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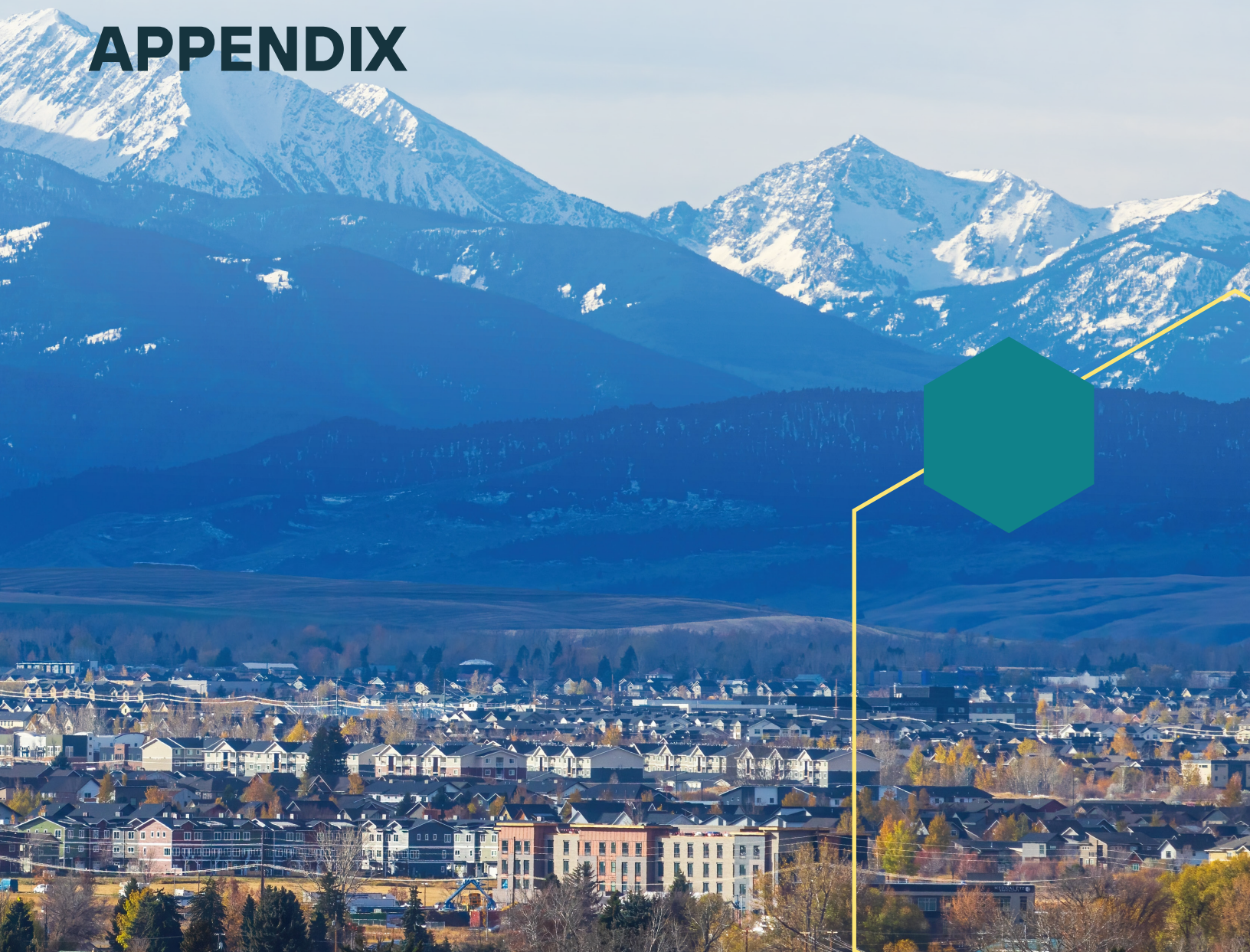


INSIGHTS
CENTER

Roots of Prosperity

**How Community Assets Create the
Conditions for Rural Entrepreneurship**

APPENDIX



Roots of Prosperity: How Community Assets Create the Conditions for Rural Entrepreneurship

