Small Business, Entrepreneurship, and Economic Recovery: A Focus on Job Creation and Economic Stabilization

Federal Reserve Bank of Atlanta, Kauffman Foundation
October, Atlanta

Entrepreneurship, the initial labor force, and the location of new firms

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Outline

- Introduction
  - Setup of the Model
- Predictions
  - The Dataset
- Results
  - Implications

Introduction

- Recent studies suggest that firms' location decision is strongly conditioned by their past

Spin-offs	**Sillicon Valley** **Akron, Detroit**	Regional clusters originated in a small number of firms	Klepper, 2007 Buenstorf and Klepper, 2009
Entrepreneurship studies	**Denmark** **Portugal**	Entrepreneurs tend to locate at home Entrepreneurs that locate at home perform better than their counterparts	Figueiredo et al., 2002 Dahl and Sorenson, 2008

- The footloose firm is not so footloose after all…

How can these findings be reconciled with modern agglomeration theories?

This paper attempts to isolate the role knowledge about labor plays in influencing the location choice of new firms, the workers they hire and the performance of new firms.

Model – Setup (1)

How do firms choose their initial location and who to hire?

The model

Expected discounted value of entering in region j at time 0 $\pi_{j0} = L_j + \varepsilon_j$

L_j Expected discounted surplus earned through the labor the entrant hires

ε_j All other factors

Hiring decisions (it is assumed that the firm can always find suitable workers in the region of entry)

Beginning: $w = V$

Wage the new firm needs to pay to a new hire:

$w_n = w + u + rR$

w=wage the worker was receiving in his/her prior employer
u=wage premium,
r=relocation premium; R=1 if hire switches region

Marginal product of the new hire at the new firm

$V_n = V - iI + \Theta^*$

Θ^* equals 0 or Θ, where $\Theta > u + i$

V=marginal product at the old firm,
Θ =worker's productivity at the new firm*
i=decrease in a worker's productivity if he switches ind.; I=1 if w. switches ind.

Expected surplus earned by a firm from hiring a worker:

$$E(V_n - w_n) = E[w - iI + \Theta^* - (w + u + rR)] = E(\Theta^*) - u - iI - rR$$

Model – Setup 2

Expected surplus earned by a firm from hiring a worker:

$E(V_n - w_n) = E[w - iI + \Theta^* - (w + u + rR)] = E(\Theta^*) - u - iI - rR$

$P(\Theta^* = \Theta) = \boldsymbol{\delta}$

$P(\Theta^* = \Theta \mid$ *worker is from* ***home region and industry*** *of the founder)* $= \boldsymbol{\beta > \delta}$

$P(\Theta^* = \Theta \mid$ *worker is from* ***previous employer*** *of the founder)* $= \boldsymbol{\alpha > \beta}$

$(B-\delta)\,\Theta > i$ $\qquad$ $(\alpha-\delta)\,\Theta < r-i$

Firm enters in its home region and industry:

- It will hire first old colleagues $E(V_n - w_n) = \alpha\,\Theta - u$
- Then it will hire workers from its home industry and region $E(V_n - w_n) = \beta\,\Theta - u$
- And then workers from its region and industry that he didn't know before $E(V_n - w_n) = \delta\,\Theta - u$

Firm enters in its home region but not its home industry:

- It will hire first old colleagues $E(V_n - w_n) = \alpha\,\Theta - u - i$
- Then it will hire workers from its home industry and region $E(V_n - w_n) = \beta\,\Theta - u - i$
- And then workers from its region and new industry $E(V_n - w_n) = \delta\,\Theta - u$

Firm enters in its home industry but not its home region:

- It will hire all its workers from its chosen industry and region $E(V_n - w_n) = \delta\,\Theta - u$

Predictions - location

Where to locate?

Surplus generated by hiring workers:
S_{IR} for entrepreneurs that enter their home region and industry
S_R for entrepreneurs that enter their home region and **not** home industry
S_I for entrepreneurs that enter their home industry and **not** region
S for all other firms

$$S_{IR} > S_R > S_I = S.$$

Difference between locating in home region or not

Firm enters its home industry
$S_{IR} - S_I$

Firm does not enter its home industry
$S_R - S$

Since $S_{IR} - S_I > S_R - S$

<u>Proposition 1</u>: The probability of a firm locating in its home region is greater than any other region and is greater for firms that enter in their home industry.

