Housing Collateral and Entrepreneurship

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- Are financing constraints a barrier to entrepreneurship? How big? Should we care?

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- Evidence for financial constraints?
- Hurst and Lusardi (2004): or business opportunities?
- Are financing constraints a barrier to entrepreneurship? How big? Should we care?
- Policy implications
  - Subsidize small business (financing)?
  - e.g. SBA in the U.S.

Does collateral supply matter for macro?

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- What about entrepreneurship?
- We look at a representative sample of entrepreneurs and offer a novel identification

Our story and results

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We find that increased collateral values lead owners to

- start more businesses
- start larger businesses
- survive longer
- stay larger – also in the long run

Contribution to the entrepreneurship literature (I)

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Contribution:

1. We *control* by comparing owners vs renters *within region*
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2. Representative sample of new business starts $\rightarrow$ macro
3. Direct evidence on size at creation and long-run effects

Contribution to the entrepreneurship literature (II)

What we already know:

- Credit *supply* stokes entrepreneurship. Bank competition...
  - ... leads to more entry (Black et al., 1996; Fracassi et al., 2012)
  - ... lowers borrowing costs (Rice and Strahan, 2010)

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Contribution:

- Show effect of shocks to credit *demand* via shocks to collateral value

Outline

1. Size at creation, long-run effects, and survival
   - Empirical strategy
   - Data
   - Results
2. Entry
   - Empirical strategy
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   - Results

Part 1: Size at creation, long-run effects, and survival

Empirical strategy: difference-in-differences

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- Entrepreneur i, in region j, in 1999

$$Y_{ij}^{1999} = \alpha + \beta \cdot D(owner)_i \times \Delta p_j^{1992 \to 1997}$$

$$+\theta \cdot D(owner)_i + \gamma \cdot Z_i + \tau \cdot Z_i \times \Delta p_j^{1992 \to 1997} + \delta_l + \varepsilon_{i,j}$$

- Y = assets, sales, debt, employees, value added, wage bill, survival

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- Y = assets, sales, debt, employees, value added, wage bill, survival
- $\beta > 0$ identifies collateral constraints by ruling out
  - local economic shocks: δ_l local economy-fixed effect
  - smarter entrepreneurs are homeowners: $D(owner)_i$

Identification assumption

- Ownership exogenous to the elasticity of size (...) at creation to past house price growth
- Example of a violation
  - Homeowners start businesses in more cyclical industries

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  - Control for industry; characteristics of entrepreneurs
  - But maybe imperfectly measured; no IV

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  - Homeowners start businesses in more cyclical industries
  - Control for industry; characteristics of entrepreneurs
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- Improvement over the literature

Data

1. Survey of entrepreneurs (INSEE)
   - Random sample of 1/3 of all firms started in H1/1998
   - 85% response rate
   - Home ownership; age, gender, education, ...
   - 14,954 firms
2. Performance: Tax files
   - Full financial statements
   - 1M firms 1999-2005; required if sales $>$30k euro
   - Miss some sole proprietors
   - Reduces sample size to 9,173 firms
3. House prices: French notaries
   - 21 régions
   - 95 départements: 600,000 inhabitants ($\approx$ U.S. MSA)

Size at creation: Summary Statistics (I)

	Mean	Std. Dev.	p(10)	p(25)	p(50)	p(75)	p(90)	Obs.
Panel A: House price growth 1992-1997								
$p_{1997}/p_{1992} - 1$	0.03	0.10	-0.03	0.00	0.03	0.09	0.13	21
Panel B: Firm characteristics (1999 book values, in thousand Euros)								
Asset	165.56	1,289.89	6.71	18.14	41.16	99.55	242.24	11,254
Sales	240.63	1,579.81	12.65	33.69	72.87	176.08	423.50	11,254
Debt	127.61	1,051.44	2.90	10.98	30.03	79.12	197.42	11,254
# Employees	1.94	7.14	0.00	0.00	0.00	2.00	4.00	11,254
Value Added	153.66	865.11	8.54	23.02	48.94	114.79	266.33	11,254
Total Wage	53.72	250.48	0.15	2.74	12.35	45.73	112.35	11,254

Should we care about small firms?