Appendix

Qualitative Data and Methods

We conducted 15 semi-structured interviews with institutional actors, entrepreneurial support providers, economic development professionals, funders, and founders (both early- and growth-stage). Interviews ranged from 30 minutes to over two hours, with most in the one-hour range. We recorded and transcribed interviews for thematic analysis. We coded 378 segments across the interview corpus. In addition to coding across the capital domains, we assigned each segment a valence of Asset, Constraint, or Mixed to identify how capital functions in the ecosystem. Where applicable, interaction codes (e.g., Spiral, Constraint) were applied to highlight the ways in which the capitals interact. We also conducted ethnographic fieldwork in Bozeman, attending entrepreneurship events, spending time in third places (e.g., coworking spaces), and holding informal conversations with residents.

Quantitative Data and Methods

For our quantitative operationalization of the community capitals framework, we construct seven capital indices, each drawing upon a set of county-level indicators from federal and administrative sources. This appendix documents how we source, transform, and combine those indicators. We select indicators for each capital following standard criteria for composite indicator construction (OECD, 2008). Indicators had to be conceptually relevant to the capital as the community capitals framework defines it, analytically sound, available for all U.S. counties from public sources, and collectively broad enough that no index rests on a single attribute. Where a capital is difficult to observe directly, we used proxy measures. The framework identifies the seven capitals but does not specify how to measure them, and no single definitive indicator set exists (Fey et al., 2006). Our sets draw on measures used in earlier county-level applications (Taylor et al., 2025; Schmit et al., 2021; Mueller et al., 2020) and add measures where public data has become available.

We measure each capital in the years preceding the entrepreneurship outcomes we test. Most indicators come from 2016 through 2018, ahead of the 2023 Rural Entrepreneurship Index, which also uses ACS 5-year average data, so whatever relationship we find runs in the direction the framework predicts and

entrepreneurship in 2023 cannot have shaped the capital measures themselves. We draw natural amenity components from earlier sources, since they reflect long-run climate and topography, and a handful of other measures are available only on less frequent schedules. The sections below take each capital in turn, describing each capital and the measures we use to approximate it.

Community Capitals Index Construction

We build each capital index in several steps. First, we scale count measures by population, expressing them in per capita terms so counties of different sizes are comparable. We then sign every indicator so that higher values always translate to more of the capital, reverse-coding measures where a lower value is better, and we log-transform skewed count and dollar measures. Next, we convert each indicator to a z-score across counties, putting measures in different units on a common scale. Lastly, we average the transformed and standardized indicators within each capital, weighting each indicator equally.

The community capitals framework treats the seven capitals as interdependent stocks that reinforce one another, with gains in one raising the likelihood of gains in others (Emery and Flora, 2006). The seven are presented as co-equal categories rather than as a hierarchy, and the framework's early measurement work took care that capitals measured with more indicators should not carry more weight in a community's overall profile (Fey et al., 2006). Quantitative applications have handled weighting in two ways. Some weight indicators equally within each capital (Taylor et al., 2025; Mueller et al., 2020); others derive weights from the data using principal components (Schmit et al., 2021; Jablonski et al., 2023).

We weight indicators equally, which is also the most common approach in composite indicator practice more broadly (OECD, 2008; Greco et al., 2019). Equal weights keep each index interpretable, so a community can see what makes up its score. They also keep the indices stable, since weights derived from the data are specific to the sample used to estimate them and complicate comparison across places and over time (OECD, 2008). Data-driven weights carry a further cost for our purposes: when indicator loadings vary in sign within a component, it becomes difficult to identify which underlying measure drives an observed relationship (Schmit et al., 2021).

We report Cronbach's alpha for each capital index, which depicts the internal consistency of each set of indicators. We report it as descriptive rather than as a validity test. Alpha assumes indicators reflect a single underlying trait, but the capitals are better understood as stocks constituted by their indicators: a county with more protected land has more natural capital regardless of its air quality (Bollen & Lennox, 1991; Diamantopoulos & Winklhofer, 2001).

