Data Talk

Institutional Investors’ Impact on the Housing Market

#LiveAtUrban
Institutional Investors and the U.S. Housing Recovery

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Federal Reserve Bank of Philadelphia*

Urban Institute
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*The views in this presentation do not necessarily reflect those of the Federal Reserve Bank of Philadelphia or the Federal Reserve System
Motivation

- A housing recovery without homeowners
Regions Differed in Recovery Paths

Data source: CoreLogic Solutions
What We Find

• Differences in recovery paths can be explained largely by the emergence of “institutional” investors purchasing through corporate entities

• Presence of institutional buyers had been mostly flat since the early 2000s but picked up significantly since the mortgage crisis
  • Phenomenon is widespread, but particularly prominent in distressed markets
  • Some investors are affiliated with large financial or real estate firms

• An increase in the share of institutional buyers helps boost local house prices and reduces vacancy rates

• No significant effect on local rent-price ratio or eviction rates

• Decreased homeownership rates
Presence of Institutional Investors Varies Between – and within – Metro Areas

Figure 3: Share Growth of Institutional Buyers Varies by City

Change in percent of institutionally purchased properties by zip code in 20 selected metropolitan statistical areas. Percentage points, 2000 vs. 2012

Figure source: Lambie-Hanson, Li, and Slonkosky (2018, Economic Insights)
Investors Have Different Business Models

• Most common business models:
  • Buy-to-rent
    • With or without investment
    • With or without intention to sell once the market improves
  • Flip (with or without renovation)

• Sometimes, business model simply depends on how market performs
  • Larger investors may be more committed to a particular strategy

• Institutions, large and small, have advantages in buying
  • As Mills, Molloy, and Zarutskie (2017) explain, they are not as sensitive to financing constraints (and post-crisis contraction of mortgage credit availability), have better institutional knowledge, facilitated by new technology
Datasets

- CoreLogic Solutions (Real Estate Deeds)
  - Property-level information on deed and mortgage transactions as originally electronically keyed at county registries
  - Tax assessor data (mailing address for tax bill)

- CoreLogic Solutions Home Price Index Data
  - County-level series

- Black Knight McDash Data
  - Loan-level mortgage servicing data

- Home Mortgage Disclosure Act (HMDA)

- And more!
  - Homeownership rates from Census
  - Unemployment from Bureau of Labor Statistics
  - Rent indices and rent-to-price ratios from Zillow*
  - Eviction rates from the Eviction Lab at Princeton University

*Source: Zillow Research at Zillow.com (data downloaded between January 2008 and August 2008)
Identifying Investors: The Literature

- Various methods have been used in the literature; each has drawbacks:
  - **Self- or lender-reported** (Gao and Li 2015, Gao, Sockin and Xiong 2017, using HMDA; Li, White and Zhu 2011 using Black Knight McDash Data)
    - Can suffer from fraud (Elul and Tilson 2015)
  - **Based the number of first-lien mortgages** (Haughwout, Lee, Tracy, and van der Klaauw 2011, using Federal Reserve Bank of New York/Equifax Consumer Credit Panel data)
    - Will miss those who don’t borrow using a loan tied to their personal credit
  - **Number of transactions within a short period** (Bayer, Mangum, and Roberts 2016, using public records)
    - Hard to link investors together, given different names
  - **Property address vs. mailing address** (Fisher and Lambie-Hanson 2012 and Chinco and Mayer 2012, using public records)
    - Messy data, may not be reliable
Identifying Investors: Our Approach

• Our approach: in public records, determine if buyer (seller) is an institution or an individual, based on name
  • Who we capture:
    • Large institutions: (Top 20 identified by 2017 Amherst Capital Market Report)
      (Blackstone (Invitation Homes), American Homes 4 Rent, Colony Starwood, Progress Residential, Main Street Renewal, Silver Bay, Tricon American Homes, Cerberus Capital, Altisource Residential, Connorex-Lucinda, Havenbrook Homes, Golden Tree, Vinebrook Homes, Gorelick Brothers, Lafayette Real Estate, Camillo Properties, Haven Homes, Transcendent, Broadtree, and Reven Housing REIT)
  
    • Smaller investors (e.g., LLCs not affiliated with large institutions)

• Like Mills, Molloy, and Zarutskie (2015), we exclude government entities, corporate relocation services, banks, etc.
Identifying Large Institutions Using Associated Mailing Addresses

- “Snowball” approach to collecting names under which the top 20 large investors purchase properties
  - Begin with a company’s name, cycling through 3 rounds of collecting mailing addresses from tax assessor data
  - Confirm no false matches (shared addresses)
  - Aggregate number of purchases to “top holder” investor, confirm they are similar to Amherst Capital 2017 report
What about individual investors?

