

Internet Appendix for “Housing Collateral and Entrepreneurship”

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This internet appendix provides additional results and robustness tests referenced but not reported in the printed paper.

We start by providing evidence for the basic source of variation exploited in the paper: cross-sectional variation in house price growth across regions in France (Figure IA1). Two additional figures help better understand the dynamics of the French housing market. Figure IA2 shows that rents are not very sensitive to house price changes. Figure IA3 reveals that house price changes from 1992-1997 do not forecast house price growth in 2000-2005. To the contrary, there is a weak negative association. This finding helps attenuate the concern that momentum in the housing market helps explain the main results of the paper.

When then provide additional descriptive statistics and robustness tests. Belonging to the “extensive margin” set of results of the main paper, Table IAI compares observable characteristics of owners and renters, for which we control. Table IAI illustrates the consequences of potential model misspecification in the main specifications we employ: it reports regressions of the propensity to become an entrepreneur to local house price appreciation *not* interacted with a home ownership dummy. There is no significant positive correlation in this arguably misspecified model, which underlines the importance of comparing owners and renters, as performed in the main paper. Next, we compare the distributions of liquid and total wealth belonging to full and partial owners in Table IAIII. As robustness tests, Table IAIIV, we provide regressions of our main “extensive margin” result, split by the size of the house in which an individual lives; Table IAIV provides similar regressions whereas the sample is split by income of the individual.

We then provide a comparison of renter and owner characteristics for the intensive margin sample in Table IAI. The first regression table, Table IAIIVII, shows robustness of the coefficient of interest to the step-wise introduction of individual-level controls. Table IAIIVIII shows robustness of the main result to controlling for local changes in GDP and unemployment, interacted with the homeownership dummy. We test – and reject – the hypothesis that momentum in house prices drives the main results by controlling for future house price appreciation in Table IAIIX. We test and reject the hypothesis that the region of Paris and surroundings drives our main results in Table IAIIX. Table IAIIXI shows robustness of our “long-run” intensive margin results to controlling for realized house-price growth, and to conditioning on survival. Table IAIIXII shows that failure hazards are no greater for firms started by individuals with greater collateral gains. Table IAIIXIII shows intensive-margin results for subsamples, split by employment status before becoming an entrepreneur.

Finally, Table IAIIXIV provides summary statistics for the data set used in the “aggregate analysis” performed in the main paper.

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I. Additional Figures

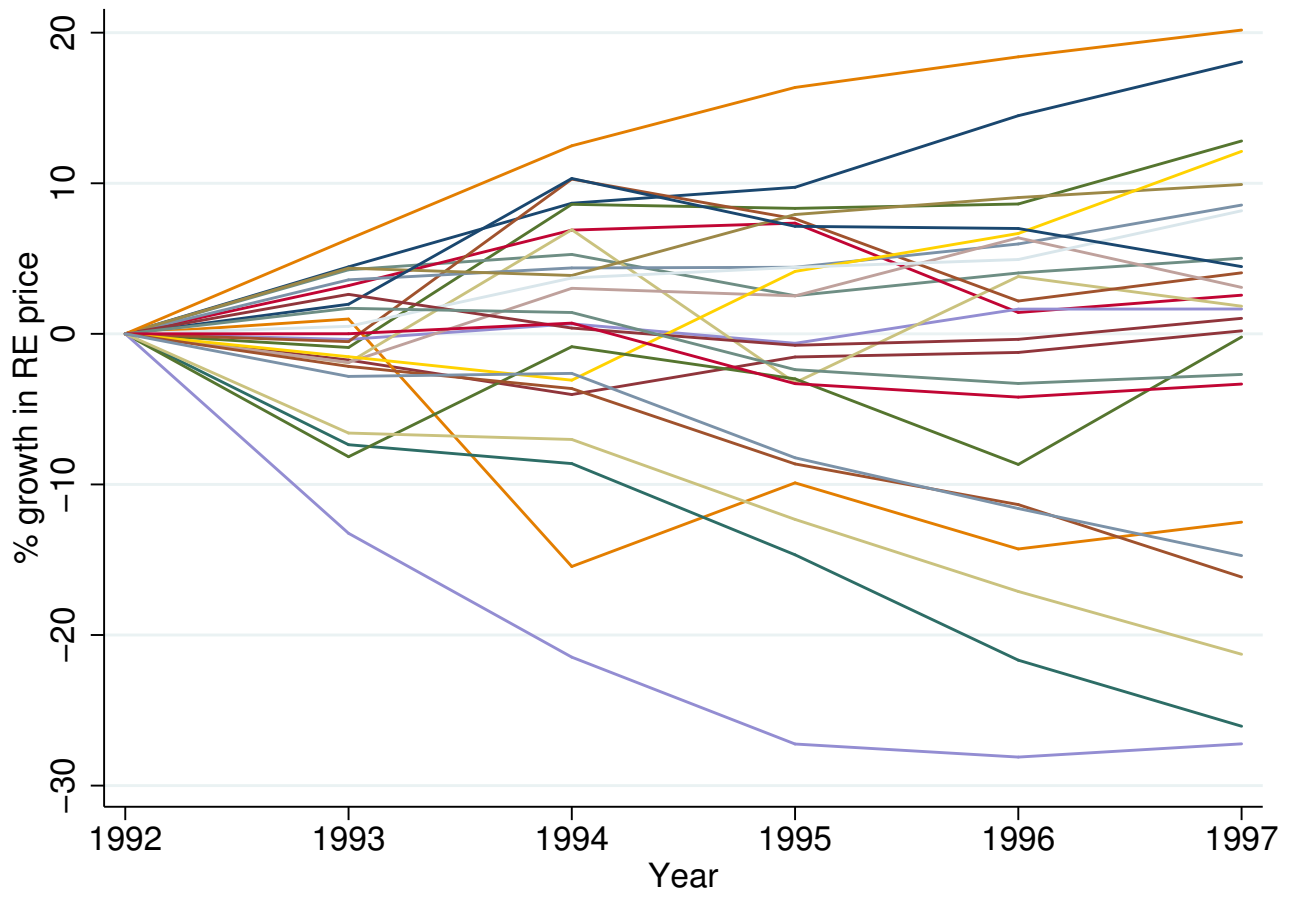


Figure IA1. Cumulative house-price growth across regions. The graph shows the cumulative house-price growth from 1992 to 1997 across the 25 regions in the sample.