- France has only 200 firms with more than 5000 employees
- 49% of employment, 37% of sales, in firms with $<$250 employees
- 20% of employment, 16% of sales in firms with $<$10 employees
- $>$ 1/3 of job creation in firms with $<$100 employees

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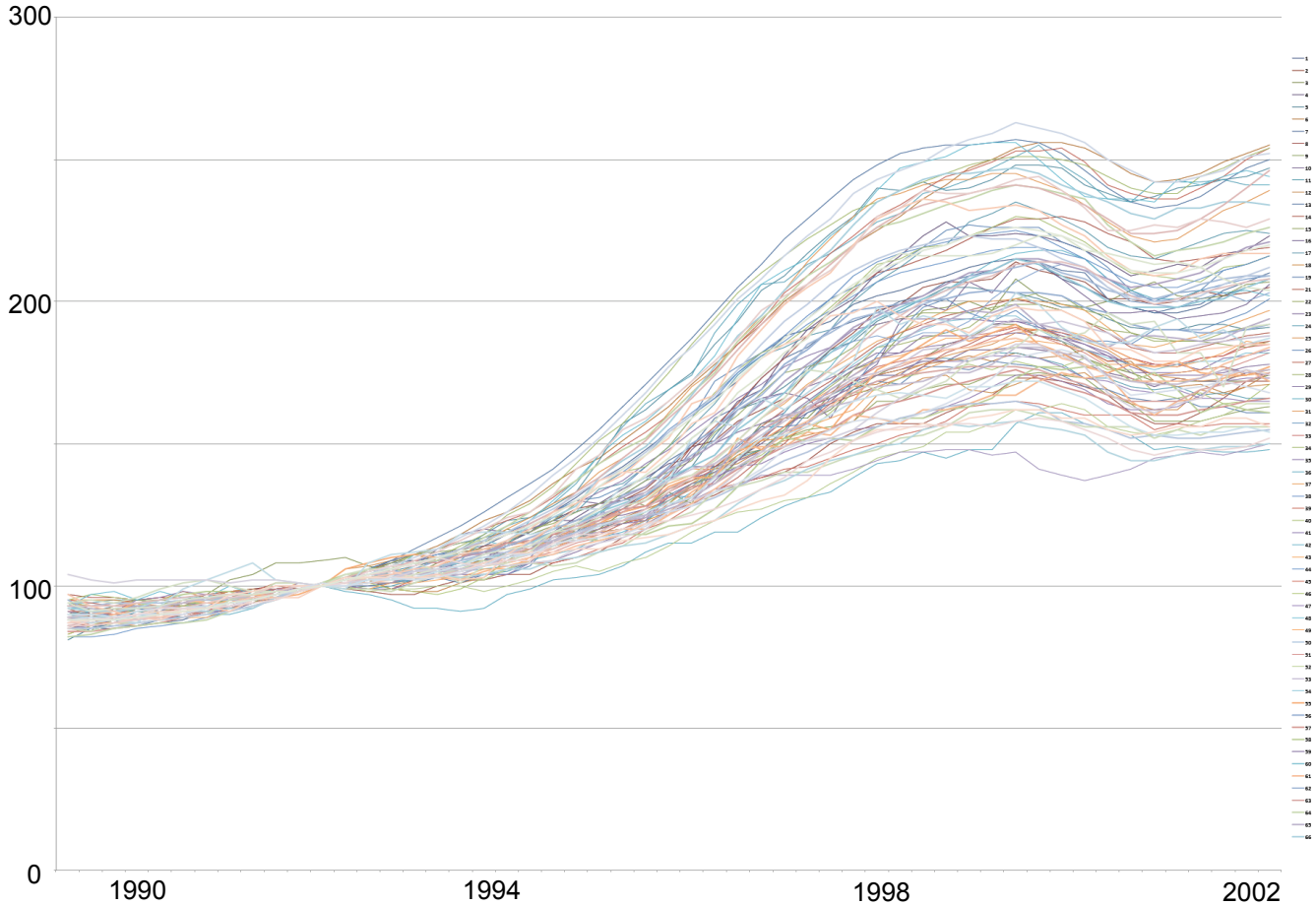
- Representative sample
- ... and our firms are only 1 year after creation – not all small firms stay small

