Pacific Northwest Regional Economics Conference (PNREC)

Regional Capacities and the Dynamics of Firm Entry following the COVID-19 Period

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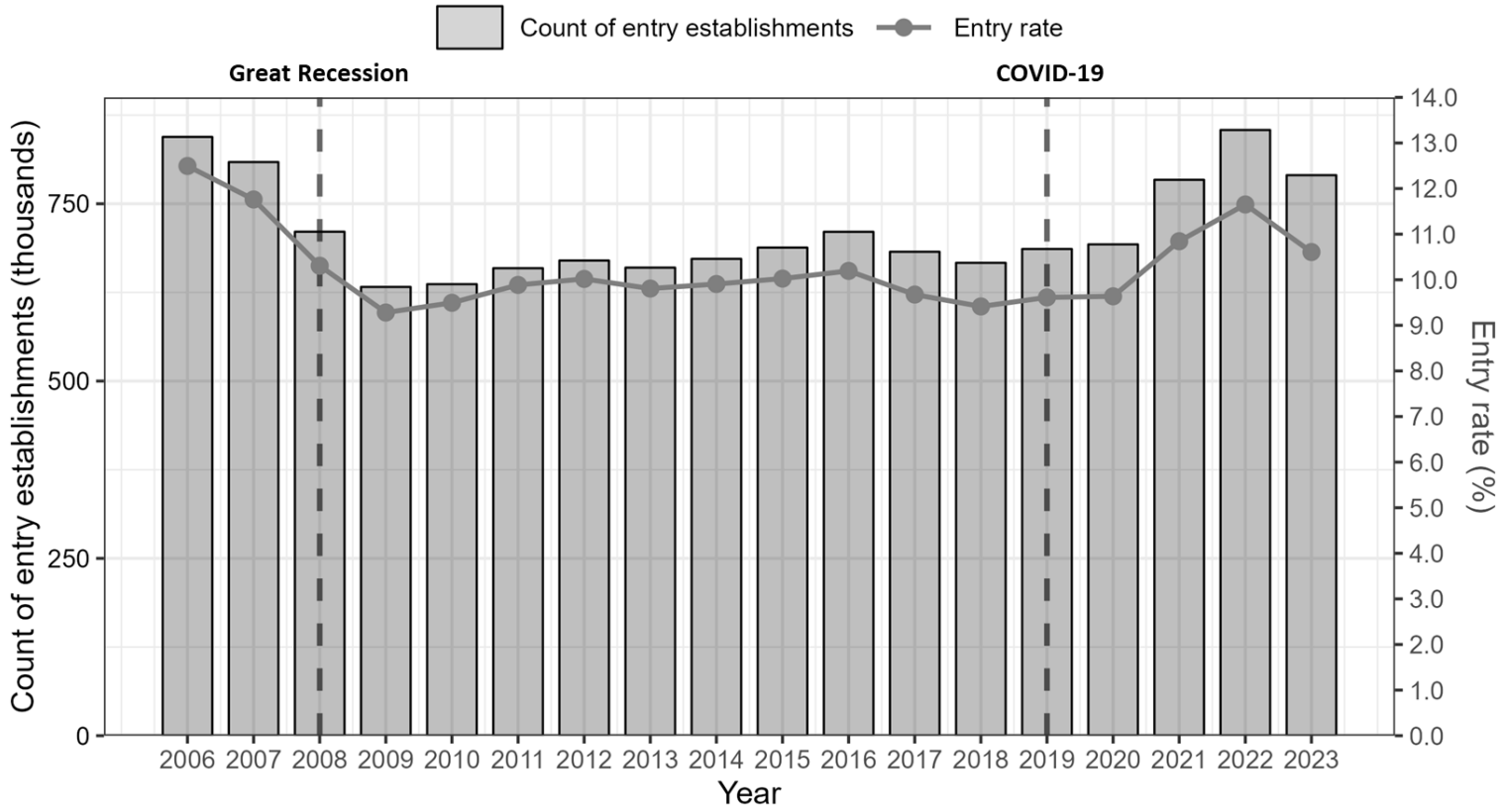
Source: https://www.wsj.com/business/entrepreneurship/covid-19s-toll-on-u-s-business-200-000-extra-closures-in-pandemics-first-year-11618580619

Research problem

The Pandemic Forced Thousands of Businesses to Close—But New Ones Are Launching at Breakneck Speed

Source: https://time.com/6082576/pandemic-new-businesses/



Establishment entry number and rates trends in the U.S. (2006-2023)

Less is known about how regional capacities shaped the timing and strength of establishment entry
After the shock, Across the regions

Research problem

The pandemic did not produce a uniform entrepreneurial rebound.