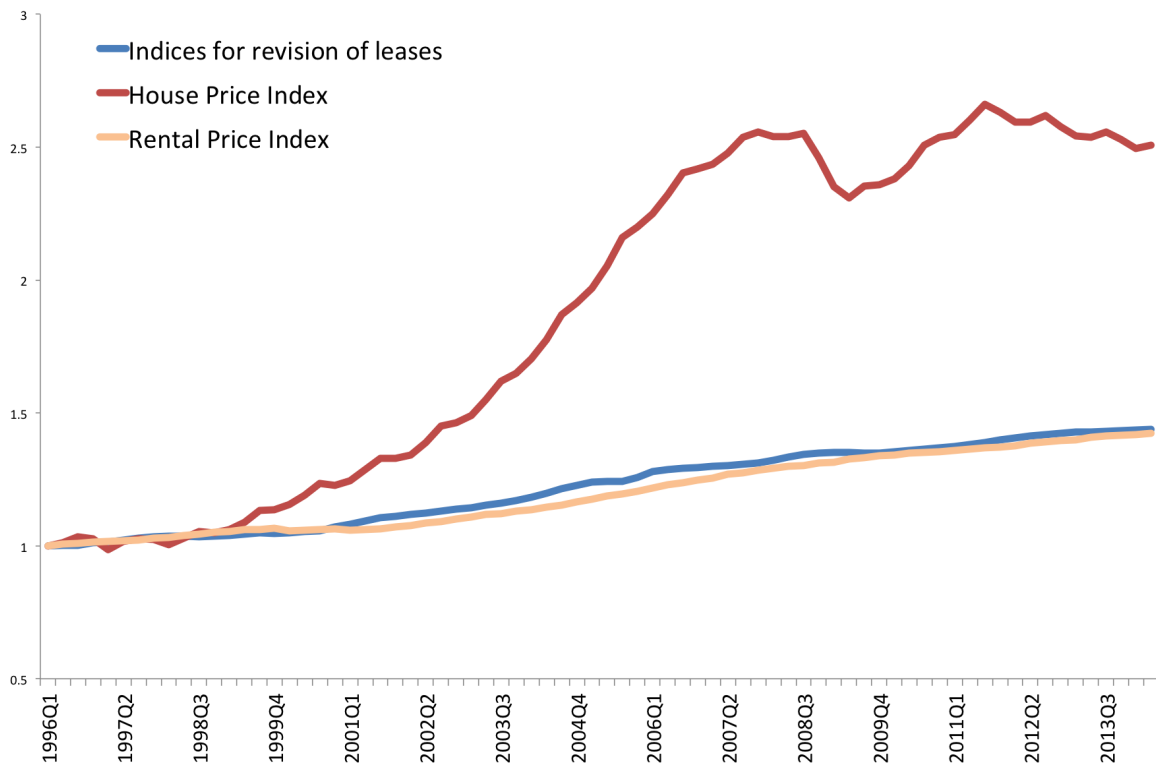


Figure IA2. Real estate price index, rent index and rent constraint in France. The figure plots (1) the national house price index from INSEE (red line), (2) an index of rental costs from the Consumer Price Index (CPI) (orange line), and (3) the index used to constrain changes in individuals' rents within a lease over the 1996–2014 period (blue line).

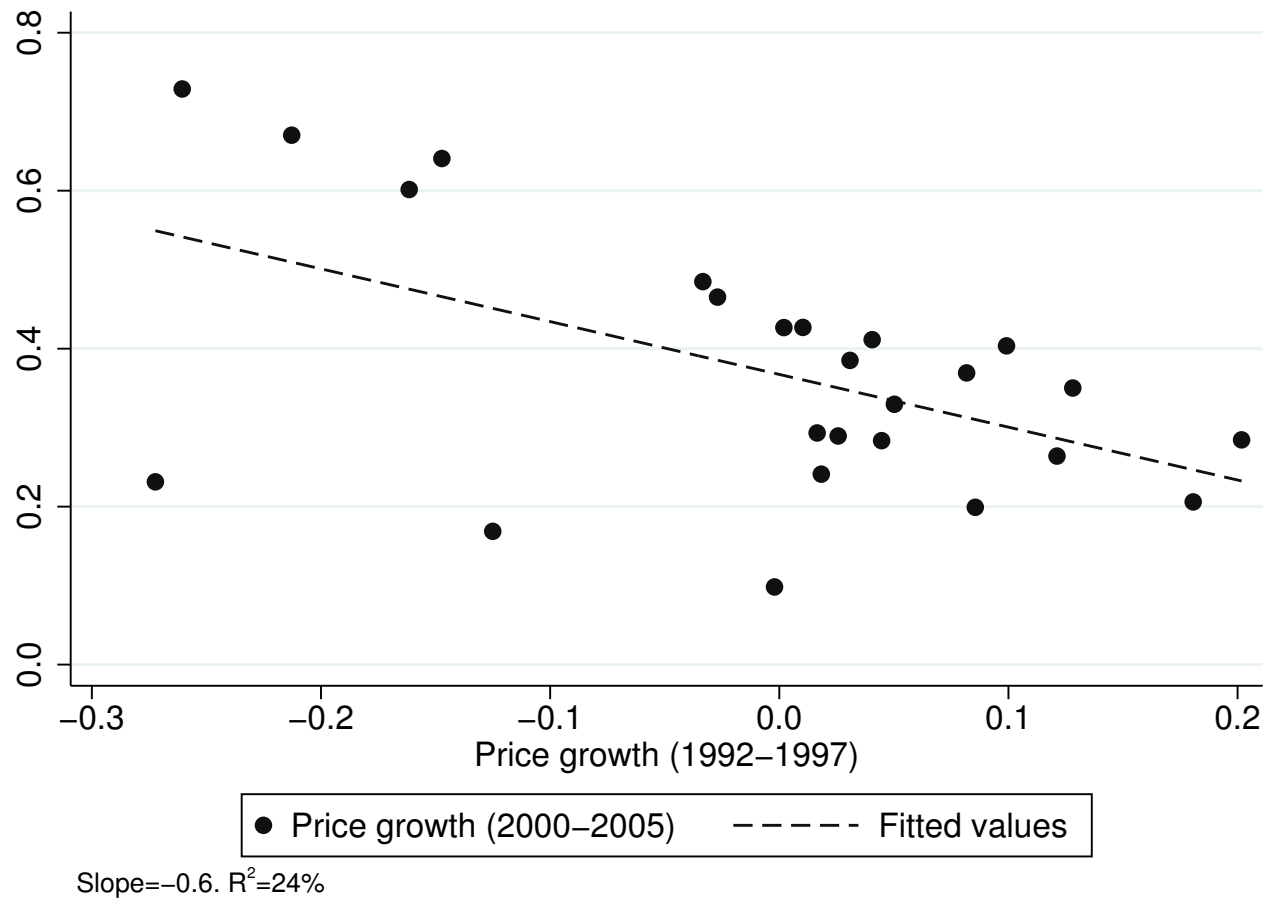


Figure IA3. Correlation between house-price growth from 1992–1997 and house-price growth from 1999–2004 across the 25 regions in our sample.

