Investor Preferences in Housing Markets: A Pre- and Post-Global Financial Crisis Comparison

Carlos Garriga — St. Louis Fed

Pedro Gete — IE University

Athena Tsouderou — University of Miami

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Background

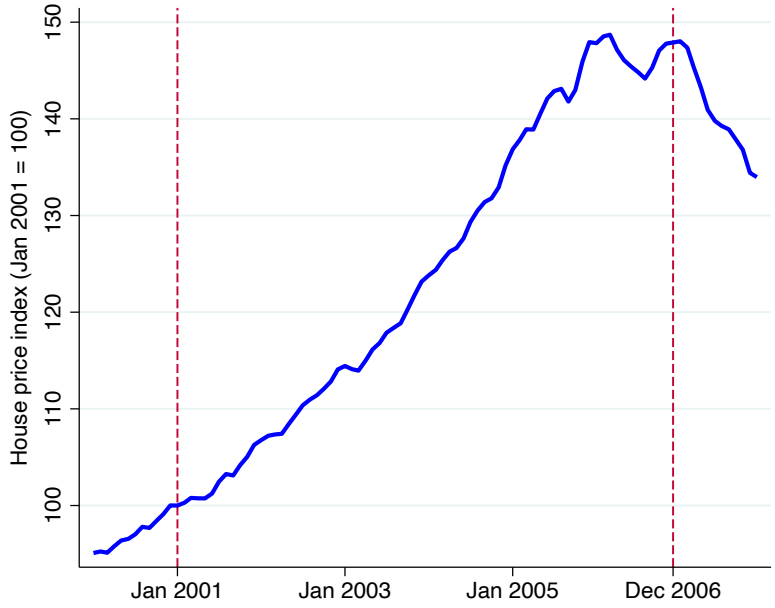
Investors in single-family housing market during the 2000s boom:

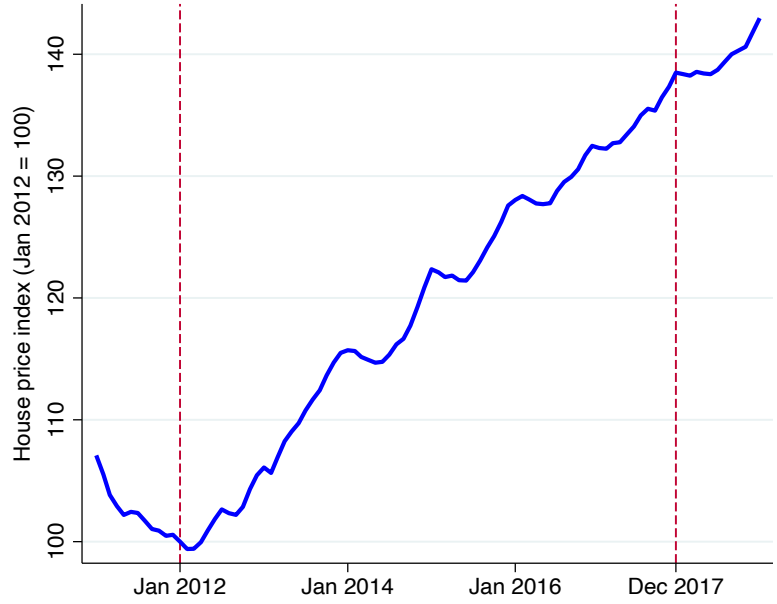
- Speculated rise in price growth (Chinco and Mayer 2016, RFS; Bayer et al. 2021, AER)
- Purchased with a short-term horizon searching for capital gains (Bayer et al. 2020, RFS)
- Purchases usually financed by rolling over high levels of debt

Consequences:

- Increases in transaction volume (DeFusco et al. 2022, JFE)
- Boom led to a bust and over-leveraged investors sold at a loss
- Housing crisis became more severe due to investors

Two Housing Booms





- Two periods, 2001-06 and 2012-17, share similarities in size and duration of housing price appreciation
- Large participation of investors in housing markets in both periods

Research Question

- How do the single-family housing investors post-crisis compare to pre-crisis?
- What are the implications for housing market liquidity and the transmission of monetary policy?

Main Findings

Investors during the 2010s boom, compared to pre-crisis, are:

- Less sensitive to price appreciation: For the same capital gains, less likely to sell in the short-term.
- Driven by search for yield: For the same rental yields, less likely to sell in the short-term.
- Less likely to finance investments with mortgages
- Wealthier, more educated and more sophisticated

Implications:

- Less susceptible to behavioral biases, such as exuberant expectations
- Liquidity: Investors keep single-family homes away from the market for sale
- Monetary policy transmission: Investors are less leveraged, less affected by credit conditions

Types of Investors in Single-Family Housing Market

Retail:

- Buy properties other than their main residence
- Use their own name or buy through a legal entity, e.g. LLC, LP, Partnership

Institutional:

- Large REITs or private equity firms ("Wall Street Landlords")
- Entered the single-family residential maker after the 2009 crisis

This paper focuses on retail investors

Investment Horizon

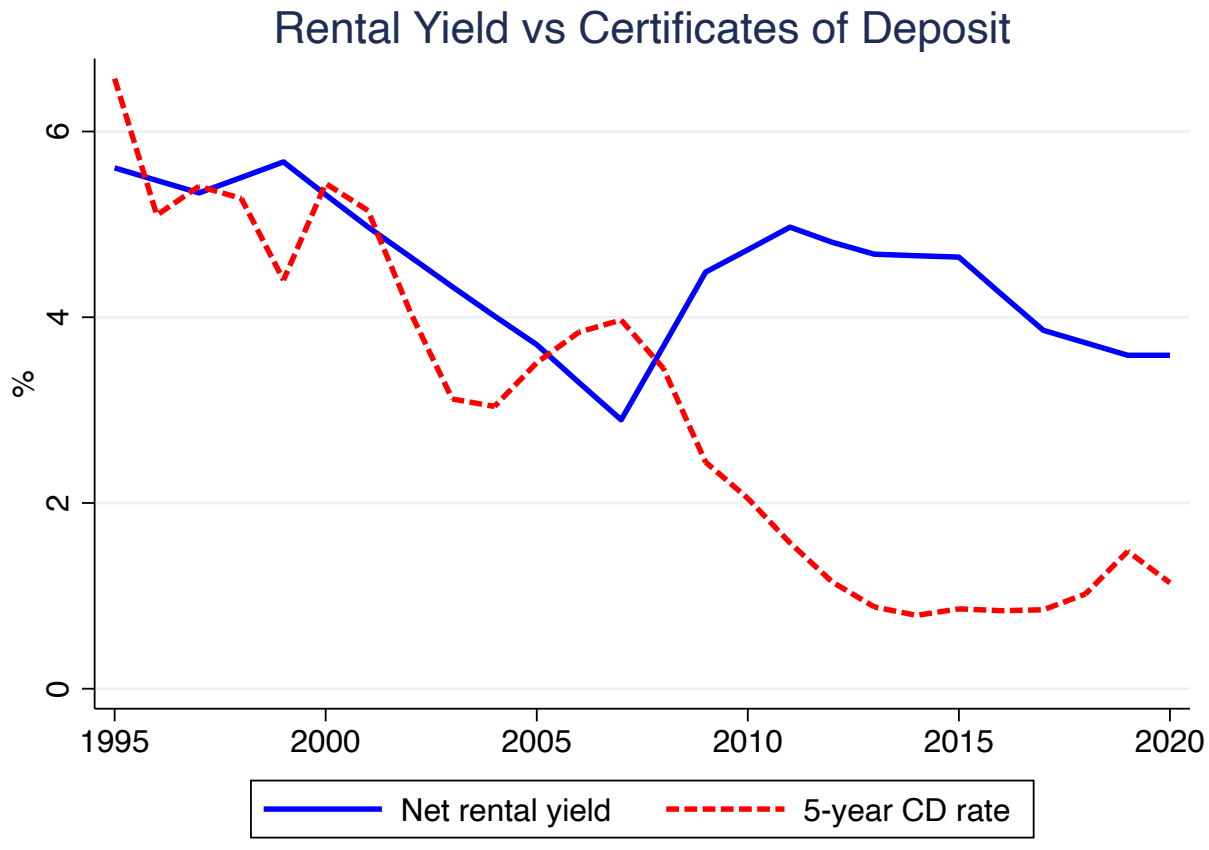
Speculators:

- Momentum investors, short-term investors, flippers
- Enter the market with expectations of increasing price growth
- Search for capital gains (price appreciation)

Buy-and-hold:

- Hold properties for a longer time horizon
- Search for rental yield
- View real estate as an income-generating asset

Quantitative Easing Makes Single-Family Homes an Attractive Investment



- Rental yield net from taxes and fees (Demers & Eisfeldt 2022)

Data

- Large database of U.S. deeds from CoreLogic (2000-2017)
- Single-family residential property ownership transfers
- Classify investors based on buyer name and number of properties they buy
- Date and price of the transaction (remove non-disclosure states)
- Address of the buyer and the address of the purchased property
- 60 million transactions by homeowners and investors

Additional Data

- Tax assessor data at the property level
  - Age of the house, size, number of rooms
- House prices at the zip code level, rent-to-price ratio at the Metropolitan Statistical Area (MSA) level from Zillow
- Demographic information at the Census tract level from U.S. Census Bureau
  - Income, owner-occupied house prices, education
- Controls for demand at the county level
  - Population from U.S. Census Bureau
  - Unemployment from U.S. Bureau of Labor Statistics
  - Income per capita from U.S. Bureau of Economic Analysis

Exclude From The Analysis

- Homeowners: Individuals or households who purchase a single property over a two-year period within their main residence MSA. May own a home in a different MSA.
- Institutional investors: Largest 26 private equity firms or trusts and their subsidiaries.
- Intermediaries: relocation companies, non-profits, construction companies, authorities, banks, credit unions, Ginnie Mae, Fannie Mae, Freddie Mac and companies and the state taking ownership of foreclosed properties.

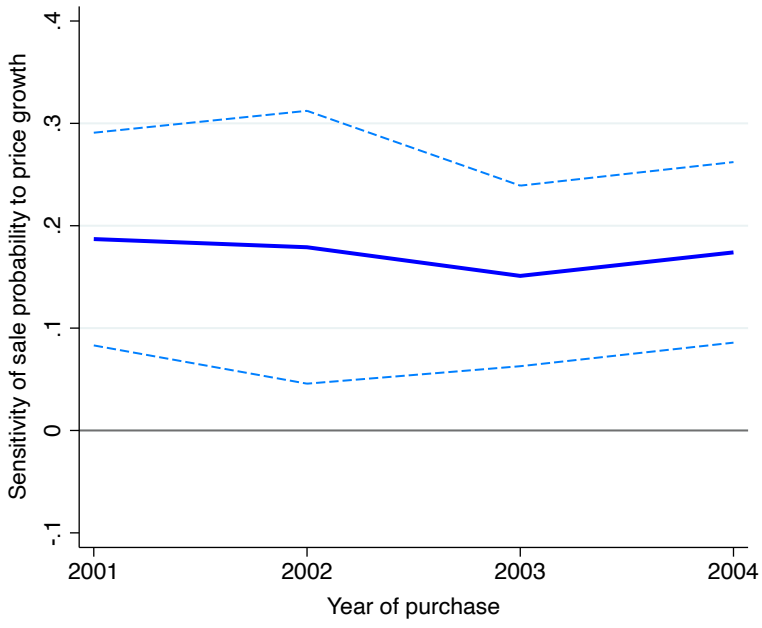
Testing Investment Strategy: Capital Gains

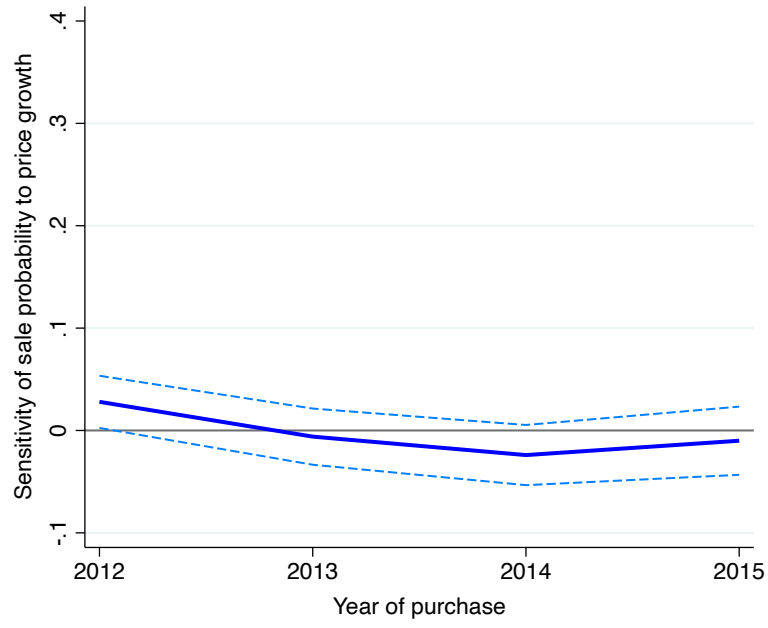
$$I(Sell)_{i,j} = \beta_0 + \beta_1 G_j + C_j + C_i + C_c + u_{i,j}$$

- Logit model, estimated separately for each year of purchase
- $I(Sell)_{i,j} = \log(\frac{\pi_{i,j}}{1-\pi_{i,j}})$, where $\pi_{i,j}$: probability of the property j that was bought by investor i is sold within 2 years
- G_j: annual price growth after purchase of the house
- C_j: Property characteristics: price, age, size, number of rooms
- C_i: Investor characteristics: local, foreign, legal entity
- C_c: Population growth, income growth, unemployment rate change
- MSA fixed effects, month dummies (seasonality)
- Standard errors clustered by zip code

- Specification controls for changes in the characteristics of units transacted during the two housing booms in our sample
- Ensure that the dynamics of prices and rents are not driven by distinct features of the units transacted
- MSA fixed effects and local factors control for local characteristics and housing demand

Short-term Sale in Response to Price Growth





- Post-crisis investors less sensitive to capital gains compared to pre-crisis

Testing Investment Strategy: Capital Gains Pre- and Post-Crisis

$$I(Sell)_{i,j,t} = \beta_0 + \beta_1 G_{j,t} Post_t + \beta_2 G_{j,t} + C_j + C_i + C_c + C_t + u_{i,j,t}$$