Size at creation: Summary Statistics (II)

Panel C: Entrepreneur characteristics								
Home Owner	0.28	0.45	0.00	0.00	0.00	1.00	1.00	9,768
Sole Proprietor	0.42	0.49	0.00	0.00	0.00	1.00	1.00	11,254
Business at Home	0.41	0.49	0.00	0.00	0.00	1.00	1.00	11,207
Age	37.19	9.46	26.00	30.00	36.00	44.00	50.00	10,561
Gender (Male==1)	0.78	0.42	0.00	1.00	1.00	1.00	1.00	10,566
Education								
No Diploma	0.18	0.38	0.00	0.00	0.00	0.00	1.00	10,590
Professional Training	0.40	0.49	0.00	0.00	0.00	1.00	1.00	10,590
High School Diploma	0.19	0.39	0.00	0.00	0.00	0.00	1.00	10,590
College Diploma	0.23	0.42	0.00	0.00	0.00	0.00	1.00	10,590
Prior occupation								
Employed	0.53	0.50	0.00	0.00	1.00	1.00	1.00	10,545
Unemployed	0.37	0.48	0.00	0.00	0.00	1.00	1.00	10,545
Out-of-Workforce	0.11	0.31	0.00	0.00	0.00	0.00	1.00	10,545

Cross-sectional variation of house prices



Main result: collateral value

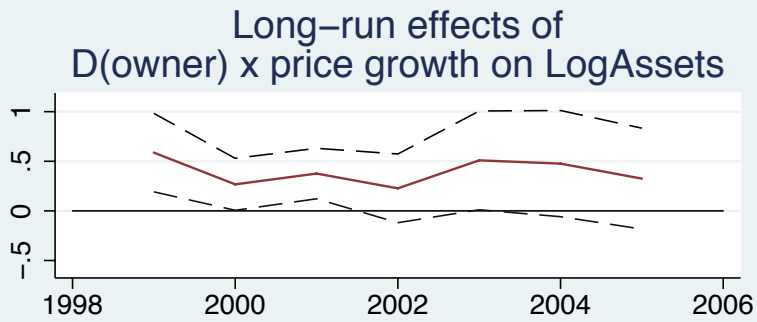
	log(Assets) (1)	log(Sales) (2)	log(Debt) (3)	log(1+#Employees) (4)	log(Value Added) (5)	log(Wage Bill) (6)
Owner $\times \Delta p$	.72***	.57***	.81**	.26***	.64***	.85***
	(4.1)	(4.1)	(2.5)	(3.1)	(5)	(5.3)
Owner	.082**	-.074**	-.028	-.11***	-.11***	-.15***
	(2.5)	(-2.7)	(-.82)	(-6.6)	(-4.8)	(-5.1)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Controls $\times \Delta p$	Yes	Yes	Yes	Yes	Yes	Yes
Départment-FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,869	8,997	8,836	9,173	8,972	8,449
Adj. R2	0.26	0.23	0.28	0.28	0.25	0.42

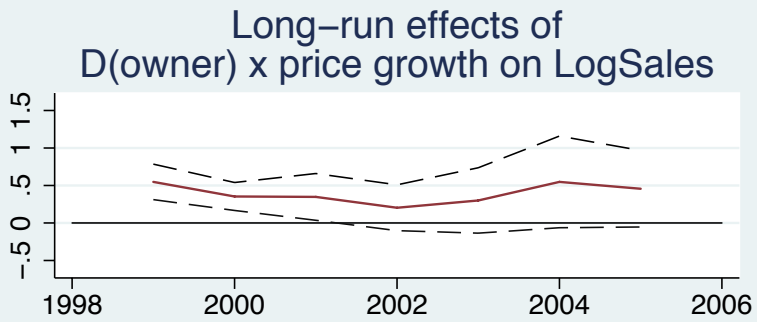
- Controls (interacted and individual):
  - characteristics of the business owner
  - legal form of the business
  - industry
  - business at entrepreneur's home or elsewhere
- Standard errors clustered at the region-level

