Mortgage-Default Research
and the Recent Foreclosure Crisis

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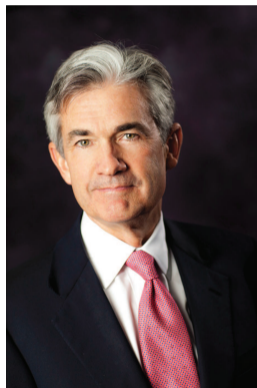
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Federal Reserve
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Eric Rosengren, President of Boston Fed

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What is the Right Question?

- Huge increase in defaults during Great Recession
- Natural question: Why so many?
- Common explanations:
  - Unafforable loans (e.g. subprime)
  - Distorted beliefs about housing prices (bubble psychology)
- For mortgage-default research, the more appropriate question is: why so <u>few</u> defaults?
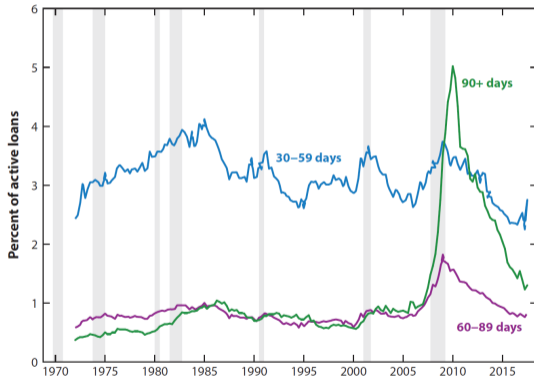
Falling House Prices and Negative Equity
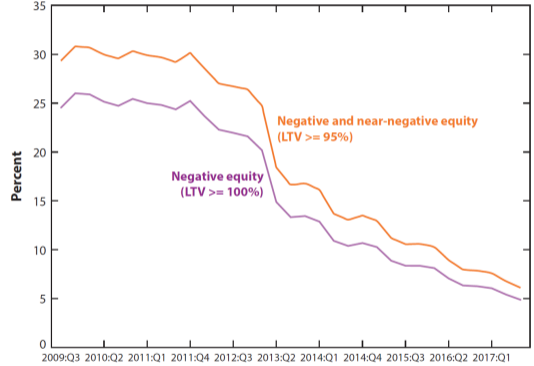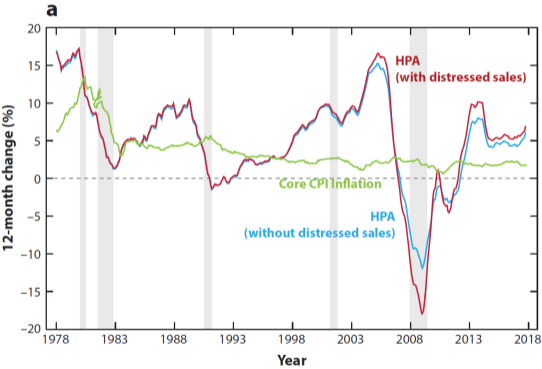
Frictionless Option Model (FOM)

