Housing bubble scars

Workshop on Global Housing Markets and the Macroeconomy

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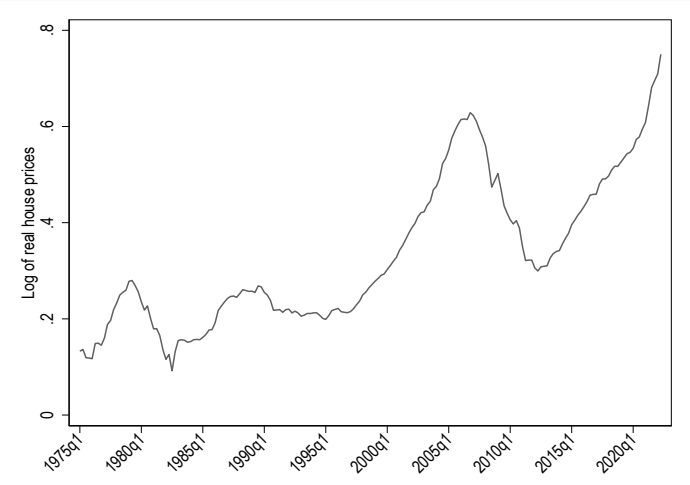
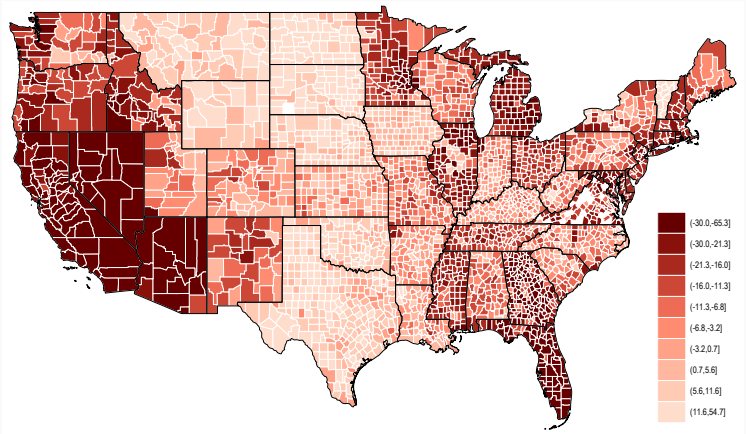
Aggregate developments are interesting...

Real US house prices (FHFA and BLS), 1975q1–2022q2



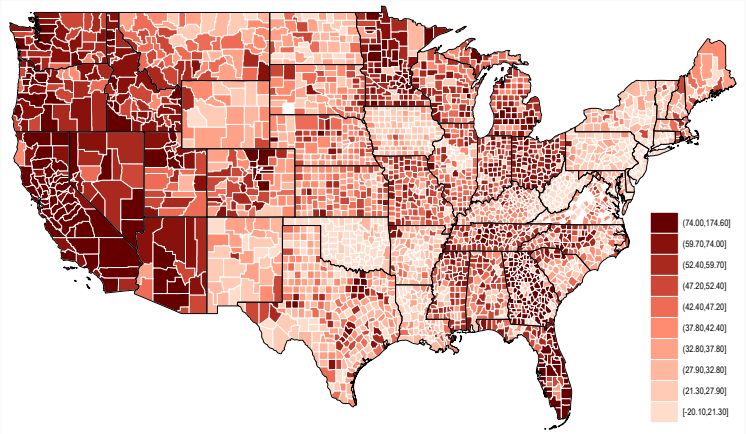
. . . but hide major regional heterogeneities during busts

Percentage change in house prices for US counties, 2007–2011. Data from Moody's



. . . and booms!

Percentage change in house prices for US counties, 2012–2019. Data from Moody's



Motivation and research questions

- Housing markets **matter for the real economy**
  - Leamer (2007, 2015): Housing is the business cycle
  - Busts can have severe consequences for unemployment, income, and construction (Mian & Sufi, 2014)

- Housing markets are **regional markets**: thousands of local cycles, not one national cycle

Our main research questions

Why do some booms become **explosive**?

Does a house price bust leave lasting **economic scars**?

