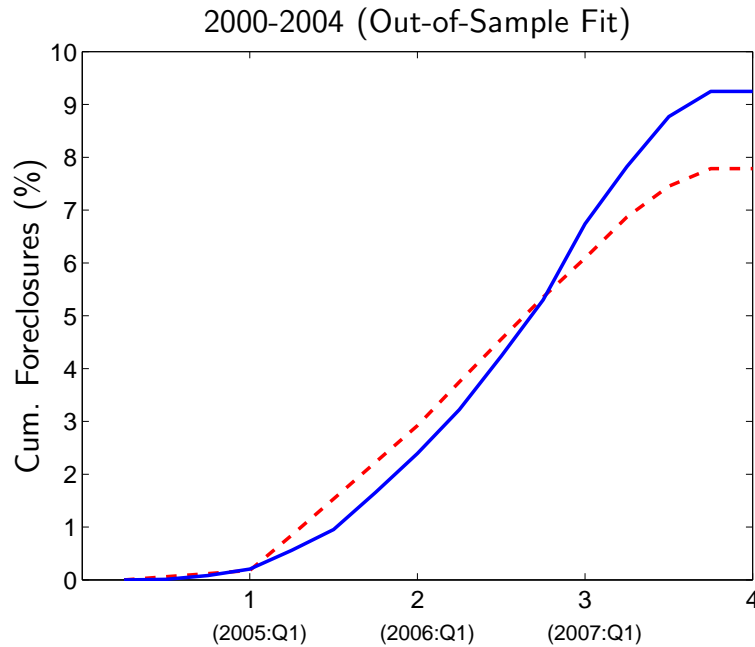
$$df/dt$$

- Decompose into

$$df/dt = df/dp \times dp/dt$$

- Did market participants not understand:
 - the sensitivity of foreclosure to house prices (df/dt)
 - or anticipate the path of house prices (dp/dt)
- Our prior was that the problem was a lack of data on negative HPA.
- Could not estimate df/dp because they had no data.

Could we have figured this out? df/dp



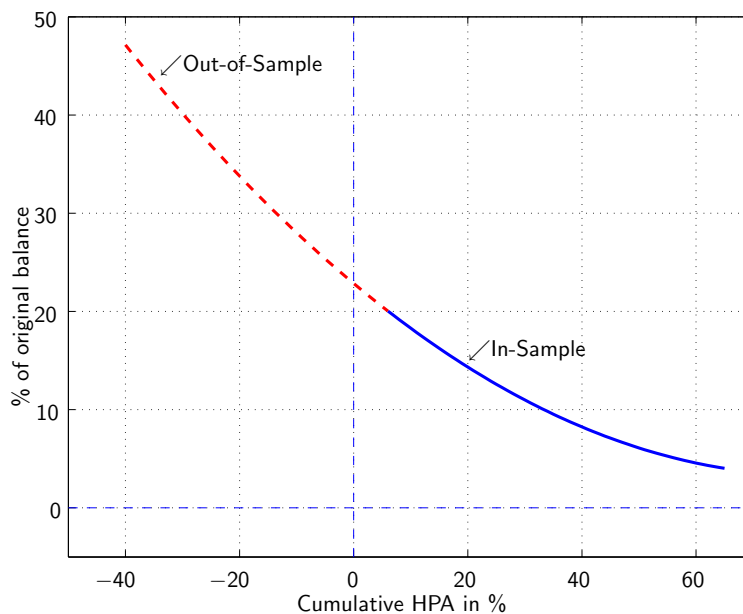
Did they figure it out? df/dp

- Quantitative implications
- Lehman Brothers "Meltdown" Scenario (-5% HPA)
 - 2005 deals suffer 17% losses.
 - Actual 2005 deals expected to suffer 17-20% losses.
- JPMorgan, April 2006:

The areas with the hottest real estate markets experienced low single-digit delinquencies, minimal LTD losses, [and] low loss severity, ... a sharp contrast to performance in areas at the low end of HPA growth. (JP Morgan, April 11, 2006.)

- Variation:
 - Greeley, CO: 6% HPA since origination and 20% delinquency.
 - Bakersfield, CA: 87% HPA and 2% delinquency.
- Possible to estimate effect of $HPA < 0$ by extrapolation.

- Relationship between HPA and delinquency for 2003 vintage as estimated in 2006. Source: JPMorgan.
- Delinquency rates from 2006-1 ABX deals: 37%.



dp/dt

- Consensus was that decline on the order we have seen was highly unlikely.
- No national decline in history...

...the risk of national decline in home prices appears remote. The annual HPA has never been negative in the United States going back at least to 1972.(Citi, December 2, 2005.)