Regions with stronger adjustment

Higher human capital

Skilled talent and knowledge depth

Diverse industry

Broader base and sectoral growth

Finance access

Strong capital and entrepreneurial support

⋮

Faster recovery and higher levels in adjustment years

Regions with weaker adjustment

Higher unemployment

Labor slack and income loss

Greater exit pressure

More business exits and distress

Weaker support

Limited resources and networks

⋮

Slower recovery and lower levels in adjustment years

Regional capacities shaped whether disruption became durable firm formation

Research problem

Research Question

RQ 1 **How did establishment entry change from the pre-pandemic period through the onset and adjustment years?**

RQ 2 **Which regional entrepreneurial ecosystem capacities helped explain stronger post-onset establishment entry?**

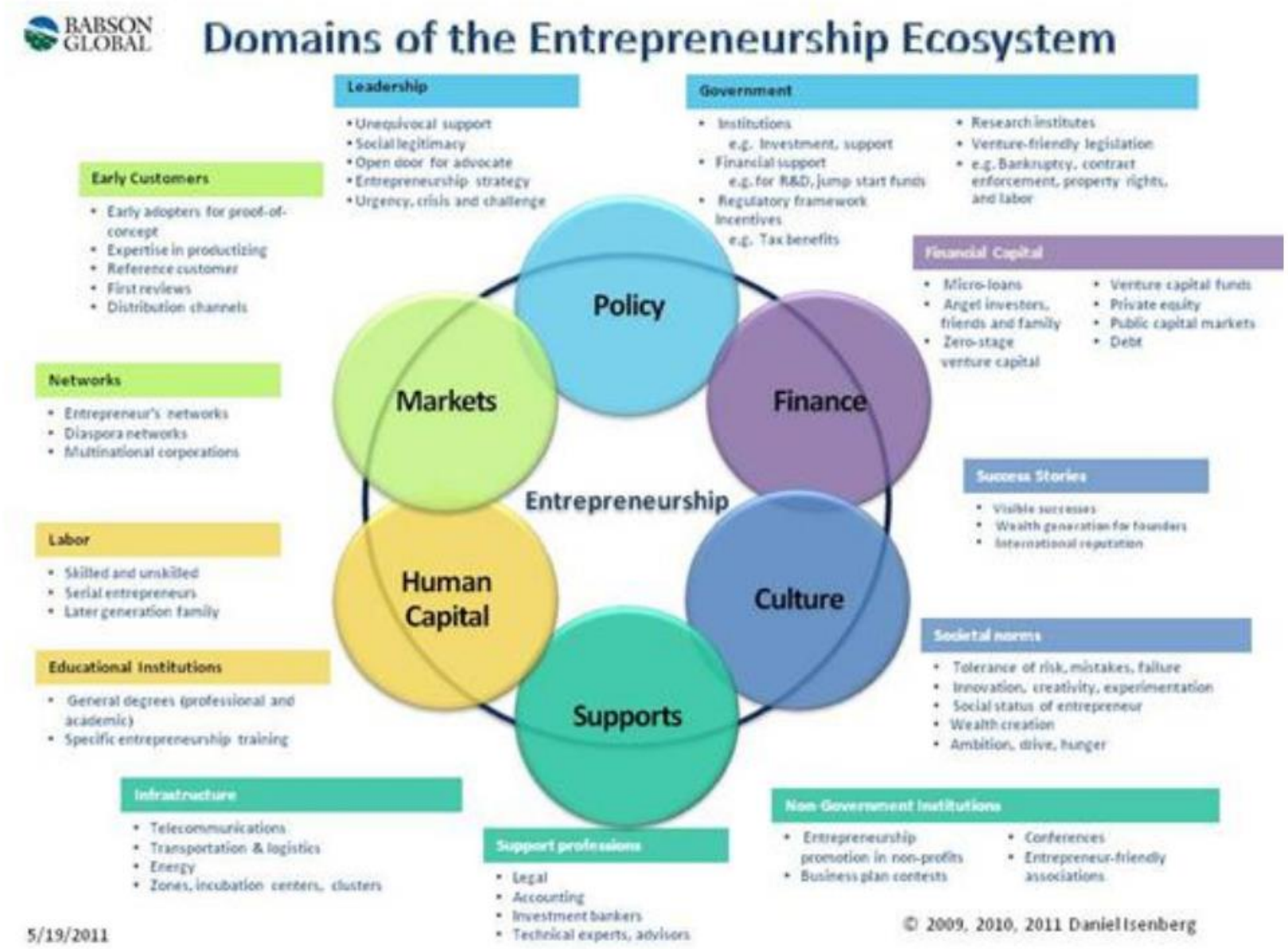
Study Scope

U.S. Metropolitan Statistical Areas, 2018-2022

Period classification

- Baseline (2018-2019)
- Onset (2020)
- Adjustment (2021-2022)