And does the **type of boom** (high-acceleration vs. normal) matter?

What we do

- Date the chronology of **regional US housing cycles** using the Bry & Boschan (1971) / Harding & Pagan (2002) algorithm
- **Date-stamp high-acceleration booms** using tests for explosive roots (Phillips et al. 2015a,b)
- Trace aftermath using **local projections** (Jordà 2005; Jordà et al. 2013)
- **3,089 US counties**, 1980q1–2019q4

Inspired by Jordà, Schularick & Taylor (2013)

Financial recessions are deeper and longer than normal recessions. We ask the same for high-acceleration vs. normal booms.

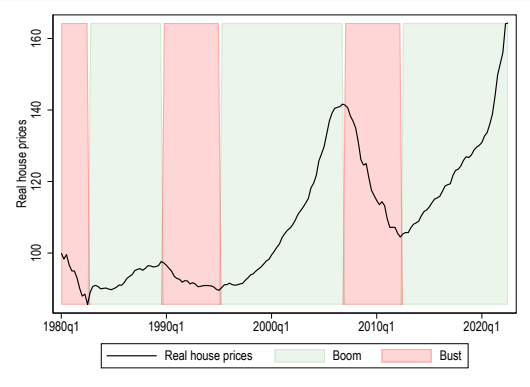
Main findings

- Major **regional heterogeneities** over the housing cycle
- Bubble probability ↑ with **limited supply** and **easy credit**
- Housing & macro outcomes **significantly more severe** after high-acceleration booms
- Scars are **surprisingly persistent** — still detectable 10+ years after peak

Housing Cycle Chronology

US housing cycle chronology

Data from FHFA and BLS



Booms:

- 1982q3–1989q3
- 1995q1–2006q4
- 2012q2–

Busts:

- 1980q1–1982q3
- 1989q3–1995q1
- 2006q4–2012q2

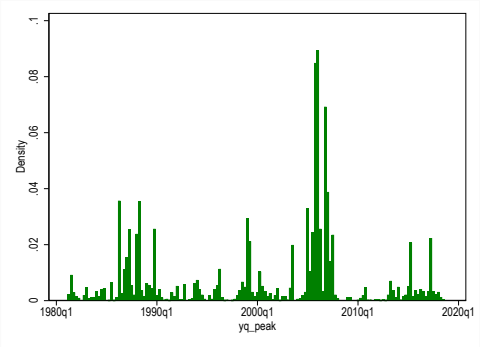
Booms last **considerably longer** than busts; price gain in boom **exceeds** loss in bust

Regional heterogeneity over the national cycle

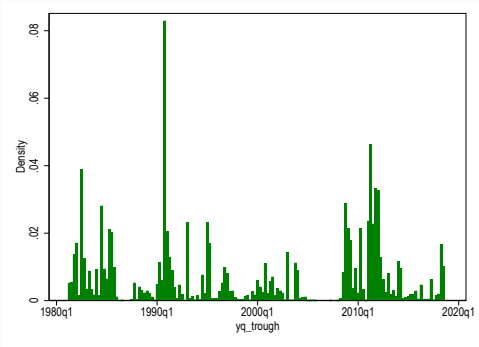
Period	Phase	5^{th}	25^{th}	50^{th}	75^{th}	95^{th}	N>0
1980q1-1982q3	Bust	-25.71	-19.47	-14.87	-8.01	1.63	204
1982q3-1989q3	Boom	-25.60	-11.18	1.01	10.65	41.22	1609
1989q3-1995q1	Bust	-19.20	-4.93	3.32	11.55	28.91	1870
1995q1-2006q4	Boom	9.36	22.17	35.99	55.71	93.33	3064
2006q4-2012q2	Bust	-41.24	-26.17	-17.48	-8.24	5.59	343
2012q2-2019q4	Boom	3.72	17.34	27.31	38.83	63.75	3010

Key: During 1995–2006 boom, 5th–95th pct. range was **9% to 93%** — one national number hides this heterogeneity

Peaks and troughs are clustered but highly regional



Peak



Trough

Histograms of starting quarter for all peaks and troughs, 3,089 counties, 1980q1–2019q4

