Consumption and House Prices in the Great Recession: Model Meets Evidence

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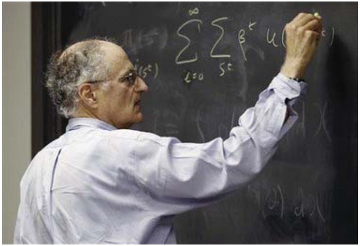
`after-dinner-seminar version`

Evoking Tom Sargent again



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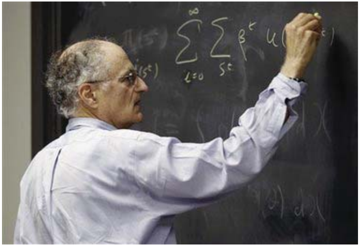

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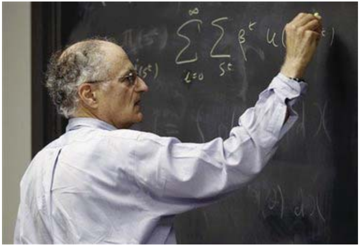

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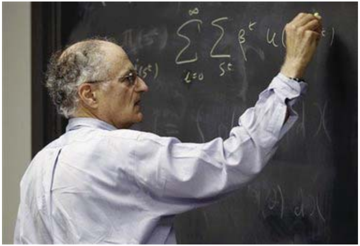

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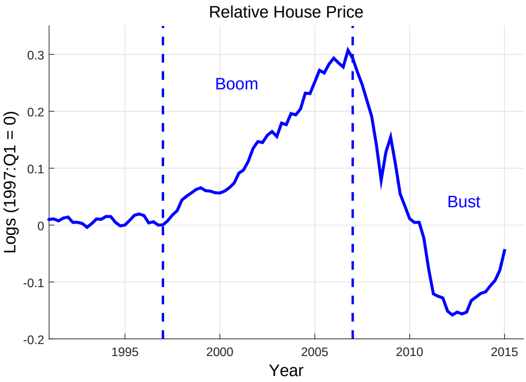
... and James discussion!

The Question



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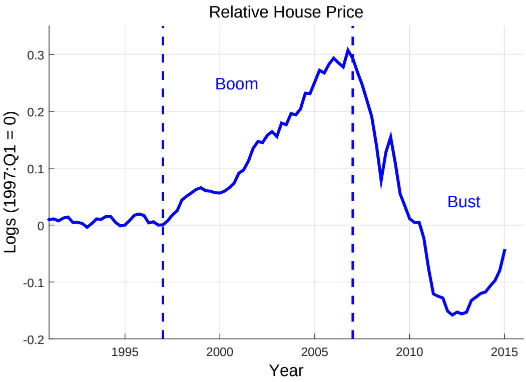

- What caused the boom and bust in house prices?

Two Views

1. Credit view

   - Availability of credit to marginal borrowers determines demand for housing and house prices

   - Financial innovations in early 2000s (i.e., PLS) led to ‘unsustainable’ lending to subprime low-income borrowers

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2. Expectations view
   - Waves of optimism and pessimism affect desire of borrowing, housing demand and house prices
   - Middle class (i.e., prime borrowers) crucial to the story

- What do the microdata say?

Micro data

- Credit view: credit growth (in boom) and defaults (in bust) concentrated among marginal borrowers
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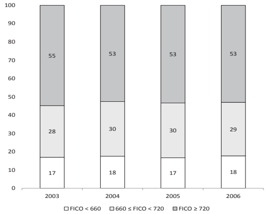
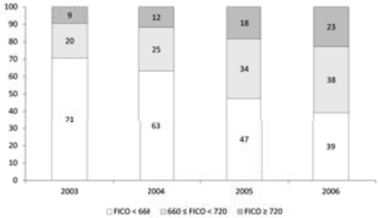


Share of originations



Share of delinquencies

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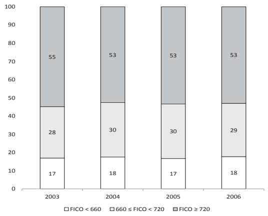

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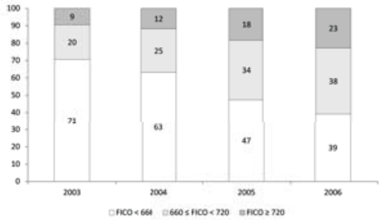

Share of delinquencies

- Suggestive evidence: need measurement through structural models

Equilibrium Models of the Credit View

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    1. Large effect on housing risk premium
    2. Many constrained households
- Model features that deliver these outcomes:
    1. Short-term debt: makes housing very risky
    2. No rental market: many households that want to consume more housing, but can't

Our Paper

- Equilibrium model with rental market and long-term mortgages
- Aggregate shocks: income, credit, and beliefs
- Parameterize to cross-sectional and life-cycle facts
- Compare to time-series on: house prices, rent-price ratio, home ownership, leverage, and foreclosures
- Decompose role of each shock
- Compare with ‘new’ micro evidence
- Study transmission of house prices to consumption