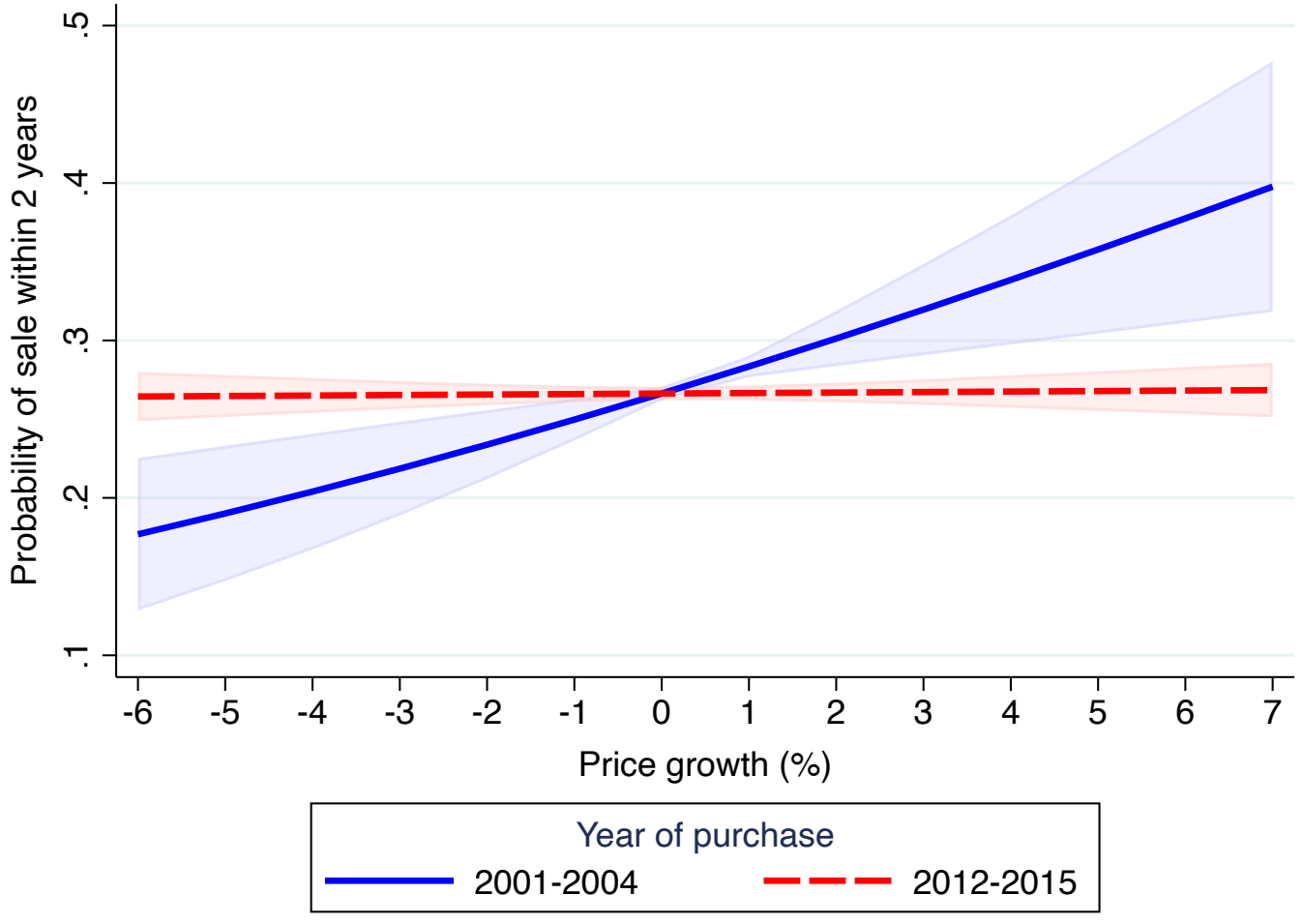
- Logit model
- Estimated using all years (50% random sample)
- $I(Sell)_{i,j,t} = \log(\frac{\pi_{i,j,t}}{1-\pi_{i,j,t}})$, where $\pi_{i,j,t}$: probability of property j bought by investor i on date t to be sold within 2 years
- $G_{j,t}$: price growth the year after purchase, using zip code price growth
- $Post_t$: dummy that is zero in 2001-2004 and one in 2012-2015
- Controls C_j, C_i, C_c and month dummies as before
- MSA$\times$year fixed effects

Probability of Short-term Sale, Price Growth and Investors

	Sale within 2 years		Sale within 3 years	
Price growth × Post-GFC investors	-0.052***	-0.095***	-0.035***	-0.072**
	(0.020)	(0.030)	(0.009)	(0.030)
Price growth	0.056***	0.097***	0.040**	0.081***
	(0.019)	(0.029)	(0.017)	(0.028)
Property characteristics	Yes	Yes	Yes	Yes
Investor type	Yes	Yes	Yes	Yes
Demand factors	Yes	Yes	Yes	Yes
MSA fixed effects	Yes	No	Yes	No
Year fixed effects	Yes	No	Yes	No
MSA × Year fixed effects	No	Yes	No	Yes
Observations	1,283,070	1,282,649	1,283,085	1,282,757

- Robust standard errors clustered by zip code

Post-crisis Investors Respond Less to Price Growth



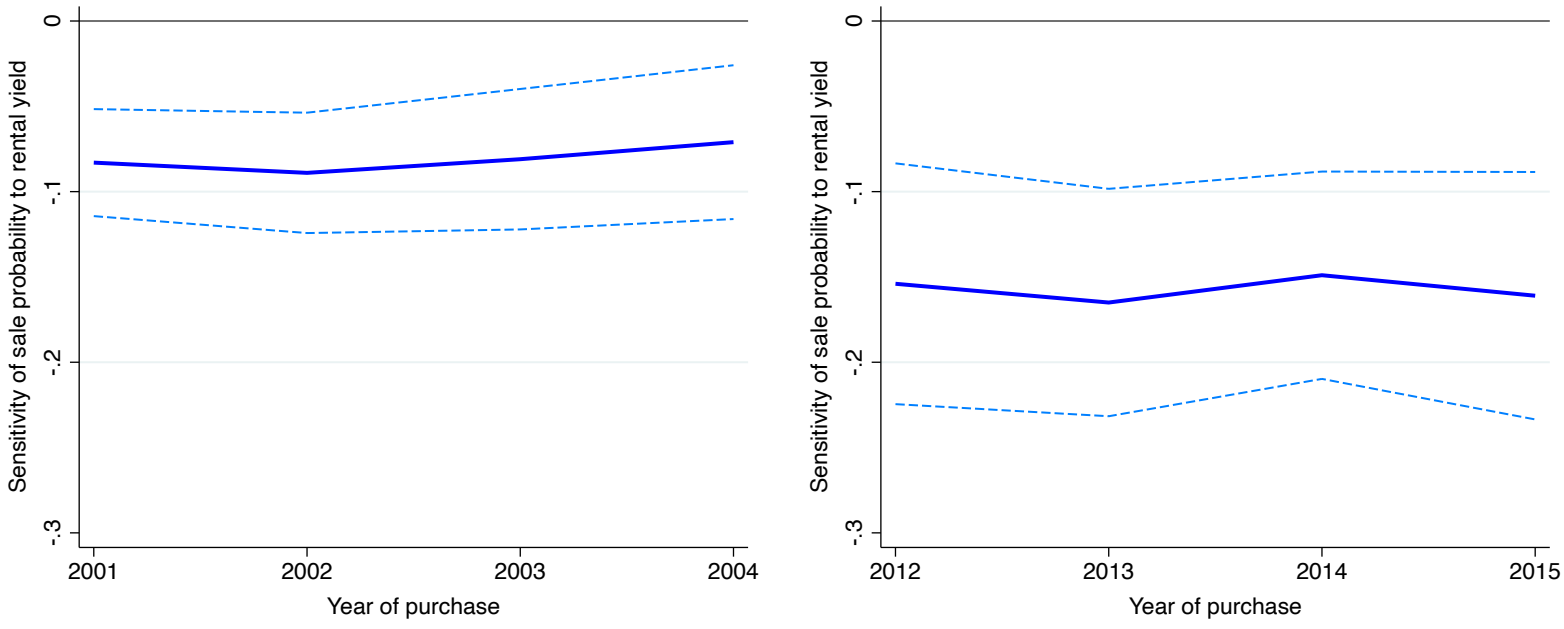
- Shaded regions show 95% confidence intervals