Stylized facts: Regional cycles

Variable	5^{th}	25^{th}	50^{th}	75^{th}	95^{th}
No. peaks	1	1	2	2	3
No. troughs	2	2	3	3	4
Peak-to-trough (qtrs.)	10	13	19	24	33
Trough-to-peak (qtrs.)	11	17	29	44	61
Peak-to-peak (qtrs.)	26	34	48	70	79
Trough-to-Trough (qtrs.)	29	35	50	75	94
Peak-to-trough (% growth)	-37.92	-28.12	-16.90	-8.50	-3.55
Trough-to-peak (% growth)	10.52	17.53	30.81	52.42	91.55
Peak-to-peak (% growth)	-9.48	1.88	15.83	33.68	60.17
Trough-to-Trough (% growth)	-13.87	-1.62	10.06	26.07	48.73

- Typical county: **2–3 boom-bust cycles** since 1980
- Median boom ($\sim$7 yrs) is **50% longer** than median bust
- Cumulative price gain in boom **far exceeds** loss in bust

Bubble Detection and Drivers

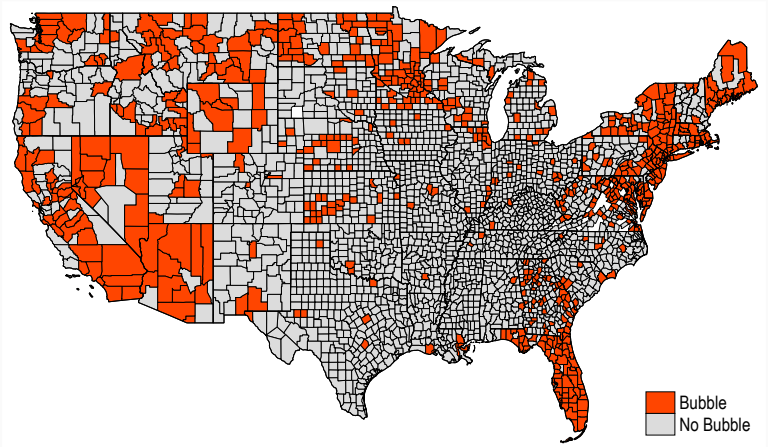
Identifying high-acceleration booms

1. Recursive ADF-test signals **explosive price developments** (Phillips et al. 2015a,b)
2. No boom (BBQ) $\Rightarrow$ **not** high-acceleration (rules out negative explosive episodes)
3. Cannot enter & exit within **4 quarters**
4. Minimum duration: **4 quarters**
5. Must be followed by a **bust within 2 years** (rules out permanent re-pricing)

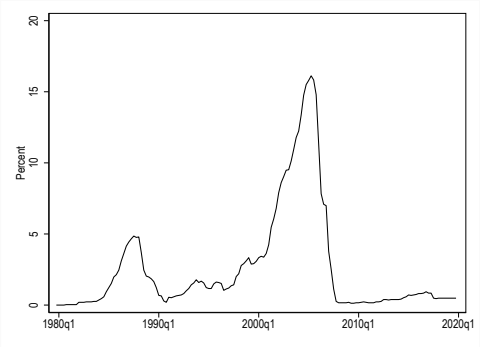
Result

24% of counties had $\geq$1 bubble; **14%** of all 5,685 booms are high-acceleration booms

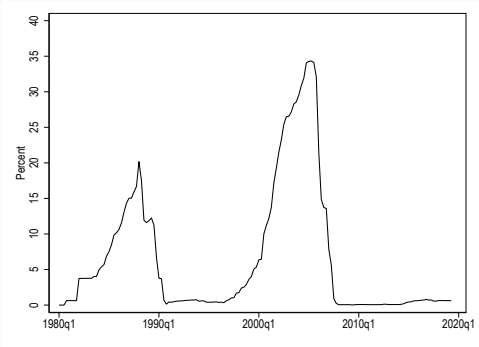
Counties with at least one high-acceleration boom, 1980–2019