- Some investors buy in their own names, rather than through corporate entities.

- We proxy for this group in two ways:
  1. Estimating the fraction of buyers in a county who are individual investors buying with a mortgage
  2. Counting up buyers who use cash (risks over-counting investors)
Dataset Summary


• Exclude nominal sales with transaction price under $1000, relocation sales, sales into REO (foreclosure deeds with bank purchasers), bank-to-bank transactions, etc.

• About 600 counties
  • Within 300 MSAs in the continental U.S.
  • 5,000 county-year observations (2007 – 2014)
Investors made up a growing share of buyers in the recovery.

Data source: CoreLogic Solutions, Black Knight McDash.
Institutional Purchases

2000

2006

2014

Data source: CoreLogic Solutions
Large Institutional Purchases in 2014

Data source: CoreLogic Solutions
How have investors affected local markets?

Our model:

\[ y_{i,t} = \beta_1 x_{i,t} + \beta_2 Z_{i,t-1} + \epsilon_{i,t} \]

where

- \( i \): county, \( t \): year;

- \( y_{i,t} \): dependent variable, change in:
  - real HPI growth
  - homeownership rate
  - REO duration
  - vacancy rates
  - construction employment
  - and more (rent index, rent-price ratio, eviction rates);

- \( x_{i,t} \): share of institutional buyers in county \( i \) in year \( t \);
  - Potentially endogenous

- \( Z_{i,t-1} \): other control variables
  - County and year fixed effects
  - Lagged: change in population, change in real HPI, unemployment, foreclosure rate, and real household income
Instrument: GSE First Look Programs

• Fannie Mae instituted its First Look program in August 2009; Freddie Mac followed in September 2010.

• For initial 15 days REO properties are on market, homeowners and nonprofit organizations could bid on REO properties before they became available to investors.

• Period since extended to 20 days, 30 in Nevada.

• Using Black Knight McDash Data on single-family properties in foreclosure and REO, calculate for each county-year:
  • Average share of distressed mortgages that list Fannie Mae (2009) or Fannie/Freddie (2010+) as investors
  • The series takes a value of zero prior to 2009.

• More distressed loans held by GSEs → Less investor prevalence
  • County fixed effects in first-stage model.

Source: https://www.homepath.com/firstlook-program.html
Results: More Investor Purchases $\rightarrow$ Greater House Price Growth

<table>
<thead>
<tr>
<th>2SLS Coefficient</th>
<th>Share of Institutional Buyers (%)</th>
<th>0.626***</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lagged real HPI growth rate (%)</td>
<td>0.451***</td>
<td></td>
</tr>
<tr>
<td>Lagged growth rate of real median household income (%)</td>
<td>-0.109***</td>
<td></td>
</tr>
<tr>
<td>Lagged changes in unemployment rate (%)</td>
<td>-1.425***</td>
<td></td>
</tr>
<tr>
<td>Lagged changes in foreclosure rate (%)</td>
<td>-19.257***</td>
<td></td>
</tr>
<tr>
<td>Lagged growth rate in population (%)</td>
<td>0.227***</td>
<td></td>
</tr>
</tbody>
</table>

Data sources: CoreLogic Solutions, Black Knight McDash Data, Census, and Bureau of Labor Statistics.
Note: *** indicates significance at the 1 percent level.

• **1-percentage-point increase** in institutional buyers $\rightarrow$ **63-bp increase** in real home prices.
## Robustness: Definition of Investors

<table>
<thead>
<tr>
<th>Share of Institutional Buyers (%)</th>
<th>2SLS Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institutions [main model]</td>
<td>0.626***</td>
</tr>
<tr>
<td>Institutions + individual investors with mortgages</td>
<td>1.021***</td>
</tr>
<tr>
<td>Institutions + individual investors with mortgages + individuals with cash purchases</td>
<td>0.709**</td>
</tr>
<tr>
<td>Net institutional investor purchases</td>
<td>0.594***</td>
</tr>
<tr>
<td>Top 20 Institutional Investors</td>
<td>1.022***</td>
</tr>
</tbody>
</table>

Data sources: CoreLogic Solutions, Black Knight McDash Data, Census, and Bureau of Labor Statistics.
Note: "***" indicates significance at the 1 percent level, "**" at the 5 percent level.
Concluding Thoughts

• Institutional investors increased their presence in the housing market during and after the crisis.

