

HOUSING AND ENTREPRENEURSHIP UNDER HETEROGENEOUS COSTS OF DEFAULT

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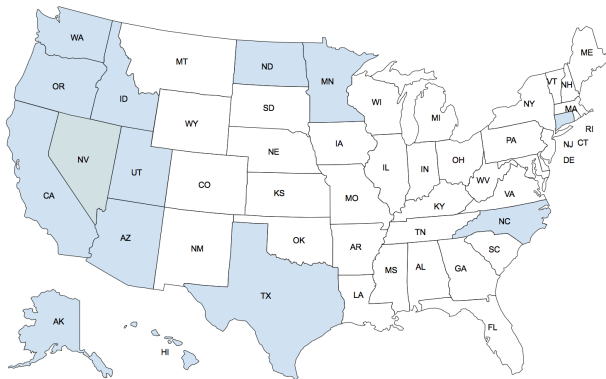
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QUESTION

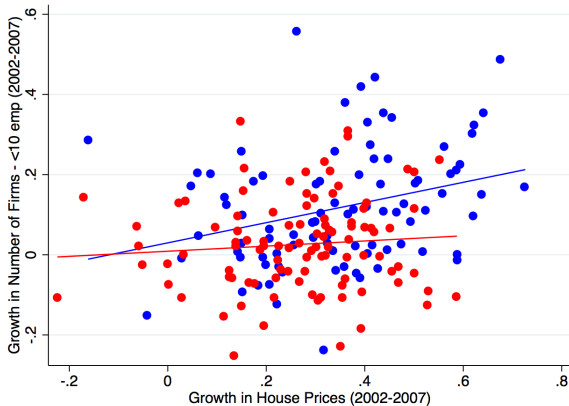
- ▶ How does home equity affect entrepreneurship? **Collateral Channel**
 - ▶ Literature: Financial constraints are relevant for small/young firms (many papers on this link!)
- ▶ Important driver neglected: **Insurance Channel**
 - ▶ **Key Heterogeneity:** Whether lender has “recourse” to pursue assets beyond pledged collateral
 - ▶ **Key Friction in the US:** GSEs (Freddie Mac and Fannie Mae) provide state-level cross-subsidies (Hurst et al., 2015)

NON-RECOURSE STATES



Source: Connecticut Office of Legislative Research (2010)

HOUSE PRICES AND FIRM CREATION (< 10 EMPLOYEES)



Blue=Non-Recourse, Red=Recourse

Note: Each observation is a Metropolitan Statistical Area.

Source: United States Census Bureau.

HOUSING AND ENTREPRENEURSHIP - 4/17

THIS PAPER

- ▶ Matters for policy and provides insight into labor market dynamics and the role of home equity for entrepreneurs
- ▶ Proposes stylized career choice model with housing and mortgage default
 - ▶ Insurance role of default (recourse vs non-recourse)
 - ▶ Interaction with housing collateral channel
- ▶ Empirically validates predictions of the model with data
- ▶ Mortgage default regulation shapes exposure of small/young firms to business cycles
- ▶ Causal evidence that increase in house prices between 2000-07 relaxed credit constraints for small/young firms
 - ▶ Driven by areas where mortgage default is less costly

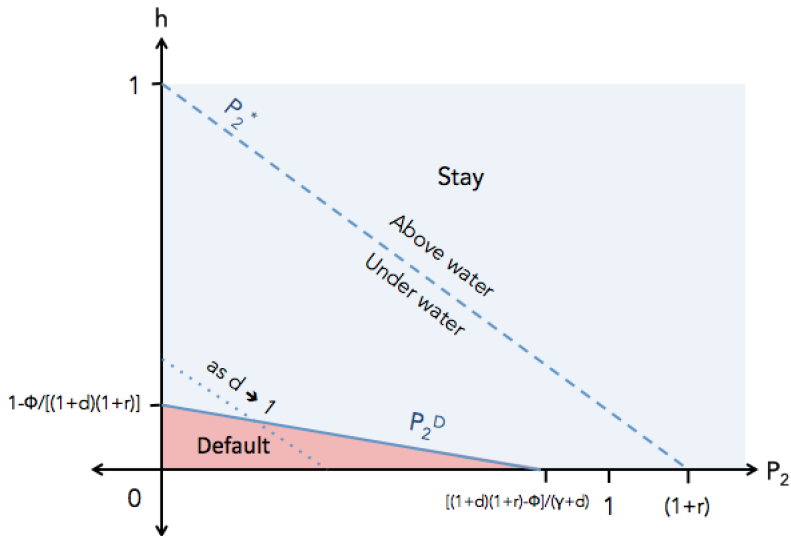
MODEL - MECHANISM

- ▶ Borrowing constrained households (even those with high entrepreneurial ability) may stay workers or become entrepreneurs and operate under their optimal scale
- ▶ A potential entrant to entrepreneurship must consider the cost of mortgage default
- ▶ An entrepreneur that gets a low ability realization and is underwater might not be able to re-pay his mortgage (double trigger)