II. Additional Tables

Table IAI.
Comparison between Homeowners and Renters in the Extensive-Margin Sample

	Renters	Owners	t-Test
Entrepreneurship	0.013	0.015	2.66***
log(Wage)	8.467	8.939	35.89***
Unemployed	0.102	0.038	35.29***
Age	40.079	45.049	78.78***
Gender	0.195	0.076	48.81***
Foreigner	0.107	0.036	39.05***
<i>Education</i>			
College Degree	0.072	0.091	9.21***
Some College	0.073	0.078	2.55**
High School	0.101	0.112	4.76***
Technical	0.326	0.365	11.13***
No Diploma	0.428	0.353	20.61***

Table IAI. House-Price Appreciation before Firm Creation and Entry into Entrepreneurship

The table reports results of regressions of the decision to start a company on local house-price appreciation in the five years prior to the decision (Δp). All regressions are linear probability models and include department fixed effects, and region-by-year fixed effects. Column (1) has no additional controls. Column (2) adds controls for education (four dummies). Column (3) adds controls for prior year salary (or unemployment insurance benefits if eligible) and prior year employment status. Column (4) controls for age. Column (5) controls for gender and nationality. Column (6) controls for current industry. Column (7) adds controls and interaction terms for the job description of the respondent's father. Column (8) additionally controls for the change in unemployment rate in the department from year $t - 6$ to year $t - 1$. Standard errors are reported in parentheses and are clustered at the region-by-ownership level. *, **, and *** indicate statistically different from zero at the 10%, 5%, and 1% level of significance, respectively.

	Entrepreneurship Dummy							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Δp	-0.005* (0.003)	-0.0047 (0.003)	-0.0033 (0.0026)	-0.0034 (0.0026)	-0.0035 (0.0026)	-0.0029 (0.003)	-0.0027 (0.0031)	-0.0027 (0.003)
College		0.014*** (0.0023)	0.024*** (0.0026)	0.024*** (0.0026)	0.024*** (0.0026)	0.026*** (0.0025)	0.021*** (0.0025)	0.021*** (0.0025)
Some College		0.0049** (0.002)	0.011*** (0.002)	0.012*** (0.002)	0.013*** (0.002)	0.014*** (0.0021)	0.011*** (0.002)	0.011*** (0.002)
High School		0.0053*** (0.0014)	0.011*** (0.0015)	0.011*** (0.0016)	0.012*** (0.0016)	0.013*** (0.0016)	0.011*** (0.0016)	0.011*** (0.0016)
Technical Training		0.00082 (0.00088)	0.0035*** (0.00083)	0.0041*** (0.00086)	0.0034*** (0.00086)	0.0035*** (0.00085)	0.0032*** (0.00085)	0.0032*** (0.00085)
Log(Wage) or log(UI)			-0.016*** (0.0013)	-0.016*** (0.0013)	-0.017*** (0.0013)	-0.016*** (0.0013)	-0.016*** (0.0013)	-0.016*** (0.0013)
Unemployed			-0.039*** (0.0055)	-0.039*** (0.0055)	-0.038*** (0.0055)	-0.012* (0.0063)	-0.012* (0.0063)	-0.012* (0.0063)
Age				0.0002*** (0.000055)	0.00022*** (0.000055)	0.0003*** (0.000058)	0.00029*** (0.00006)	0.00029*** (0.00006)
Sex					-0.017*** (0.0012)	-0.015*** (0.0011)	-0.016*** (0.0011)	-0.016*** (0.0011)
Foreign					-0.00099 (0.0023)	-0.0026 (0.0024)	-0.0022 (0.0025)	-0.0022 (0.0025)
Department FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region \times Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	None	Educ.	Wage & Emp.	Age	Gender & national.	fathers' job descr.	Industry	All
Observations	73,390	73,390	73,390	73,390	73,390	73,390	73,390	73,390
Adj.-R ²	0.00	0.00	0.05	0.05	0.05	0.06	0.07	0.07

Table IAIII. Liquid Wealth of Full and Partial Owners

Source: French Wealth Survey, 1998 and 2004 waves. This table shows the 10th, 25th, 50th, 75th and 90th percentile of the cross-sectional distribution of households' liquid financial wealth (in '000€), total financial wealth (in '000€), gross housing wealth (in '000€), and ratio of liquid financial wealth to gross housing wealth (in %). Total liquid financial wealth is defined as total financial wealth minus the cash value of life insurance, private equity investment, retirement accounts, certificate of deposits, and saving bonds. Panel A uses the 1998 wave of the survey; Panel B uses the 2004 wave of the survey.

	p10	p25	p50	p75	p90	Obs.
<u>Panel A: 1998 Wave</u>						
<i>Partial Owners:</i>						
Liquid Wealth	0	1	5	14	34	2,468
Total Financial Wealth	1	4	9	23	53	2,468
Gross Real Estate Wealth	57	76	105	152	234	2,468
$\frac{\text{Liquid Wealth}}{\text{Gross RE Wealth}}$	0%	1%	4%	12%	28%	2,468
<i>Full Owners:</i>						
Liquid Wealth	0	3	12	34	77	3,322
Total Financial Wealth	3	8	21	52	114	3,322
Gross Real Estate Wealth	39	62	98	164	266	3,322
$\frac{\text{Liquid Wealth}}{\text{Gross RE Wealth}}$	0%	3%	12%	32%	68%	3,322
<u>Panel B: 2004 Wave</u>						
<i>Partial Owners:</i>						
Liquid Wealth	1	3	11	28	67	2,742
Total Financial Wealth	2	5	15	39	100	2,742
Gross Real Estate Wealth	82	114	165	264	441	2,742
$\frac{\text{Liquid Wealth}}{\text{Gross RE Wealth}}$	1 %	2%	6%	15%	28%	2,741
<i>Full Owners:</i>						
Liquid Wealth	2	5	16	41	93	3,006
Total Financial Wealth	2	8	24	66	151	3,006
Gross Real Estate Wealth	54	89	143	235	381	3,006
$\frac{\text{Liquid Wealth}}{\text{Gross RE Wealth}}$	1%	4%	11%	27%	59%	3,005

Table IAIV. Real Estate Capital Gains before Firm Creation and Probability of Starting a Business: House Size.