Predictions – hiring choices

Who do firms hire?

How do these patterns evolve over time?

	Old Colleagues *Proposition 2*		Workers from the home region and industry *Proposition 3*	
Firms that enter in the home region and industry	++	↓↓$_0$	++	=
Firms that enter in the home region and **not** industry	++	↓↓$_0$	+	↓$_0$
All other firms				

Green: time 0

Black: time > 0

Predictions – Quality of the hire

Why are hiring choices important?

Worker exits if (s)he is confirmed **not** to be high productivity

Probability of their probability not being learned after t: $(1-h)^t$

Probability of being confirmed high productivity : $p.[1-(1-h)^t]$

Where $p \equiv prob(\theta^* = \theta)$

Likelihood of exiting at time t, given that the employee was employed till t

$$\frac{(1-h)^t h(1-\mathbf{p})}{\mathbf{p}.[1-(1-h)^t]+(1-h)^t}$$

Decreasing in p.

<u>Proposition 4</u>: For all workers the hazard of exit at each age (at the firm) is lowest for old colleagues and next lowest for the initial workers hired from the firm's home region and industry.

Predictions – Quality of the hire and entrepreneurial success

Why are hiring choices important?

<u>Proposition 4</u>: For all workers the hazard of exit at each age (at the firm) is lowest for old colleagues and next lowest for the initial workers hired from the firm's home region and industry.

What is the influence of hiring choices on entrepreneurial success?

Since $S_{IR} > S_R > S_I = S$ firms that enter in their home region will not be as affected by external shocks in every period t as others firms.

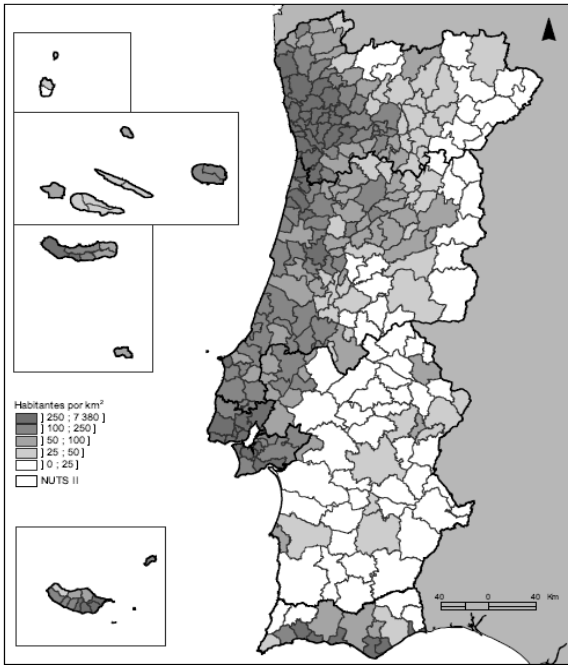
<u>Proposition 5</u>: The hazard of firm exit will be lowest for firms that enter in their home region and industry and next lowest for firms that enter in their home region but not home industry.

Dataset – Portugal

Why Portugal?

- OECD country, with a representative firm distribution OECD, 2008
- Representative average rate of entrepreneurial activity OECD, 2005

Portugal
Administrative regional subdivision used – *"concelho"*



The *concelho* is a small administrative region in Portugal. There were 275 *concelhos* in mainland Portugal in 1995 with an average area of 225.5 km^2 (~87 sq miles).

Population density by concelho, 2005.
Source: National Institute of Statistics

Methods (1) - Data

Dataset

- "Quadros de Pessoal" – Portuguese matched employer-employee dataset

Sample

- 10236 firms started between 1996-1999; 2002-2004
  - Nationally owned firms
  - All sectors except primary sector, energy distribution, public administration, schools and social service (such as daycare)
  - Firms with at least one founder whose background was identified
  - Firms with at least one employee
- Random sample of the total number of hires, composed of 27282 workers in the first year, 8851 new workers in the second year, and 6235 new workers in the third year

Results (1) – Conditional Logit

Entrepreneur assigns region j profit $\pi_j = L_j + \varepsilon_i$
and chooses region m such that $\pi_m > \pi_j$

Variable	Proxy
Home Location	Home
Willingness to relocate	Distance
Proposition 1	Home x Same 4d. Ind.
	Home x Same 3d. Ind.
	Home x Same 2d. Ind.
	Dist x Same 4d. Ind.
	Dist x Same 3d. Ind.
	Dist x Same 2d. Ind.
Controls for firm quality	
Regional characteristics	

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Interactions between home and:
- Tenure of the founder in previous employer
- Tenure of the founder in the region
- Firm with more than one founder
- Founder was a high level executive in previous firm

And interactions between distance and same variables.

