Mortgage Choices and Housing Speculation

Gadi Barlevy Jonas Fisher
Chicago Fed

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Theory: Equilibrium Housing Bubble

Fixed Supply and Uncertain Demand

- Fixed stock of housing
- Two types of buyers: high and low value for housing
- Fundamental value = value of additional house
- Shock creates random flow of new buyers who arrive gradually $\Rightarrow$ high types may exceed stock

Leverage

- Uncertain future prices $\Rightarrow$ leveraged speculation profitable
  - Many high types arrive, price high: sell house, repay debt
  - Not enough high types arrive, price low: default
- Price may exceed fundamentals while uncertainty persists

Mortgage Choices

Given price path: choice between interest-only or traditional

With speculative bubble:

- Typically $\exists$ IO $\succ$ traditional mortgage
- Lender achieves earlier pay-back (before bubble possibly bursts) in exchange for the speculator not building equity (so option to default is more valuable)

Absent a speculative bubble:

- Without other frictions IO contract cannot make both lender and speculator better-off

Empirical Implications

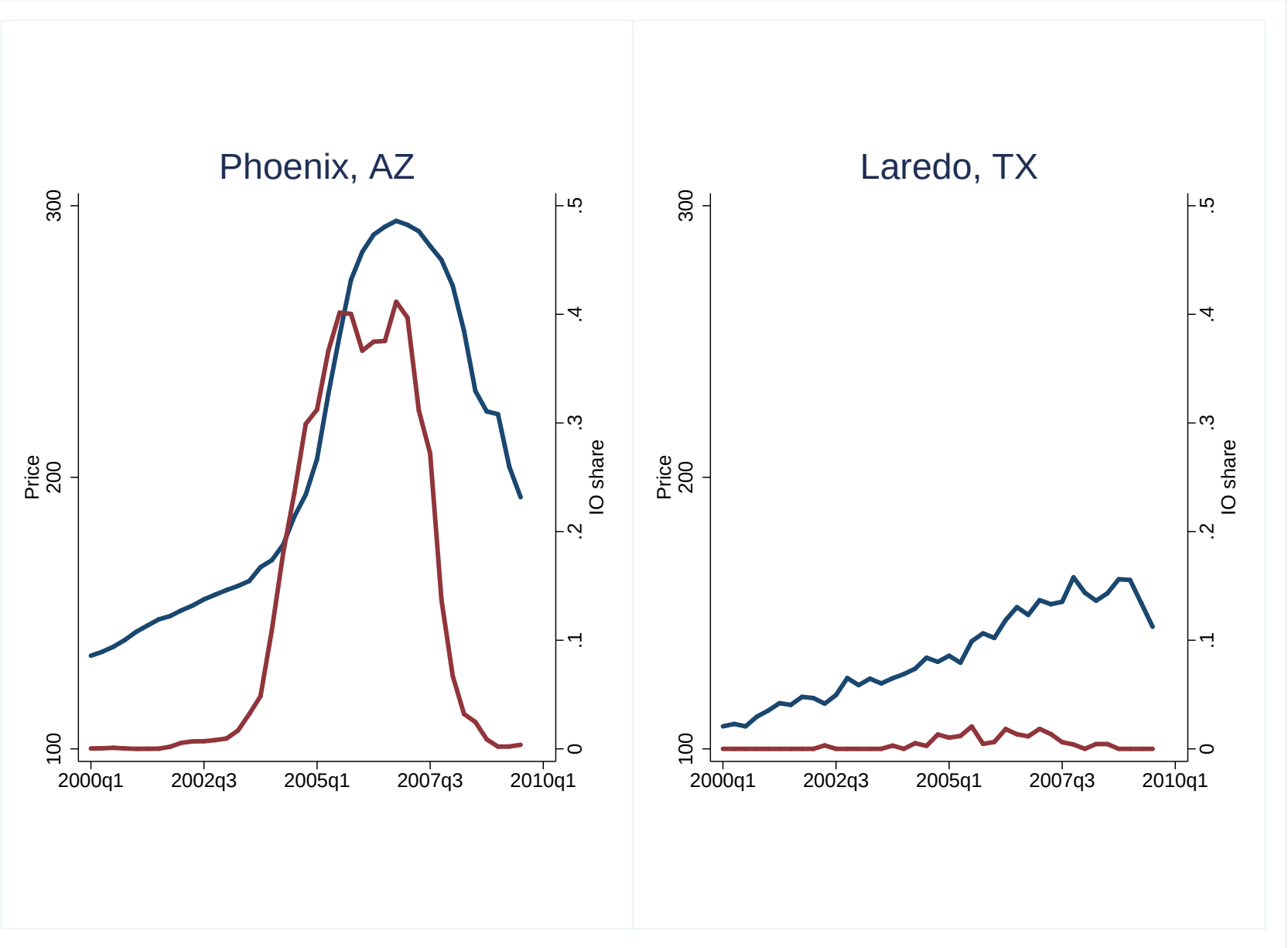
Cities with elastic supply:

