Mortgage Default with Positive Equity

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Frictionless models $\Rightarrow$ defaulters have negative equity.

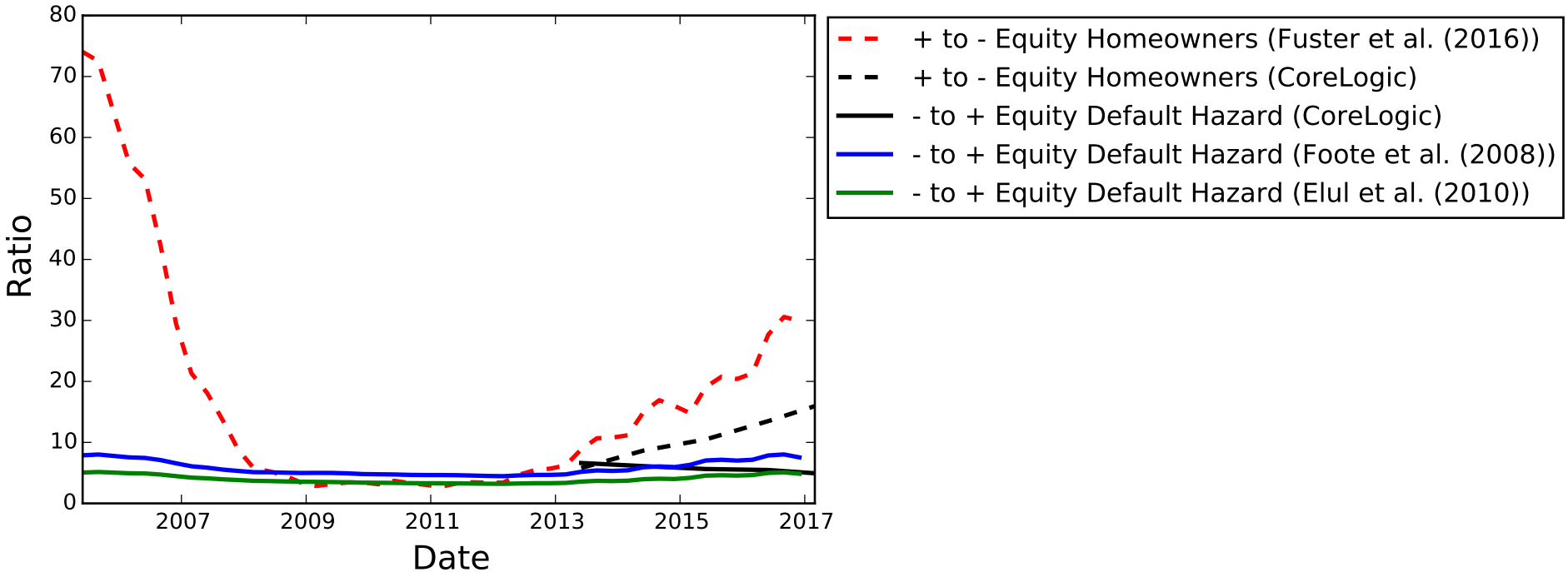
Evidence $\Rightarrow$ many defaulters have positive equity.
Evidence has issues, so most research focuses on negative equity default.

Today, focus on positive equity default. Two major questions:

1. How many defaulters have positive equity?
2. Is this consistent with theory?

Available Evidence

Intuition from Ratios

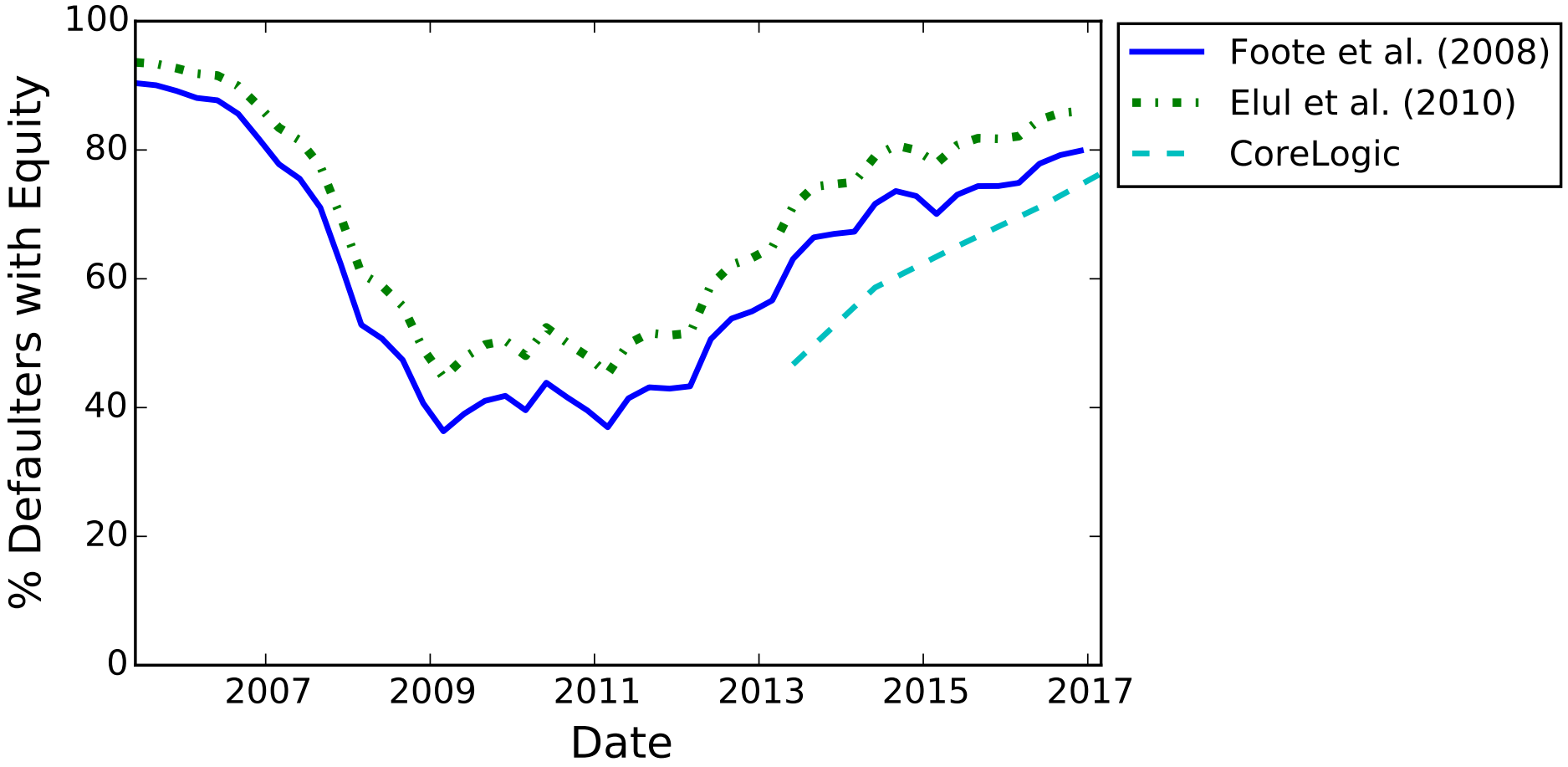


Abovewater homeowners approximately:

- 70 times more common in 2005
- 3-5 times more common during crisis
- 15-30 times more common in 2017

