

House Money and Entrepreneurship

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Introduction

- Credit constraints for startups?
 - Yes! (base distributions, windfall gains)
 - No! (tail distributions, luxury good, OVB)
- Home prices, collateral, and entry
 - Debt finance is very important for startups
 - Home price changes can have huge impacts in wealth and effective collateral
 - Direct policy interest given recent events

Home Equity and Business Loans

- 19%: Personal real estate was used to secure the most recent business loan
- 9%: Lack of collateral was the official reason why the loan was turned down
- 6%: Did not apply for a loan because feared rejection due to lack of collateral
- 1998 Survey of Small Business Finances

Rapidly Expanding Literature

- Black, de Meza, and Jeffreys
- Hurst and Lusardi (... →)
- Adelino, Schoar and Severino
- Harding and Rosenthal
- Schmalz, Sraer, and Thesmar
- Bracke, Hilber, and Silva
- Fairlie and Krashinsky
- Jensen, Leth-Petersen, and Nanda

Channels and Confounders

- Collateral is unlocked (baseline belief)
- Complication #1: Wealth and behavioral effects
 - Entrepreneurship as a luxury good
 - Risk profiles and wealth levels
 - Irrational exuberance, mental accounting
 - Note: “housing price effect” correctly identified, but not operating through the credit channel
- Complication #2: Correlated omitted factors
 - Local demand is increasing alongside prices

Our Edge

- Study entrepreneurship in the US
 - Special laboratory of 2000-2004
- Unique data to leverage
 - Fine grained locations and prices
 - Owners and their home values
 - Renters and their rental payments
 - New startups and existing business owners
 - Firm dynamics and career trajectories

Agenda

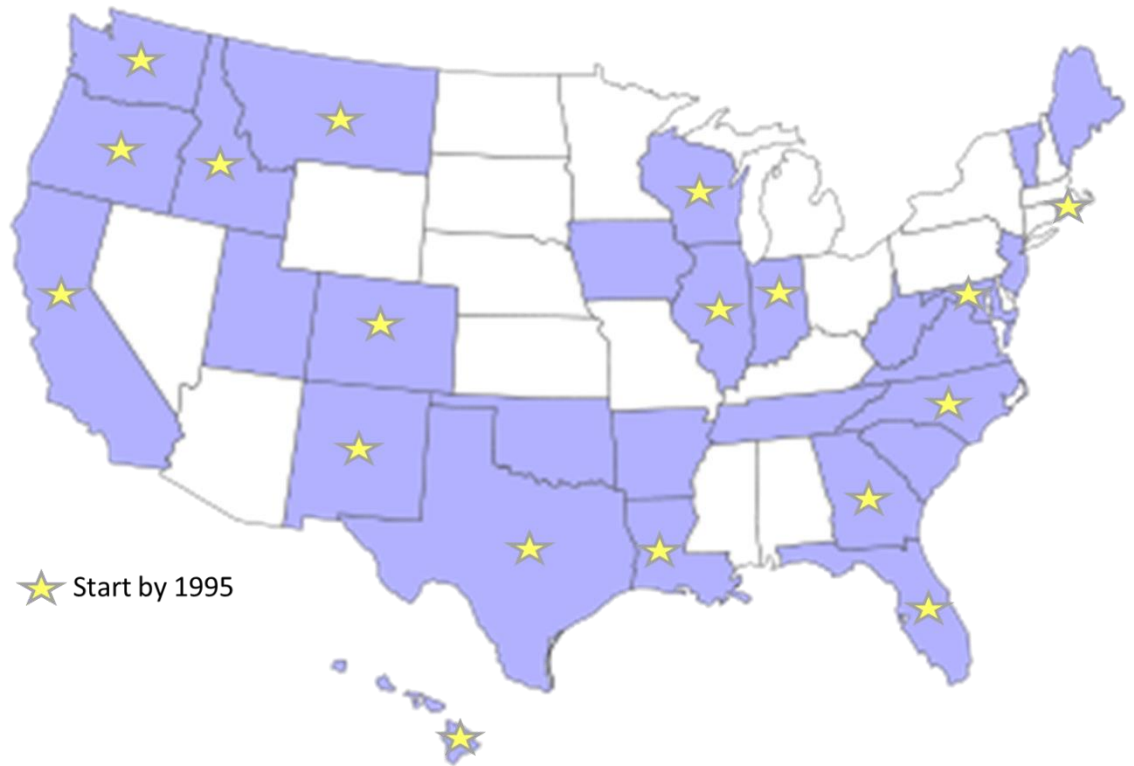
- Describe LEHD + Census data platform
- Analyze home values and entry:
 - Establish owners vs renters baseline
 - Comparisons back-up the chain
 - Consider collateral roles via decompositions
- Solicit going-forward ideas
- Wax poetically as time remains

Punch Line!