• They sped local house price recovery and reduced vacancies.

• No evidence that more investors led to higher rents or greater eviction rates.

For the latest version of the paper, please contact Lauren.Lambie-Hanson@phil.frb.org
Data source: CoreLogic Solutions; Census.
Appendix: Institutional **sales** show no consistent pattern across MSAs during the recovery.

Data source: CoreLogic Solutions
Tracing the Source of Liquidity for Distressed Housing Markets

Rohan Ganduri ¹  Steven Chong Xiao ²  Serena Wenjing Xiao ²

¹Emory University  ²University of Texas at Dallas

Urban Institute

February 5, 2020
Motivation

• Foreclosure crisis following the 2007–2010 financial crisis:
  • 7.8 million homes were foreclosed between 2007–2016.
  • Foreclosure crisis peaked in 2011 at 1.6 million foreclosed homes (≈20% of all foreclosed homes).

• Returns from price appreciation.

• Returns from rental income.
Motivation

- Foreclosure crisis following the 2007–2010 financial crisis:
  - 7.8 million homes were foreclosed between 2007–2016.
  - Foreclosure crisis peaked in 2011 at 1.6 million foreclosed homes (∼20% of all foreclosed homes).

- The large wave of foreclosures resulted in:
  - Depressed prices for the foreclosed properties (Clauretie & Daneshvary 2009, Campbell et al. 2011).

- Several government-led initiatives to mitigate the foreclosure crisis and stabilize neighborhoods (e.g., NSP, REO-to-Rental, VRPOs, HAMP).

- Simultaneously, institutional investors (e.g., Blackstone, Starwood) were purchasing the deeply discounted distressed properties (Allen et al. 2018, Mills et al. 2019, Lambie-Hanson et al. 2019).

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• Foreclosure crisis following the 2007–2010 financial crisis:
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- Simultaneously, institutional investors (e.g., Blackstone, Starwood) were purchasing the deeply discounted distressed properties (Allen et al. 2018, Mills et al. 2019, Lambie-Hanson et al. 2019).
  - Returns from price appreciation.
  - Returns from rental income.
Single family homes purchases by institutional investors

- Insitutional investors have purchased more than 300K homes between 2010–2018 (30-fold increase), and still growing.

- Largest owners are comparable in scale to the large multifamily owners.

- Blackstone (Invitation Homes) ($12 Billion), American Homes 4 Rent ($10.7 Billion), Colony Starwood Homes ($8 Billion).
We study the effect of institutional investment on the local real estate market.

1. We focus on institutional investment in *distressed homes*.

2. We focus on the *foreclosure crisis period*. 
Research question

• We study the effect of institutional investment on the local real estate market.

1. We focus on institutional investment in *distressed homes*.

2. We focus on the *foreclosure crisis period*.

• **Research question:** How do institutional purchases of distressed homes affect neighborhood home prices?
Institutional investors were an important source of liquidity for distressed housing markets during the foreclosure crisis.

Institutional purchases of distressed properties have a positive spillover effect of neighboring home values.

- Homes that are within 0.25 miles (∼ 5 blocks) from an institutional purchased home sell at $1.33 per sqft, or a 1.4% higher value relative to properties that are within 0.25–0.50 miles away.

- Above estimates imply 20% less underpricing of homes in distressed areas after institutional purchases.

Positive spillover effect is greater for:
  - Neighboring foreclosed transactions (4.3%)
  - Similar properties (e.g., 2.5% of same-age properties)
  - In more distressed neighborhoods (7.4%)
Effect of institutional purchases on neighboring homes

- Ex ante, the effect is not obvious:
  - Institutional investment reduces the supply of properties available for sale (\(+\)).
  - Institutional investors can bargain for deeper discounts (\(-\)).
  - Lower preference for rental properties in neighborhoods (\(-\)).
  - Purchases by informed institutional investors can subject unsold properties to adverse selection issues (\(-\)).
Data

• **Primary Data:** Zillow’s ZTRAX Database.
  - 400 million detailed public records across 2,750+ U.S. counties.
  - 20 years of deed transfers, mortgages, foreclosures, auctions, property tax delinquencies for commercial and residential properties.

• **ZTRAX transactions data:** transaction date, sales price, buyer and seller’s identity, foreclosure information, etc.