The table reports results of a linear probability model regressing the decision to start a company on the interaction of local house-price appreciation in the five years prior to the decision (Δp) and a dummy for individual homeownership (Owner). Columns (1) and (2) have no additional controls. Columns (3) and (4) add controls for education (four dummies), prior year employment status, age, gender, nationality, father's job description, and current industry, as well as their interactions with house-price growth in the region from year $t-6$ to year $t-1$. Columns (5) and (6) additionally control for the change in unemployment rate in the department from year $t-6$ to year $t-1$, and its interaction with the homeownership dummy. Columns (1), (3), and (5) are run on the sample of individuals who are either renters or owners of a house with three rooms or less ("Small Houses"). Columns (2), (4), and (6) are run on the sample of individuals who are either renters or owners of a house with four rooms or more ("Large Houses"). All regressions include department fixed effects, and region-by-year fixed effects. Standard errors are reported in parentheses and are clustered at the region-by-ownership level. *, **, and *** indicate statistically different from zero at the 10%, 5%, and 1% level of significance, respectively.

	Entrepreneurship Dummy					
	(1)	(2)	(3)	(4)	(5)	(6)
	Small houses			Large Houses		
Owner \times Δp	0.0068*	0.0013	0.0017	0.021***	0.016***	0.014***
	(0.0038)	(0.0036)	(0.0036)	(0.0033)	(0.0037)	(0.0037)
Owner	0.00058	0.0009	0.00053	-0.00099	-0.0013	-0.00066
	(0.0011)	(0.0013)	(0.0013)	(0.0012)	(0.0013)	(0.0012)
Owner \times Δ Unemp			0.00079*			-0.0014***
			(0.00043)			(0.00049)
Δ Unemp			0.0021			0.00047
			(0.0022)			(0.0018)
Controls	No	Yes	Yes	No	Yes	Yes
Controls \times Δp	No	Yes	Yes	No	Yes	Yes
Department FE	Yes	Yes	Yes	Yes	Yes	Yes
Region \times Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	22,722	22,722	22,722	47,590	47,590	47,590
Adj.-R ²	0.00	0.03	0.03	0.00	0.03	0.03

Table IAV. Real Estate Capital Gains before Firm Creation and Probability of Starting a Business: Income.

The table reports results of a linear probability model regressing the decision to start a company on the interaction of local house-price appreciation in the five years prior to the decision (Δp) and a dummy for individual homeownership (Owner). Columns (1) and (2) have no additional controls. Columns (3) and (4) add controls for education (four dummies), prior year employment status, age, gender, nationality, father's job description, and current industry, as well as their interactions with house-price growth in the region from year $t-6$ to year $t-1$. Columns (5) and (6) additionally controls for change in unemployment rate in the department from year $t-6$ to year $t-1$, and its interaction with the homeownership dummy. Columns (1), (2), and (3) (resp. (4), (5), and (6)) are run on the sample of individuals whose prior-year income is below the median (above the median). All regressions include department fixed effects, and region-by-year fixed effects. Standard errors are reported in parentheses and are clustered at the region-by-ownership level. *, **, and *** indicate statistically different from zero at the 10%, 5%, and 1% level of significance, respectively.

	Entrepreneurship Dummy					
	(1)	(2)	(3)	(4)	(5)	(6)
	Income below median			Income above median		
Owner \times Δp	0.038*** (0.0059)	0.023*** (0.0063)	0.023*** (0.0064)	0.0069** (0.0028)	0.0047* (0.0025)	0.0042* (0.0024)
Owner	0.0041*** (0.0013)	0.0014 (0.0013)	0.0016 (0.0013)	0.0001 (0.00095)	-0.0007 (0.001)	-0.00038 (0.0011)
Owner \times Δ Unemp			-0.00044 (0.00049)			-0.00053 (0.00043)
Δ Unemp			0.00029 (0.0024)			0.0013 (0.0016)
Controls	No	Yes	Yes	No	Yes	Yes
Controls \times Δp	No	Yes	Yes	No	Yes	Yes
Department FE	Yes	Yes	Yes	Yes	Yes	Yes
Region \times Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	36,983	36,983	36,983	36,407	36,407	36,407
Adj.-R ²	0.01	0.05	0.05	0.00	0.02	0.02

Table IAVI.
Comparison between Homeowners and Renters in the Intensive-Margin Sample

	Renters	Owners	Test
Panel A: Firm characteristics (1999 book values, in '000 Euros)			
Log(Asset)	3.79	3.55	7.29***
Log(Sales)	4.42	4.07	10.93***
Log(Debt)	3.51	3.10	12.12***
Log(1+# Employees)	0.69	0.43	15.07***
Log(Value-Added)	4.02	3.71	10.09***
Log(Total Wage)	2.76	2.27	13.41***
Panel B: Entrepreneur characteristics			
Sole Proprietor	0.38	0.59	19.41***
Business at Home	0.26	0.77	50.57***
Age	36.83	39.16	10.9***
Entr. Background	0.72	0.70	2.17**
Gender (Male==1)	0.76	0.81	5.35***
Serial Ent.	0.28	0.22	5.54***
<i>Education</i>			
No Diploma	0.17	0.21	3.9***
Technical training	0.38	0.47	8.27***
High School Diploma	0.20	0.15	5.85***
College Diploma	0.25	0.18	7.88***
<i>Prior occupation</i>			
Employed	0.53	0.54	0.23
Unemployed	0.36	0.37	0.91
Out of Workforce	0.11	0.09	1.85*
<i>Previous Job Description</i>			
Craftsman	0.16	0.14	2.27**
Executive	0.21	0.18	3.26***
Intermediary Prof.	0.10	0.11	1.46
Employee	0.27	0.21	5.68***
Worker	0.17	0.30	13.71***

Table IAVII. Real Estate Capital Gains before Firm Creation and Entrepreneurial Outcomes: Robustness to Controls.