Name	Scenario	Probability
(1) Aggressive	11% HPA over the life of the pool	15%
(2) [No Name]	8% HPA for life	15%
(3) Base	HPA slows to 5% by end-2005	50%
(4) Pessimistic	0% HPA for the next 3 years 5% thereafter	15%
(5) Meltdown	-5% for the next 3 years, 5% thereafter	5%

Adaptive expectations

- JPMorgan "HPA Update"

Date of	Data from	Title
12/8/06	10/06	"More widespread declines with early stabilization signs"
1/10/07	11/06	"Continuing declines with stronger stabilization signs"
2/6/07	12/06	"Tentative stabilization in HPA"
3/12/07	1/07	"Continued stabilization in HPA"
9/20/07	7/07	"Near bottom on HPA"
11/2/07	9/07	"UGLY! Double digit declines in August and September"

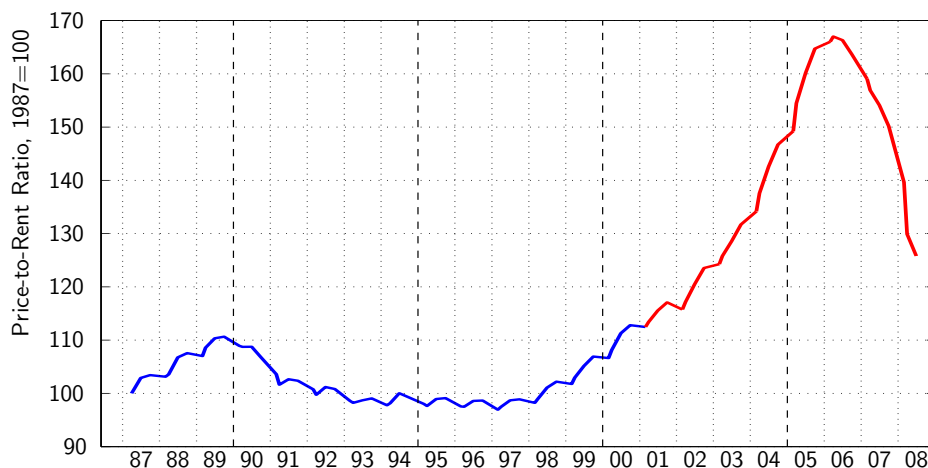
- JP Morgan, May 16, 2008.: "We expect another 15% drop in home prices over the next 12 months."

What about the prices?

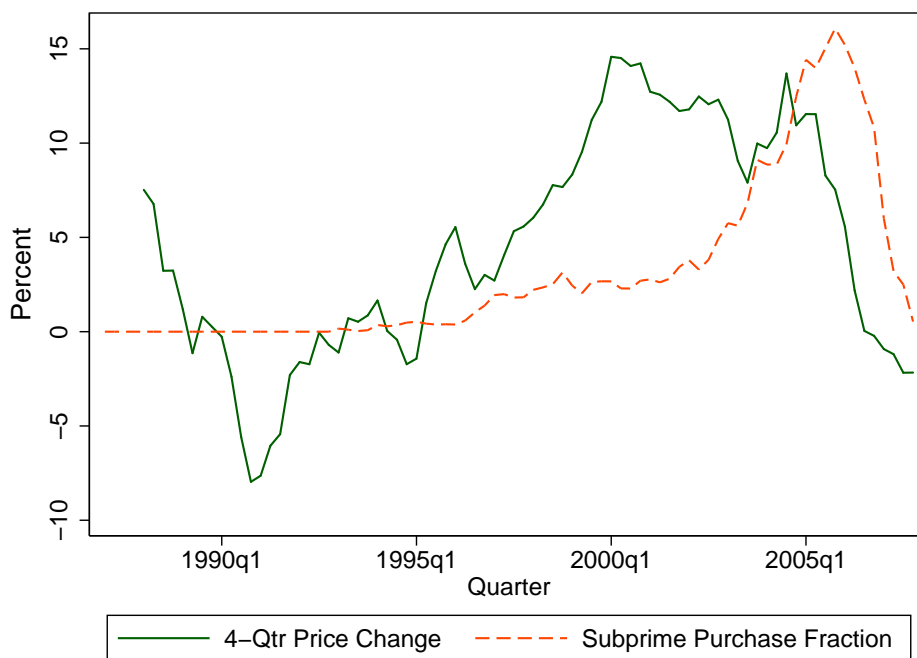
- The truth is that we know very little about prices.
- Understanding the determinants of prices is extremely difficult.
- Which makes forecasting them virtually impossible.
- Take the price-rent ratio:
 - Makes sense that price cannot deviate "that far" from rent.
 - Never deviated from long-term average by more than 10% between 1987 and 2001.
 - In 2005, it was 70 percent above its long-term average.
 - Shouldn't we have known?

The Price-Rent Ratio over time

- Case-Shiller 20-city composite index
- BLS Rent index



HPA and subprime activity



Thanks for listening

- Papers are available on the website.
- A draft of “Making Sense of the Subprime Crisis” is available on the Brookings Institution website.
- Slides are/will be available