- No speculative bubble (price = building cost)
- No obvious reason for IOs

Cities with inelastic supply:

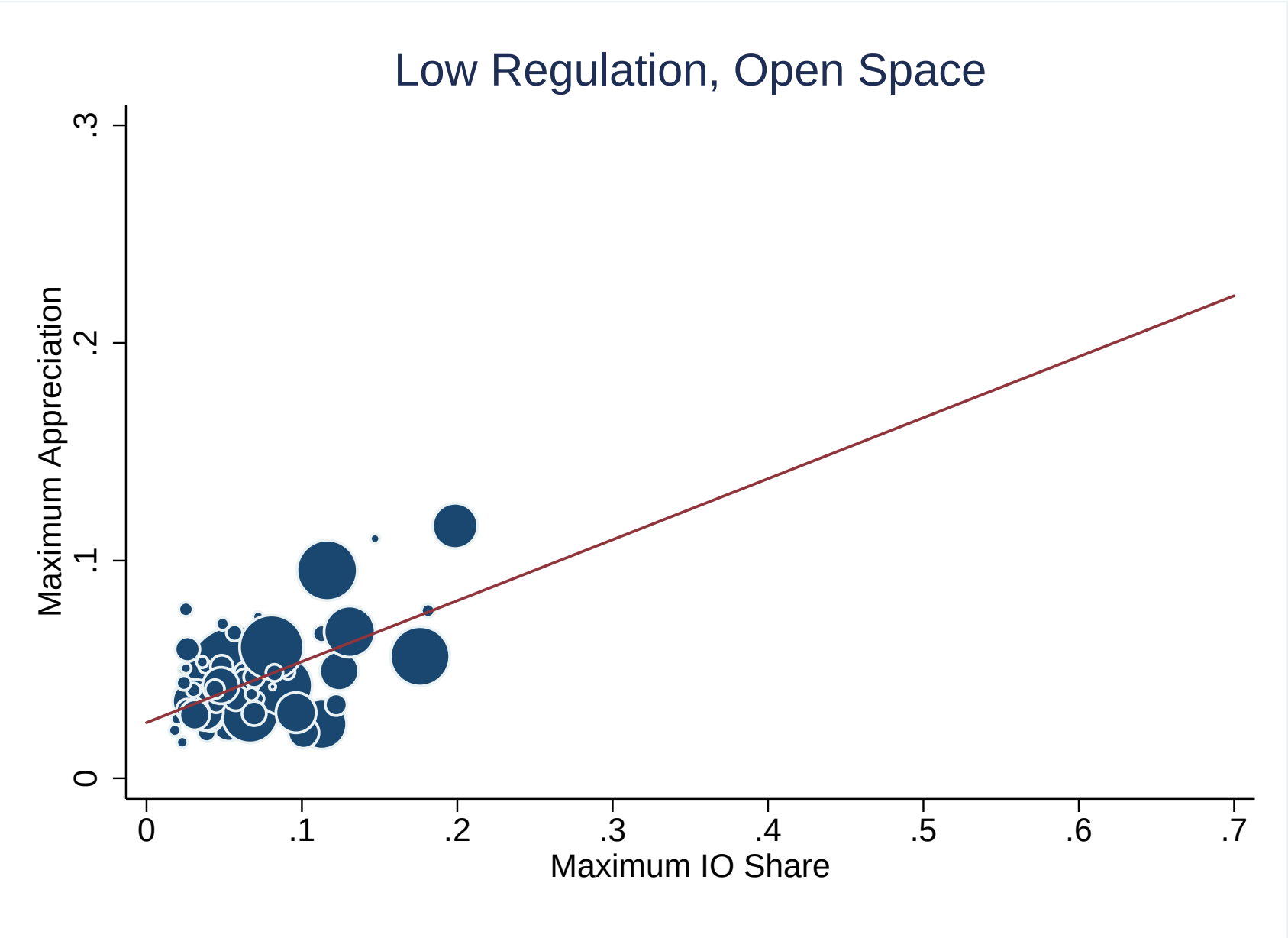
- Speculative bubble possible
- If rapid appreciation, then high usage of IOs