Theory



Source: Isenberg, D. J. (2011, May 12). The Entrepreneurship Ecosystem Strategy as a New Paradigm for Economic Policy: Principles for Cultivating Entrepreneurship. Institute of International and European Affairs, Dublin, Ireland.

Theory and hypotheses

Entrepreneurial ecosystem framework

- Entrepreneurship is shaped by local institutions, networks, and support systems
- Ecosystem assets reduce search, coordination, and resource frictions
- Regional capacities condition whether opportunities scale into durable firms

Acs et al., 2017; Stam, 2015; Spigel & Harrison, 2018; Audretsch & Keilbach, 2004

Entrepreneurship during COVID-19

- COVID-19 disrupted incumbent small businesses while also triggering new business formation
- Institutional responses and government interventions shaped whether firms could manage liquidity constraints, continue operations, and recover after the initial disruption
- Pandemic entrepreneurship reflected both necessity and opportunity

Fairlie, 2020; Bartik et al., 2020; Brown et al., 2020; Block et al., 2022; Haltiwanger, 2022

Regional determinants of entrepreneurship

- Human capital, industrial structure, finance, and local condition shape entry
- Place-specific factors explain why entrepreneurship varies across regions
- Adjustment is likely stronger where regional capacities are more supportive

Armington & Acs, 2002; Sternberg, 2009; Qian et al., 2013; Delgado et al., 2010; Cowling et al., 2020

Post-COVID entrepreneurship depends on regional capacities and adjustment conditions

Data and empirical design

Variable setting

Category	Variables
Dependent variable	Establishment entry rates
Human capital	✓ Educational attainment ✓ Migration of educated population
Economic environment	✓ Business exit rates ✓ Establishment size ✓ Industrial diversity
Financial access	✓ CDFI loan volume ✓ Small business loan volume
Infrastructure	✓ Internet accessibility
Control variables	✓ Immigration ✓ Unemployment ✓ Income

General panel framework

$$Y_{it} = \alpha_i + \beta X_{it} + \sum_{t=2020}^{2022} \gamma_t D_t + \sum_{t=2021}^{2022} \delta_t (Z_{it} \times D_t) + \varepsilon_{it}$$

Baseline specification (Model 1)

- Fixed-effects baseline model
- Year indicators (dummy) capture onset and adjustment shifts
- Stepwise inclusion of human capital, economic environment, finance, and infrastructure

Mechanism specification (Model 2)

- Interaction terms evaluate phase-specific catalytic effects
- Interactions for 2021 and 2022

Notation

Y_{it}: establishment entry rate
α_{it}: MSA fixed effects
X_{it}: independent variables
D_{it}: year indicators (baseline= 2018-2019)
Z_{it}: focal ecosystem component

Findings – Model 1

Temporal pattern

- Entry rises in 2021 and remains higher in 2022
- The 2022 increase is the strongest and most consistent

Positive association

- Educational attainment is positively associated
- In the full model, educated population influx becomes weakly positive

Negative association

- Business exit rates are consistently negative
- Unemployment is also negative throughout

Limited evidence

- Other variables show limited independent effects across models

Post-pandemic entry growth appears mainly in the adjustment years (2021-2022), while human capital supports entry and local stress constrains it