- Home price growth connects to entry
 - Especially for those with high home values
 - But quite modest in size!!
 - More for new entrants than incumbents
 - Mixed evidence about whether collateral is at play
 - (built up at zip code level with rental effect as zero)
- Must interpret city-wide work carefully
 - To “kill the renter” effect, we need zip-level prices

LEHD Data

- All private U.S. firms and their employees
 - Sourced from unemployment insurance filings
 - Combined with social security information
 - Use states starting by 1995



Defining Startups & Entrepreneurs

- Link SEINs to Census Business Register
- Startups = firm founded after 1995 (LBD)
- Entrepreneurs = persons present in the initial year that the firm is created
- Same for 2004, and test variations on these themes

Decennial Census Data

- Many demographic traits
- Household income
- Home ownership data
 - Whether a home owner
 - Est. home value (intervals, \$1 mil cap)
 - Whether an outstanding mortgage exists
 - Monthly mortgage or rental payment
 - Move-in date to dwelling
 - Zip code location of dwelling

Housing Data and Definitions

- Estimated home equity for owners
 - Share = $20\% + 80\% * (\text{years in home} / 30)$
 - If no mortgage, equity share = 100%
- Renter dwelling value = 20 x rent
 - 2000 av. of 21.6 with FHFA and Case-Shiller
- Housing price data
 - CBSA/MSA: ~130, FHFA
 - Zip codes: ~5900, Zillow