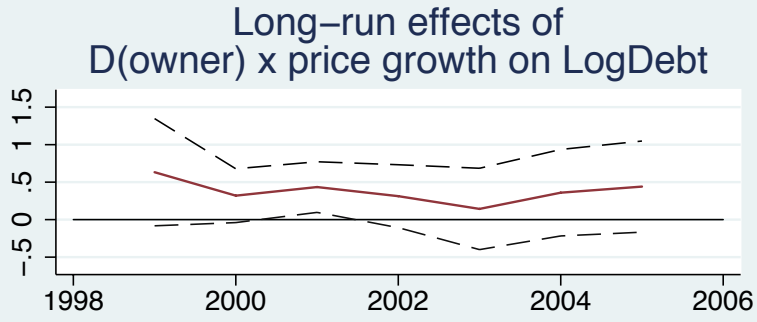
Magnitudes

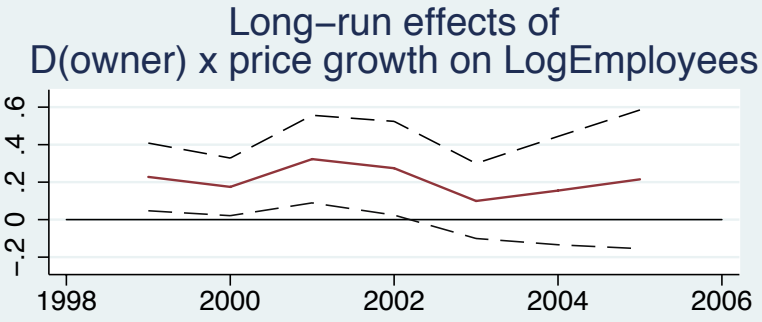
- Compare 25th to 75th percentile of house price growth (9%-point difference)
- Effect on size at creation: $.09 \times .72 = 6.5$%-points or €11k
- Effect on debt at creation: $.09 \times .81 = 7.3$%-points or €9k
- Effect on sale in 1st year: $.09 \times .57 = 5.1$%-points or €12k
- Effect on wage bill: 7.7%-points or €12k

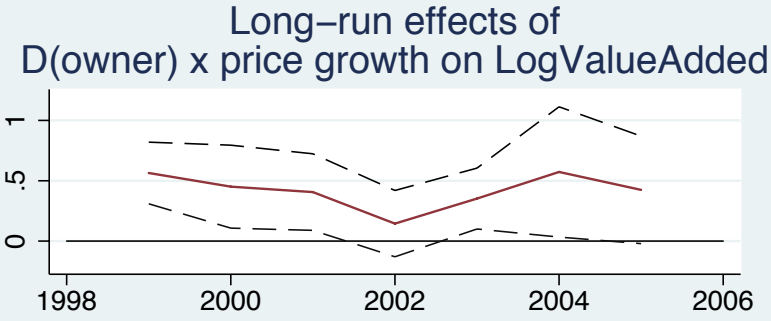
Long-run effects: year-by-year coefficients