Testing Investment Strategy: Rental Yield

$$I(Sell)_{i,j} = \beta_0 + \beta_1 R_j + C_j + C_i + C_c + u_{i,j}$$

- Logit model, estimated separately for each year of purchase
- R_j: rental yield during the year after purchase of the house
- State fixed effects
- Standard errors clustered by MSA

Short-term Sale in Response to Rental Yield



- Post-crisis investors more sensitive to rental yields compared to pre-crisis

Testing Investment Strategy: Rental Yield Pre- and Post-Crisis

$$I(Sell)_{i,j,t} = \beta_0 + \beta_1 R_{j,t} Post_t + \beta_2 R_{j,t} + C_j + C_i + C_c + C_t + u_{i,j,t}$$

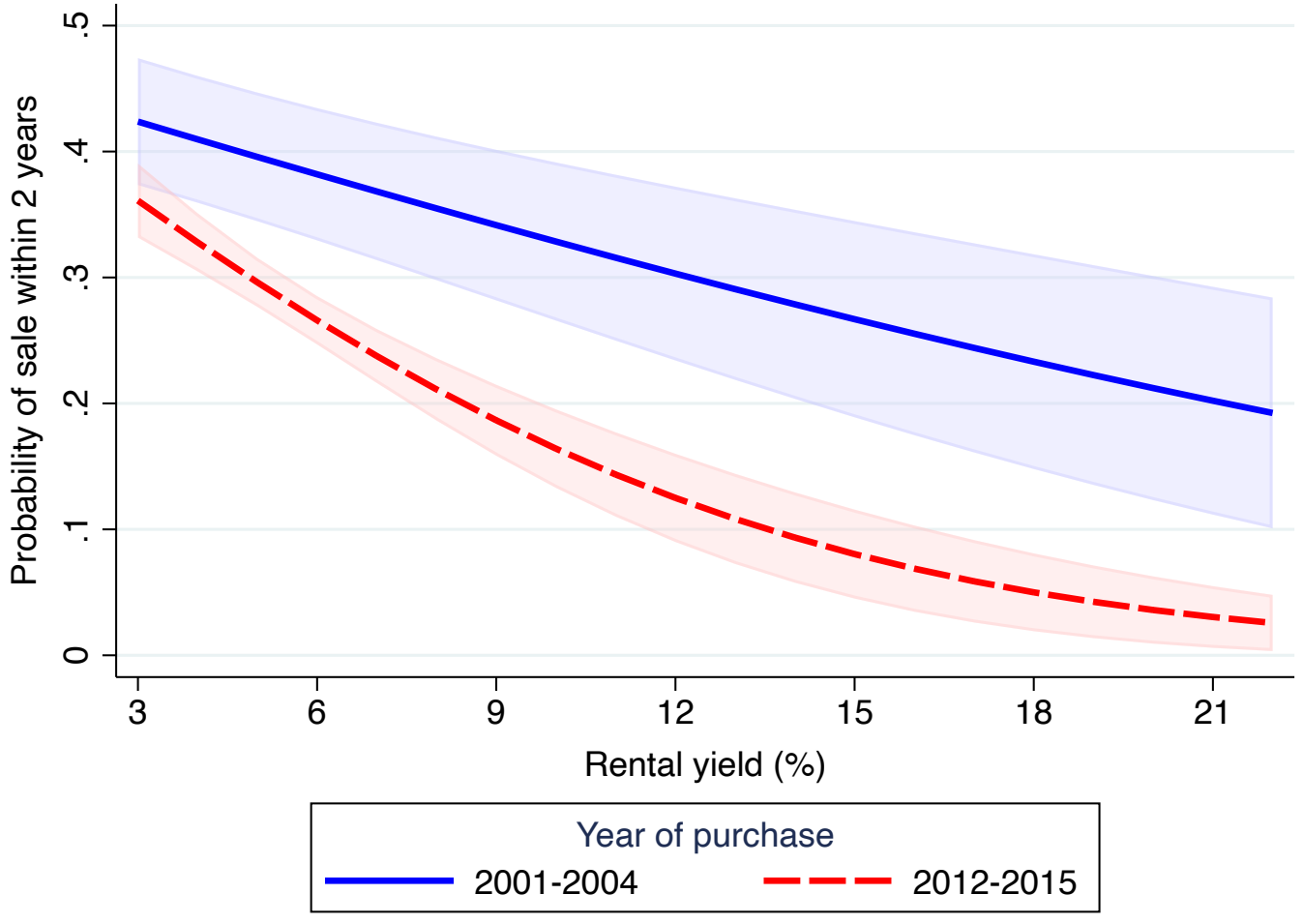
- Logit model
- Estimated using all years (50% random sample)
- $R_{j,t}$: rental yield the year after purchase, using MSA price growth
- $Post_t$: dummy that is zero in 2001-2004 and one in 2012-2015
- Controls C_j, C_i, C_c and month dummies as before
- State$\times$year fixed effects

Probability of Short-term Sale, Rental Yield and Investors

	Sale within 2 years		Sale within 3 years	
Rental yield × Post-GFC investors	-0.084***	-0.108***	-0.070***	-0.084***
	(0.028)	(0.035)	(0.024)	(0.031)
Rental yield	-0.055**	-0.072***	-0.043*	-0.065***
	(0.025)	(0.016)	(0.022)	(0.015)
Property characteristics	Yes	Yes	Yes	Yes
Investor type	Yes	Yes	Yes	Yes
Demand factors	Yes	Yes	Yes	Yes
State fixed effects	Yes	No	Yes	No
Year fixed effects	Yes	No	Yes	No
State × Year fixed effects	No	Yes	No	Yes
Observations	885,977	885,893	885,977	885,977