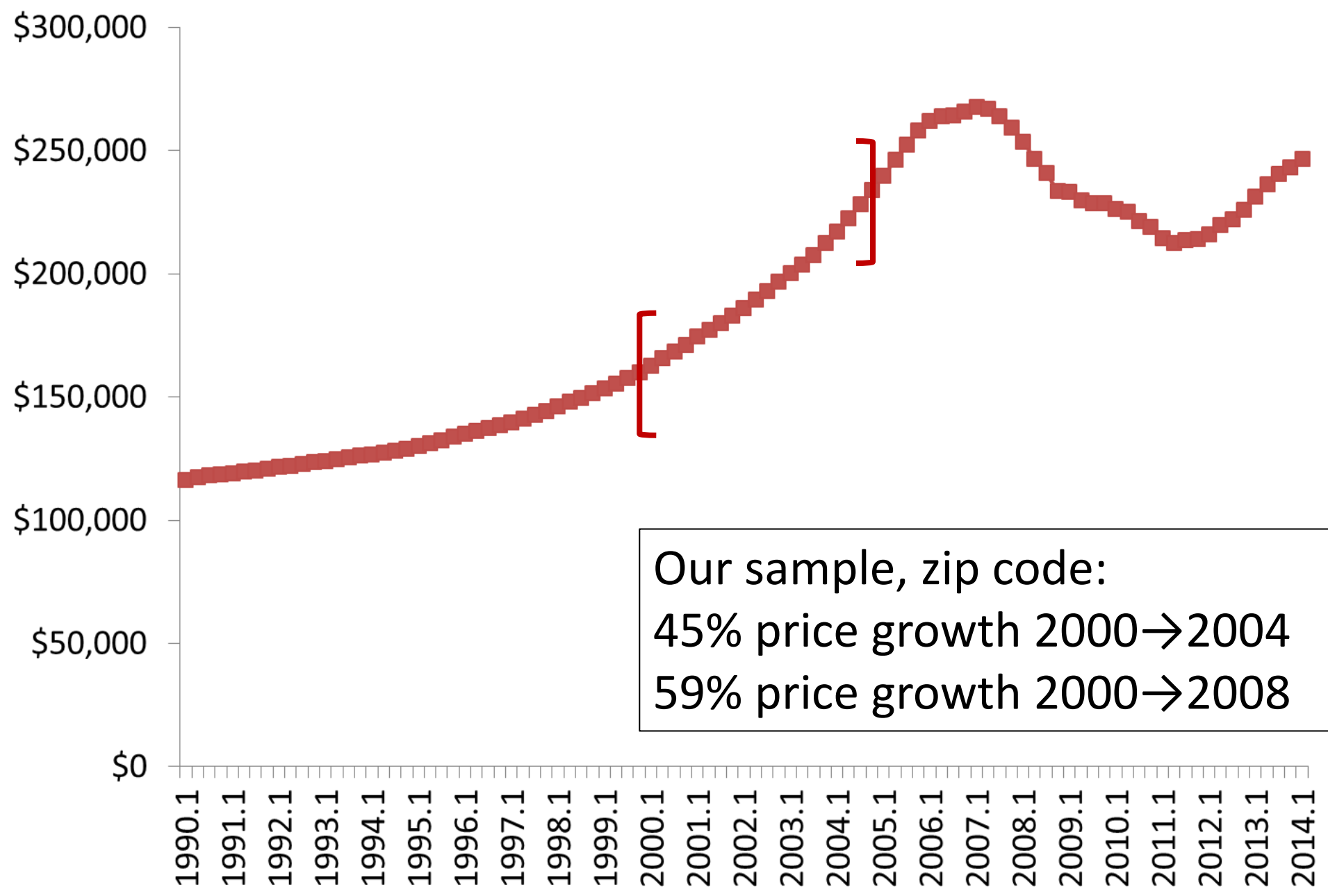
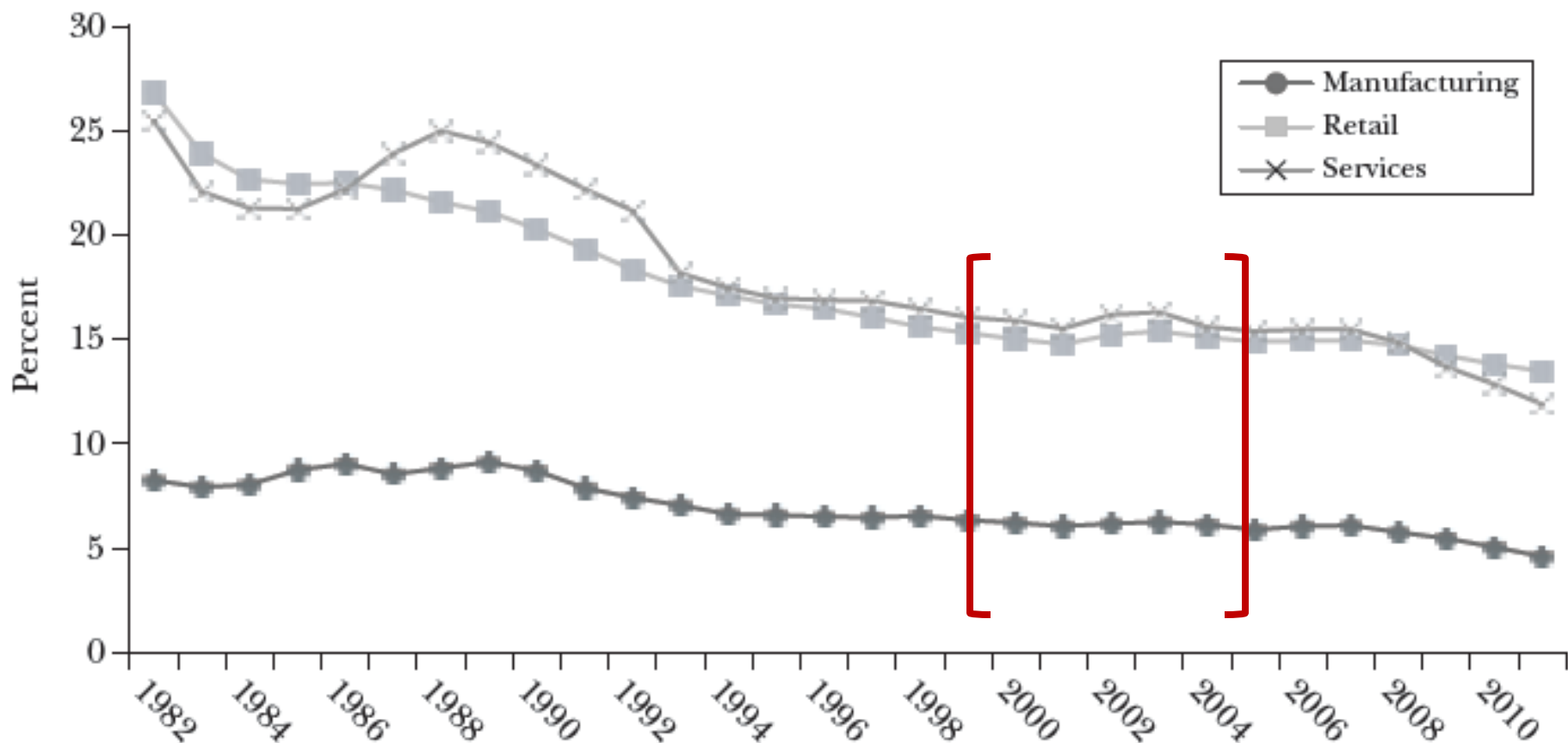