The table reports results of regressions of entrepreneurial outcomes – measured in 1999 (the first entire fiscal year after creation) – on the interaction of regional house-price appreciation from 1992 to 1997 (Δp) and a dummy for individual homeownership (Owner). Columns (1) to (4) use the log of one plus total assets (sales) as the dependent variable. Columns (1) and (5) have department fixed effects and region-industry fixed effects. Columns (2) and (6) control for industry (36 industries) and legal status of the firm (sole proprietorship versus corporation), as well as their interaction with house-price growth. Columns (3) and (7) add controls and interaction terms for education, previous job description and previous employment status. Columns 4 and 8 add controls and interaction terms for age, gender, entrepreneurial background, and past entrepreneurial activity. Standard errors are reported in parentheses and are clustered at the region-by-ownership level. *, **, and *** indicate statistically different from zero at the 10%, 5%, and 1% level of significance, respectively.

	log(Assets)				log(Sales)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Owner $\times \Delta p$	0.95*** (0.19)	1.1*** (0.13)	1*** (0.15)	1.2*** (0.18)	0.86*** (0.16)	0.98*** (0.15)	0.85*** (0.15)	0.94*** (0.17)
Owner	-0.24*** (0.028)	-0.052** (0.021)	-0.073*** (0.023)	0.079*** (0.027)	-0.39*** (0.021)	-0.25*** (0.02)	-0.27*** (0.021)	-0.13*** (0.026)
Controls	None	+ Indust. & legal status	+ educ., job descr.& empl.	+ age, sex entr. act.	None	+ Indust. & legal status	+ educ., job descr.& empl.	+ age, sex entr. act.
Controls $\times \Delta p$	None	Yes	Yes	Yes	None	Yes	Yes	Yes
Department FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region \times Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Price Change	0	0	0	0	0	0	0	0
Observations	9,125	9,125	9,125	9,125	9,125	9,125	9,125	9,125
Adj.-R ²	0.05	0.25	0.28	0.29	0.05	0.17	0.19	0.20

Table IAVIII. Real Estate Capital Gains and Entrepreneurial Outcomes: Robustness to Local GDP and Unemployment

The table reports results of regressions of entrepreneurial outcomes – measured in 1999 (the first entire fiscal year after creation) – on the interaction of regional house-price appreciation from 1992 to 1997 (Δp) and a dummy for individual homeownership (Owner). We control for characteristics of the business owner (occupation prior to becoming an entrepreneur, age, education, gender), legal form of business (sole proprietorship or corporation), industry, whether the firm is located in the owner's home, whether the entrepreneur has an entrepreneurial background, a serial entrepreneur dummy, as well as interactions of these controls with Δp . We also control for region-level GDP growth from 1992 to 1997 interacted with the homeownership dummy and the department-level change in unemployment from 1992 to 1997, also interacted with the homeownership dummy. The regressions include department fixed effects and region-by-industry fixed effects. The outcomes we consider are the logarithm of one plus total assets (column (1)), sales (column (2)), number of employees (column (3)), total debt (column (4)), value-added (column (5)), and total wage bill (column (6)). Standard errors are reported in parentheses and are clustered at the region-by-ownership level. *, **, and *** indicate statistically different from zero at the 10%, 5%, and 1% level of significance, respectively.

	log(Assets) (1)	log(Sales) (2)	log(#Empl.) (3)	log(Debt) (4)	log(Value Added) (5)	log(Wage Bill) (6)
Owner \times Δp	1.1*** (0.19)	0.9*** (0.18)	0.37*** (0.12)	0.94*** (0.29)	0.81*** (0.18)	0.88*** (0.22)
Owner	0.32*** (0.091)	0.062 (0.18)	0.013 (0.072)	0.14 (0.1)	0.13 (0.14)	0.13 (0.15)
Owner \times Δ GDP	-1.1* (0.57)	-0.93 (0.89)	-0.74* (0.38)	-1.1* (0.61)	-1.4* (0.73)	-2.3*** (0.74)
Owner \times Δ Unemp	-0.052** (0.024)	-0.038 (0.035)	-0.012 (0.016)	-0.009 (0.029)	-0.04 (0.029)	-0.024 (0.035)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Controls \times Δp	Yes	Yes	Yes	Yes	Yes	Yes
Department FE	Yes	Yes	Yes	Yes	Yes	Yes
Region \times Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9,125	9,125	9,125	9,125	9,125	9,125
Adj.-R ²	0.29	0.20	0.30	0.32	0.22	0.30

Table IAIX. Real Estate Capital Gains and Entrepreneurial Outcomes: Controlling for Future House-Price Growth.

The table reports results of regressions of entrepreneurial outcomes – measured in 1999 (the first entire fiscal year after creation) – on the interaction of regional house-price appreciation from 1992 to 1997 (Δp) and a dummy for individual homeownership (Owner). We control for characteristics of the business owner (occupation prior to becoming an entrepreneur, age, education, gender), legal form of business (sole proprietorship or corporation), industry, whether the firm is located in the owner’s home, whether the entrepreneur has an entrepreneurial background, a serial entrepreneur dummy, as well as interactions of these controls with Δp . The sample contains only firms started by entrepreneurs 40 and older. The regressions include department fixed effects and region-by-industry fixed effects. The outcomes we consider are the logarithm of one plus total assets (column (1)), sales (column (2)), number of employees (column (3)), total debt (column (4)), value-added (column (5)), and total wage bill (column (6)). Standard errors are reported in parentheses and are clustered at the region-by-ownership level. *, **, and *** indicate statistically different from zero at the 10%, 5%, and 1% level of significance, respectively.

	log(Assets) (1)	log(Sales) (2)	log(# Emp.) (3)	log(Debt) (4)	log(Value Added) (5)	log(Wage Bill) (6)
Owner $\times \Delta p^{92-97}$	1.2*** (0.18)	0.98*** (0.16)	0.37*** (0.12)	1*** (0.26)	0.81*** (0.17)	0.79*** (0.28)
Owner $\times \Delta p^{99-04}$	0.15 (0.15)	0.093 (0.14)	-0.0042 (0.094)	0.2 (0.2)	-0.061 (0.13)	-0.17 (0.17)
Owner	0.024 (0.061)	-0.16*** (0.057)	-0.11** (0.041)	-0.11 (0.074)	-0.11** (0.05)	-0.15** (0.069)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Controls $\times \Delta p$	Yes	Yes	Yes	Yes	Yes	Yes
Department FE	Yes	Yes	Yes	Yes	Yes	Yes
Region \times Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9,125	9,125	9,125	9,125	9,125	9,125
Adj.-R ²	0.29	0.20	0.30	0.32	0.22	0.30

Table IAX. Real Estate Capital Gains and Entrepreneurial Outcomes: Excluding Paris and Neighboring Department.