Variable	Model 1			
	Model 1-1	Model 1-2	Model 1-3	Model 1-4
Educational attainment	0.0878 *** (0.0317)	0.0684 ** (0.0317)	0.0655 * (0.0336)	0.0678 ** (0.034)
Migration of educated population	0.0233 (0.0163)	0.0172 (0.017)	0.0225 (0.0176)	0.0227 * (0.0176)
Business exit rates		-0.1523 *** (0.0242)	-0.1504 *** (0.0246)	-0.1520 *** (0.0247)
Establishment size		-0.0003 (0.0003)	-0.0002 (0.0003)	-0.0002 (0.0003)
Industrial diversity		0.0935 (0.0701)	0.0854 (0.0709)	0.0847 (0.0707)
CDFI loan volume (Ln)			-0.0002 (0.0002)	-0.0002 (0.0002)
Small business loan volumes (Ln)			-0.0008 (0.0012)	-0.0008 (0.0012)
Digital infrastructure				-0.0089 (0.013)
Immigration	-0.0719 (0.0694)	-0.059 (0.069)	-0.0586 (0.0711)	-0.0592 (0.0712)
Unemployment	-0.1891 *** (0.0399)	-0.1616 *** (0.0419)	-0.1775 *** (0.0437)	-0.184 *** (0.0448)
Income	3.52E-08 (1.00E-07)	3.69E-08 (9.54E08)	-4.43E-09 (1.04E-07)	-2.90E-09 (1.04E-07)
D2020	-0.0011 * (0.0006)	1.92E-05 (0.0006)	0.0005 (0.0007)	0.0007 (0.0008)
D2021	0.0084 *** (0.001)	0.0103 *** (0.001)	0.0109 *** (0.0011)	0.0113 *** (0.0013)
D2022	0.01482 *** (0.0011)	0.0167 *** (0.0011)	0.0174 *** (0.0013)	0.0179 *** (0.0015)
F (df1, df2)`	326.994 (8, 1475) ***	247.008 (11, 1464) ***	196.856 (13, 1391) ***	182.764 (14, 1390) ***
R^2	0.63945	0.64985	0.64786	0.64798
$Adj.R^2$	0.54705	0.55897	0.55394	0.55378

Notes: Clustered standard errors at the MSA level are in the parentheses. * p < 0.10; ** p < 0.05; *** p < 0.01

Findings – Model 2

Regional capacities matter, but adjustment is not driven by every ecosystem domain equally

Human capital mechanism

- Educational attainment remains positive,
- Interaction terms show a weaker education gradient by 2022

Industrial diversity mechanism

- Industrial diversity does not show a stable baseline effect
- Positive and significant interaction with 2021 indicates stronger early adjustment in more diverse regions

Finance mechanism

- CDFI loan volume show a positive and significant interaction with 2021
- Small business loan volume shows no specific associations

Digital infrastructure mechanism

- Internet accessibility does not show meaningful baseline and interaction effects

	Model 2			
Variable	**Model 2-1**	**Model 2-2**	**Model 2-3**	**Model 2-4**
Educational attainment	0.0837 ** (0.0357)	0.0677 ** (0.0342)	0.0627 * (0.0347)	0.0631 * (0.0346)
Migration of educated population	0.02069 (0.0174)	0.0229 (0.0176)	0.022 (0.0174)	0.0228 (0.0177)
Business exit rates	-0.1567 *** (0.0248)	-0.1493 *** (0.0247)	-0.1495 *** (0.0247)	-0.1516 *** (0.0248)
Establishment size	-0.0002 (0.0003)	-0.0002 (0.0003)	-0.0002 (0.0002)	-0.0002 (0.0003)
Industrial diversity	0.0865 (0.0699)	0.0825 (0.0741)	0.0713 (0.071)	0.0814 (0.0704)
CDFI loan volume (Ln)	-0.0002 (0.0002)	-0.0002 (0.0002)	-0.0003 * (0.0002)	-0.0002 (0.0002)
Small business loan volumes (Ln)	-0.0011 (0.0012)	-0.0008 (0.0012)	-0.001 (0.0012)	-0.0008 (0.0012)
Digital infrastructure	-0.0183 (0.0146)	-0.0085 (0.013)	-0.0086 (0.0129)	-0.0054 (0.0136)
Immigration	-0.0582 (0.0713)	-0.0622 (0.0696)	-0.0679 (0.0704)	-0.0644 (0.0711)
Unemployment	-0.1738 *** (0.0449)	-0.1844 *** (0.045)	-0.1934 *** (0.0453)	-0.1859 *** (0.0447)
Income	7.12E-08 (9.83E-08)	2.43E-10 (1.03E-07)	-3.33E-08 (1.08E-07)	-2.91E-08 (1.14E-07)
D2020	0.0008 (0.0008)	0.0007 (0.0008)	0.001 (0.0008)	0.0007 (0.0008)
D2021	0.011 *** (0.0012)	0.0113 *** (0.0013)	0.0116 *** (0.0013)	0.0112 *** (0.0013)
D2022	0.0177 *** (0.0014)	0.0179 *** (0.0014)	0.018 *** (0.0015)	0.0177 *** (0.0015)
Educational attainment x D2021	0.0016 (0.0049)			
Educational attainment x D2022	-0.0137 ** (0.0057)			
Industrial diversity x D2021		0.0367 ** (0.016)		
Industrial diversity x D2022		-0.01532 (0.01555)		
CDFI loan volume x D2021			0.0005 ** (0.0002)	
CDFI loan volume x D2022			0.0004 (0.0003)	
Small business loan volumes x D2021			0.0008 (0.0005)	
Small business loan volumes x D2022			-0.0004 (0.0006)	
Digital infrastructure x D2021				0.0075 (0.0103)
Digital infrastructure x D2022				0.0093 (0.0137)
F (df1, df2)`	161.341 (16, 1388) ***	160.964 (16, 1388) ***	145.338 (18,1386) ***	159.857 (16, 1388) ***
R^2	0.65033	0.6498	0.65368	0.64823
$Adj.R^2$	0.55611	0.555543	0.55973	0.55344