Underwater default rate estimates $\approx 5 - 10$ times higher

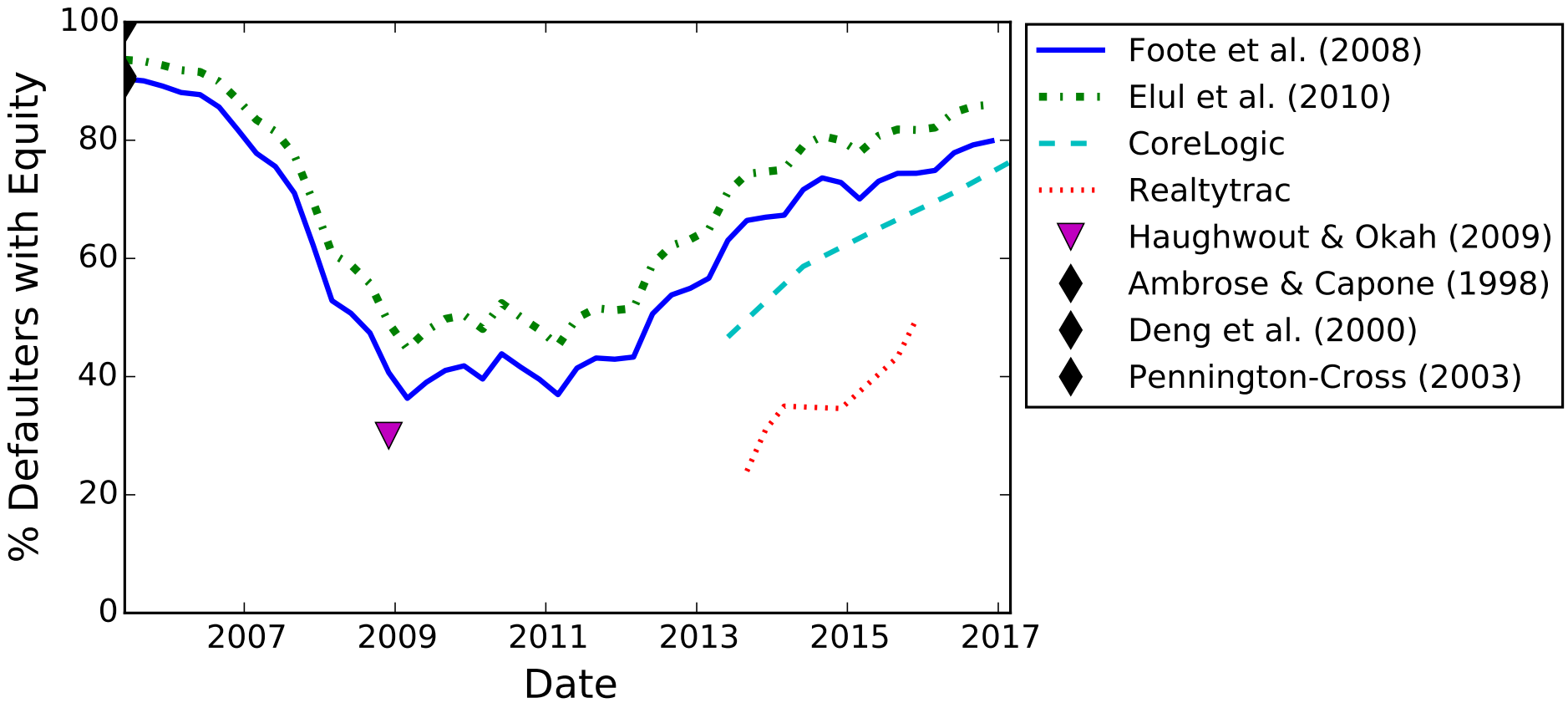
Back-of-the-Envelope Evidence from Ratios



Underwater homeowners default more, but most homeowners abovewater

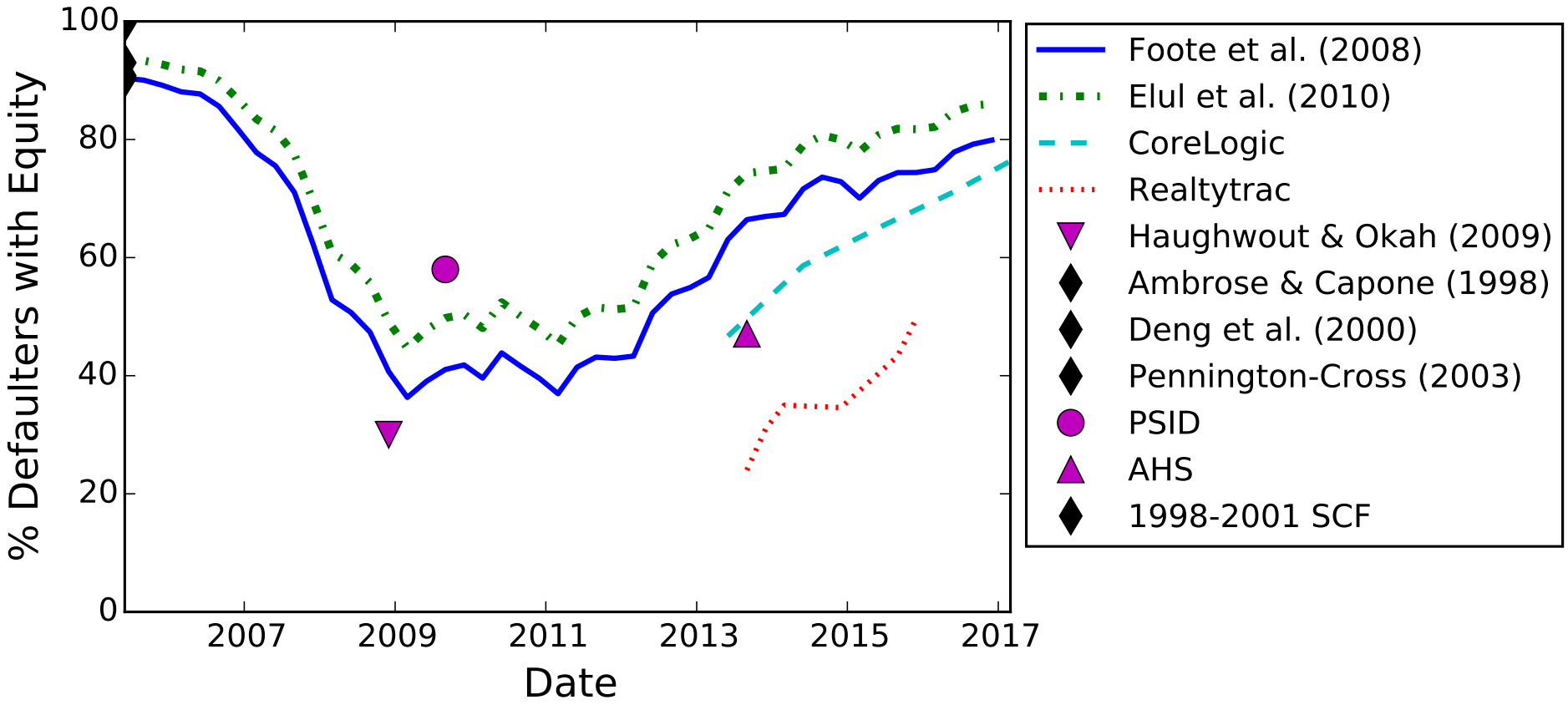
Issues? Measurement error, incompatible samples, "default" definition, etc.