• **ZTRAX assessment data:** property type, address, year built, lot size and building area, number of bedrooms and bathrooms, etc.

• Manually identify institutional owners based on owner mailing address and name.

• We find 166,635 SFH owned by 26 institutional investors as of 2016.
  - Amherst Capital Market Report 2016: 190,000 SFH owned by institutional investors.
  - Therefore, we are able to identify 88% of all the SFHs owned by institutional investors.
Geographic Distribution of Institutional SFR Holdings

<table>
<thead>
<tr>
<th>Rank</th>
<th>Investor</th>
<th>Properties (#)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Invitation Homes</td>
<td>41,735</td>
</tr>
<tr>
<td>2</td>
<td>American Home 4 Rent</td>
<td>36,231</td>
</tr>
<tr>
<td>3</td>
<td>Starwood Waypoint</td>
<td>27,290</td>
</tr>
<tr>
<td>4</td>
<td>Progress Residential</td>
<td>13,890</td>
</tr>
<tr>
<td>5</td>
<td>Silver Bay</td>
<td>6,872</td>
</tr>
<tr>
<td>6</td>
<td>Main Street Renewal</td>
<td>5,819</td>
</tr>
<tr>
<td>7</td>
<td>Tricon American Homes</td>
<td>5,677</td>
</tr>
<tr>
<td>8</td>
<td>Altisource</td>
<td>4,256</td>
</tr>
<tr>
<td>9</td>
<td>Havenbrook Homes</td>
<td>3,568</td>
</tr>
<tr>
<td>10</td>
<td>Cerberus</td>
<td>3,440</td>
</tr>
<tr>
<td>11</td>
<td>Camillo Properties</td>
<td>2,817</td>
</tr>
<tr>
<td>12</td>
<td>Golden Tree Insite Partners(GTIS)</td>
<td>2,515</td>
</tr>
<tr>
<td>13</td>
<td>Connorex-Lucinda</td>
<td>2,434</td>
</tr>
<tr>
<td>14</td>
<td>Haven Homes</td>
<td>1,728</td>
</tr>
<tr>
<td>15</td>
<td>Gorelick Brothers Capital</td>
<td>1,717</td>
</tr>
</tbody>
</table>
Institutional Investment and House Prices

(A) House prices in t+1, t+2

(B) House prices in t+3, t+4
Empirical challenge

• Selection concerns:
  
  • **Selection bias in favor (†):** Institutional investors can cherry-pick properties in neighborhoods that have the greatest potential for future growth.
    
    • \(\implies\) Neighboring home prices trending up regardless of institutional purchases.
  
  • **Selection bias against (−):** Institutional investors more likely to invest when they get the deepest discounts – i.e., in the most distressed neighborhoods.
    
    • \(\implies\) Neighboring home prices trending down regardless of institutional purchases.
Empirical Strategy

• In February 2012, FHFA announced the REO-to-Rental Pilot Initiative:

  • **Purpose:** Help clear the national backlog of real estate owned (REO) foreclosed homes.

  • **Strategy:** Sell pre-packaged REO foreclosed properties in bulk to institutional investors.

  • **Implementation:** Auction process, where investors bid on pre-packaged pools of foreclosed properties (individual homes only privately valued).

  • **Other requirements:** Investors were required to rent out the properties.

  • Importantly, pre-packaging of foreclosed properties ensured investors were not allowed to cherry-pick individual properties.
Empirical Strategy

• Difference-in-differences (DD) setup in hyper-local areas around the pilot bulk-sale transactions (e.g., within 0.5 miles).

• **Treatment group:** Properties close to the pilot institutional bulk-sale transactions.

• **Control group:** Properties far away from the pilot institutional bulk-sale transactions.

• **Assumption:** In the absence of the institutional bulk-sale transaction, house prices for properties close to, and far away from the bulk-sold property trend similarly.

• Plausible because of investor’s inability to cherry pick properties at highly local levels (however, while bidding, investors likely accounted for house price growth at broader geographic levels, such as county.).
Empirical Strategy

• DD model around REO bulk transactions:

\[ P_{i,t} = \alpha + \beta_1 Post_t \times BS_{i}^{Close} + \beta_2 BS_{i}^{Close} + f(X_{i,t}) + \gamma_{c,t} + \delta_s + \varepsilon_{i,t} \]

• Sample: transactions within 0.5-mile radius from bulk-sold properties that are neither related to the bulk transactions nor purchased by other institutional investors

• Period: six months before and after bulk transactions, excluding the event month (June, 2012).