Share of counties and population in a bubble, over time



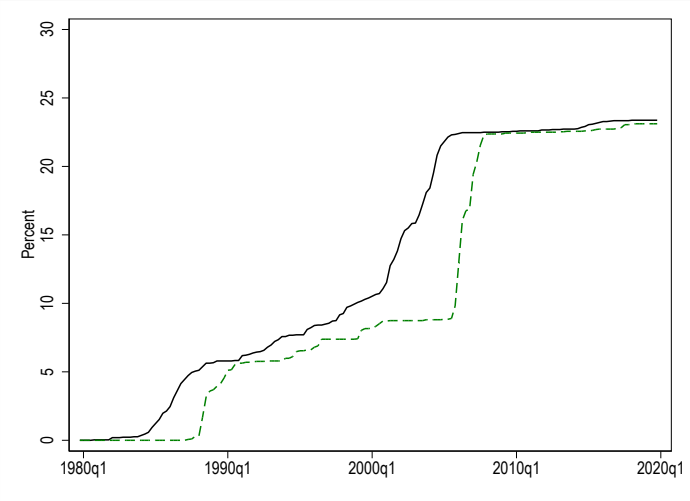
Percentage of counties in bubble



Percentage of population in a bubble county

Population share $>$ county share $\Rightarrow$ bubbles occur in more populous counties

Cumulative share: high-acceleration boom (solid) and bust (dashed)



What drives high-acceleration booms? Logit results

	I	II	III
Land unav.	0.69^{***}	0.82^{***}	0.81^{***}
Bank concentration		-2.86^{***}	-2.33^{***}
Pop. share 25–44			0.04^{***}
Income growth			1.62^{**}
Year-qtr FE	No	No	Yes

Bubble probability ↑ with:

- **Land unavailability** (inelastic supply)
- **Banking competition** (low HHI = more competition)
- Credit market **deregulation**
- Income growth & younger population

Consequences of a Bubble Bust

Conditional response paths: specification

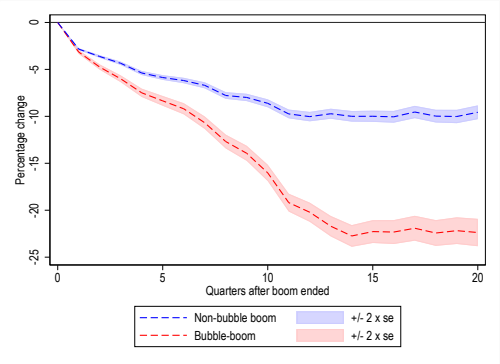
$$y_{i,t+h} - y_{i,t} = \alpha_i + \beta_{j,t} + \theta^{NBB} D_{i,t}^{\text{NBB}} + \theta^{BB} D_{i,t}^{\text{BB}} + \boldsymbol{\Gamma}' \boldsymbol{W}_{i,t} + \varepsilon_{i,t}$$

- α_i = **county fixed effects**; D^{NBB}/D^{BB} = peak-of-boom dummies
- $\boldsymbol{W}$ contains: 4 lags of house price growth, starts growth, income growth, unemployment rate, population growth; lagged Herfindahl index; **cumulative price growth** over the boom
- Key: θ^{BB} vs. θ^{NBB} — the **conditional path** after each boom type

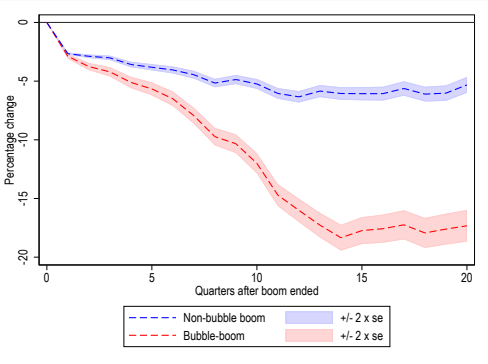
Conditional response path: high-acceleration boom characteristics

	h=8	h=12	h=20
Panel A: House prices			
High-acc. boom	-12.7^{***}	-20.2^{***}	-22.4^{***}
Normal boom	-7.8^{***}	-10.0^{***}	-9.6^{***}
Panel B: Housing starts			
High-acc. boom	-32.5^{***}	-44.4^{***}	-43.1^{***}
Normal boom	-7.9^{***}	-18.1^{***}	-23.8^{***}
Panel C: Unemployment rate (pp)			
High-acc. boom	0.82^{***}	1.98^{***}	1.96^{***}
Normal boom	0.20^{***}	1.10^{***}	1.34^{***}