Model: Household and Financial Sectors

- OLG with two phases in lifecycle: work and retirement
- CES utility over ND consumption $(1-\phi)$ and housing (ϕ)
- Idiosyncratic uninsurable earnings shocks
- Saving in risk-free bonds with exogenously fixed interest rate
- Housing can be bought at p_h (sold s.t. transaction cost) or rented at ρ
- Long-term mortgages (to be repaid before death), with cash-out refi option, defaultable, competitively priced by financial intermediaries
- At origination: max LTV and max PTI constraints (λ^m, λ^π) and origination cost (proportional to loan size) κ^m
- HELOCs: one-period debt, non defaultable (λ^b)

Closing the Model

Final good sector

- Linear technology in labor with productivity $Z \quad \rightarrow \quad w = Z$

Construction sector

- Housing permits + labor $\rightarrow$ aggregate housing investments $I(p_h)$

Rental sector

- Frictionless conversion of rental units into OO units and viceversa
- Zero-profit condition yields equilibrium rental rate ρ

Government

- Taxes workers (with mortgage interest deduction) and properties, sells land permits, and pays SS benefits to retirees

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  (a) ϕ_L: low housing share and unlikely transition to ϕ_H

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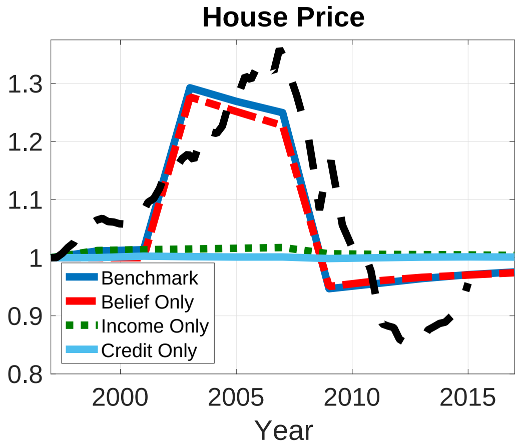
  Boom-Bust: shift from (a) to (b), and back to (a)
- Calibration of news shock: use data on expectations... but residual

House Prices



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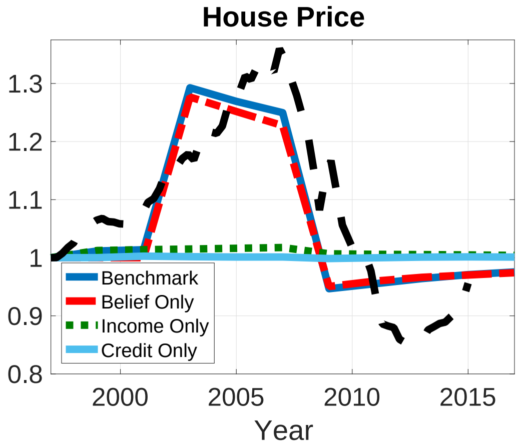
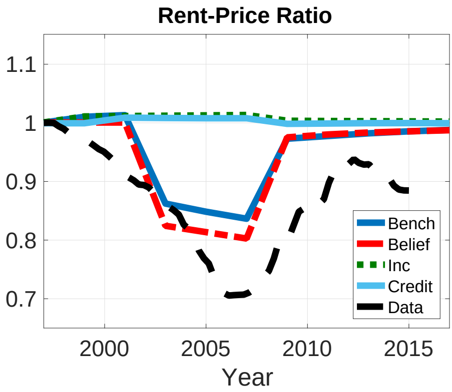


- Belief shock accounts for all boom-bust in house prices
- Households unconstrained with respect to housing consumption

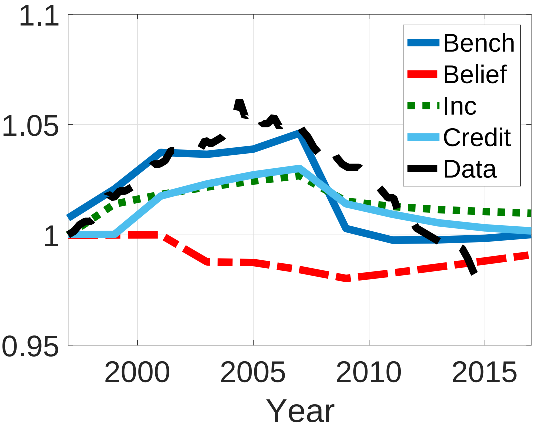
Rent-Price Ratio



$$\rho = \psi + p_h - \left(\frac{1 - \delta_h - \tau_h}{1 + r^b} \right) \mathbb{E}_{p_h} \left[p_h' \right]$$

- Belief about future appreciation shared by investment company

Home Ownership Rate



- Cheap credit drives rise in home ownership
- Households constrained with respect to their tenure choice

