Housing and the Financial Crisis

Ec 10 Lecture
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My background

Harvard University

Federal Reserve Board

Brookings Institution

U.S. Treasury Department
Assistant Secretary for Economic Policy
Outline for today

Basic facts about the mortgage boom and bust
The rise of riskier mortgages
Changes in the way mortgages were funded
Overly optimistic home price expectations
Fallout
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The early 2000s saw an extraordinary boom and bust in home prices
The run-up in home prices was mirrored by rapid growth in mortgage debt

Data from the U.S. Financial Accounts via FRED
The plunge in home prices left nearly one-quarter of mortgage borrowers “underwater.”

A **mortgage** is a loan that finances a home.

A mortgage is **underwater** if its outstanding balance exceeds the value of the underlying home.

[Map showing share of loans with negative equity, Third Quarter 2010]

Source: CoreLogic

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3/9/20

Dynan - Ec 10 Lecture
In 2010, nearly 10 percent of U.S. mortgages were seriously delinquent or in foreclosure.

You become **delinquent** when you fail to make payments; **foreclosure** is the process by which the lender takes possession of a home after the borrower has failed to make the agreed-upon mortgage payments.

Foreclosure often leads to displacement, which is **costly and personally traumatic**.

It damages your credit record and **impairs access to credit** for years.

Concentrations of foreclosures can **reduce neighboring property values**.
In the remainder of my talk today

I will focus on three important developments in the period leading up to the mortgage crisis and discuss what we know about how these developments set the stage for the crisis.

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Screenshot from Perry (2008)
In the early 2000s, subprime and Alt-A grew as a path for riskier borrowers to get mortgages.

**Subprime**—mortgage loans made to borrowers with relatively poor credit histories (sometimes combined with other risky features).

**Alt-A**—loans made to borrowers with strong credit scores but which have other characteristics that make them riskier such as:

- Low downpayments
- Investor-owned properties
- Limited or no documentation—sometimes known as NINJA ("no income, no job, no assets") loans
These loans also often featured non-traditional repayment schemes

Traditional mortgage products amortize—with each monthly payment you pay down some principal and you pay interest on the remaining balance.

**Interest-only mortgages** allow the borrower to only pay the interest accrued.

**Option ARMs** (or “pick-a-pay loans”) allow the borrower to pay less than the interest charged in which case the outstanding balance of the loan will grow over time.
Non-standard repayment schemes are generally viewed negatively in hindsight but, at the time, some championed them as a way to increase access to homeownership.
Subprime and Alt-A mortgages became riskier as we approached the financial crisis

Data from Mayer, Pence, Sherlund (2009) analysis of loans in securitized subprime pools
High leverage may result in benefits, but it’s risky

Consider a highly leveraged homeowner:

- Value of home = $200,000
- Mortgage balance = $190,000
- Home equity = $10,000

This homeowner has a loan-to-value ratio (LTV) of 95%

You can think of equity as the homeowner’s “housing wealth”

If home prices rise by 10% ($20,000), the homeowner now has $30,000 of home equity—she has tripled her money!

But, if home prices fall by 10% ($20,000), the homeowner has not only lost all her housing wealth—she is underwater!
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Traditional model—banks make mortgage loans and hold them in their own portfolios
Over the decades, lenders increasingly engaged in mortgage securitization

Lenders sold their mortgages to entities that securitized them and sold the resulting security to investors

*Securitization is the practice of pooling together loans and then selling the cash flow from the loans*—the interest and principal payments—to financial investors as a security (a “mortgage-backed security” or MBS)

Roughly speaking, *the investor is buying the borrower’s future mortgage payments*

[Mortgage-related securities can be created in other ways, including by re-securitizing MBS into collateralized debt obligations but we won’t worry about this for now]
Government-sponsored enterprises (Fannie Mae and Freddie Mac) had been in the mortgage securitization business for decades; what changed in the early 2000s was a surge in “private-label” securitization.
Private-label MBS funded most subprime (and Alt-A) loans

Subprime Mortgage Originations

IN BILLIONS OF DOLLARS

Subprime share of entire mortgage market
Securitized
Non-securitized

NOTE: Percent securitized is defined as subprime securities issued divided by originations in a given year. In 2007, securities issued exceeded originations.
SOURCE: Inside Mortgage Finance

Screenshot from FCIC report (p. 70)
Why was securitization attractive to lenders?

Selling mortgages and buying back MBS was appealed to many financial institutions because:

- It was a different way of making money from the maturity transformation that you learned about in lecture 9.
- Getting income from pools of loans (for example, from different geographic areas) could help diversify risk.
- Holding highly rated MBS could lower their capital requirements.
One attraction of securitization for investors—it created “safe” investments

**GSE MBS included a credit guarantee** that protected investors from losses associated with defaults of the underlying mortgages.

**Privately securitized MBS were divided into “tranches”** that were ordered according to their priority in receiving cash flow from the pool.

If you didn’t like risk, you could buy the “Triple-A” tranches that yielded less but had income streams that were (in principle) unlikely to be disrupted by defaults.
Important context (which you’ll learn more about in future classes)

We had seen a long-term downtrend in government interest rates

This downtrend left investors particularly interested in securities that were “safe” but yielded a little more than government bonds

Screenshot from Rachel and Summers (2019)
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The evidence we’ve seen so far raises some important questions

Why were borrowers, lenders, and investors so willing to enter these seemingly risky contracts?

It wasn’t just borrowers who suffered when their underwater mortgages were foreclosed upon—lenders/investors lost the difference between the value of the mortgage and the price at which they could sell the home

Why weren’t regulators more alarmed?