Conditional response path: house prices

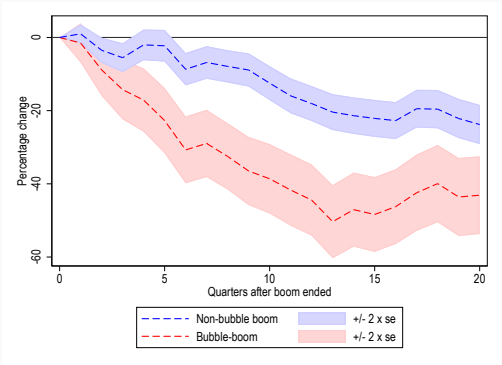


House prices

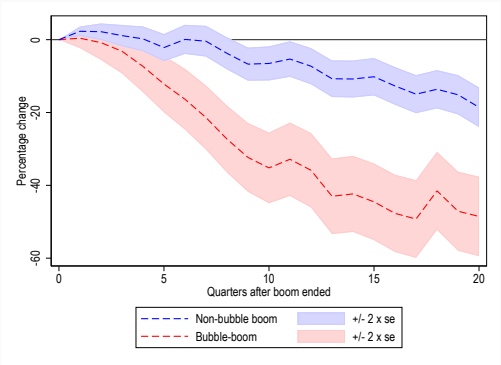


Price-to-income

Conditional response path: construction activity

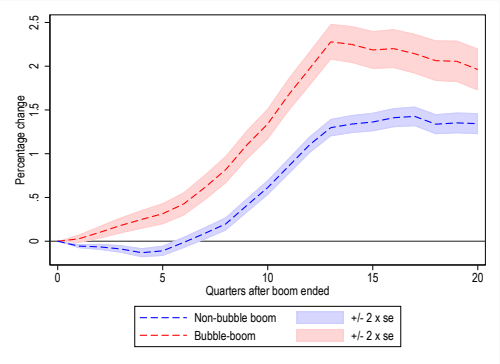


Starts

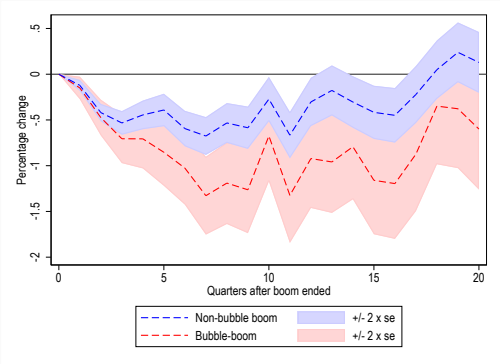


Completions

Conditional response path: unemployment and income



Unemployment



Per capita disp. income

Conclusion and Policy Implications

Clear signs of scars

- **More severe scars** from high-acceleration boom-busts: deeper price falls, construction collapse, higher unemployment, lower income — and all more **persistent**
- Should try to **limit probability** of high-acceleration booms:
  - ◇ **Primary — supply side:** Remove unnecessary political barriers to building
    $\Rightarrow$ more elastic supply, lower prices, fewer bubbles
  - ◇ **Secondary — credit side:** Macroprudential regulation (LTV/DTI limits)
- Caveat: we document associations, not causal effects. But the association is strong, robust, and economically large.

Conclusion

1. Housing markets are **highly regional** — one national cycle masks enormous heterogeneity
2. **24%** of US counties experienced $\geq$1 bubble (1980–2019); clusters on the coasts, mainly pre-GFC
3. Bubble probability rises with **land unavailability** and **easy credit**
4. After a bubble bust: **deeper and more persistent** declines in prices, construction and income; **sharper rises** in unemployment
5. House prices remain **17% below** peak 10 years after a high-acc. bust — vs. 4% for normal busts
6. Policy levers: **elastic supply** and **macroprudential regulation**