ENVIRONMENT

- ▶ Builds on Evans and Jovanovic (1989)
- ▶ Two periods, heterogeneous risk averse agents, partial equilibrium model
- ▶ Predetermined initial home equity (h_i)
- ▶ Uncertainty about future house prices (P_2) and own entrepreneurial ability (θ_i)
- ▶ **Key elements:** State-level heterogeneity on mortgage default costs and homogeneous interest rates
- ▶ Agents choose:
 1. **Career:** worker (w) or entrepreneur (k)
 2. **Housing:** stay (pay mortgage) or default ($d, \Phi, \rho(P_2)$)

HOUSING DECISION - SUMMARY



CAREER CHOICE

DEFINITION 1

Period 1 home equity threshold, $h^(\theta; P_2, d)$, is the level of h that solves*

$$V^W(h; d) = V^E(h; d)$$

When $h \geq h^(\theta; P_2, d)$ agents become entrepreneurs. When $h < h^*(\theta; P_2, d)$ agents become workers.*

PROPOSITION 1

$h^(\theta; P_2, d)$ is increasing on d , $\mathcal{V}(P_2)$, and $\mathcal{V}(\theta)$. It is decreasing on $\mathcal{E}(P_2)$ and $\mathcal{E}(\theta)$.*

COROLLARY 1

If the probability density function of h is non-increasing around $h^(\theta; P_2, d)$, the mass of new entrants due to an increase in P_2 is decreasing on d .*

SUMMARY

1. As d increases, the default interval on P_2 gets smaller
 - ▶ Ghent and Kudlyak (2011), Mitman (2012), Desai et al. (2013), Demiroglu et al. (2014), Li and Oswald (2014), Chan et al. (2015), among others
2. As d increases, the entry threshold h^* increases too
3. **As P_2 increases, h^* decreases. The mass of new entrepreneurs is decreasing on d**
 - ▶ **This is what the paper tests empirically**

PREVIEW OF EMPIRICAL RESULTS

- ▶ Employment at small/young firms responded strongly to the increase in house prices between 2000 and 2007 (also number of firms and establishments)
 - ▶ Results are stronger in those areas where mortgage default is less costly
 - ▶ Even more for industries where the amount of start-up capital is lower
 - ▶ Not driven by construction or non-tradable sector
- ▶ Effects became smaller after 2007
- ▶ Evidence that the insurance and collateral channels are important for small business creation and growth

IDENTIFICATION

- ▶ Main concern is that common unobserved factors could be driving up real estate prices and small firms growth
 - ▶ Expectations about income growth, regional investment opportunities, reverse causality
- ▶ Instrument for exogenous shock to house prices with the Saiz (2010) land unavailability measure
 - ▶ In low land availability areas, increases in demand for housing translate into higher prices (e.g. Manhattan, NY)
 - ▶ In high land availability areas, increases in demand have main effect on volume / new construction (e.g. Casper, WY)
- ▶ Identification assumption: Land unavailability only impacts firm creation through its effect on house prices

EMPIRICAL METHODOLOGY

$$\Delta^{00-07} HP_i = \phi_0 + \phi_1 SLU_i + \psi X_i + \eta_i$$

$$\begin{aligned} \Delta^{00-07} Y_{ijk} = & \beta_0 + \beta_1 REC_i + \beta_2 \Delta^{00-07} \hat{HP}_i + \beta_3 \Delta^{00-07} \hat{HP}_i \times REC_i \\ & + \beta_4 \Delta^{00-07} \hat{HP}_i \times \mathbf{1}_j + \beta_5 \Delta^{00-07} \hat{HP}_i \times REC_i \times \mathbf{1}_j \\ & + \beta_5 \Delta^{00-07} \hat{HP}_i \times \mathbf{1}_k + \beta_6 \Delta^{00-07} \hat{HP}_i \times REC_i \times \mathbf{1}_k \\ & + \gamma X_i + \eta \mathbf{1}_j + \nu \mathbf{1}_k + \epsilon_{ijk}, \end{aligned}$$