• \( P_{i,t} \): residual transaction price from a hedonic regression for single family home \( i \) that is sold at time \( t \).

• \( BS_{i}^{Close} \): treatment variable that equals 1 for all properties within 0.25-mile radius of the bulk-sold property
Illustration of Treated and Control Properties in Maricopa County, AZ

- **Black circle**: Bulk-sold institutional property.
- **Blue diamond**: Nearby treated property.
- **Green triangle**: Farther away control property.
### Bulk Sale Transactions

<table>
<thead>
<tr>
<th>Transaction Name</th>
<th>Transaction Size (# of Properties)</th>
<th>Geography</th>
<th>Winning Bidder</th>
<th>Vacancy Rate</th>
<th>Third Party Valuation</th>
<th>Transacted Value (% of Third Party)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SFR 2012-1-Florida</td>
<td>699 Florida (Central, NE, SE, West Coast)</td>
<td>Florida</td>
<td>Pacifica L 47, LLC</td>
<td>32.62%</td>
<td>$81,527,995</td>
<td>95.8%</td>
</tr>
<tr>
<td>SFR 2012-1-Chicago</td>
<td>94 Chicago, Illinois</td>
<td>Cogsville Capital Partners Fund I, LP</td>
<td>38.74%</td>
<td>$13,689,012</td>
<td>86.2%</td>
<td></td>
</tr>
<tr>
<td>SFR 2012-1 West</td>
<td>970 Arizona, California, Nevada</td>
<td>Colony Homes, LLC</td>
<td>36.05%</td>
<td>$156,771,744</td>
<td>112.3%</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1763</strong></td>
<td></td>
<td></td>
<td><strong>$251,988,751</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Neighboring House Prices Around Bulk Transactions.

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>Adjusted price per sqft</th>
<th>Adjusted ln(total price)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>Post-sales × I(Distance&lt;0.25mi)</td>
<td>1.330** (0.64)</td>
<td>0.014*** (0.00)</td>
</tr>
<tr>
<td>I(Distance&lt;0.25mi)</td>
<td>-1.673** (0.70)</td>
<td>-0.012* (0.01)</td>
</tr>
<tr>
<td>County×Year-Month FE</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Census-tract FE</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>N</td>
<td>13,593</td>
<td>13,593</td>
</tr>
<tr>
<td>adj.R-sq</td>
<td>0.623</td>
<td>0.556</td>
</tr>
</tbody>
</table>

- Homes in bulk-sale areas sell at $6.52/sqft discount relative other homes in same zip-code → $1.33/sqft higher sale price reduces underpricing by 20%.

- Spillover effect is greater if there are more number of nearby bulk-sold properties (i.e., greater treatment intensity).

- Results unchanged even after controlling for other potential spillover effects (e.g., due to neighboring sales via regular transactions, neighboring foreclosures).
Neighboring House Prices Around Bulk Transactions

0–0.25 mi (close) vs. 0.25–0.5 mi (far)

0–0.25 mi (close) vs. 0.25–1 mi (far)
### Neighboring foreclosed transactions.

- Positive price spillover effect is greater for neighboring distressed properties.

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>Adjusted price per sqft</th>
<th>Adjusted ln(total price)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>Post-sales × I(Distance &lt; 0.25mi)</td>
<td>0.410 (0.69)</td>
<td>0.005 (0.01)</td>
</tr>
<tr>
<td>Post-sales × I(Distance &lt; 0.25mi) × Foreclosed</td>
<td>3.844* (2.04)</td>
<td>0.038* (0.02)</td>
</tr>
</tbody>
</table>

- County × Year-Month FE: Yes
- Census-tract FE: Yes

| N | 13,593 |
| adj.R-sq | 0.634 | 0.577 |
Neighboring foreclosed transactions.

- Positive price spillover effect is greater for more illiquid distressed properties.

```
Dependent Variable: Adjusted price per sqft | Adjusted ln(total price)
---------------------------------------------|--------------------------
|                                      |  (1)                      |  (2)                      |
| Post-sales × I(Distance < 0.25mi)       | 4.215                     | 0.043                     |
|                                         | (2.52)                    | (0.03)                    |
| Post-sales × I(Distance < 0.25mi) × ln(Foreclosure time) | 2.774***                 | 0.027***                  |
|                                         | (0.59)                    | (0.01)                    |
| County × Year-Month FE                 | Yes                       | Yes                       |
| Census-tract FE                        | Yes                       | Yes                       |
| N                                       | 2,574                     | 2,574                     |
| adj.R-sq                                | 0.695                     | 0.610                     |
```
• Positive price spillover effect is greater for properties that are more similar to the bulk-sold institutional property.