Figure 5

Share of Employment from Young Firms (Firms Age 5 or Less), Selected Sectors



Source: Author calculations from the US Census Bureau's Business Dynamics Statistics.

Notes: Sector definitions are on an Standard Industrial Classification basis. Employment shares in each period are based on the average of employment in period $t - 1$ and t (the denominator of the Davis, Haltiwanger, and Schuh (DHS) growth rate).

Sample Traits

Business owner 2000	0.0535	Bachelor's education (>=)	0.3774
Business owner 2004	0.0667	Renter	0.2933
Business owner 2008	0.0702	Own with mortgage	0.6597
Survival of SEIN to 2004	0.8529	Own without mortgage	0.0384
Survival of SEIN to 2008	0.7534	Home value (max=\$1m)	180,047
Age (25-50)	38.07	Implied rental value	163,731
Male	0.5281	Move-in date	1993.5
Hispanic	0.1387	Household income (\$2.5m)	76,232
African American	0.0771	LEHD earnings 2000	44,286
Asian	0.0538	LEHD earnings 2004	53,901
Immigrant	0.1600	LEHD earnings 2008	64,000
Married	0.7280	N	976,875

Nation in 2000: 67% ownership, mean value of \$167k

	Respondent occupation in 2000	All	Wage	Wage	Entrepreneur	Entrepreneur
	Respondent home ownership in 2000	All	Owner	Renter	Owner	Renter
(1)	N	976,870	653,570	271,070	36,800	15,430
(2)	Share	1.0000	0.6690	0.2775	0.0377	0.0158
(3)	Zip code house price 2004 / price 2000	1.4525	1.4269	1.5104	1.4466	1.5282
(4)	Zip code house price 2008 / price 2000	1.5927	1.5622	1.6626	1.5805	1.6849
(5)	Business owner 2000	0.0535	n.a.	n.a.	1.0000	1.0000
(6)	Business owner 2004	0.0667	0.0383	0.0428	0.5911	0.4381
(7)	Business owner 2008	0.0702	0.0488	0.0520	0.4779	0.3271
(8)	Survival of SEIN in 2000 to 2004	0.8529	0.8679	0.8403	0.7503	0.6846
(9)	Survival of SEIN in 2000 to 2008	0.7534	0.7772	0.7300	0.6015	0.5184
(10)	Age	38.07	39.3	35.17	38.82	35.17
(11)	Male	0.5281	0.5264	0.5215	0.5846	0.5780
(12)	Hispanic	0.1387	0.1167	0.1907	0.1183	0.2043
(13)	African American	0.0771	0.0562	0.1329	0.0340	0.0865
(14)	Asian	0.0538	0.0485	0.0637	0.0627	0.0842
(15)	Immigrant	0.1600	0.1378	0.2068	0.1712	0.2526
(16)	Married	0.7280	0.8254	0.4911	0.8349	0.5099
(17)	Bachelor's education and higher	0.3774	0.4064	0.3115	0.3838	0.2893
(18)	Renter	0.2933	n.a.	1.0000	n.a.	1.0000
(19)	Own with mortgage	0.6597	0.9335	n.a.	0.9332	n.a.
(20)	Own without mortgage	0.0384	0.0665	n.a.	0.0668	n.a.
(21)	Home value (max=\$1 million)	180,047	178,750	n.a.	203,117	n.a.
(22)	Implied rental value	163,731	n.a.	163,242	n.a.	172,317
(23)	Move-in date	1993.5	1992.4	1996.1	1992.9	1996.1
(24)	Household income (max=\$2.5 million)	76,232	86,479	49,965	97,360	53,252
(25)	LEHD earnings 2000	44,286	49,624	31,235	51,174	30,998
(26)	LEHD earnings 2004	53,901	59,508	40,000	62,357	40,502
(27)	LEHD earnings 2008	64,000	69,745	49,542	74,071	50,659

