Spatial Variation in Housing Market Bust and Recovery Responses: Are Urban Areas More Resilient?

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Background

- The Great Recession occurred from 2007-2009 in the U.S. and strongly affected the housing market
- Before that there was housing boom during 2001-2006
- Fluctuation of housing price varied across counties even in the same metro area
- Economic standing of housing in the U.S.
  - Households spend 1/3 of their income after taxes on housing expense
  - 60% of American own a home
  - Housing represents 70% of the net worth for the median home owning household

S&P/ Case-Shiller National Home Price Index (Annual)

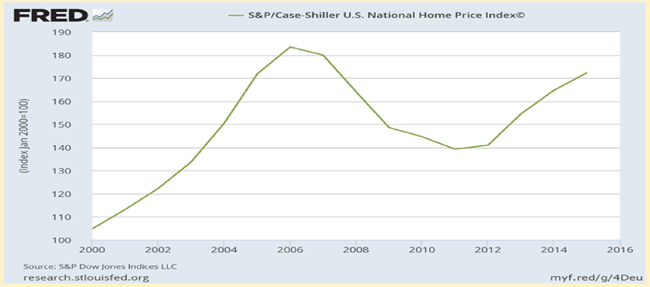


Figure 2. Case-Shiller U.S. National Home Price Index.

Objectives

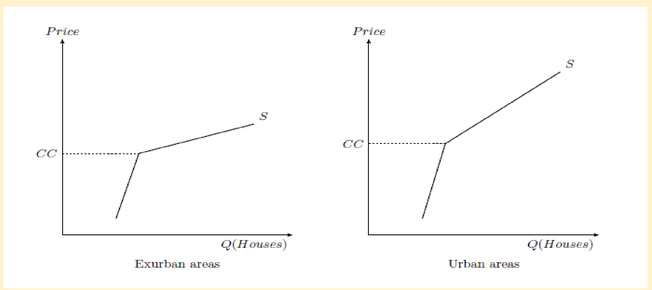
Investigate the recovery rates of house prices from the collapse during the Great Recession by comparing high-density, mid-density, and low-density Census tracts in the top 51 MSAs

Research Question

How do urban core areas respond to a negative (positive) shock contrary to surrounding places? Which areas are more resilient to the housing crisis?

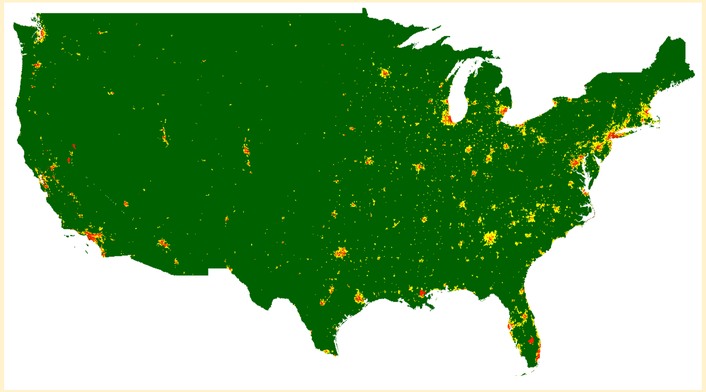
Motivation

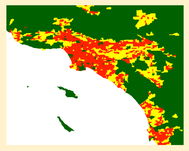
- 2 characteristics determines the short-medium run housing market equilibrium on the supply
  - House is a durable good
    - hard to adjust in the short run
  - Supply elasticity of housing
    - Varies with urban form and land-use regulation (Green et al. (2005))
    - Results of function of both physical and regulatory restrictions (Saiz (2010))



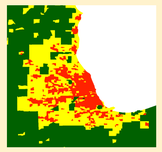
Data

- Housing sales data from CoreLogic
  - Top 51 MSAs (over 1M population)
  - From 2000 to 2014
- Price standardized to 2014 USD
- Study periods: based on S&P/ Case-Shiller Index
  - Boom: 2000 – 2006
  - Bust: 2007 – 2011
  - Recovery: 2012 – 2014
- U.S. Census tract shapefile
  - From 2010 Decennial Census (72,392 tracts)
  - Population, housing units, land areas
  - Calculate density based on population (# people/mi^2)
    - High density: over 3,000 ppl/mi^2 (42 %) – urban
    - Mid density: 100 – 3000 ppl/mi^2 (29 %) – suburban
    - Low density: less than 100 ppl/mi^2 (29 %) – exurban