Community Capital Indicators

Natural capital. Natural capital is the set of assets rooted in a particular place, from its climate and terrain to its natural resources, scenery, and remoteness (Emery and Flora, 2006). We measure this through a county's physical endowment, including its climate, terrain, water, air quality, protected land, and the recreation economy that grows around it to leverage the natural resources. Six indicators come from McGranahan's (1999) natural amenity scale, which combines January temperature and sunlight, July temperature and humidity, topographic variation, and water area, and which is widely used in rural development research. Prior operationalizations of the framework use it the same way, alone or alongside land-use measures (Taylor et al., 2025; Schmit et al., 2021). We add protected land share, air quality, natural hazard exposure, elevation, distance to a coast, and recreation-oriented businesses, extending the scale from climate and terrain toward features that shape whether an amenity is accessible and usable.

Table A1, Panel A. Natural Capital

Cronbach's Alpha: -0.596 | Items: 12 | N: 3097

Indicator	Source	Year
January Temperature (z-score)	USDA Natural Amenities	1999
January Sunlight (z-score)	USDA Natural Amenities	1999
July Temperature (z-score, reverse-coded)	USDA Natural Amenities	1999
July Humidity (z-score, reverse-coded)	USDA Natural Amenities	1999
Topographic Variation (z-score)	USDA Natural Amenities	1999
Water Area (z-score)	USDA Natural Amenities	1999
Public / Protected Land (% of county)	USGS PAD-US	2018
AQI Days with Good PM2.5	EPA Air Quality Index	2018
Recreation Businesses per 10k	Census CBP (Eckert)	2016
Mean Elevation (m)	USGS 3DEP	2020
FEMA Natural Hazard Risk Score (rev)	FEMA National Risk Index	2025
Distance to Coast (km, rev)	NOAA / Census coastline	2018

Human capital. Human capital is the skills and capabilities people have to develop local resources and to draw on knowledge and expertise from beyond their community (Emery and Flora, 2006). We measure it through educational attainment along with the health and demographic conditions that shape a workforce, following prior research (Taylor et al., 2025; Schmit et al., 2021). This includes the share of

adults with a bachelor's degree or higher, average years of schooling, higher-education institutions per 10,000 residents, labor force participation, K-12 reading scores, adult literacy, preschool enrollment, disability rate, life expectancy, and median age. We include median age as a proxy for the experience of a county's workforce.

Table A1, Panel B. Human Capital

Cronbach's Alpha: 0.806 | Items: 10 | N: 3069

Indicator	Source	Year
% Bachelor's Degree or Higher	ACS (Census)	2018
Average Years of Schooling	ACS (Census)	2018
Labor Force Participation Rate (25-64)	ACS (Census)	2018
K-12 Reading Score (grade-cohort scale)	Stanford SEDA	2018
Adult Literacy Level 3+ (%)	NCES / PIAAC	2017
% Children Enrolled in Preschool	ACS (Census)	2018
Disability Rate (18-64) (reverse-coded)	ACS (Census)	2018
Life Expectancy	County Health Rankings (RWJF)	2019
Median Age	ACS (Census)	2018
Higher-Ed Institutions per 10k	NCES IPEDS	2018

Cultural capital. Cultural capital is a community's shared worldview and practices, including its traditions and language, and it shapes whose voices carry weight and how new ideas take hold (Emery and Flora, 2006). We measure it through the institutions and population characteristics associated with cultural life, including museums, historical sites, arts and entertainment venues, public libraries, racial and ethnic diversity, and the share of residents who are foreign-born or speak a language other than English at home. Prior work has taken a similar approach, combining cultural institutions with measures of population diversity (Taylor et al., 2025; Schmit et al., 2021). We also include the Bohemian index, a measure of how concentrated a county's employment is in artistic occupations such as designers, musicians, writers, and performers, relative to the national average (Florida, 2002). Nonmetropolitan counties that host performing arts organizations show higher rates of design-oriented and innovative business activity, which supports treating local creative activity as a marker of the cultural conditions the framework describes (Wojan and Nichols, 2018).