• **Channel:** Evidence suggests supply effect rather than the disamenity effect.

<table>
<thead>
<tr>
<th>Similarity:</th>
<th>Size</th>
<th>Age</th>
<th>Property Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable:</td>
<td>price per sqft (1)</td>
<td>ln(total price) (2)</td>
<td>price per sqft (3)</td>
</tr>
<tr>
<td>Post-sales × I(Distance &lt; 0.25mi)</td>
<td>0.634</td>
<td>0.009*</td>
<td>3.269***</td>
</tr>
<tr>
<td></td>
<td>(0.80)</td>
<td>(0.00)</td>
<td>(1.00)</td>
</tr>
<tr>
<td>Post-sales × I(Distance &lt; 0.25mi) × Similarity</td>
<td>1.655***</td>
<td>0.007***</td>
<td>0.487*</td>
</tr>
<tr>
<td></td>
<td>(0.08)</td>
<td>(0.00)</td>
<td>(0.24)</td>
</tr>
<tr>
<td>County × Year-Month FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Census-tract FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>N</td>
<td>11,703</td>
<td>11,703</td>
<td>11,753</td>
</tr>
<tr>
<td>adj.R-sq</td>
<td>0.626</td>
<td>0.556</td>
<td>0.620</td>
</tr>
</tbody>
</table>
Positive price spillover effect is greater for properties that are in the more distressed areas.

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<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>Post-sales × I(Distance &lt; 0.25mi)</td>
<td>-0.004 (0.71)</td>
<td>0.006 (0.01)</td>
</tr>
<tr>
<td>Post-sales × I(Distance &lt; 0.25mi) × Bottom Quintile Neighborhood</td>
<td>8.404*** (2.54)</td>
<td>0.068** (0.03)</td>
</tr>
<tr>
<td>Baseline Controls</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>County × Year-Month FE</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>RegionID FE</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>N</td>
<td>7,130</td>
<td>7,130</td>
</tr>
<tr>
<td>adj.R-sq</td>
<td>0.542</td>
<td>0.421</td>
</tr>
</tbody>
</table>
Bulk sale vs. individual sale

• Compare spillover effects between the bulk-sold properties and individually-sold properties.

• No evidence for positive spillover effect from individually-sold properties.

• Suggests that through bulk sales, investors accept some less desirable properties in the pool.

### Table: Spillover effect due to individually-sold properties

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>Adjusted price per sqft</th>
<th>Adjusted ln(total price)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>Post-sales × I(Distance &lt; 0.25mi)</td>
<td>-0.276</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>(1.06)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>I(Distance &lt; 0.25mi)</td>
<td>-0.295</td>
<td>-0.010</td>
</tr>
<tr>
<td></td>
<td>(1.05)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>County × Year-Month FE</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Census-tract FE</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>N</td>
<td>16,782</td>
<td>16,782</td>
</tr>
<tr>
<td>adj.R-sq</td>
<td>0.588</td>
<td>0.519</td>
</tr>
</tbody>
</table>
Conclusion

• Institutional purchases of distressed properties have a positive spillover effect of neighboring home values.

• Positive price spillover effect is stronger for:
  • Neighboring foreclosed transactions.
  • Similar properties.
  • In more distressed neighborhoods.

• Institutional investors were an important source of liquidity for distressed housing markets during the foreclosure crisis.
Implications

- Liquidity provision to distressed housing markets is difficult when credit markets are tight, and significant negative price externalities are present.

- Institutional investors can play an important part in providing this liquidity and stabilizing housing markets.

- Importantly, this liquidity provision is market-driven, which contrasts with other government spending programs.

- Bulk sales not limited to FHFA’s program; banks such as Wells Fargo also implemented pre-packaged bulk sale strategies.
Thoughts, Questions, and Reactions


- Are institutional investors large enough to impact housing prices or homeownership rates at the submarket or zip code level?
- How do we think about the difference in impact between large investors (1,000+ homes) and smaller investors (1-10 units) in 2008-14?
- Initial investment allocations were to areas with substantial decreases in home values. Today, focus has shifted to identifying assets with the best long-term cash flow returns. What does that mean for the impact of institutions going forward?
- Foreclosures were 25-30% of home sales in 2008-2010 in 20 largest markets. If the next downturn is driven less by mortgage distress (and therefore fewer foreclosures) how does that shape the magnitude of institutional buying on home prices?