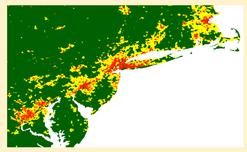




Los Angeles



Chicago



Eastern Coast

Method

- Repeat sales analysis
  - 3 time repeat sales
    - At least one transaction occurred before, during, and after the recession respectively
    - If multiple sales in 1 sub-period, remain only 1 transaction (highest during boom & recovery, lowest during bust)
  - Standard repeat sales
    - At least two sales over 2 consecutive sub-periods
      - Boom-bust or bust-recover
- First difference
  - Assume structural characteristics and local attributes do NOT vary over time except age of buildings

Model

$$p_{it} = \delta' X_{it} + \theta_1 BUST_{it} + \theta_2 RECOVER_{it} + \varepsilon_{it}$$

X: structural characteristics and local attributes

$$\Delta p_{i,t,t'} = \beta_1 \Delta BUST_{i,t,t'} + \beta_2 \Delta \mathrm{RECOVER}_{i,t,t'} + \delta_1 \Delta age_{i,t,t'} + \Delta \varepsilon_{i,t,t'}$$

1. Housing crash

$$\Delta p_{i,t,t'} = \beta_1 \cdot 1 + \delta_1 \Delta age_{i,t,t'} + \Delta \varepsilon_{i,t,t'}$$

β_1 captures the price drops during a boom-bust cycle

2. Housing recovery

$$\Delta p_{i,t,t'} = \beta_2 \cdot 1 + \delta_1 \Delta age_{i,t,t'} + \Delta \varepsilon_{i,t,t'}$$

β_2 captures the recovery rate from the Great Recession

Results

Table 1. First-Difference Estimation on All 3 Sub-periods Repeat Sales

	(1)	(2)	(3)	(4)
Variables	Overall	Urban	Suburban	Exurban
During Bust				
Bust	-0.315***	-0.357***	-0.286***	-0.224***
	(0.00210)	(0.00296)	(0.00325)	(0.00702)
Observations	420,713	216,950	158,529	45,234
R-squared	0.213	0.235	0.206	0.152
During Recovery				
Recover	0.435***	0.506***	0.355***	0.352***
	(0.00188)	(0.00274)	(0.00282)	(0.00574)
Observations	420,713	216,950	158,529	45,234
R-squared	0.125	0.139	0.123	0.106

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 2. First-Difference Estimation on the Standard Repeat Sales

	(1)	(2)	(3)	(4)
Variables	Overall	Urban	Suburban	Exurban
During Bust				
Bust	-0.337***	-0.393***	-0.280***	-0.261***
	(0.000499)	(0.000690)	(0.000783)	(0.00171)
Observations	2,664,363	1,407,163	976,834	280,366
R-squared	0.327	0.372	0.300	0.217
During Recovery				
Recover	0.279***	0.342***	0.216***	0.241***
	(0.000769)	(0.00113)	(0.00116)	(0.00234)
Observations	1,259,786	585,940	500,240	173,606
R-squared	0.163	0.193	0.155	0.114

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

- ✓ Urban: 30% drop, recover 116% of pre-shock price
- ✓ Suburban: 25% drop, recover 107% of pre-shock price
- ✓ Exurban: 20% drop, recover 114% of pre-shock price
- ✓ Robust check: similar patterns on the standard repeat sales

Conclusion/Discusison

- Urban areas (high density) was the most volatile, but fringes(low density) recovered their housing price fast, too
- Surprisingly, suburban areas (mid-density) were the least resilient to a negative shock
- In boom-bust cycle, housing prices were plunged in areas where the supply of housing was less elastic (urban areas)
  - Consistent with previous studies
- In bust-recovery cycle, exurban areas (most elastic) performed the best and suburban areas did worst in terms of recovery, surprisingly
- Policy implication for spatial variation
  - Vulnerability of housing market in suburban
  - Exurban areas in MSAs have strong resilience in housing price comparing to other areas