Prices vs. IOs in Phoenix and Laredo

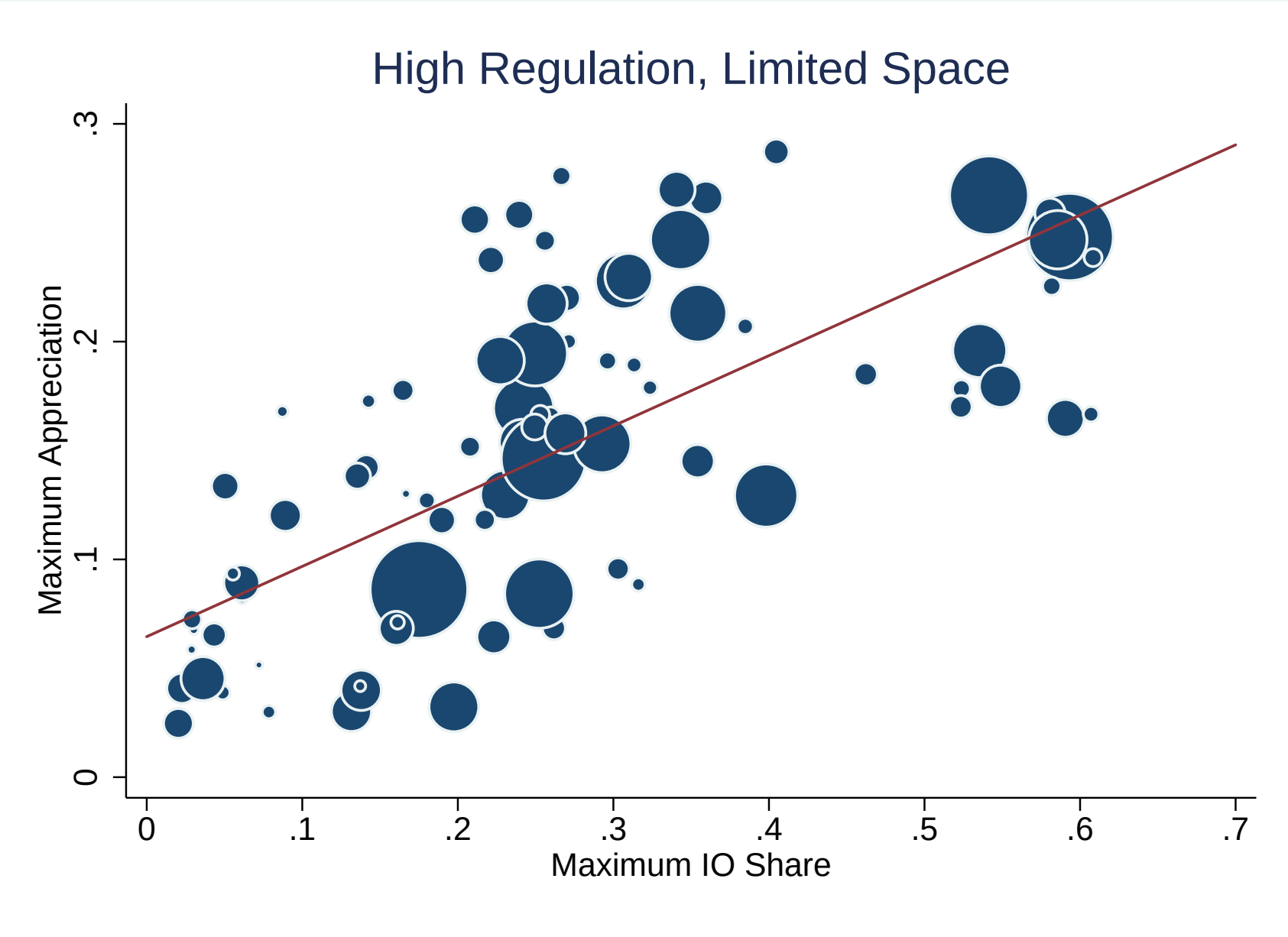


- Blue – Price, Red – IO Share

Maximum IO Share vs. Fastest Price Growth



Maximum IO Share vs. Fastest Price Growth



Explanatory Power of IOs in Boom

	1	2	3	4
Max IO Share	.42		.35	.23
Regulation		.02	.004	-.004
Undevelopable land		.10	.02	.02
Fundamentals	N	Y	Y	Y
State Fixed Effects	N	N	N	Y
R^2	.65	.74	.87	.98

- 1%, 5%, 10% significance

Other Mortgage Features

	1	2	3	4	5	6	7	8
IO	.35	.40	.33	.36	.35	.31	.34	.25
Hybrid		-.14						.01
Long Term			.43					.43
Sub-Prime				-.19				-.20
Securitized					.01			.10
High CLTV						-.15		-.06
Investors							.62	.58
R^2	.87	.88	.88	.88	.88	.88	.90	.91

- 1%, 5%, 10% significance

Affordability

	1	2	3	4
IO Share		.28		.29
Peak Price	.13	.04		
Price/Income at Peak			.13	.04
R^2	.86	.90	.86	.90