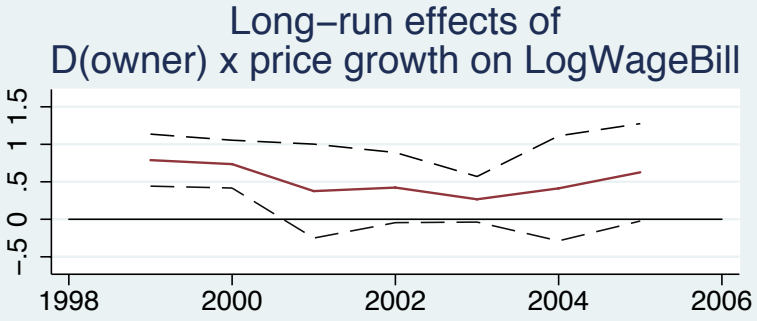












Time-series correlation of house price growth

Note: Each point is a region. Spearman correlation = -.1

Survival analysis: failure hazards

Failure probability in year t conditional on survival until year $t-1$

	fh(1)	fh(2)	fh(3)	fh(4)	fh(5)	fh(6)	$\mathbb{P}[Failure \leq 2006]$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Owner $\times \Delta p$	-.024	-.04***	.022	-.027	-.028**	-.0096	-.11
	(-1.3)	(-2.7)	(.88)	(-1.5)	(-2)	(-.86)	(-1.4)
Owner	-.0089***	-.016***	-.016***	-.01***	-.0035*	-.0046***	-.063***
	(-5.3)	(-6.7)	(-7.4)	(-4.8)	(-1.8)	(-3)	(-11)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls $\times \Delta p$	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Région-FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	15,234	14,778	14,310	13,905	13,296	13,371	15,315
Pseudo-R2	0.10	0.10	0.09	0.12	0.10	0.10	0.13

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- But: failure hazards are *lower* for entrepreneurs with higher housing wealth

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- But: failure hazards are *lower* for entrepreneurs with higher housing wealth
- Collateral constraints more likely explanation our results

Part 2: Entry

Empirical strategy

1. Individual i, in region j, in year t:

$$Pr\left[E_{i,j,t} = 1 \middle| E_{i,j,t-1} = 0\right] = \alpha + \beta \cdot D(owner)_i \times \Delta p_j^{t-6 \to t-1}$$

$$+\theta \cdot D(owner)_i + \gamma \cdot Z_i + \tau \cdot Z_i \times \Delta p_j^{t-6 \to t-1} + \delta_l + \varepsilon_{i,j}$$

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   - Interacted controls: education, previous salary, age, gender, foreign national dummy
   - Department- and year-fixed effects

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2. Aggregate version of the above equation
   - Regional firm starts on $\%owners \times$ price growth

Data

1. Individual level: Labor Force Survey: 1990-2001
   - Rent vs. own
   - 3-year rotating panel: observe transitions into entrepreneurship
   - Use price growth at regional level
2. Aggregate level
   - Regional firm creation: exhaustive registry
   - % Ownership rate: 1990 census