The table reports results of regressions of entrepreneurial outcomes – measured in 1999 (the first entire fiscal year after creation) – on the interaction of regional house-price appreciation from 1992 to 1997 (Δp) and a dummy for individual homeownership (Owner). We control for characteristics of the business owner (occupation prior to becoming an entrepreneur, age, education, gender), legal form of business (sole proprietorship or corporation), industry, whether the firm is located in the owner's home, whether the entrepreneur has an entrepreneurial background, a serial entrepreneur dummy, as well as interactions of these controls with Δp . Paris and the "petite couronne" (three departments around Paris) are excluded from the sample. The regressions include department fixed effects and region-by-industry fixed effects. The outcomes we consider are the logarithm of one plus total assets (column (1)), sales (column (2)), number of employees (column (3)), total debt (column (4)), value-added (column (5)), and total wage bill (column (6)). Standard errors are reported in parentheses and are clustered at the region-by-ownership level. *, **, and *** indicate statistically different from zero at the 10%, 5%, and 1% level of significance, respectively.

	log(Assets) (1)	log(Sales) (2)	log(#Emp.) (3)	log(Debt) (4)	log(Value Added) (5)	log(Wage Bill) (6)
Owner \times Δp	1.1*** (0.25)	0.95*** (0.2)	0.39*** (0.13)	0.97*** (0.29)	0.85*** (0.19)	0.83*** (0.28)
Owner	0.084** (0.032)	-0.13*** (0.029)	-0.11*** (0.017)	-0.032 (0.03)	-0.14*** (0.026)	-0.21*** (0.033)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Controls \times Δp	Yes	Yes	Yes	Yes	Yes	Yes
Department FE	Yes	Yes	Yes	Yes	Yes	Yes
Region \times Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,448	8,448	8,448	8,448	8,448	8,448
Adj.-R ²	0.29	0.21	0.30	0.32	0.23	0.31

Table IAXI. Real Estate Capital Gains before Firm Creation and Long-Run Outcomes: Robustness

The table reports results of regressions of entrepreneurial outcomes – measured in year $t \in [2000, 2005]$ – on the interaction of regional house-price appreciation from 1992 to 1997 (Δp) and a dummy for individual homeownership (Owner). We control for characteristics of the business owner (occupation prior to becoming an entrepreneur, age, education, gender), legal form of business (sole proprietorship or corporation), industry, whether the firm is located in the owner’s home, whether the entrepreneur has an entrepreneurial background, a serial entrepreneur dummy, as well as interactions of these controls with Δp . The regressions also include department fixed effects, as well as region-by-industry fixed effects. The outcomes we consider are the logarithm of one plus total assets (column (1)), sales (column (2)), number of employees (column (3)), total debt (column (4)), value-added (column (5)), and total wage bill (column (6)). Standard errors are reported in parentheses and are clustered at the region-by-ownership level. *, **, and *** indicate statistically different from zero at the 10%, 5%, and 1% level of significance, respectively.

	Log(Assets)					
	2000	2001	2002	2003	2004	2005
Panel A: Controlling for realized house-price growth						
Owner $\times \Delta p^{92-97}$	1*** (0.34)	1.3*** (0.42)	0.5 (0.43)	0.8* (0.41)	1.1*** (0.37)	0.9** (0.45)
Owner $\times \Delta p^{99-t}$	-0.046 (0.86)	0.3 (0.95)	-0.59 (0.63)	-0.37 (0.52)	-0.24 (0.33)	-0.35 (0.26)
Observations	9,125	9,125	9,125	9,125	9,125	9,125
Panel B: Conditional on survival						
Owner $\times \Delta p$	0.51** (0.21)	0.6*** (0.17)	0.47* (0.25)	0.58** (0.27)	0.71*** (0.19)	0.69** (0.29)
Observations	8,440	7,108	6,873	6,307	6,081	5,583

Table IAXII. Real Estate Capital Gains before Firm Creation and Survival

This table reports coefficient estimates of a linear probability model of the failure hazard in year $1998+t$, $fh(t)$, defined as failure probability in year $1998+t$ conditional on survival until year $1998+t-1$, as a function of the interaction of house-price growth from 1992 to 1997 (Δp) and a dummy for individual homeownership (Owner). Columns (7) and (8) use the probability of failure before 2005 as the dependent variable. We control for characteristics of the business owner (occupation prior to becoming an entrepreneur, age, education, gender), legal form of business (sole proprietorship or corporation), industry, whether the firm is located in the owner's home, whether the entrepreneur has an entrepreneurial background, a serial entrepreneur dummy, as well as interactions of these controls with Δp . The regressions also include department fixed effects, as well as region-by-industry fixed effects. Standard errors are reported in parentheses and are clustered at the region-by-ownership level. *, **, and *** indicate statistically different from zero at the 10%, 5%, and 1% level of significance, respectively.

	fh(1) (1)	fh(2) (2)	fh(3) (3)	fh(4) (4)	fh(5) (5)	fh(6) (6)	$\mathbb{P}[\text{year}(\text{failure}) < 2005]$ (7)	(8)
Owner $\times \Delta p$	-0.1 (0.089)	-0.0023 (0.051)	0.056 (0.088)	-0.024 (0.069)	-0.13** (0.057)	-0.028 (0.063)	-0.14 (0.1)	-0.18** (0.086)
Owner	-0.007 (0.0089)	-0.059*** (0.0075)	-0.022** (0.0085)	-0.022*** (0.0075)	-0.021*** (0.0066)	-0.018* (0.0092)	-0.097*** (0.012)	-0.034 (0.058)
Owner $\times \Delta GDP$								-0.14 (0.37)
Owner $\times \Delta Unemp$								-0.029*** (0.01)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls $\times \Delta p$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Department FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region \times Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9,125	8,268	7,051	6,610	6,107	5,709	9,125	9,125
Adj.-R ²	0.02	0.03	0.02	0.01	-0.00	0.01	0.06	0.06