- 1%, 5%, 10% significance

Price Dynamics and IO Use

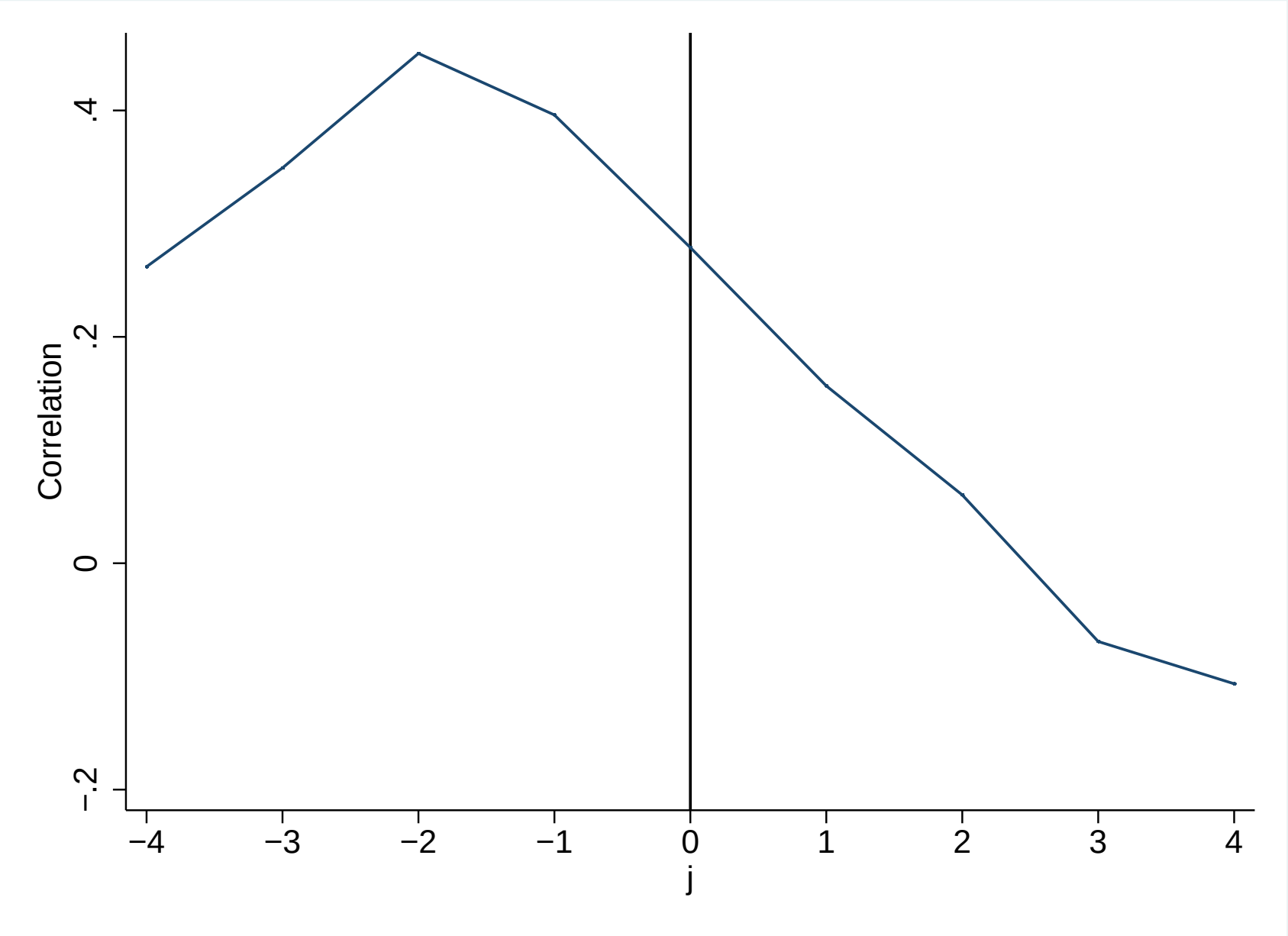
If IOs chosen for affordability

- house price appreciation leads IO usage

If agents speculate on rising house prices