- Application of option-pricing techniques to default decision generates the FOM
- Assumptions:
    - Frictionless capital markets
    - Well-known stochastic processes for house prices and interest rates
- Borrowers with moderate negative equity do not default
- FGW (2008): Massachusetts data from early 1990s predicts low default rate in 2000s
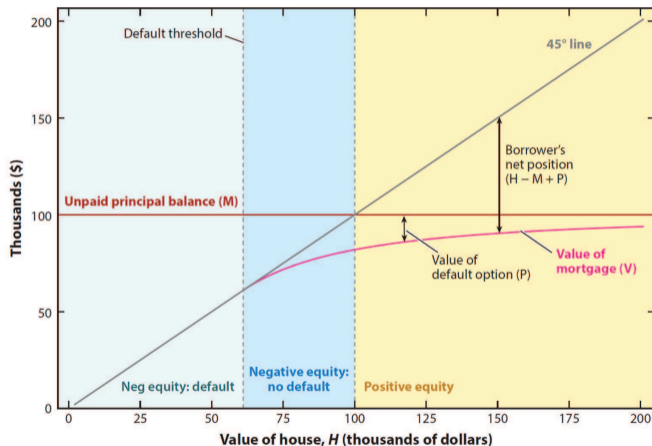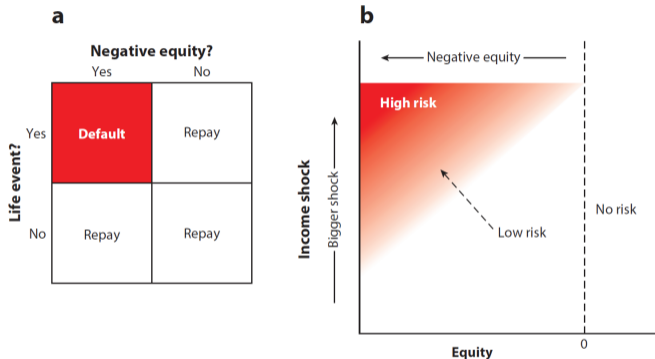
Two Empirical Problems with the FOM
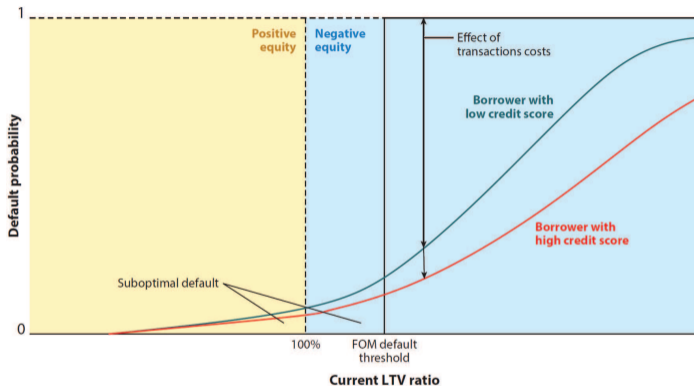
1. "Transactions costs" depress default function below FOM benchmark
   - Foster & Van Order (1984), Bhutta et al. (2017)
2. Borrower-level characteristics matter (e.g., high vs. low credit score)

Double-Trigger Models: Basic and Modified

a

Negative equity?

	Yes	No
Life event? Yes	**Default**	Repay
No	Repay	Repay

b

← Negative equity →

High risk

Income shock (Bigger shock →)

Low risk

No risk

Equity   0

- Borrowing constraints mean that adverse life events can prompt default
- "Modified" double-trigger model takes into account <u>depth</u> of negative equity as well

Double-Trigger and the Reluctance to Default
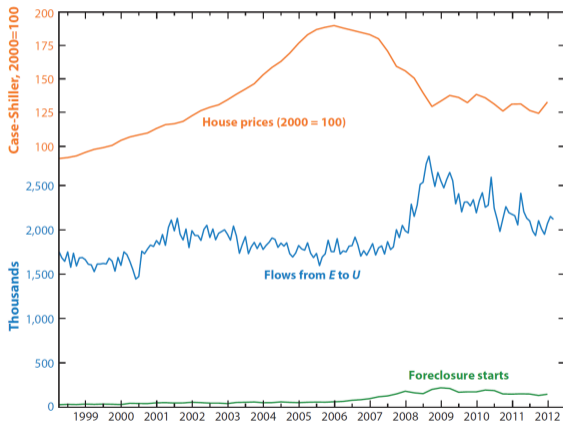
- Huge number of "adverse life events" each month
- Yet foreclosure starts are low, even after house prices fall and unemployment rises
- Gerardi et al. (2018): Even financially stressed borrowers with negative equity default at low rates ($\approx 20\%$)
- That rate is higher than non-stressed borrowers, but still low.

The Research Frontier

- Researchers are now trying to build a double-trigger/FOM hybrid in which
    1. Expectations about future house prices matter (as implied by the FOM)
    2. Price expectations of borrowers could be non-rational and involve mean reversion (Glaeser, Laibson, Schelkle, etc.)
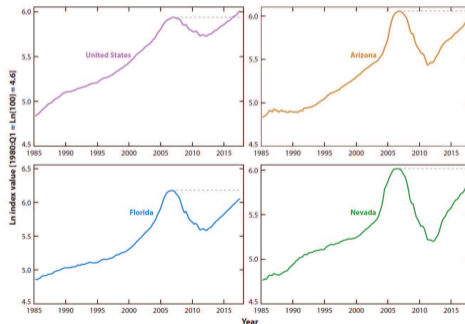
The Research Frontier (con't)

