Discussion of

“House Prices, Foreclosures, and Bail-Outs”

by Garriga and Schlagenhauf

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Note: Slope coefficient = \(-0.126\) with an R-square of 0.72.

Source: Calomiris, Longhofer and Miles (2008)
1 Introduction

The boom in ownership in the United States that was initiated in 1994 started to have significant impact in house prices around 2002. Figure 1 describes the real appreciation rate measured by different house price indices.

![Figure 1: Evolution of House Prices](image)

The figure combines a relatively steady appreciation of house prices between 1998 and 2002, a much rapid increase in house prices between 2003 and 2005, with a final decline after the summer 2005. Changes in house prices have a significant impact in the homeowners portfolios since they change the level of equity accrued in the dwelling. In periods with high appreciation homeowners can borrow against a collateral with an increased value to increase consumption or can opt to sell the property and purchase a bigger one, but in periods with falling prices the outstanding debt can be larger than the market value of the property making default a viable option for some homeowners. The evidence seems to suggest a connection between house prices and housing foreclosures. Next figure, summarizes the evolution of seriously delinquent mortgages between 1990 and 2007.

![Figure 2: Evolution of Seriously Delinquent Mortgages](image)

The concept of "seriously delinquent mortgages" is calculated by adding the percentages of mortgage payments 90 days past due and the percentages of inventory of mortgages in foreclosure. "Inventory of Mortgages in foreclosure" refers to the total number of loans in the legal process of foreclosure as a percentage of the total number of mortgages in the pool during a quarter. The number of loans in the process of foreclosure during a quarter means that some foreclosures may have started in other quarters but have yet to be resolved.
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Motivation

- Strong negative correlation between changes in house prices and changes in foreclosure rates in the U.S.

- Conventional wisdom I: price declines lower owners’ equity in the home and thus cause changes in default rates on mortgages (foreclosures).

- Conventional wisdom II: rising foreclosures increase supply of homes on the market, cause price declines.
Motivation

• (Quantitative) Theory: home prices and foreclosure rates are *jointly* determined in general equilibrium. Garriga & Schlagenhauf’s research agenda: provide us with this quantitative theory

• This paper: causality runs from price changes to foreclosure rates.
  
  – Construct model that matches homeownership rates, foreclosure rates
  
  – Engineer a change in the house price and document what happens to foreclosure rates in the model.
Model: Key Ingredients

- Chambers, Garriga & Schlagenhauf’s (2007) model of housing market
  - OLG model with uninsurable idiosyncratic income risk
  - Relative price of real estate, $p$, and risk free rate $r^*$ exogenous.
  - Endogenous housing tenure and mortgage decisions
  - Housing investment lumpy and subject to transaction costs and idiosyncratic price shocks $\xi$.
- Introduction of mortgage default as in Krueger and Jeske (2007).
Time line for households that owned in previous period

Stay put \( c, d, a', l_r \)
Sell, rent \( c, d, a' \)
Sell, buy \( \xi \sim \pi_\xi \) Foreclose? \( c, d, a', h', z', l_r \)

State \( s = (a, h, z, n, \epsilon, j) \)
State \( s' = (a', h', z', n', \epsilon', j+1) \)

Today
Tomorrow
Mortgage Contracts and Default

- Pre-commitment to “sell”. House price shock $\xi$ realized. Default iff
  \[(1 - \phi_s)\xi ph - D(z, n)h < 0\]

- Threshold $\xi^*(z, n)$ such that default iff $\xi < \xi^*(z, n)$. Corresponding
default probability $\psi(z, n)$ and mortgage interest rate $\rho(z)$.

- $\xi^*(z, n), \psi(z, n), \rho(z)$ depend on mortgage type $z$ and length
  $n$, but not on characteristics of borrower, $s$, or size of the house $h$.

- Note: for default only difference in contracts is $D(z, n)$.
Prices and Default Decision

Default Region

$\xi^*(z,n;p)$

$\Pi_\xi$
Quantitative Prediction of Benchmark Model

- Model matches homeownership rates over the life cycle and aggregate statistics remarkably well.

- Focus on foreclosure rates \( d = d_{FR}s_{FR} + d_{GP}s_{GP} \)
  
  - \( z_{FR} \): Standard 30 year fixed rate contract with 20% down
  
  - \( z_{GP} \): 30 year contact, low downpayment, growing payments

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<th>Stat.</th>
<th>( d )</th>
<th>( s_{FR} )</th>
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Thought Experiment: Unexpected Exogenous Fall in House Price \( p \)

- Default if

\[(1 - \phi_s)\xi ph - D(z, n)h < 0.\]

- For contract \( z \) a decline from \( p \) to \( p' \) leads to an increase in \( \xi^*(z, n) \).

- Is the model “continuous” in \( p \) if \( \xi \in \Xi \), and \( \Xi \) is a very finite set?

- Note that for given contract \( z \) heterogeneity in \( s \) does not help since \( \xi^*(z, n) \) not a function of \( s \). Mortgage contract is a choice, \( z = Z(s) \).
Prices and Default Decision

\[ p' < p \]
Prices and Default Decision

\[ p' < p \]
Prices and Default Decision

$p' < p$
Fall in House Price $p$ by 15 Percent: Results

- Ownership rate not affected much (despite the fact that $R/p$ changes significantly).

- Effects on mortgage default:

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Conclusions

- Ambitious paper. Introduces endogenous default into elaborate model of housing.

- Model fits homeownership rates well.

  - Very coarse set of mortgage contracts
  - Model has significant heterogeneity, but maybe not enough (unobserved differences in types?)
What fundamental factors *jointly* determine (recent) trends in house prices and mortgage default rates?