Rohan Ganduri: “Tracing the Source of Liquidity for Distressed Housing Markets”

- Supply effect (institutions buying excess homes for sale) was positive for local / MSA home prices in 2009-2014 – how does that dynamic change in an environment of historically low inventory for sale?
- Disamenity effect – Largest investors have a significant incentive to repair and maintain homes in excellent condition, for residents, for cash flows, and for reputational risk. One-off owners and smaller investors may potentially have different incentives.
- Today, there is a move away from buying discounted homes and a move to buying homes with the highest potential cash flows in the right submarkets. A considerable amount of time and resources are spent identifying the right markets and home attributes.
- Does the impact of institutions on home prices change as institutions keep these homes as rentals for the long-term, thereby adding to the rental stock but reducing for sale stock.
Agenda

I. Institutional SFR: Growth and Differentiation of Large Owners

II. Acquisitions: Comparison of Current to Post-GFC, and Concentration of Owners

III. Focus on Higher Growth MSA and Submarkets
SFR Has Always Been A Large Part of the U.S. Housing Landscape

15mn units today, and ~12% of all housing since 1970

Components of Rental Housing\(^1\)

\(~15\text{mn units}\)

SFR as % of Rentals\(^2\)

SFR as % of All Housing\(^2\)

2. U.S. Census Bureau. For 1970-1995 data, we use the American Housing Survey data. For 2000 and 2010 we use the Decennial Census. For 2005, and 2015-2018 we use the American Community Survey 1 Year Survey. Any error in combining these various data series is ours.
We’re Discussing the Increase in Institutional Ownership

Part of a larger increase in SFR stock from 2005 (11.3mn units) to 2016 (15.3mn units)

Increase in Large Institutional Owners

SFR Ownership by Number of Properties

<table>
<thead>
<tr>
<th>Portfolio Size</th>
<th># of Investors</th>
<th>SFR Properties</th>
<th>Est. Market Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institutional Investors</td>
<td>2000+</td>
<td>18</td>
<td>~188,000</td>
</tr>
<tr>
<td>Middle-Tier Investors</td>
<td>50-2000</td>
<td>~6,250</td>
<td>~703,000</td>
</tr>
<tr>
<td>Small Investors</td>
<td>11-50</td>
<td>~88,000</td>
<td>~1.6mn</td>
</tr>
<tr>
<td>Very Small Investors</td>
<td>1-10</td>
<td>15.5mn</td>
<td>~19.3mn</td>
</tr>
</tbody>
</table>

SFR Units (Attached + Detached)

---

3. U.S. Census Bureau. For 1970-1995 data, we use the American Housing Survey data. For 2000 and 2010 we use the Decennial Census. For 2005, and 2015-2018 we use the American Community Survey 1 Year Survey. Any error in combining these various data series is ours.
Larger Institutions Own A Higher Quality SFR Home Than Mom & Pops

Pretium Fund I Home Attributes¹

- **Avg. Home Age**
  - 18 years

- **Home Attributes**
  - ~1,900 sf
  - 3.4 bedrooms

- **School Score**
  - 6.2

### Homeowner Association

- **Atlanta, GA**
  - ~70%

- **Nashville, TN**
  - ~70%

- **Raleigh, NC**
  - ~70%

### Total Investment

- ~$200,000 / home

### Rent

- ~$1,600 / month

### Non-Institutional SFR is older²

- **Four largest institutional owners’ average home is 20 years old.³**

---

1. Past performance is not indicative of future results. There can be no assurance that these objectives will be achieved. Based on homes owned or managed as of June 30, 2019.
3. Average for AMH, INVH, TCNB, and Pretium.
Institutional SFR: Benefits and Challenges as Ownership Increases

**Benefits**

- Provides high-quality housing in desirable neighborhoods and school districts to residents who are unable to or choose not to own their home
- Institutional ownership favors higher quality homes and effective governance practices demanded by institutional capital providers
- Provides a significantly higher level of service and convenience to customers than ‘mom and pop’
- National Rental Home Council ("NRHC," SFR industry trade group) members:
  - Invest $21,000 in upfront repairs for each home acquired; an investment that many first-time homebuyers may be unable to afford, at greater efficiency given institutional scale