Let’s consider how overly optimistic home price expectations might help answer these questions
We know that households were extremely optimistic about home prices

"On average over the next 10 years, how much do you expect the value of your property to change each year?"

Results from a survey conducted of people who bought homes in previous year near major cities

Data from [Case and Shiller](2012)
Households considered homes to be about as safe as savings accounts

Data from Fannie Mae National Housing Survey
Wall Street analysts were also incredibly optimistic

<table>
<thead>
<tr>
<th>Name</th>
<th>Scenario</th>
<th>Probability</th>
<th>Cum Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Aggressive</td>
<td>11% HPA over the life of the pool</td>
<td>15%</td>
<td>1.4%</td>
</tr>
<tr>
<td>(2)</td>
<td>8% HPA for life</td>
<td>15%</td>
<td>3.2%</td>
</tr>
<tr>
<td>(3) Base</td>
<td>HPA slows to 5% by end-2005</td>
<td>50%</td>
<td>5.6%</td>
</tr>
<tr>
<td>(4) Pessimistic</td>
<td>0% HPA for the next 3 years 5% thereafter</td>
<td>15%</td>
<td>11.1%</td>
</tr>
<tr>
<td>(5) Meltdown</td>
<td>-5% for the next 3 years, 5% thereafter</td>
<td>5%</td>
<td>17.1%</td>
</tr>
</tbody>
</table>

Table 2. Conditional Forecasts of Losses on Subprime Investments from Lehman Brothers. This table shows that investors knew that subprime investments would turn sour if housing prices fell. The “meltdown” scenario for housing prices above implies cumulative losses of 17.1 percent on subprime-backed bonds; such losses would be large enough to wipe out all but the highest-rated tranches of most subprime deals. The table also shows that investors placed small probabilities on these adverse price scenarios, a fact that explains why they were so willing to buy these bonds.


Screenshot from Foote, Gerardi, Willen (2012)
Home price optimism and the rise of riskier mortgages

A good case can be made that optimism was a central factor behind the rise in the nontraditional mortgage products we discussed earlier—when home prices are expected to rise rapidly, the risk is muted

Lose your job and can’t make your mortgage payments?

If your home is worth more than your mortgage: you can sell your home, pay off your mortgage, walk away with some cash, and the lenders/investors don’t take a loss

If you are underwater with your mortgage: you can’t pay off your loan by selling your home—you’ll probably be foreclosed upon and the lenders/investors will take losses
What about the role of securitization—did it allow lenders to pass off bad loans to unsuspecting investors?

As noted earlier, lenders were very optimistic about home prices too—and they don’t appear to have been just passing the risk along, as they too held risky mortgage products.

The consumer portfolio of Wachovia shortly before the government forced a sale to Wells Fargo to avoid its failure in 2008.

The option ARMs we discussed earlier.
Were investors naïve or were they just optimistic too?

A key fact here is that **lots of information** about the loans underlying MBS were available to investors.

A great website if you want to see for yourself what information was typically available to investors, see [The Story of a Security: Inside CMLTI 2006-NC2](#) by the Financial Crisis Inquiry Commission—it has **the data** for all 4499 loans underlying the deal.
Investors probably did put too much faith in the “Triple A” ratings of mortgage securities

But recognize that the credit ratings agencies (e.g. Moody’s, S&P, Fitch) who assigned the ratings likely made the same inaccurate assumptions about home prices as others did

Indeed, the models used to predict the relationship between risky loan features and mortgage defaults for any given path of home prices were generally fairly accurate [see Foote and Willen, 2017]

[That’s not to entirely let the ratings agencies off the hook—there were some incentive problems and the ratings on more complicated mortgage-related securities were inaccurate]
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The mortgage crisis ultimately wreaked havoc on the financial system

By September 2008, mortgage-related losses had crippled important financial institutions such as Countrywide Financial, Wachovia, Bear Stearns, Washington Mutual, Fannie Mae, and Freddie Mac.

By this time, it was recognized that there would be many channels through which the economy would weaken—including lower wealth, an overbuild of housing, reduced credit access.
And, yet, forecasters did not see anything like the Great Recession coming.

Unemployment Rate

Percent

2005 2006 2007 2008 2009 2010

Actual

Federal Reserve Forecast, 9/10/08

Data from the Philadelphia Fed Greenbook Data Set
What explains the miss? Factor 1—lack of recognition that the mortgage crisis was not just about risky borrowers

Households across the income (and credit) distribution were spurred to do more borrowing by rapidly rising home prices

Many of these households were “extracting equity” through cash-out refinancings to fund other types of spending

Screenshots from Foote, Loewenstein, and Willen (2016)
What explains the miss? Factor 1—lack of recognition that the mortgage crisis was not just about risky borrowers.

High leverage left a broad swath of the population exposed to the risks of being underwater with their mortgages.

In the end, there were more foreclosures on prime mortgages than on subprime mortgages.

[Prime mortgages had lower default rates but there were far more of them]
What explains the risk? Factor 2—lack of recognition of how mortgage losses would be amplified through the financial system

Credit markets seized up in late September 2008 due to panic about the exposure of financial institutions to mortgage losses.

There were widespread liquidity problems, failures, and near-failures, including in the regulated banking sector and among systemically important institutions.

You can take EC 1746 if you want to know more about this amplification, as well as:

- What policymakers did to stop the crisis and the recession
- What policies we have put in place to protect homeowners and the financial system from another crisis
Summary

Over-optimism about home prices (the home price “bubble”) likely played a central role fueling the housing and mortgage boom and bust.

The rise in home prices was enabled and sustained by the rise of riskier mortgages and financial engineering that drew in a large amount of funding for mortgages.

The losses were amplified by the pre-crisis structure of the financial system, leading to the global financial crisis that precipitated the Great Recession.