Table IAXIII. Real Estate Capital Gains before Firm Creation and Entrepreneurial Outcomes: Unemployment Split
The table reports results of regressions of entrepreneurial outcomes – measured in 1999 (the first entire fiscal year after creation) – on the interaction of regional house-price appreciation from 1992 to 1997 (Δp) and a dummy for individual homeownership (Owner). We control for characteristics of the business owner (occupation prior to becoming an entrepreneur, age, education, gender), legal form of business (sole proprietorship or corporation), industry, whether the firm is located in the owner's home, whether the entrepreneur has an entrepreneurial background, a serial entrepreneur dummy, as well as interactions of these controls with Δp . The regressions also include department fixed effects, as well as region-by-industry fixed effects. The outcomes we consider are logarithm of 1 plus total assets (columns (1) and (2)), sales (columns (3) and (4)), number of employees (columns (5) and (6)), and total debt (columns (7) and (8)). Columns (1), (3), (5), and (7) run the estimation on the sample of entrepreneurs who were previously unemployed. Columns (2), (4), (6), and (8) run the estimation on the sample of entrepreneurs who were previously employed. Standard errors are reported in parentheses and are clustered at the region-by-ownership level. *, **, and *** indicate statistically different from zero at the 10%, 5%, and 1% level of significance, respectively.

	log(Assets)		log(Sales)		log(# Emp.)		log(Debt)	
	(1) Unemp.	(2) Emp.	(3) Unemp.	(4) Emp.	(5) Unemp.	(6) Emp.	(7) Unemp.	(8) Emp.
Owner $\times \Delta p$	1.5*** (0.42)	0.82** (0.41)	1.1*** (0.27)	0.95*** (0.33)	0.6*** (0.21)	0.28 (0.18)	1.4*** (0.39)	0.61 (0.46)
Owner	0.055 (0.044)	0.13*** (0.047)	-0.16*** (0.035)	-0.093* (0.051)	-0.13*** (0.02)	-0.086*** (0.026)	-0.049 (0.048)	0.018 (0.047)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls $\times \Delta p$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Department FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region \times Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,255	4,870	4,255	4,870	4,255	4,870	4,255	4,870
Adj.-R ²	0.24	0.27	0.22	0.15	0.29	0.26	0.29	0.29

Table IAXIV. Summary Statistics for the Aggregate Analysis

This table presents summary statistics for the sample we use in our analysis of the effect of real estate capital gains on regional-level entrepreneurial activity. The sample period is 1992–2002.

	Mean	Std. Dev.	p(10)	p(25)	p(50)	p(75)	p(90)	Obs.
log(#Firms created)	8.57	0.71	7.77	8.02	8.50	8.99	9.72	349
log(#Jobs created)	8.84	0.72	8.03	8.26	8.81	9.24	10.02	349
Fraction homeowners	55.27	9.18	39.33	55.25	56.70	61.10	64.25	349
Median Wage (in '000 Francs)	6.00	0.64	5.50	5.59	5.80	6.00	7.12	349
<i>Workforce composition</i>								
Agriculture	0.06	0.04	0.00	0.03	0.06	0.09	0.10	349
Manufacturing	0.21	0.06	0.12	0.18	0.23	0.25	0.28	349
Construction	0.07	0.01	0.06	0.07	0.07	0.08	0.09	349
For Profit Services	0.38	0.07	0.32	0.33	0.36	0.41	0.47	349
Non-Profit Services	0.27	0.03	0.24	0.26	0.28	0.29	0.30	349

III. Construction of the House Price Data Set

We construct a sample of yearly house-price growth for 25 regions in France for the 1985–2005 period from two sources of information. We start with a data set available from the French Ministry of Housing, which provides the average value of houses from 1985 to 2002 for 21 regions in France.¹ This data set is based on a representative sample of housing transactions and is collected from tax files. We combine this data set with a repeat-sale house-price index, which is available from the office of Parisian Notaries for the 1992–2002 period and covers five subregions within the larger region containing Paris.

IV. Other Sample Splits in Extensive Margin Analysis

In this section, we consider two additional comparative statics in our extensive-margin analysis, both of which are consistent with a collateral channel interpretation.

If the collateral channel drives our main results, we expect that for a given increase in local house prices, owners of larger houses will experience a larger increase in the collateral value, which will lead to relatively more business creation, compared to owners of smaller houses. In Table IAIV, we split our sample based on the size of the house in which the household lives. Columns (1) to (3) estimate equation (1) on the sample of individuals living in houses with three rooms or less. Columns (4) to (6) estimate equation (1) on the sample of individuals living in houses with four rooms or more. We see in the table that an increase in house prices leads to a significant increase in self-employment relative to renters, mainly for those individuals living in larger houses: going from the 25th to the 75th percentile of house-price growth leads to a significant 16% increase in the relative probability of self-employment for owners of larger houses, compared to an insignificant 2% increase in the relative probability of self-employment for owners of smaller houses.

Another dimension of cross-sectional heterogeneity we consider is household income. The premise of this analysis is that accessing the unsecured credit market is more difficult for poorer households. We therefore, we expect the self-employment decisions of poorer households to be more affected by changes in collateral value than those of richer households. In Table IAV, we split our sample based on the household’s income. Columns (1) to (3) estimate equation (1) on the sample of individuals with below-median income, while columns (4) to (6) use the sample of individuals with above-median income. The effect of collateral value on entry decisions is about twice as large for individuals in the bottom half of the income distribution. The point estimate for β in the most saturated specification is 0.023 for individuals with income below the median income and 0.0042 for individuals above the median income. The interpretation is that a 16-percentage-point increase in house-price growth from $t - 6$ to $t - 1$ (the interquartile range of house-price growth in this sample) leads to a 0.36-percentage point-increase in the probability of an individual in the bottom half of the income distribution starting a business, while for an individual in the top-half of the income distribution, this number is only 0.07 percentage points. In our sample, individuals in the bottom half of the income distribution are twice as likely to start businesses unconditionally (1.8% versus 0.95%). These effects can thus be quantified as a 20% increase in the probability of individuals in the bottom half of the income distribution starting a business, and a 7% increase in the probability of individuals in the top half of the income distribution starting one.

V. Data Construction for Intensive-Margin Analysis

To construct the data set that we use in our analysis of the intensive margin, we start from the 1998 wave of the SINE survey (see Landier and Thesmar (2009) for a thorough description of this data source). The French statistical office (INSEE) surveys a random sample of one-third of all firms created in the first semester of the year every four years.² The survey contains information on the entrepreneur (age, education, work experience, etc.) and her project (ambition, industry, scope, form of business, etc.). We restrict our analysis to “new” start-ups as opposed to firms that new entrepreneurs have taken over. Importantly for our purposes, the survey asks the entrepreneur whether she owns real estate.³

We merge these survey data with accounting information from tax files. These files, available yearly from the Finance Ministry for the 1999–2005 period, cover all firms subject to either the regular corporate tax regime (Bénéfice Réel Normal) or the simplified corporate tax regime (Régime Simplifié d’Imposition). Together, these

data cover about 55% of newly created firms. The remaining 45% correspond to micro firms with annual sales below €32,600 (€81,500 in retail and wholesale trade). From the tax files, we extract information on firms' location, assets, sales, financial debt, number of employees, value-added, and wage bill.