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Interactions between home and:

- Worker density (localization economies)
- Population density (to control for urbanization economies)

And county dummies.

Results (1) – Conditional Logit

Entrepreneur assigns region j profit $\pi_j = L_j + \varepsilon_i$

and chooses region m such that $\pi_m > \pi_j$

Variable	Proxy	Model 1	Model 5
Home Location	Home	3.209*** (0.039)	2.771***(0.070)
Willingness to relocate	Distance	-0.028***(0.001)	-0.014***(0.001)
Proposition 1	Home x Same 4d. Ind.	0.454***(0.069)	0.658***(0.069)
	Home x Same 3d. Ind.		0.502**(0.152)
	Home x Same 2d. Ind.		0.302**(0.097)
	Dist x Same 4d. Ind.	-0.012***(0.001)	-0.008***(0.001)
	Dist x Same 3d. Ind.		-0.002 (0.002)
	Dist x Same 2d. Ind.		-0.004**(0.001)
Controls for firm quality	Founder characteristics		Included
Regional characteristics	Pop. Density, Worker Den. County Dummies		Included
Log-Lik.		-21285.600	-19186.766
Observations		10236 x 275=2814900	

***significance at the 0.01 level; **significance at the 0.05 level; *significance at the 0.1 level. Standard errors in parenthesis

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% of firms entering founder's home reg.	66%
% of firms entering ind. of the founder's prior employer that entered in home region	77%
% firms **not** entering ind. of the founder's prior employer that entered home region	57%

Results (2) – Probability that the new hire is an old colleague of the founder

Variable	Proxy	Description
Proposition 2	H4IR	Dummy=1 if entrepreneur is from same ind., same reg.
	H4I	Dummy =1 if entrepreneur is from same ind., different reg
	HR	Dummy=1 if entrepreneur is from dif. ind., same reg.
Firm quality controls	Firmtenure	
	Highlevel	
	Multiplefounders	
	Regionaltenure	
Ind. And Reg. controls	2 Dig. Ind. Dummies and Dist. Dummies	

Results (2) – Probability that the new hire is an old colleague of the founder

Variable	Proxy	Year 1	Year 2	Year 3
Proposition 2	H4IR	1.067***(0.049)	0.511***(0.080)	0.412***(0.115)
	H4I	0.661***(0.068)	0.433***(0.101)	0.262**(0.134)
	HR	0.596***(0.049)	0.219**(0.078)	0.247*(0.123)
Firm quality controls	Firmtenure	0.223***(0.033)	0.236***(0.055)	0.124* (0.070)
	Highlevel	0.333***(0.031)	0.208** (0.063)	0.108 (0.076)
	Multiplefounders	0.093**(0.030)	0.011 (0.060)	-0.045 (0.077)
	Regionaltenure	0.009 (0.034)	-0.117* (0.056)	-0.096 (0.075)
Ind. And Reg. controls	2 Dig. Ind. Dummies and Dist. Dummies	Included	Included	Included
Constant		-1.621***(0.111)	-1.729***(0.239)	-1.861*** (0.308)
Observations		27277 [1]	8770 [1]	6057 [1]
L.Pseudolik.		-15268.338	-2304.4512	-1037.7086

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Results (3) – Probability that the new hire is from the home region and industry of the founder

Variable	Proxy	Year 1	Year 2	Year 3
Proposition 3	H4IR	1.353***(0.088)	1.191***(0.116)	1.188***(0.126)
	H4I	0.719***(0.111)	0.573***(0.137)	0.658***(0.154)
	HR	0.555***(0.100)	0.430*** (0.129)	0.436***(0.138)
Firm quality controls	Firmtenure	-0.155***(0.041)	0.040 (0.044)	-0.126*** (0.051)
	Highlevel	-0.044 (0.050)	-0.023 (0.069)	-0.052 (0.070)
	Multiplefounders	-0.016 (0.050)	0.148** (0.064)	0.040 (0.066)
	Regionaltenure	0.177***(0.041)	0.054 (0.048)	0.200***(0.055)
Ind. And Reg. controls	2 Dig. Ind. Dummies and Dist. Dummies	Included	Included	Included
Constant		-1.950***(0.281)	-2.689***(0.265)	-3.177***(0.344)
Observations		17764 [1]	7991 [1]	5895 [1]
L.Pseudolik.		-3914.1788	-1631.211	-1247.0042