Direct Evidence



Issues? Unrepresentative samples, only first lien observed, house price change $\neq$ HPI change, "default" definition, etc.

Evidence from Surveys



Issues? "Default" definition, homeowner-reported values biased and noisy

Available Evidence: Summary

Available evidence $\Rightarrow$ many defaulters have equity.

But this evidence has many issues.

Next: first formal estimates of defaulters' equity.

Estimation

Panel data: 1997-2013 American Housing Survey

Rich set of controls for idiosyncratic shocks

- Broken window, cracks in walls or foundation, holes in roof, leaks, etc.

Some controls for local/regional shocks

- Census-division HPI, "fair market rent", nearby abandoned buildings

Noisy signals of other unobserved shocks

- Transaction prices
- Homeowner-reported values

30,000+ properties used to estimate parameters
Focus: 46 properties occupied in 2011, vacant in 2013 due to foreclosure

- Misses re-occupied properties (likely more equity)
- Counts properties vacated before foreclosure occurs (likely less equity)

Empirical Approach

Extension of Bayesian Gibbs sampler from Korteweg & Sorensen (2016)

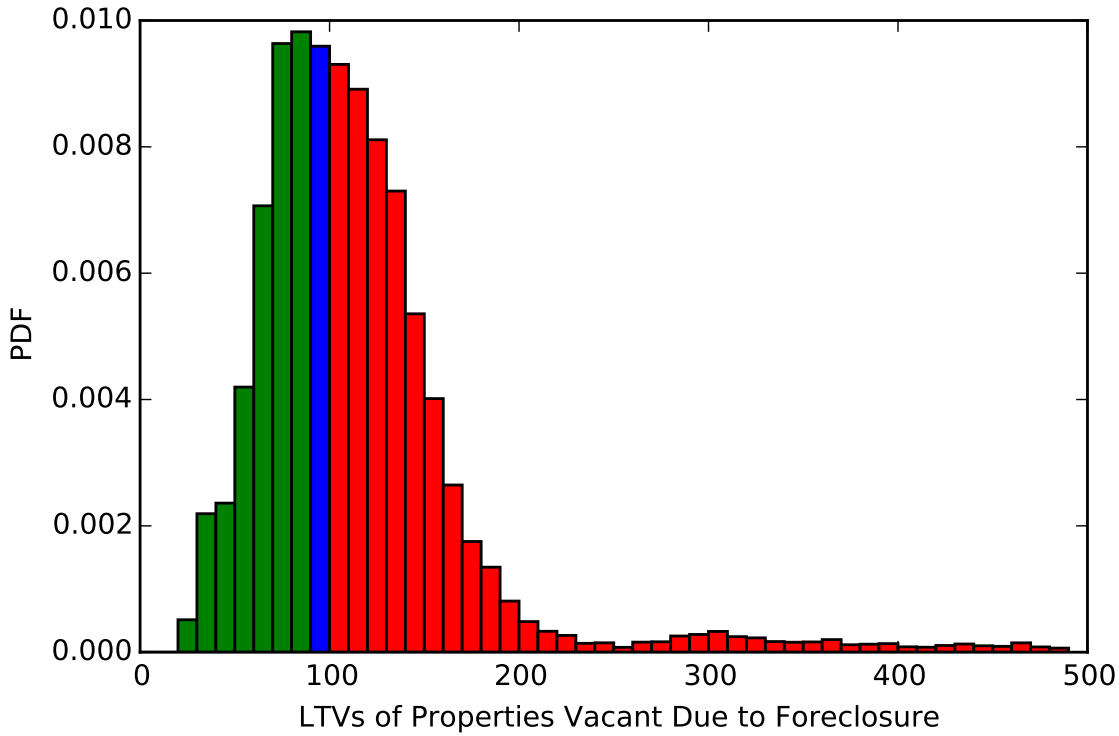
This extension:

1. Controls for observable changes to property value
2. Filters transaction prices, homeowner-reported values as noisy signals of unobservable changes to property value

$\Rightarrow$ Yields posterior distributions for LTVs, accounting for:

1. Measurement error
2. Changes in property value between measurements
3. Uncertainty in parameter estimates of empirical model

LTV Posteriors for Foreclosed Properties



47% of LTV posteriors have mean < 100

27% of LTV posteriors have 95^{th} percentile < 100

Interpretation of Results

$\approx$ 27% - 47% of foreclosures abovewater from 2011-2013

Equity lower during recession than before or since (Fuster et al. (2016))
Estimates imply roughly 81-87% of foreclosures abovewater 1998-2001

Is this consistent with theory?
Next: model with search frictions

Model

Model Outline

Many standard ingredients:

- Consumption, housing, and mortgage choices over lifecycle
- Income shocks, including "disastrous" shock
- Nonhomeowners can rent or buy
- Current homeowners can sell, refinance, pay, or not pay mortgage
- Mortgages priced endogenously, but subject to LTV & PTI constraints

Transaction costs $\Rightarrow$ default with equity $<$ transaction costs

Delinquent Homeowners in the Model

Delinquent homeowners may:

1. Repay delinquent debt, interest, & fees to keep home
   - Herkenhoff & Ohanian (2015)
2. Sell home in *frictional* market
   - Can $\downarrow$ price to $\uparrow$ probability of sale
   - Head et al. (2016), Hedlund (2016a,b), Garriga & Hedlund (2017)

$\Rightarrow$ Foreclosure occurs only if owner:

1. When current, chose delinquency over selling
2. When delinquent, did not make up their payment, and
3. When delinquent, did not sell in frictional market

Model Estimation & Results

Estimation targets number & default rate of underwater homeowners
$\Rightarrow$ model forced to match # of underwater foreclosures

Can model match number & default rate of abovewater homeowners?

- Foreclosure rate of .45% (.5% "long-run" rate in Jeske et al. (2013))
- 83% of defaulters abovewater (81-87% estimated earlier)

$\Rightarrow$ Abovewater default rates in data are compatible with theory

Policy Implications: Lender Recourse

"Recourse" allows lenders to seize assets of underwater defaulters

Frictionless models $\Rightarrow$ defaulters underwater $\Rightarrow$ recourse $\searrow$ default

In this model, recourse lowers:

- Underwater foreclosure rate from 2.49% to 1.85%
- Aggregate foreclosure rate only from 0.45% to 0.43%

Why? Abovewater defaulters not subject to recourse

First model to match empirical evidence:

- Recourse $\searrow$ underwater default rate
  (Ghent & Kudlyak (2011), Dobbie & Goldsmith-Pinkham (2015))
- Recourse $\not\searrow$ default rate
  (Clauretie (1987), Ghent & Kudlyak (2011), Li & Oswald (2014))

Conclusion

First formal estimates $\Rightarrow$ many defaulters have positive equity

- Estimates from larger dataset & longer time period would be valuable

Model $\Rightarrow$ abovewater default in data:

- Consistent with search frictions
- Consistent with evidence on recourse

Model $\not\Rightarrow$ income shocks & search frictions only factors

- Other shocks (divorce, health, etc.)
- Information frictions
- Behavioral factors, etc.