- IO use should lead realized appreciation

$\text{Corr}(\Delta io_{t+j},\ \Delta p_t)$

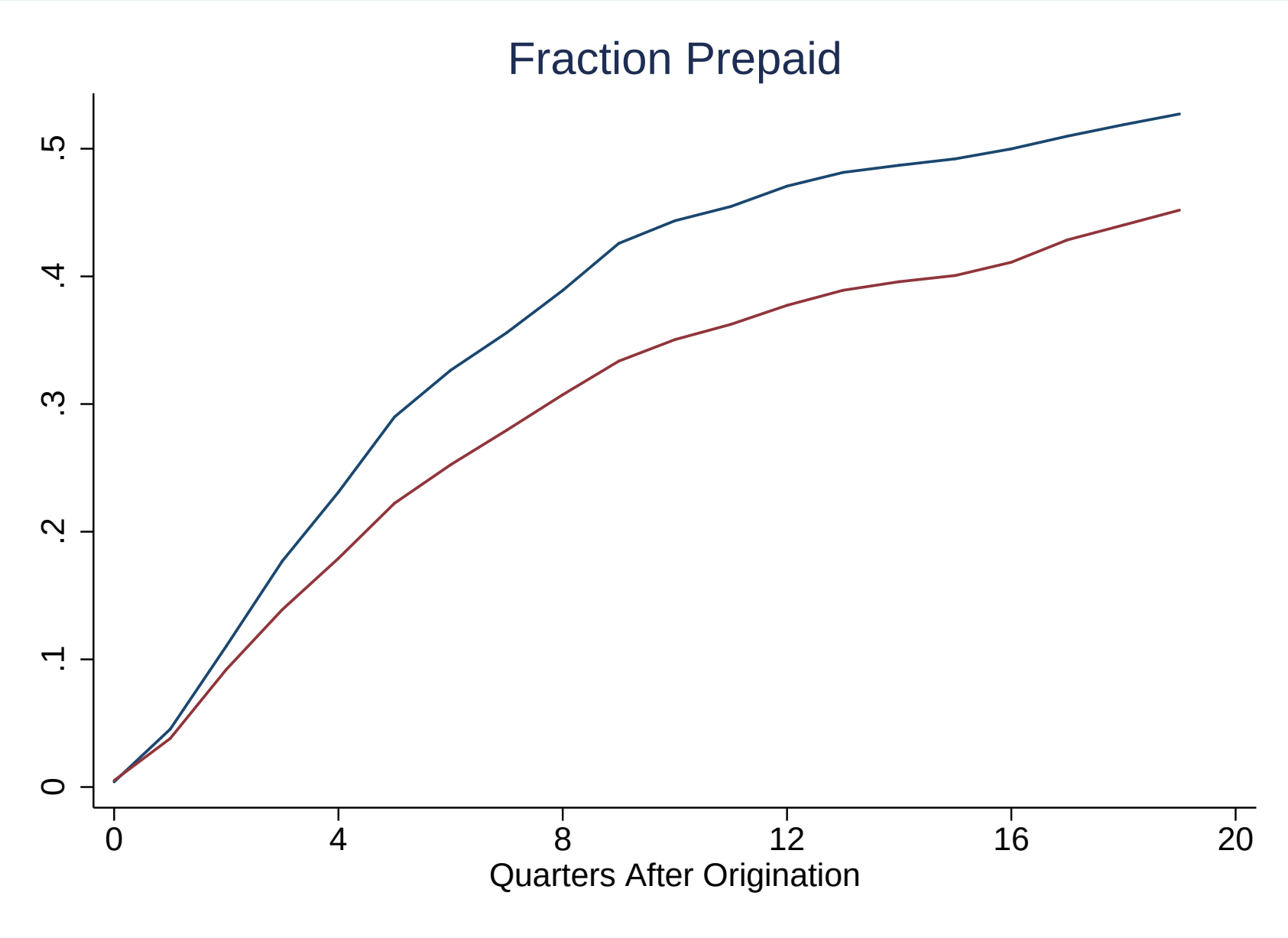


Mortgage Pre-payment and Default

Two more checks on theory:

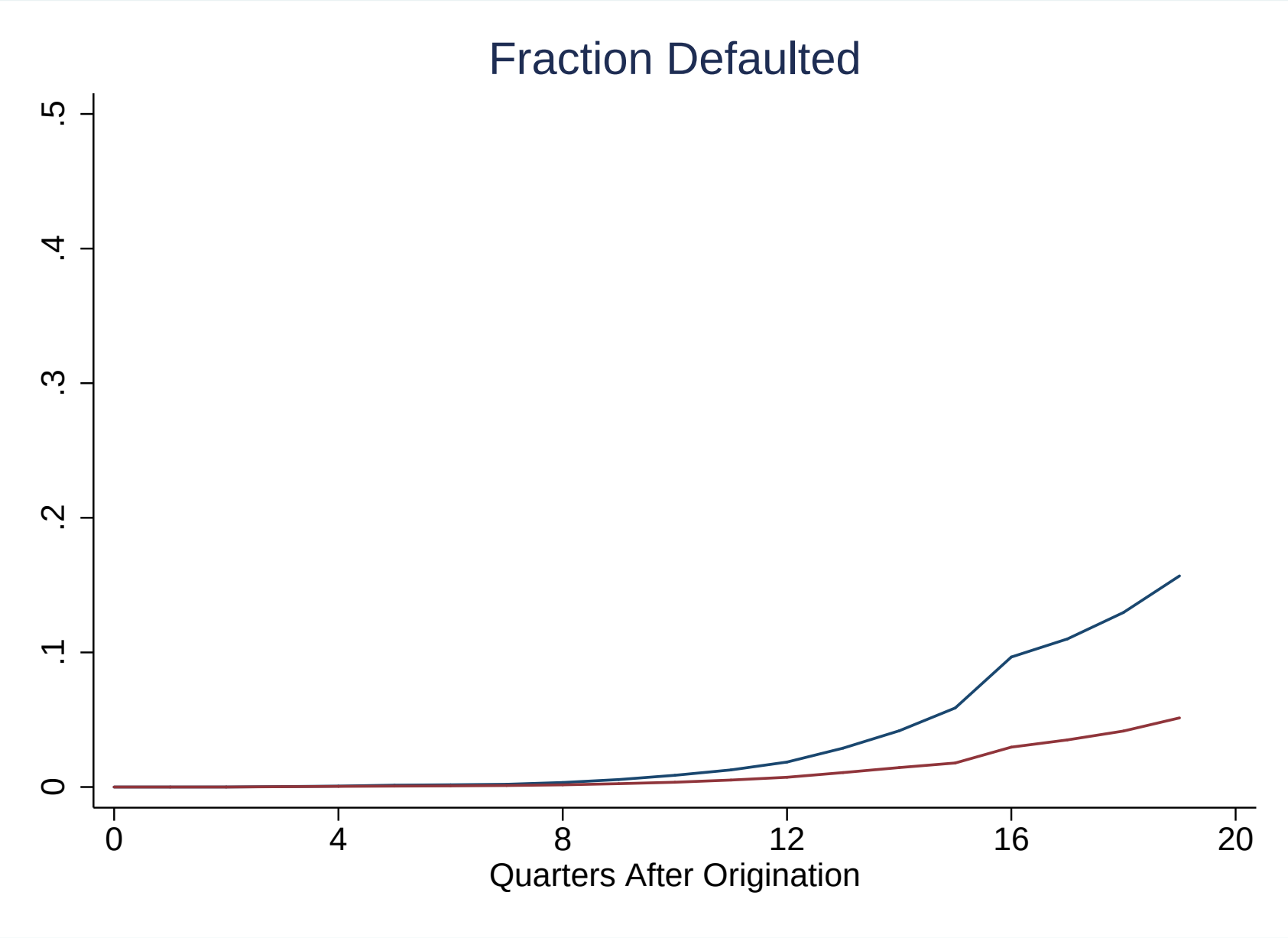
- Theory relies on back-loading encouraging earlier sales
- Theory implies IOs default when prices fall