- Robust standard errors clustered by MSA

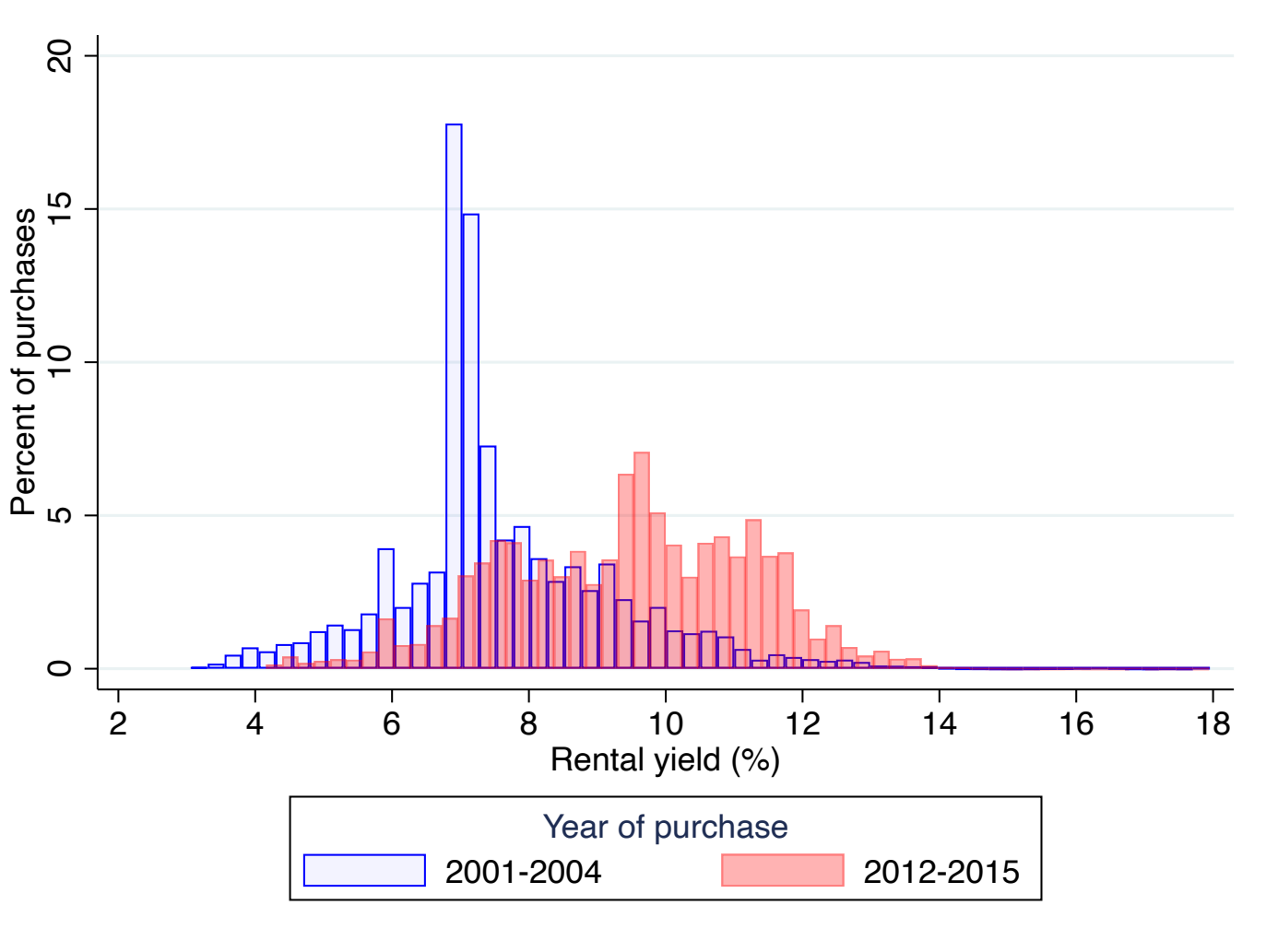
Post-crisis Investors More Sensitive to Rental Yield



- Shaded regions show 95% confidence intervals

Similar Price Growth During the Two Housing Booms in Locations of Investments

Rental Yield During the Two Housing Booms in Locations of Investments



Economic Significance

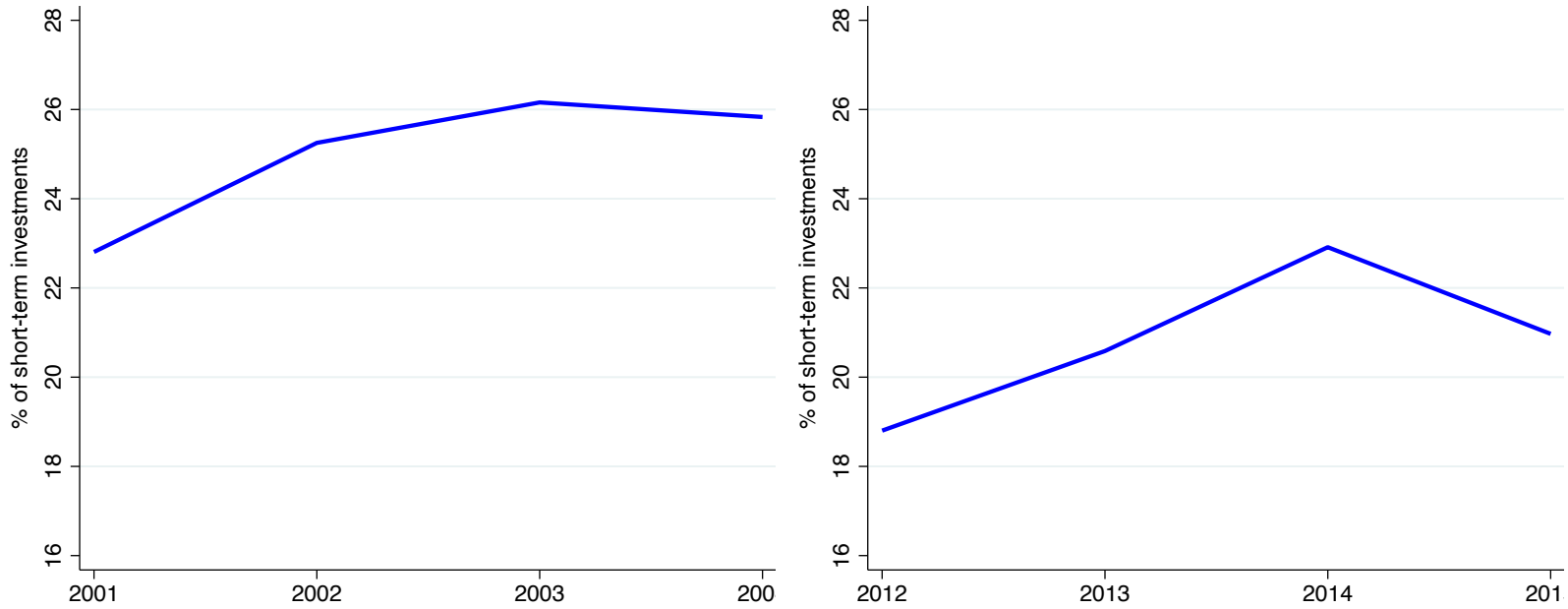
One standard deviation higher price growth from the mean:

- 4.7% higher probability pre-crisis that investors flip their properties
- 0.1% higher probability post-crisis, keeping everything else equal

One standard deviation higher rental yield from the mean:

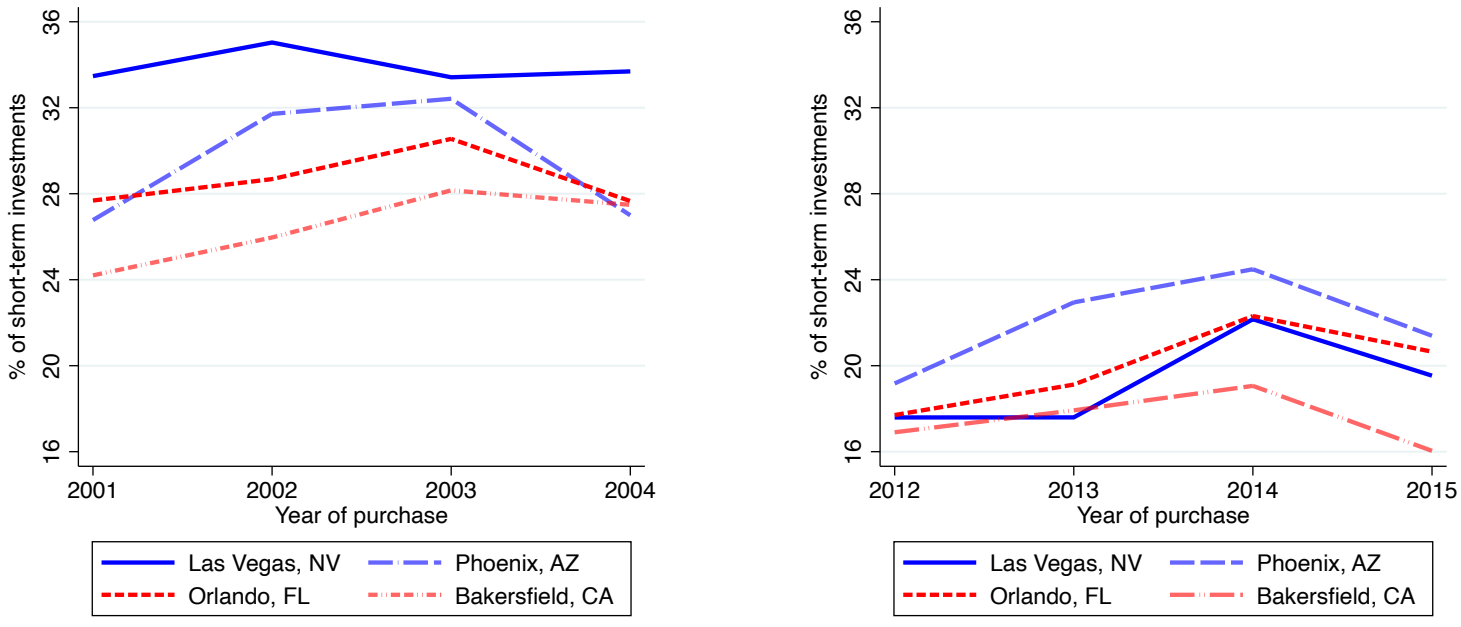
- 7.4% lower probability pre-crisis that investors flip their properties
- 22.4% lower probability post-crisis, keeping everything else equal

Short-term Sales by Investors



- Implication: Post-crisis investors have a long-term horizon, they alter the liquidity of housing markets
- Buy-and-hold investors decrease transaction volumes: Less inventory for sale during boom periods

Short-term Sales by Investors in MSAs With the Largest Boom–bust Cycles During the 2000s

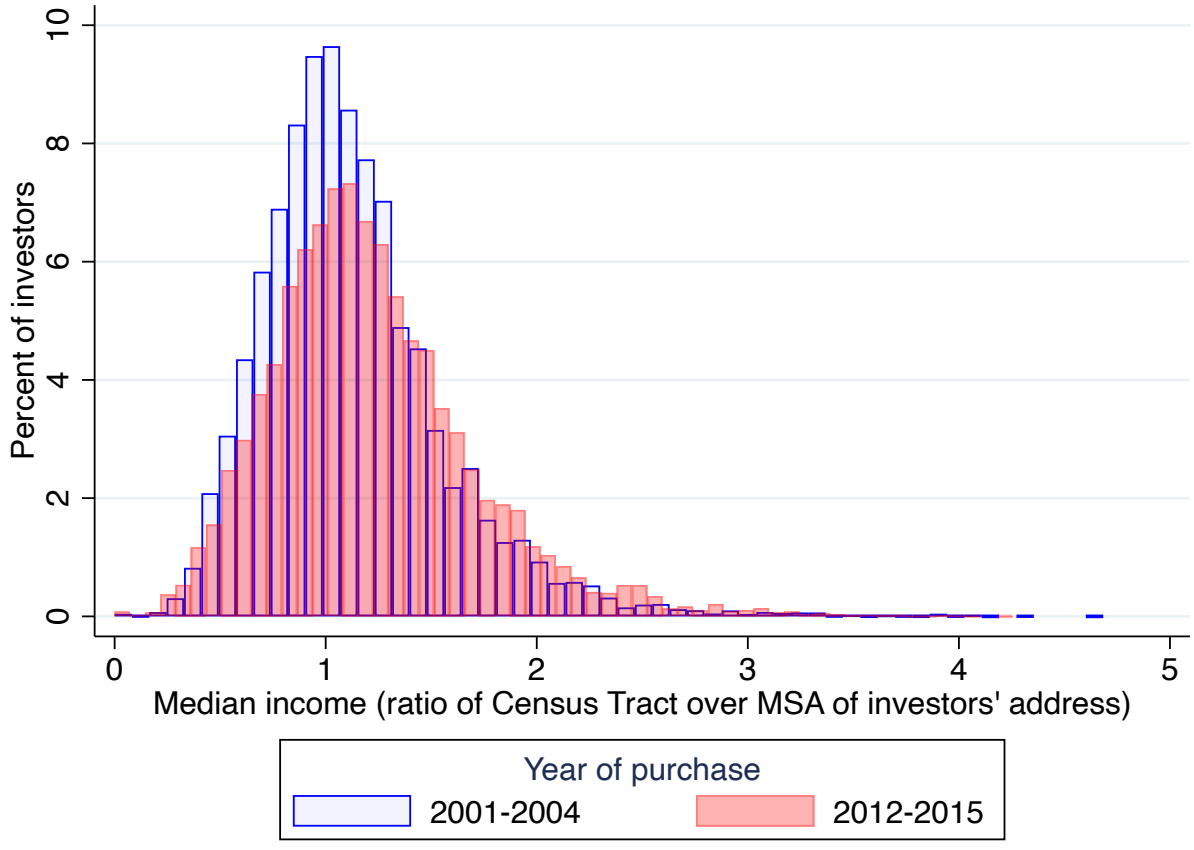


- Post-crisis the investment horizon is shorter on average
- Larger differences in the cities with the largest housing cycles