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Results (4) – Hazard of exit of new hires

Variable	Proxy
Quality of the match	Duration of employment
Proposition 4	Old colleague (Years 1, 2, and 3)
	W. same Region/Ind (Years 1, 2, and 3)
Background of the employee	College
	Woman
	High occupation
	Medium ocupation
	Age
	Unknown background
Firm quality controls	Firmtenure
	Highlevel
	Multiplefounders
	Regionaltenure
Labor market controls	2 Dig. Ind. Dummies, District Dummies, Year Dummies

C1, C2, C3

WHIR1, WHIR2, WHIR3

Results (4)

Cox Proportional Model on the annual Hazard of exit of new hires

Proposition 4
Background of the employee
Firm quality controls
Labor market controls

Proxy	Model 3
C1	-0.552***(0.025)
C2	-0.247***(0.064)
C3	-0.359** (0.114)
WHIR1	-0.268***(0.049)
WHIR2	-0.125* (0.061)
WHIR3	-0.021 (0.069)
Age	-0.002** (0.001)
Female	-0.118***(0.019)
College	0.023 (0.046)
Highoccupation	-0.175***(0.045)
Middleoccupation	-0.052***(0.016)
UK_Age	-0.073 (0.066)
UK	0.157***(0.016)
Firmtenure	-0.046*(0.013)
Highlevel	0.014 (0.021)
Multiplefounders	-0.009 (0.020)
Regionaltenure	-0.023 (0.018)

***significance at the 0.01 level;
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Results (5) – Cox Proportional Hazard model of the hazard of exit of new firms

Variable	Proxy
Composition of the team	%OldColleagues
	%Workersfromhomeindustry&region
Proposition 5	H4IR
	H4I
	HR
Firm Quality Controls	Firmtenure
	Highlevel
	Multiplefounders
	Regionaltenure
Market Conditions Controls	Year Dummies, 2 Dig. Industry and District Dummies

Results (5) – Cox Proportional Hazard model of the hazard of exit of new firms

Variable	Proxy	Coefficient
Composition of the team	%OldColleagues	-0.004***(0.001)
	%Workersfromhomeindustry&region	0.000 (0.001)
Proposition 5	H4IR	-0.266***(0.047)
	H4I	-0.079 (0.056)
	HR	-0.130** (0.041)
Firm Quality Controls	Firmtenure	-0.194***(0.028)
	Highlevel	-0.124***(0.035)
	Multiplefounders	-0.304***(0.035)
	Regionaltenure	0.011 (0.027)
Market Conditions Controls	Year Dummies, 2 Dig. Industry and District Dummies	Included
Subjects	10236	
Log likelihood	-35983.737	

***significance at the 0.01 level; **significance at the 0.05 level; *significance at the 0.1 level. Standard errors in parenthesis

Conclusion

- Entrepreneurs that locate in their home regions benefit from taking advantage of the knowledge they have about the labor of a region.

- This knowledge is more useful if the entrepreneur founds a firm in the same industry where he was previously working:
  - Entrepreneurs that found a firm in the same industry they were working are therefore more likely to stay local
  - They:

    •Hire more workers from the old firm
    •Hire more workers from the old region and industry
    •Make better matches
    •Perform better than other entrepreneurs

Implications

- If entrepreneurs tend to locate at home, localization and performance are heavily determined by origin
  - To understand patterns of industry agglomeration in a region it is important to understand what conditions entry in a region

- Firms founded in the same industry and region of the founder are more successful, contributing to a self-reinforcing process of industry agglomeration

Entrepreneurship, the initial labor force, and the location of new firms

Acknowledgements: David Greenstreet, Serguey Braguinsky provided useful comments

Support for this research was provided by the “Portuguese Foundation for Science and Technology)” through the Carnegie Mellon Portugal Program