Table A1, Panel C. Cultural Capital**Cronbach's Alpha: 0.391 | Items: 8 | N: 3219**

Indicator	Source	Year
Museums per 10k	Census CBP (Eckert)	2016
Historical Sites per 10k	Census CBP (Eckert)	2016
Arts & Entertainment Venues per 10k	Census CBP (Eckert)	2016
Bohemian Index	ACS (Census)	2018
Racial/Ethnic Diversity (Herfindahl)	ACS (Census)	2018
% Non-English Spoken at Home	ACS (Census)	2018
% Foreign Born	ACS (Census)	2018
Public Library Outlets per 10k	IMLS Public Libraries Survey	2018

Social capital. Social capital is the web of connections among people and organizations that lets a community get things done, for better or worse, and the framework distinguishes the close ties that build cohesion within a group from the looser ties that link across groups and communities (Emery and Flora, 2006). We measure it through the density of local organizations, including religious, civic, business, professional, and sports organizations, alongside nonprofits and the shares of residents born in the state and who are veterans. Prior work combined organizational density with civic participation measures in a similar way (Taylor et al., 2025; Schmit et al., 2021). Both draw on the county-level social capital index developed by Rupasingha et al. (2006). These measures capture the close ties more fully than the connecting ones, since few nationwide county-level measures exist for the ties that bridge a community outward, which the framework treats as the ties most likely to drive development.

Table A1, Panel D. Social Capital**Cronbach's Alpha: 0.228 | Items: 8 | N: 3142**

Indicator	Source	Year
Religious Organizations per 10k	Census CBP (Eckert)	2016
Civic Organizations per 10k	Census CBP (Eckert)	2016
Business Associations per 10k	Census CBP (Eckert)	2016
Professional Organizations per 10k	Census CBP (Eckert)	2016
Sports Teams & Clubs per 10k	Census CBP (Eckert)	2016
Nonprofits per 10k	IRS Business Master File	2018
% Born in State	ACS (Census)	2018

% Veterans	ACS (Census)	2018
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Built capital. Built capital is, in the framework's terms, "the infrastructure supporting these activities" (Emery and Flora, 2006, p. 21). We measure it through the physical and digital infrastructure a business relies on, including broadband availability and fiber access, highway density, distance to a hub airport, median housing age, and local capital spending. Prior operationalizations have taken a similar approach, combining transportation access, broadband, and housing stock (Taylor et al., 2025; Schmit et al., 2021). Broadband is the component with the clearest evidence behind it, with instrumented evidence finding it raises rural establishment birth rates, particularly among nonemployer, women-led, and remote rural firms (Conroy and Low, 2022).

Table A1, Panel E. Built Capital

Cronbach's Alpha: 0.274 | Items: 6 | N: 3118

Indicator	Source	Year
% Population with Broadband $\geq 25/3$ Mbps	FCC Form 477	2018
% Population with Fiber Broadband	FCC Form 477	2018
Median Housing Age (reverse-coded)	ACS (Census)	2018
Interstate & Arterial Highway Density	FHWA Highway Statistics	2017
Distance to Hub Airport (km, reverse-coded)	FAA / BTS	2018
Local Capital Spending per 10k (Highways + Utilities + Capital Outlays)	Census of Governments	2017

Financial capital. Financial capital includes the assets available to invest in building community capacity, underwriting businesses, and accumulating wealth for future development (Emery and Flora, 2006). We measure it through the institutions that lend locally and the wealth households hold, including FDIC-insured banks and deposits per capita, community bank branch share, the presence and lending activity of Community Development Financial Institutions (CDFIs), SBA loan volume, venture capital raised, and median household income and home value. Prior operationalizations of the community capitals framework have combined banking presence with lending activity in a similar way (Taylor et al., 2025; Schmit et al., 2021). We include both community banking and venture capital because rural founders depend on both ends of the capital stack, and evidence suggests they have been thinning over time. Small community banks lend on relationships in ways that the quantitative credit decisions of large, centralized banks often do not, and rural bank consolidation has reduced that access, with the number of rural community banks falling from 5,029 in 1994 to 2,618 in 2024 (Weinstein and Dewbury, 2025). Venture