Comparing Investors in Two Booms

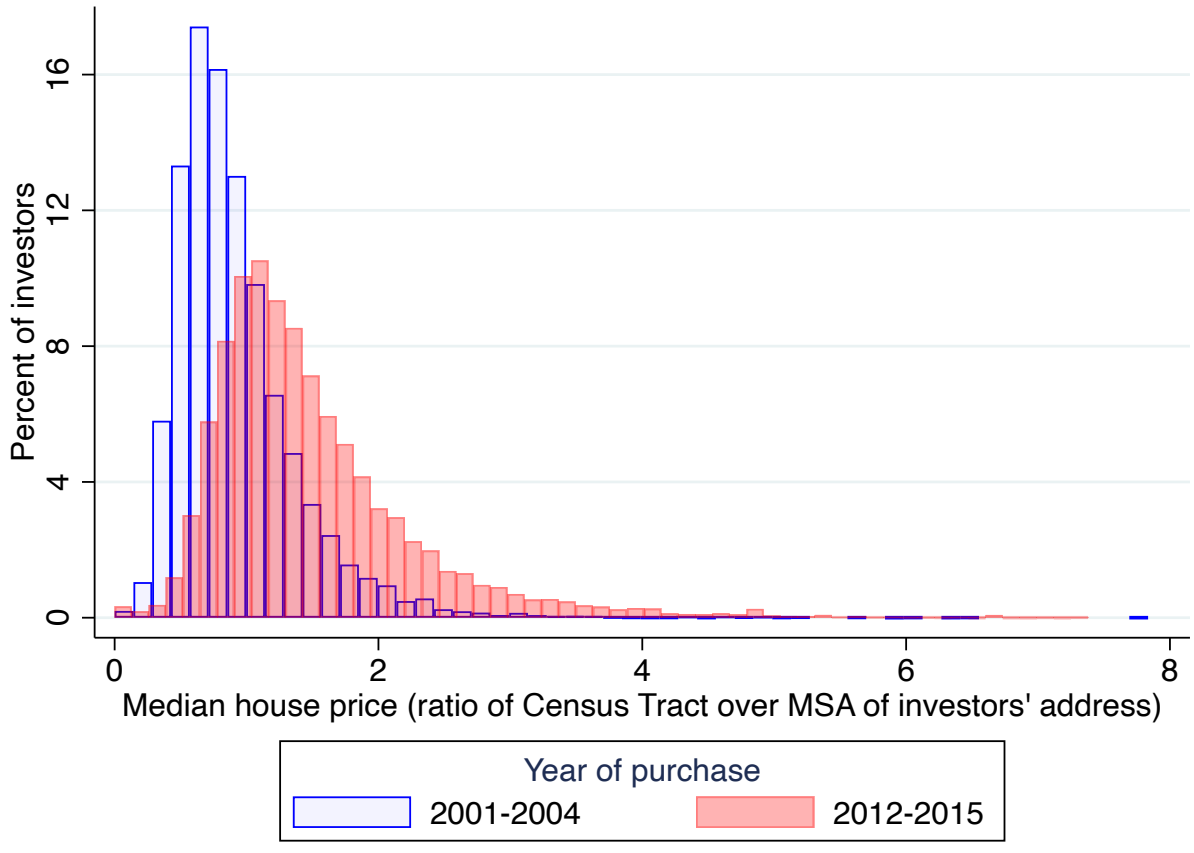
	Pre-GFC boom (2001-2004)		Post-GFC boom (2012-2015)		Comparison
	Mean	SD	Mean	SD	Difference
Median income in Census tract ($000)	54.4	23.4	69.1	30.8	14.7***
Income ratio, Census tract to MSA	1.12	0.44	1.22	0.49	0.09***
Owner-occupied house price ($000)	158	101	284	186	126***
House price ratio, Census tract to MSA	0.92	0.48	1.50	0.80	0.58***
Master's degree or above (%)	8.66	6.73	11.4	7.58	2.69***
Bachelor's degree or above (%)	30.2	18.62	37.2	19.6	7.01***
Legal entity (%)	34.0	47.1	55.1	50.0	21.1***
Observations	507,239		828,670		

Distribution of Investors' Income



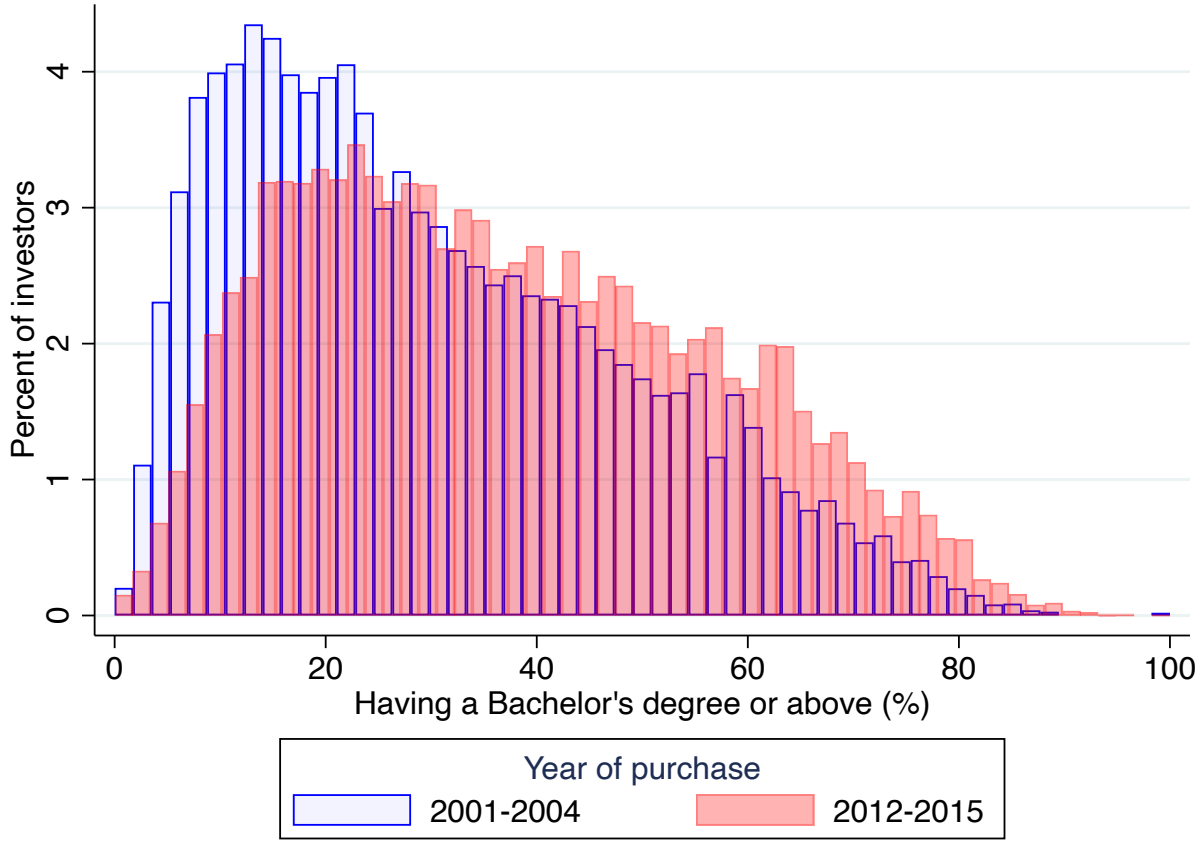
- Post-GFC investors live in Census tracts with higher median income relative to the MSA median income.