Explaining the effects of credit shocks

- Why looser/tighter credit does not affect housing demand?
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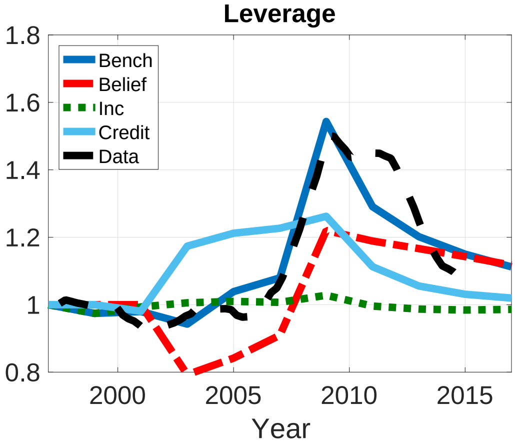
  - It's the current home owners who upsize and push up demand
- If hh's consume optimal amount of housing, why buying more?
  - Housing is both a consumption good and an asset
  - Many households buy larger houses to realize expected capital gains

Leverage (debt/house value)



- Credit loosening is crucial to maintain constant leverage pre-boom

Endogenous credit boom through beliefs

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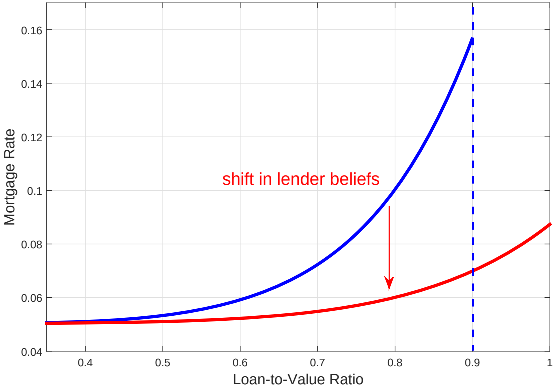
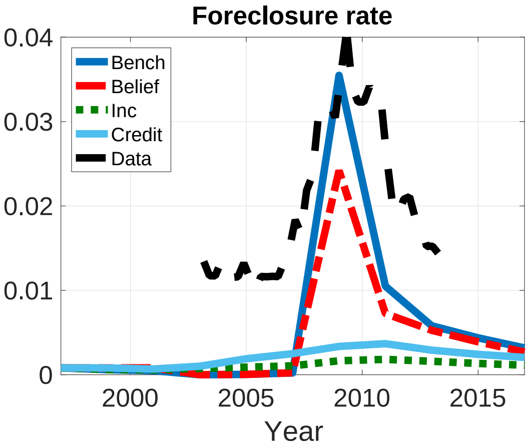


- Lender's optimist beliefs $\rightarrow$ lower expected default rates $\rightarrow$ lower mortgage rates, especially for subprime borrowers

Foreclosure Rate



- Foreclosure spike due to interaction between optimistic belief and looser credit

Comparison with New Evidence

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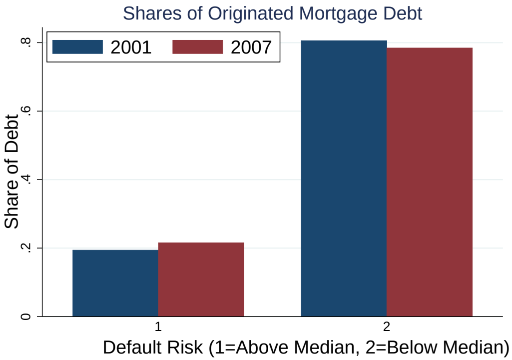
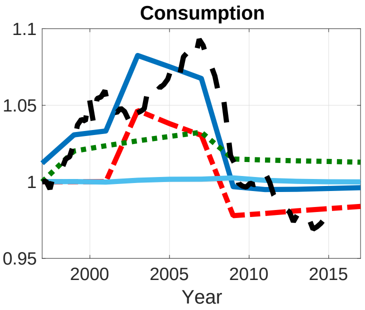
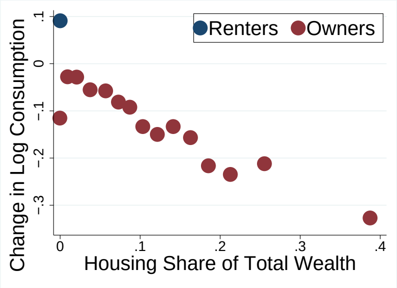


Consumption





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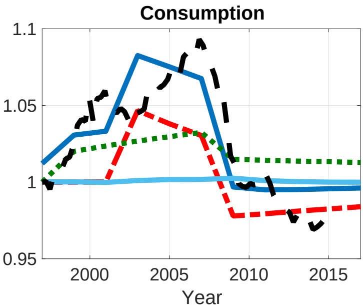

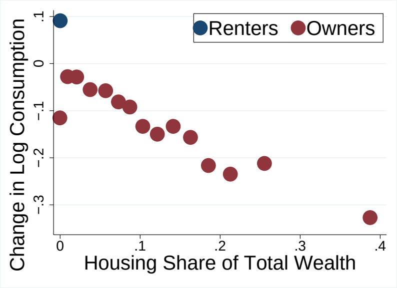

- House prices explain 1/2 of boom and bust in C
- It's a wealth effect (through household balance sheet)

Summary: what did we learn from the model?

- Shift in expected house appreciation key to boom-bust in p_h
- Credit important for home ownership, leverage, and foreclosures
- Rental market + long-term mortgages are the key model features
- Model tells us that aggregate time series and micro evidence agree
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