capital matters most for scalable, high-growth startups but stays concentrated in urban hubs where investors favor established local networks, leaving rural businesses with under 1 percent of it despite making up 12 percent of U.S. firms (Weinstein and Dewbury, 2025). We include median household income and home value because personal savings remain the most common source of startup capital for rural entrepreneurs, with more than half of all businesses drawing on personal or family savings (Hwang et al., 2019). Higher personal savings correlate with stronger business formation (Sutaria and Hicks, 2004; Low et al., 2005), and rural counties have lower median household incomes and home values, which limits personal wealth as a financing tool (Weinstein and Dewbury, 2025). Access is thinnest in less dense, non-agricultural, and high-amenity rural communities (Van Leuven et al., 2024), which is to say in many of the places where natural capital is strongest.

Table A1, Panel F. Financial Capital

Cronbach's Alpha: 0.327 | Items: 9 | N: 3108

Indicator	Source	Year
FDIC-Insured Banks per 10k	FDIC Summary of Deposits	2018
FDIC Deposits per Capita (log)	FDIC Summary of Deposits	2018
Community Bank Branches per 10k	FDIC Summary of Deposits	2018
CDFIs per 10k	CDFI Fund	2018
CDFI Lending per Capita (log)	CDFI Fund	2018
SBA Total Loans per 10k (log, 2016-18)	SBA Loan Data	2016-18
Venture Capital Raised per Capita (log, 2016-18)	PitchBook	2016-18
Median Household Income (log)	ACS (Census)	2018
Median Home Value (log)	ACS (Census)	2018

Political capital. Political capital is a community's access to power and to the organizations and people who hold it, along with the ability of residents to find their own voice and act on behalf of the place they live (Emery and Flora, 2006). It operates through the rules a community sets and the investments it makes, which means the relevant measures are as much about how local government functions as about how large it is. We measure it through participation and public-sector capacity, following prior work in this area (Taylor et al., 2025; Schmit et al., 2021). This includes presidential voter turnout, political and labor organizations per 10,000 residents, and county government employment and revenue per 10,000. These indicators

capture the scale of civic participation and the size of local government rather than how it operates. A larger public sector may reflect a greater capacity to invest, or it may reflect more permitting steps and regulatory friction, and our measures cannot distinguish the two. Nor do they capture a community's ability to draw on political support from beyond its own borders, which the framework treats as central and which no public dataset records (Turner, 1999).

Table A1, Panel G. Political Capital

Cronbach's Alpha: 0.291 | Items: 5 | N: 3016

Indicator	Source	Year
Presidential Voter Turnout (avg)	MIT Election Lab	2016
Political Organizations per 10k	Census CBP (Eckert)	2016
Labor Organizations per 10k	Census CBP (Eckert)	2016
Govt. FTE per 10k	Census of Governments	2017
Govt. Total Revenue per 10k (log)	Census of Governments	2017

Rural Entrepreneurship Outcome

Our outcome is the Rural Entrepreneurship Index, a county-level composite [developed in related work](#) by the Center on Rural Innovation (Weinstein et al., forthcoming). The index draws from the entrepreneurship literature to calculate indicators across three dimensions that together capture what makes a rural entrepreneurship ecosystem. These dimensions include entrepreneurial capacity, measured through self-employment; business dynamism, measured through establishment entry and exit rates; and innovation and growth, measured through job creation, patent intensity, and venture capital intensity. The indicators are then combined using robust principal component analysis, which weights each by how strongly it co-varies with the dominant entrepreneurial pattern across counties while limiting the influence of extreme observations, which matters in a national sample that includes both major innovation hubs and very small rural counties. The resulting first principal component is the index score used as our primary outcome measure of entrepreneurship in this report.