Distribution of Investors' Main Residence Value



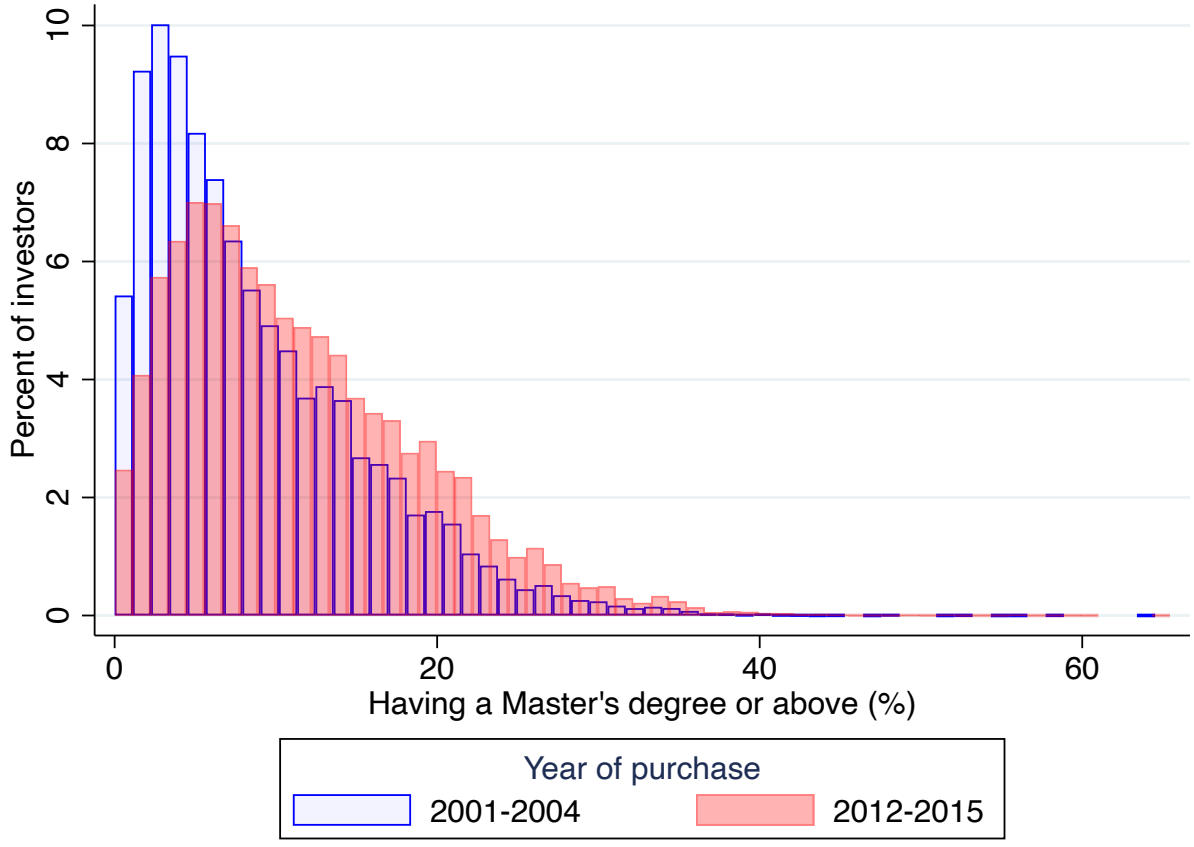
- Post-GFC investors live in Census tracts with higher median house price relative to the MSA median house price.

Distribution of Investors' Education Level



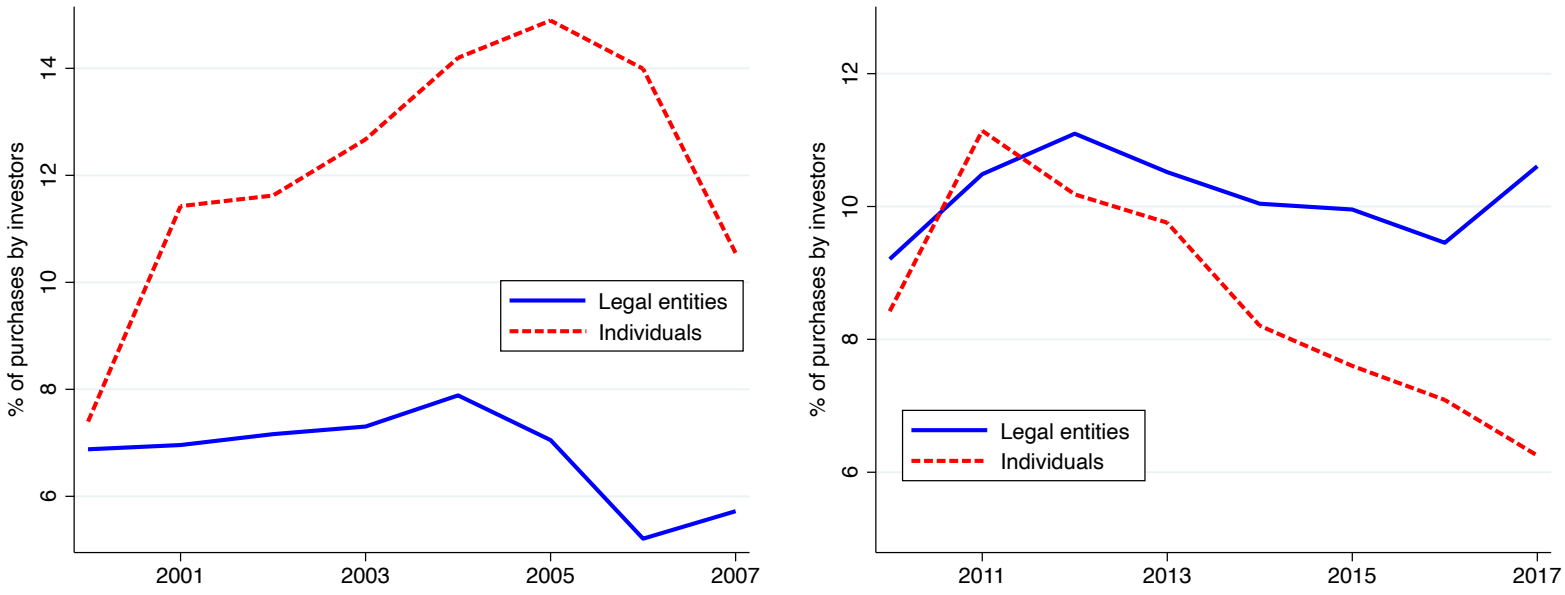
- Post-GFC investors live in Census tracts with higher percentage of the population having a Bachelor's degree or above.

Distribution of Investors' Education Level



- Post-GFC investors live in Census tracts with higher percentage of the population having a Master's degree or above.

Retail Investors' Sophistication



- Post-GFC investors use more sophisticated corporate structures

Retail Investors' Leverage Per Year

Pre-GFC boom			Post-GFC boom		
Year	Has mortgage	LTV ratio	Year	Has mortgage	LTV ratio
2001	64.55	0.849	2012	19.69	0.810
2002	64.14	0.842	2013	26.54	0.807
2003	64.38	0.833	2014	23.01	0.811
2004	65.37	0.817	2015	22.73	0.821

- Post-GFC investors are more likely to have mortgages
- If they have mortgages the loan-to-value (LTV) is similar to pre-GFC or slightly smaller

Implications

- More educated, wealthier, and more sophisticated investors are less prone to the behavioral biases studied in the literature for the early 2000s boom (e.g. Calvet, Campbell and Sodini 2009; Gomes, Haliassos and Ramadorai 2021)

- These investors are more likely to resist contagion from neighboring households and avoid selling in panic. Less likely to form irrational bubbly expectations by extrapolating from past price increases

- Monetary policy affects these new investors differently. Less leveraged from pre-crisis: Not sensitive to credit conditions

Conclusions

- Arrival of new buy-and-hold housing investors searching for income
- Investment strategy driven less by expectations of price growth compared to speculators in the 2000s boom
- New strategy associated with higher rental yields and higher sensitivity to rental yields
- Long holding horizon reduces liquidity in housing markets
- New investors are wealthier, less leveraged and less sensitive to monetary policy.