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    3. Adverse life events significantly increase default probability (due to borrowing constraints)
    4. Most borrowers remain current on their loans, even when negative equity is deep and/or liquidity constraints bind (b/c of transactions costs)
- Data to test this model should improve over time
- Ideal dataset is large and has information on both life events and equity at the monthly frequency
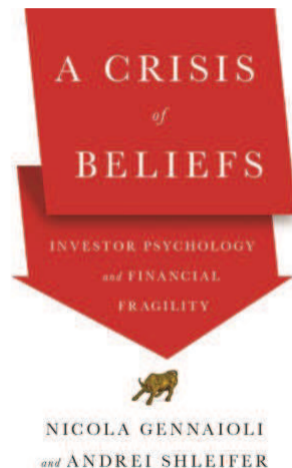
Three Questions Related to the Crisis

1. Should the government have written down mortgage principal more aggressively?
2. Does the pattern of defaults suggest that an exogenous decline in lending standards caused the boom?
3. Could causality run from high foreclosures $\rightarrow$ falling house prices?

#1.) Principal Reductions vs. Payment Reductions to Reduce Default

- Key problems with principal reductions as an anti-foreclosure strategy:
  - **Double-trigger foreclosures:** Liquidity constraints mean that increase in future wealth does not help much (Eberly and Krishnamurthy 2014)
  - **"Ruthless" or "strategic" defaults**: Low default rate among non-stressed borrowers means that mass principal reductions are not cost-effective in preventing FOM defaults
- Payment reductions are better at preventing double-trigger foreclosures, as illustrated by <u>downward</u> interest-rate resets (Fuster & Willen 2017)
- Imperfect-information problems plague all anti-foreclosure policies
  - HAMP included a "hardship affidavit" to screen potential double-trigger defaulters
  - What screen could identify potential strategic/FOM defaulters?
 - Geithner vs. economists: Geithner was right.

#2.) Default Patterns and the Underwriting Standards

- Early papers used patterns of default to blame crisis on poor underwriting for marginal borrowers
  - Mian & Sufi (2009); Keys et al. (2010); Demyanyk & Van Hemert (2008)
- Recent work shows that problems were widespread throughout the income distribution
- "New narrative" links the housing cycle to distorted beliefs about prices rather than securitization and/or bad underwriting
  - Foote, Gerardi & Willen (2012)
  - Adelino, Schoar & Severino (2016)
  - Albanesi, Di Giorgi & Nosal (2017)
  - Gennaioli & Shleifer (2018)

A CRISIS
of
BELIEFS

INVESTOR PSYCHOLOGY
and FINANCIAL
FRAGILITY

NICOLA GENNAIOLI
and ANDREI SHLEIFER

#3.) Foreclosures → Housing Prices?

- Foreclosures reduce set of potential buyers...
- ... but they also <u>raise</u> the set of potential renters—and thus rents.
- Higher rents encourage landlords to buy foreclosed properties and rent them out.
- Key question: How separate are owner-occupied and rental markets?
- In the data, house prices stabilized as completed foreclosures grew.
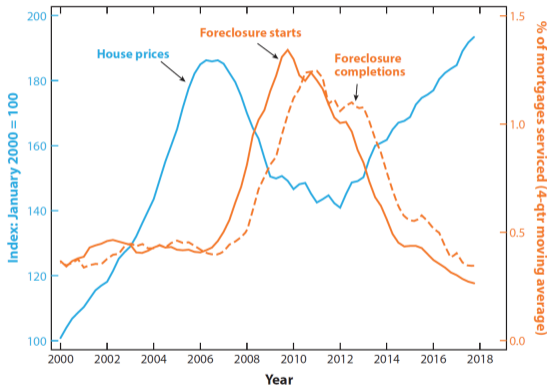
Bottom Lines

- Great Depression : Macroeconomics :: Great Recession : Mortgage-default research
- Basic patterns were consistent with pre-crisis research:
  - Big increase in defaults after house-price collapse was not surprising
  - But vast majority of people with negative equity do not default
  - As a result, policymakers find it hard to prevent foreclosures
- Going forward, researchers will try to blend FOM and double-trigger models
  - Theory: Treatment of expectations will be critical
  - Data: Empirical work will improve as more "big data" comes online
- Given imperfect markets, default may be the best way to share risk (Zame 1993; Dubey, Geanakoplos & Shubik 2005)