Sample Traits

- Entrepreneurs: higher income, pricier homes, male, married, more immigrant, less minority
- Owners: higher income, older, male, married, less immigrant, less minority
- Ownership rates pretty similar among the entrepreneurs and wage workers

Indicator
variable for
entrepreneur
in 2004



y_i^{04}

=

Log home
value or
implied value
in 2000



$\beta[VAL_i^{00} \cdot \Delta H P_a^{00-04}]$

$+ \gamma VAL_i^{00} + \theta \mathbf{X}_i^{00} + \phi_a + \epsilon_i$

Log price
ratio of 2004
to 2000 for
the area



Indicator
variable for
entrepreneur
in 2004



y_i^{04}

Log home
value or
implied value
in 2000



VAL_i^{00}

Log price
ratio of 2004
to 2000 for
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$\Delta H P_a^{00-04}$

$$y_i^{04} = \beta [VAL_i^{00} \cdot \Delta H P_a^{00-04}]$$

$$+ \gamma VAL_i^{00} + \theta \mathbf{X}_i^{00} + \phi_a + \epsilon_i$$



Main effect
for home
values in
2000



Demographics,
including (0,1)
entrepreneur
in 2000



Area fixed
effects (can
differ from
price level)

Fixed Effect Controls

- Whether entrepreneur in 2000
- Zip code of residence (5909)
- Age (9), education (6), gender, married
- Race (4) and immigration status
- LEHD earnings in 2000 (10)
- Accumulated LEHD earnings to 2000 (10)
- Date of move-in to residency (6)

Additional Notes

- Introduce price main effect when needed
- Demean before interactions
- Unweighted at person-level
- Cluster by zip code
- Zip code prices available for 85% of obs
- Observation counts are all rounded

A Starting Point

Group	Owners
Price level	CBSA
Geographic fixed effect level	Region
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Home value 2000 * Price change 2000-2004	0.0119 (0.0032)
Price change 2000-2004	0.0013 (0.0029)
CBSA Rental Entry Rate	0.5821 (0.0431)
Number of observations	681,410
Mean of dependent variable	0.0678
75th-25th interaction differential / mean of DV	0.0565
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A Starting Point

Group	Owners	Renters
Price level	CBSA	CBSA
Geographic fixed effect level	Region	Region
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Home value 2000 * Price change 2000-2004	0.0119 (0.0032)	0.0127 (0.0058)
Price change 2000-2004	0.0013 (0.0029)	0.0048 (0.0038)
CBSA Rental Entry Rate	0.5821 (0.0431)	0.9056 (0.0605)
Number of observations	681,410	286,170
Mean of dependent variable	0.0678	0.0641
75th-25th interaction differential / mean of DV	0.0565	0.0638
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Killing the Renter...