We next merge this sample with the data set on house-price growth described in Section II.A of the Internet Appendix. This sample contains cumulative house-price growth for the 1992–1997 period for the 25 regions used in our analysis. This cumulative growth measure is our proxy for housing capital gains for entrepreneurs who register their firms in 1998 and own real estate. Figure IA1 shows the evolution of house prices in our sample across these 25 regions from 1992 to 1997. Over this period, the median region experienced cumulative house-price growth of about 2%. Significant heterogeneity exists across régions, from a decline of about 3% at the 25th percentile to an increase of about 8% at the 75th percentile. Of the 25 regions covered in the sample, nine experienced house-price decreases over that period. In particular, Paris and the surrounding regions experienced a severe decrease in house prices of around 20% on average over this five-year period. Our final sample has 9,125 firms created in the first semester of 1998 with available accounting information in 1999.

VI. Long-Run Effects and the Persistence of House Price Growth

If house prices exhibit momentum at the five-year horizon, firms started by homeowners following an increase in house prices from 1992 to 1997 would also experience a subsequent increase in collateral value from 2000 to 2005. This subsequent increase in collateral value could explain why these firms are able to remain larger than the other firms in the sample. If this mechanism were at play, the results from Table VI could not be interpreted as the long-run effects of initial conditions, that would be more in line with a contemporaneous collateral channel as in Chaney, Sraer, and Thesmar (2012). We first address this issue by looking directly at house-price dynamics in this sample. Figure IA3 plots region-level house-price growth from 2000 to 2005 against region-level house-price growth from 1992 to 1997. House-price growth from 1992 to 1997, which we use as our measure of collateral gains for owners in 1998, is negatively correlated with house-price growth from 2000 to 2005. The slope of the relationship between house-price growth from 1999 to 2004 and house-price growth from 1992 to 1997 is -0.6^{**} , with an R^2 of 24%. Hence, firms that we consider collateral-rich at birth in 1998 experience lower house-price growth after creation, which, if anything, should bias the effect of our main long-run analysis downward.

To address this concern more precisely, we augment equation (3) by including an interaction term for house-price growth from 1999 to t interacted with the homeownership dummy (where t is the year in which the outcome variable is measured). This additional control should capture the effect of post-creation variation in collateral values. The results from this estimation are presented in Table IAXI, Panel A, where we only use $\log(\text{Asset})$ as the dependent variable. The point estimates of ϕ_t for each year are of the same magnitude as what we find when we do not control for realized price growth from 1999 to t . The point estimate on the interaction of house-price growth from 1999 to t and the homeownership dummy is insignificant and small in magnitude. Finally, Panel B of Table IAXI estimates equation (3) on the sample of surviving firms only. We find that even conditional on survival, a significant long-run effect of initial collateral value on subsequent firm outcomes still exists. The effect is, however, almost half the effect we find when we include exiting firms in the analysis. In other words, firms with higher initial collateral value seem to be, if anything, less likely to exit the sample, so that not accounting for the attrition of firms with lower initial collateral value leads to underestimation of the long-run effect of initial collateral value shocks. We explore this question of attrition in more detail in Section III.C.3.

VII. Other Sample Splits in Intensive Margin Analysis

In this section, we consider another dimension of cross-sectional heterogeneity based on unemployment, which leads to estimations that are consistent with a collateral channel interpretation. The underlying premise of this analysis is that obtaining outside financing, and in particular unsecured financing, is more difficult for entrepreneurs who are currently unemployed.⁴ If the collateral channel drives our results, we would expect ϕ to be larger when estimated over the sample of unemployed entrepreneurs, for whom collateral values matter more. To test this idea, we split our sample into previously employed and previously unemployed individuals and estimate equation (2) on these two samples separately. The results are presented in Table IAXIII for the outcome variables assets, sales, number of employees, and debt. The effect of collateral value on size, debt, and number of employees in

the first fiscal year after creation is about twice as large for previously unemployed entrepreneurs than it is for previously employed entrepreneurs; the effect on sales is of a slightly smaller magnitude. All effects are economically significant. For an unemployed entrepreneur who owns his or her house, an increase in house-price growth from 1992 to 1997 of 11 percentage points (the interquartile range of house-price growth in this sample) leads to assets at creation that are almost 18% larger. For previously employed entrepreneurs, this effect is only 6.9%. The difference between previous unemployed versus employed entrepreneurs is most striking when we look at debt: for a previously unemployed entrepreneur who owns his or her house, an increase in past house-price growth of 11 percentage points lead to a 16.5% increase in debt at creation. This effect is only 5% for previously employed entrepreneurs and is not statistically significant.

REFERENCES

- Chaney, Thomas, David Sraer, and David Thesmar, 2012, The collateral channel: How real estate shocks affect corporate investment, *American Economic Review* 102, 2381–2409.
- Landier, Augustin, and David Thesmar, 2009, Financial contracting with optimistic entrepreneurs, *Review of Financial Studies* 22, 117–150.

¹These regions (*régions*) correspond to administrative regions in France. The median region has a population of 1.8 million. In terms of relative size, a French region is smaller than a U.S. state but larger than a U.S. county.

²The survey uses stratified sampling, where the strata are the headquarter’s region and the two-digit industry of the firm. The survey response rate is high (85%).

³Other waves of this survey (1994, 2002, 2006) exist, but the 1998 wave is the only one that has information on homeownership. This data limitation forces us to focus on a single cross-section of data for the post-entry growth analysis, in contrast to our analysis of the extensive margin in Section II of the main article, which uses 11 repeated cross-sections.

⁴Using the 2006 wave of the SINE survey, we can gain some insight on the validity of this assumption. Controlling for all the observables described in Section III.B.1, we find that relative to employed workers, unemployed individuals are, all else equal, 23% more likely to self-report obtaining outside finance as a main difficulty in creating their firms. Further supporting this hypothesis, “easing access to credit for unemployed individuals” was one of the 20 priorities highlighted by the French Department of Labor in 2005 in its annual report.