- ▶ MSAs indexed by i , age by j and size by k
- ▶ HP_i is the log of house price in i , SLU_i is the share of land unavailability in i , X_i is a set of controls
- ▶ $REC_i = 1$ if debt is recourse in i , equal to 0 otherwise
- ▶ Y_{ijk} is employment, number of firms, or number of establishments

SIZE RESULTS (2000-07)

TABLE: All Industries

	House Price Growth		Employment Growth	
	WLS (1)	WLS (2)	IV (3)	IV (4)
Share of Land Unavailability	0.22*** (0.10)			
Recourse Debt		-0.08 (0.06)	-0.05 (0.07)	-0.13* (0.07)
House Price Growth		0.51*** (0.13)	0.56*** (0.14)	0.51*** (0.16)
House Price Growth x Recourse		-0.30*** (0.05)	-0.20* (0.10)	-0.45*** (0.11)
House Price Growth x 10-19 Employees		-0.00* (0.00)	-0.01* (0.00)	-0.07* (0.04)
House Price Growth x 20-99 Employees		-0.08 (0.07)	-0.20** (0.09)	-0.18** (0.08)
House Price Growth x >99 Employees		-0.01 (0.02)	-0.24** (0.11)	-0.28** (0.13)
Constant	1.19** (0.50)	-1.98*** (0.50)	-1.51** (0.70)	-3.03*** (0.68)
2-Digit Industry Fixed Effects	N	N	N	Y
Number of Observations	974	1167	1167	10348
F-stat	18.21	294.10	260.92	1328.20
R2	0.51	0.39	0.28	0.31

SIZE RESULTS (2000-07) (2)

TABLE: By Start-up Capital Level

	Employment Growth	
	Start-up Capital < P50 IV (5)	Start-up Capital > P50 IV (6)
Recourse Debt	-0.09 (0.08)	-0.17** (0.08)
House Price Growth	0.57*** (0.16)	0.28* (0.15)
House Price Growth x Recourse	-0.53*** (0.15)	-0.10* (0.06)
House Price Growth x 10-19 Employees	-0.09* (0.05)	-0.31* (0.16)
House Price Growth x 20-99 Employees	-0.17** (0.08)	-0.37*** (0.18)
House Price Growth x >99 Employees	-0.20** (0.08)	-0.36*** (0.10)
Constant	-2.86*** (0.76)	-3.00*** (0.81)
2-Digit Industry Fixed Effects	Y	Y
Number of Observations	5111	5237
F-stat	790.10	187.93
R2	0.38	0.28

AGE RESULTS (2000-07)

	House Price Growth	Employment Growth		
	WLS (1)	WLS (2)	IV (3)	IV (4)
Share of Land Unavailability	0.29*** (0.01)			
House Price Growth		-0.29 (0.37)	-0.29 (0.65)	-0.29 (0.65)
Recourse Debt		-0.05 (0.05)	-0.08 (0.05)	-0.08 (0.05)
House Price Growth x Recourse		0.55 (0.93)	1.64 (1.46)	1.64 (1.46)
House Price Growth x Young Firm		0.33* (0.17)		0.44*** (0.06)
House Price Growth x Young Firm x Recourse		-0.34*** (0.23)		-0.42*** (0.04)
House Price Growth x Small Firm		0.41 (0.37)	0.22** (0.12)	0.16 (0.28)
House Price Growth x Small Firm x Recourse		-0.10 (1.13)	-0.16** (0.08)	-0.10 (0.19)
Constant	0.31*** (0.03)	-0.14 (0.26)	0.08 (0.28)	0.08 (0.29)
Number of Observations	22,973	14,079	12,346	12,346
F-Statistic	2972	69.92	50.31	49.37
R2	0.44	0.11	0.12	0.15

FINAL REMARKS

- ▶ Contribution to the debate about the channels that drove employment dynamics over the last decade
- ▶ Presents stylized career choice model with housing, mortgage default and financial frictions
- ▶ Provides insight into role of home equity and default laws for employment and firm creation dynamics
- ▶ Mortgage default regulation shapes exposure of small/young firms to business cycles
- ▶ Causal evidence that increase in house prices between 2000-07 relaxed credit constraints for small/young firms