Arrested Development: Theory and Evidence of Supply-Side Speculation in the Housing Market

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Broad Motivation

**How do prices aggregate information?**

- Setting: housing market with heterogeneous beliefs

- Price bias towards optimists $\implies$ booms/busts amplified

- What types of housing markets have optimism bias?
a) Price Increases and Construction, 2000-2006

b) Historic Construction

c) Historic Prices
1. **Anomalous City Puzzle:** Olesiuk & Kalser (2009), Davidoff (2013, 2014), Gao (2014), Sockin & Xiong (2014),


U.S. Cities, 2000-2006

Note: Land prices from Nichols, Oliner & Mulhall (2013)
a) Homebuilder Land Holdings

b) Homebuilder Market Equity

c) Homebuilder Short Interest
Model

- Developers build houses, invest in land, issue equity → **sty. facts**

- Residents buy/rent housing. Flow utility:

\[ c + v(a_i h^{own} + h^{rent}) \]

- Demand shock \( N_t = \bar{N}_t + \mu_t x \). At \( t = 0 \): observe \( x \), disagree on \( \mu \)

- Space \( S \). Land demand \( D_l(r_l) \) from farms; housing supply \( S - D_l \)
  - Short-run elasticity \( \epsilon_t^S \). Falls with development
  - Long-run elasticity \( \tilde{c}_t^S \). Averages future \( \epsilon_t^S \)

- No short-selling of housing or land
Results

\[ \frac{d \log p_0^h}{dx} = \left( \frac{\epsilon_0^S + (1 - \chi)\epsilon^D}{\epsilon_0^S + \epsilon^D} \mu_{\text{opt}} + \frac{\chi\epsilon^D}{\epsilon_0^S + \epsilon^D \mu_{\text{avg}}} \right) \frac{1}{\bar{\epsilon}^S + \epsilon^D} \]

aggregate belief

How do housing markets aggregate information?

• Abundant land or rent. hous. \([\epsilon_0^S = \infty \text{ or } \chi = 0]\) \(\rightarrow\) only \(\mu_{\text{opt}}\) matters

• No land & all hous. owner-occ. \([\epsilon_0^S = 0 \text{ & } \chi = 1]\) \(\rightarrow\) only \(\mu_{\text{avg}}\) matters

When does optimism bias amplify prices most?

• Supply easy now, difficult soon \([\epsilon_0^S \text{ big, } \bar{\epsilon}^S \text{ small}]\): “arrested development”
a) Inverse Supply Elasticity

- Short-Run
- Long-Run

b) Price Increase

- With Disagreement
- Without Disagreement
Long-Run Development Constraints in Las Vegas
New prediction: within city, higher $\chi \rightarrow$ lower price boom

1. **Neighborhoods.** $\text{std}(\chi)$ over ZIPs is 0.17 in 2000 Census
   
   - Reg. $\Delta \log p$ '00-'06 on $\chi$ & city f.e $\rightarrow$ coeff. $-0.10$ (0.026)
   
   - Caveat: $\text{corr}(\chi, \text{income}) = 0.4$ & lower income $=$ higher shocks

2. **Structures.** $\chi = 0.87$ for detached single-family; 0.14 for multifamily
   
   - Example: Stuy. Town/Peter Cooper Village [large NYC rental complex]
   
   - Record price '06 [investors: CalPERS & Church of Eng.], foreclosure '10