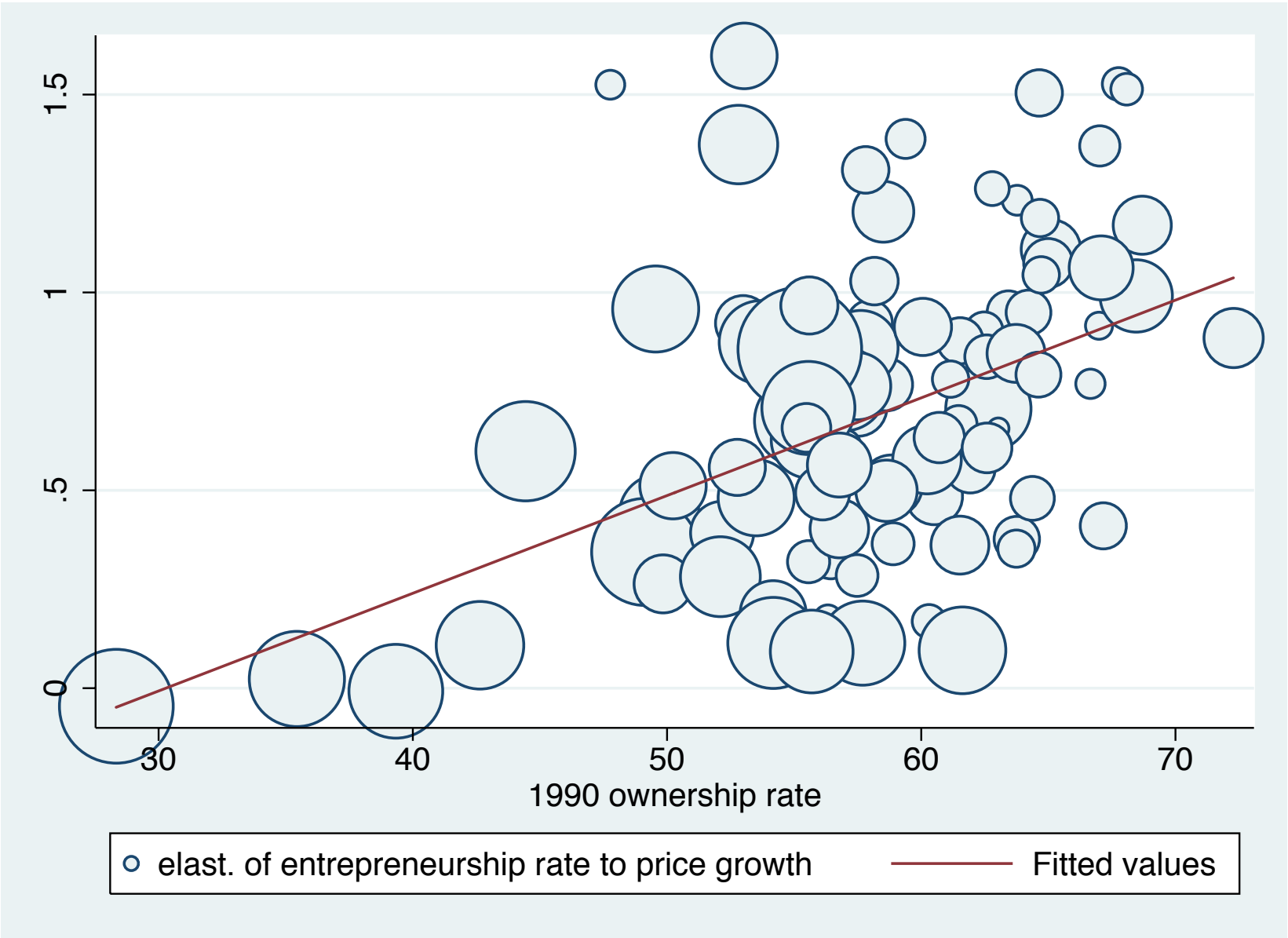
Entry Decision

	Probability of entrepreneurship			
	(Probit)	(Probit)	(Linear)	(Linear)
Owner $\times \Delta p$	.007***	.0019**	.0095***	.0065***
	(6.5)	(2.2)	(7.3)	(5.8)
Owner (d)	.0013	.0022***	.0012	.0039***
	(1.6)	(4.1)	(1.4)	(6.1)
Δp	-.007***	.0077**	-.0083***	.12***
	(-5.3)	(2.3)	(-5.2)	(3.5)
Département FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes
Controls $\times \Delta p$	No	Yes	No	Yes
Observations	87,123	87,104	87,123	87,104

Magnitudes

- 1 s.d. increase in house price growth (34%-points)
- 17% (.22%-points; 1.3% baseline) increase in the probability of becoming an entrepreneur

Region-level: graphical evidence



business starts and employment in startups

	Measure of Entrepreneurial Activity			
	(1)	(2)	(3)	(4)
Panel A: Log(# firms created by département)				
% owners $\times \Delta p$	.76***	.75***	.58**	.41***
	(5.6)	(7.6)	(2.8)	(3.5)
Δp	-.37***	-.37***	1.5	1.4
	(-8.9)	(-12)	(1.1)	(1.3)
Panel B: Log(Emp. by département)				
% owners $\times \Delta p$	1***	.88***	.67**	.53***
	(3.9)	(6.4)	(2.4)	(3.6)
Δp	-.44***	-.38***	.54	.47
	(-4.9)	(-8.6)	(.23)	(.25)
Département-FE	Yes	Yes	Yes	Yes
Year-FE	Yes	Yes	Yes	Yes
Controls	No	No	Yes	Yes
Controls $\times \Delta p$	No	No	Yes	Yes
Observations	1,494	1,494	1,494	1,494

Magnitudes

- median ownership rate 58%
- 1 s.d. = 34% house price appreciation
- 11.5% increase in firm starts
- 13.3% more jobs created in new firms

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- 1 s.d. = 34% house price appreciation
- 11.5% increase in firm starts
- 13.3% more jobs created in new firms
- In the 1990s, $\approx$ 100k new firms created per year
- Would create some 13k jobs per year in new firms
- France creates about 200k jobs in good years

Conclusion

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- Large effects both at the intensive and extensive margin

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- Collateral important determinant of entrepreneurial activity
- Large effects both at the intensive and extensive margin
- Long-run effects of credit constraints that matter for macro

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