**Challenges**

- As portfolios grow, incumbent on owners to continue to provide high-quality, timely service for residents
- Acquire homes primarily in neighborhoods with high rates of homeownership that may otherwise have been purchased by individuals or ‘mom and pop’ owners
  - In historically low periods of existing home inventory, this impact may be more significant than in normal supply / construction periods
- As Rohan’s paper pointed out, institutional owners are profit seeking firms, with a focus on generating rent and profit growth
  - Occupancy rate for 4 largest owners nearly 96% in 3Q 2019, suggesting rents are in-line with market

2. Stabilized or same-property portfolio occupancy rates for AMH, INVH, TCN, and Pretium as of September 30, 2019.
I. Institutional SFR: Growth and Differentiation of Large Owners

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Acquisitions in 2012-2013 vs. Today

Larger proportion of distressed purchases in 2012-14; today more selective

2. Pretium Partners, data through December 2019. Past performance is not indicative of future results. There can be no assurance that these objectives will be achieved.
Institutional Ownership Concentrated in High Peak to Trough HPA Markets

Freddie Mac analysis shows institutional ownership is concentrated than overall SFR inventory. ¹

Concentration of Institutional Investors

We estimate the four largest institutional investors own ~1.1% of the housing stock in the 15 markets where Pretium is most active¹

<table>
<thead>
<tr>
<th>Institutional Ownership as % of SFR and Housing in Select Markets</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Institutional Ownership (000s)</strong></td>
</tr>
<tr>
<td><strong>Total Owned Homes (AMH, INVH, Prog, TCN )</strong></td>
</tr>
<tr>
<td>Atlanta Overall MSA</td>
</tr>
<tr>
<td>Charlotte Overall MSA</td>
</tr>
<tr>
<td>Dallas Overall MSA</td>
</tr>
<tr>
<td>Houston Overall MSA</td>
</tr>
<tr>
<td>Indianapolis Overall MSA</td>
</tr>
<tr>
<td>Jacksonville Overall MSA</td>
</tr>
<tr>
<td>Las Vegas Overall MSA</td>
</tr>
<tr>
<td>Memphis Overall MSA</td>
</tr>
<tr>
<td>Miami Overall MSA</td>
</tr>
<tr>
<td>Nashville Overall MSA</td>
</tr>
<tr>
<td>Orlando Overall MSA</td>
</tr>
<tr>
<td>Phoenix Overall MSA</td>
</tr>
<tr>
<td>Raleigh Overall MSA</td>
</tr>
<tr>
<td>Sarasota Overall MSA</td>
</tr>
<tr>
<td>Tampa Overall MSA</td>
</tr>
<tr>
<td><strong>Pretium Target Markets</strong> Overall</td>
</tr>
</tbody>
</table>

¹ Housing inventory data from 2018 1 Yr-ACS survey. Institutional home counts by market through 3Q 2019, from public company financials and Pretium data.
Agenda

1. Institutional SFR: Growth and Differentiation of Large Owners

2. Acquisitions: Comparison of Current to Post-GFC, and Concentration of Owners

3. Focus on Higher Growth MSA and Submarkets
Strictly confidential. Not for distribution.

Setting Acquisition Criteria: MSA and Submarket

Focused on adding homes in high growth, quality submarkets

- Pretium’s investment team performs a comprehensive analysis on each target MSA based on demographic trends, job growth, school scores, delinquency rates, replacement cost, overall economic data, and HPA trends, with a zip-code score assigned to each neighborhood before any homes in the area are evaluated for acquisition.

- The initial target markets, and locations within those markets, have largely been selected for their:
  - Favorable outlooks for population, employment, and income growth
  - Strong demonstrated single-family rental demand
  - Fiscal stability and tax rates at the state, MSA, and local level
  - Community stability, good schools, and low crime rates
  - Business friendly environments
  - Newer, affordable housing stock
  - Attractive going-in yields and outlook for potential capital appreciation.

- These attributes have generally led us to invest in high growth Sun Belt markets.

1. Represents homes managed by Pretium’s Real Estate Platform across Pretium’s investment vehicles. Past performance is not indicative of future results. There can be no assurance that these objectives will be achieved.
Focus on the submarkets where we expect above average growth, and where we can acquire the homes which work best for us as rentals.

1. Represents homes managed by Pretium’s Real Estate Platform across Pretium’s investment vehicles.
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