Group	Owners	Renters
Price level	Zip	Zip
Geographic fixed effect level	Zip	Zip
Home value 2000 * Price change 2000-2004	0.0094 (0.0034)	0.0025 (0.0060)
Home value 2000	0.0091 (0.0019)	0.0138 (0.0060)
Estimated home equity 2000	0.0021 (0.0018)	
Household income 2000	0.0060 (0.0008)	0.0025 (0.0010)
Number of observations	581,880	244,650
Mean of dependent variable	0.0681	0.0641
75th-25th interaction differential / mean of DV	0.0444	0.0390

Size of Impact

- 25th home value ~ \$95,000, 75th ~ \$225,000
- Sample mean price growth is 1.4525
- $\Delta\text{Entry} = \underbrace{\beta \cdot \ln(V_{75} / V_{25}) \cdot \ln(\text{P Gr})}_{0.0030} + \underbrace{\gamma \cdot \ln(V_{75} / V_{25})}_{0.0078}$

Size of Impact

- 25th home value ~ \$95,000, 75th ~ \$225,000
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- $\Delta\text{Entry} = \underbrace{\beta \cdot \ln(V_{75} / V_{25}) \cdot \ln(\text{P Gr})}_{0.0030} + \underbrace{\gamma \cdot \ln(V_{75} / V_{25})}_{0.0078}$
- Raw terms: $V_{75} - V_{25} = \$130,000$
- Raw terms: $\Delta P \cdot (V_{75} - V_{25}) \sim \$59,000$
- 4.4% relative effect to national baseline
- 40% of initial unconditional gap of 0.0075

Robustness Checks

- Variations on price x value design
 - Normalized by base equity or accumulated earnings from LEHD
 - Using mortgage payout tables
 - Horseraces against other interactions
- IV using Saiz (2010) home price elasticity
- Variations on covariates and controls
- Variations on weighting approaches
- Most impact came from wage transitions

Resurrecting the Renter ...

Price level	Zip				CBSA			
Geographic FE level	Zip	CBSA	Region	Region	Zip	CBSA	Region	Region
PANEL A - Owners								
Home value 2000	0.0094	0.0127	0.0097	0.0115	0.0119	0.0163	0.0095	0.0119
* Price change 2000-2004	(0.0034)	(0.0030)	(0.0029)	(0.0029)	(0.0039)	(0.0035)	(0.0033)	(0.0032)
Price change 2000-2004		0.0080	0.0065	0.0005			0.0092	0.0013
		(0.0057)	(0.0023)	(0.0022)			(0.0029)	(0.0029)
CBSA Rental Entry Rate				0.6541				0.5821
				(0.0480)				(0.0431)
PANEL B - Renters								
Home value 2000	0.0025	0.0049	0.0066	0.0067	0.0109	0.0146	0.0119	0.0127
* Price change 2000-2004	(0.0060)	(0.0054)	(0.0050)	(0.0049)	(0.0070)	(0.0063)	(0.0058)	(0.0058)
Price change 2000-2004		-0.0019	0.0102	0.0021			0.0167	0.0048
		(0.0074)	(0.0029)	(0.0028)			(0.0038)	(0.0038)
CBSA Rental Entry Rate				0.9234				0.9056
				(0.0681)				(0.0605)

Channels and Confounders

- Collateral is unlocked (baseline belief)
- Complication #1: Wealth and behavioral effects
 - Entrepreneurship as a luxury good
 - Risk profiles and wealth levels
 - Irrational exuberance, mental accounting
 - Note: “housing price effect” correctly identified, but not operating through the credit channel
- Complication #2: Correlated omitted factors
 - Local demand is increasing alongside prices

Examining Capital Intensity...

Group	Owners	Owners
Capital intensity of firm's industry	High	Low
Price level	Zip	Zip
Geographic fixed effect level	Zip	Zip
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Home value 2000	0.0031	0.0063
* Price change 2000-2004	(0.0021)	(0.0031)
Number of observations	581,880	581,880
Mean of dependent variable	0.0188	0.0492
Interaction / mean of DV	0.0531	0.0412
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& Homestead Exemptions...

Group	Owners	Owners
Homestead exemption of state	High	Low
Price level	Zip	Zip
Geographic fixed effect level	Zip	Zip
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Home value 2000	0.0159	0.0071
* Price change 2000-2004	(0.0073)	(0.0039)
Number of observations	152,725	429,155
Mean of dependent variable	0.0773	0.0648
Interaction / mean of DV	0.0662	0.0353
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Path Forward

- Correct many mistakes, I am sure
- Examine growth of businesses
 - Preliminary cut says “not much”
- Other avenues:
 - Use career trajectories to evaluate earnings compared to path departed
 - Separate wealth and collateral?
 - Other ideas?