Notes: Clustered standard errors at the MSA level are in the parentheses. * p < 0.10; ** p < 0.05; *** p < 0.01

Discussion and conclusion

Phased adjustment

- ✓ Entry growth is concentrated after the onset year
- ✓ A narrative of recovery and reorientation rather than an immediate shock response

Mechanism interpretation

- ✓ Early-adjustment catalysts (industrial diversity and CDFI finance) strengthen opportunity pipelines and ease early financing frictions
- ✓ Digital infrastructure: more complementary than catalytic

Capacity and constraint framework

- ✓ Human capital (positively) vs. unemployment and business exit rates (negatively)
- ✓ Recovery and adaptation depend on both capacities and constraints; neither alone is sufficient to produce sustained increases in new establishments

Policy implications

- ✓ Phase-specific policy for stabilization first and entry support later: effective instruments differ between the early adjustment and the subsequent consolidation

Appendix – Data sources

Variable		Description	Unit
Dependent variable	Establishment entry rate[1]	Ratio of establishment entry in year t relative to the average establishments between t and t-1 years	Percentage
Human capital	Educational attainment[3]	Percentage of population 25 years and over who have a bachelor's degree or higher	Percentage
	Migration of educated population[3]	Percentage of inbound migration of population with a bachelor's degree or higher	Percentage
Economic environment	Business exit rates[1]	Percentage of the number of exit establishments during t and t-1 years	Percentage
	Establishment size[2]	Employment-weighted midpoint estimates from establishment size bins aggregated to MSA	Number
	Industrial diversity[1]	Inverse Herfindahl-Hirschman Index: $1 - \sum E_{ikt}^2$, where employment share of industry i in region k and year t	
Financial access	CDFI loan volume[4]	Amount of original loan/investment by banks and credit unions from CDFI fund (Ln)	Ln (dollar)
	Small business loan volume[5]	Total amount of loans originated to small businesses with gross annual revenues < $1 million (Ln)	Ln (Thousand dollars)
Infrastructure	Internet accessibility[3]	Percentage of the population with internet subscriptions	Percentage
Control variables	Immigration[3]	Percentage of the number of foreign-born population	Percentage
	Unemployment[3]	Unemployment rate	Percentage
	Income[6]	Annual personal income per capita	Thousand dollars

[1] U.S. Census Bureau, Business Dynamics Statistics (BDS).

[2] U.S. Census Bureau, County Business Patterns (CBP).

[3] U.S. Census Bureau, American Community Survey (ACS).

[4] CDFI Fund (aggregated CDFI investment/loan activity).

[5] Federal Financial Institutions Examination Council (FFIEC) small business loan data.

[6] U.S. Bureau of Economic Analysis (BEA).

Appendix – Descriptive Statistics

Descriptive statistics

Vars	Mean	SD	Median	Min	Max
Establishment entry rates	9.21	0.05	9.01	4.74	16.95
Educational attainment	29.44	0.20	28.38	12.90	63.23
Migration of educated population	13.00	0.09	12.70	3.50	37.30
Business exit rates	8.50	0.03	8.41	5.24	13.96
Establishment size	16.87	2.96	17.01	9.17	29.13
Industrial diversity	0.89	0.02	0.89	0.64	0.93
CDFI loan volume (Ln)	15.87	2.30	16.08	6.84	21.49
Small business loan volumes (Ln)	12.69	1.08	12.54	9.68	16.16
Digital infrastructure	84.01	0.12	84.70	53.90	94.70
Immigration	8.26	0.15	6.31	0.84	41.49
Unemployment	5.45	0.04	5.30	2.10	15.30
Income	52,422.00	11,924.55	50,570.00	26,831.00	144,331.00

Thank you

If you have questions, feel free to contact me

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