Mortgages Originated in 2005q1



- Blue – IOs, Red – Non-backloaded

Mortgages Originated in 2005q1



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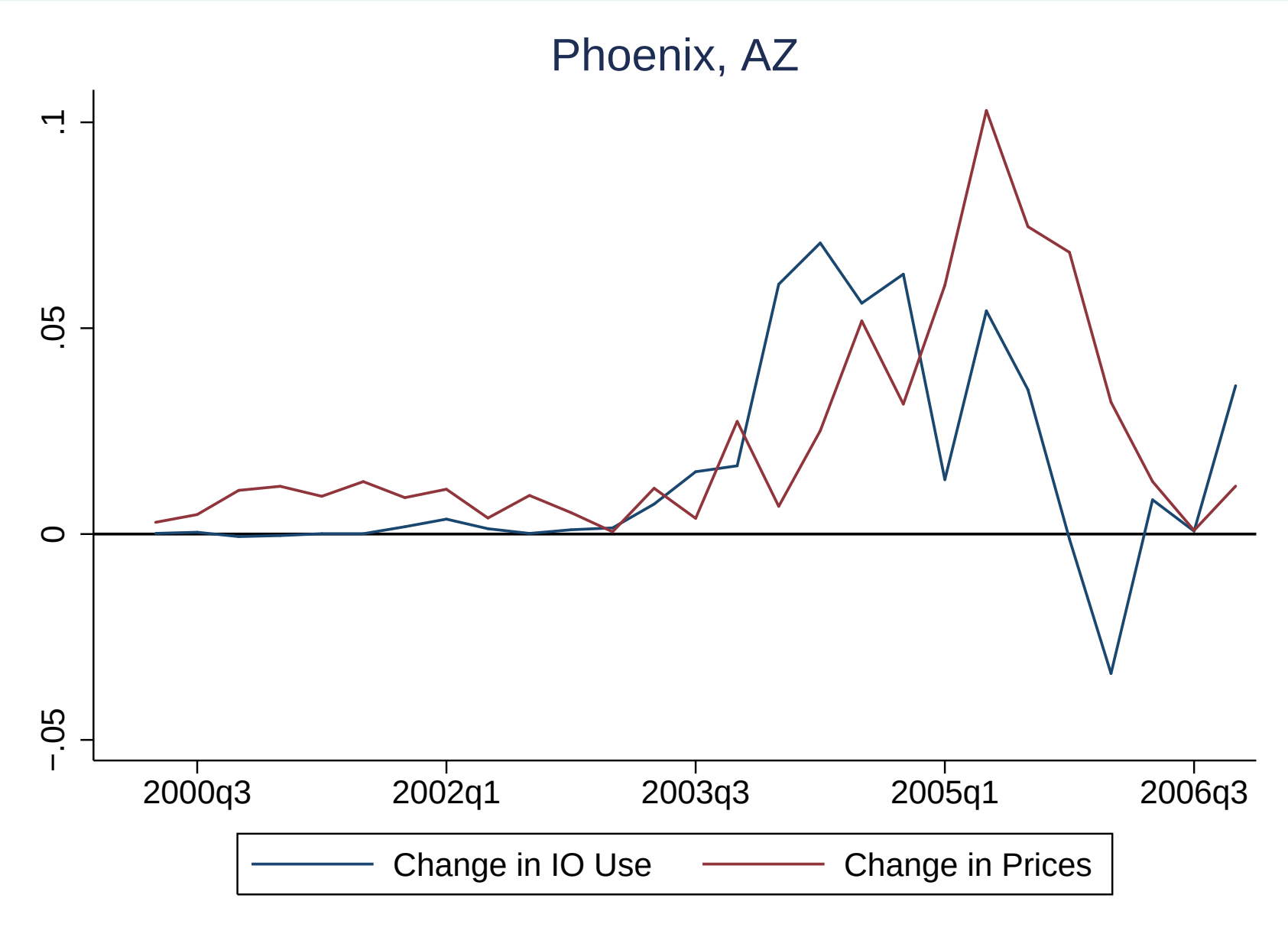
Bottom Line

- IO usage is a robust predictor of boom-bust episodes
- Our theory suggests the pattern of mortgage choice we observe is consistent with there having been speculative bubbles in some cities
- Other explanations possible
  - **But:** Why, where price risk was greatest, were lenders willing to let borrowers avoid this risk?
- **Caveat:** In our model, IOs do not cause bubble; restricting the use of these contracts does NOT prevent bubbles

Descriptive Statistics from McDash Data

Type	Year	All	Own	Inv.	Priv. Sec.	Sub-prime	P.P. Pen.
IO	2000	0.1	97.1	2.9	58.7	0.2	0.3
	2005	19.7	88.6	11.4	52.5	9.3	17.8
O-ARM	2000	1.1	97.3	2.7	N/A*	1.2	31.9
	2005	8.2	84.7	15.3	58.4	24.3	64.2
Fixed	2000	85.2	95.8	4.2	9.4	0.6	4.5
	2005	67.4	92.6	7.4	14.3	2.1	2.0
ARM	2000	10.6	98.1	1.9	17.6	7.6	14.5
	2005	14.2	90.4	9.6	45.0	29.8	28.0
All	2000	100.0	96.1	3.9	10.7	1.3	5.7
	2005	100.0	90.9	9.1	29.8	9.3	13.9

- Entries are percentage of indicated type of mortgage

IOs Move Before Prices