Descriptive Statistics

Table A2. Descriptive statistics, rural and nonrural counties

Variable	Rural		Nonrural		Min	Max	Difference (t)
	Mean	SD	Mean	SD			
Natural Capital	0.02	0.23	-0.03	0.23	-0.57	3.06	5.82***
January Temperature (z-score)	-0.12	1.00	0.22	0.94	-2.63	2.81	-9.46***
January Sunlight (z-score)	0.05	1.01	-0.08	0.97	-3.12	3.45	3.49***
July Temperature (z-score)	-0.05	1.02	0.08	0.96	-2.86	6.50	-3.59***
July Humidity (z-score)	0.12	1.01	-0.21	0.95	-1.64	2.87	9.25***
Topographic Variation (z-score)	0.04	1.01	-0.07	0.99	-1.19	1.84	3.05**
Water Area (z-score)	-0.13	0.95	0.27	0.97	-2.35	2.37	-11.13***
Public / Protected Land (% of county)	14.44	22.89	10.19	16.29	0.00	99.10	6.05***
AQI Days with Good PM2.5	265.81	47.10	241.01	43.00	100.00	363.00	15.02***
Recreation Businesses per 10k	33.39	130.19	40.40	104.56	0.00	3390.64	-1.68+
Mean Elevation (m)	512.04	543.35	330.69	414.36	-0.12	3476.26	10.53***
FEMA Natural Hazard Risk Score	40.78	24.83	65.27	28.62	0.03	100.00	-24.43***
Distance to Coast (km)	448.39	316.13	287.79	275.39	0.05	1313.75	14.95***
Built Capital	-0.14	0.39	0.24	0.48	-1.40	5.75	-23.22***
% Population with Broadband ≥25/3 Mbps	0.50	0.28	0.69	0.25	0.00	1.00	-20.19***
% Population with Fiber Broadband	0.17	0.24	0.17	0.22	0.00	1.00	-0.01
Median Housing Age	44.60	10.54	38.49	10.55	15.00	77.00	15.97***

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Interstate & Arterial Highway Density	37.23	43.23	126.87	230.60	0.00	3275.42	-13.21***
Distance to Hub Airport (km)	253.56	160.70	145.84	119.62	3.18	1335.33	21.40***
Local Capital Spending per 10k (Highways + Utilities + Capital Outlays)	20226.29	35068.11	14116.33	13485.20	381.41	910706.44	6.90***
Cultural Capital	-0.08	0.35	0.12	0.52	-0.71	7.30	-11.87***
Museums per 10k	1.61	6.27	2.30	27.38	0.00	962.11	-0.87
Historical Sites per 10k	0.26	2.26	0.48	3.28	0.00	66.34	-2.07*
Arts & Entertainment Venues per 10k	2.36	9.53	7.48	16.51	0.00	262.30	-9.97***
Bohemian Index	0.49	0.38	0.70	0.39	0.00	4.10	-15.11***
Racial/Ethnic Diversity (Herfindahl)	0.28	0.18	0.34	0.19	0.00	0.78	-9.47***
% Non-English Spoken at Home	0.09	0.13	0.16	0.22	0.00	0.99	-9.45***
% Foreign Born	0.04	0.04	0.06	0.07	0.00	0.53	-11.81***
Public Library Outlets per 10k	2.41	3.00	0.78	0.97	0.00	36.32	22.34***
Social Capital	0.00	0.33	0.00	0.48	-1.01	9.06	-0.07
Religious Organizations per 10k	45.61	31.36	47.60	28.56	0.00	653.13	-1.85+
Civic Organizations per 10k	7.14	11.96	6.32	8.18	0.00	124.50	2.31*
Business Associations per 10k	2.34	5.60	2.63	8.88	0.00	202.11	-1.03
Professional Organizations per 10k	0.38	5.91	1.37	8.14	0.00	252.50	-3.76***
Sports Teams & Clubs per 10k	0.03	0.33	0.75	2.92	0.00	47.86	-8.66***
Nonprofits per 10k	65.55	38.08	51.76	49.71	0.00	1589.64	8.18***
% Born in State	0.69	0.15	0.60	0.21	0.00	0.95	13.30***
% Veterans	0.09	0.03	0.09	0.03	0.00	0.26	2.56*
Financial Capital	-0.04	0.40	0.07	0.38	-3.96	5.00	-7.60***
FDIC-Insured Banks per 10k	1.70	2.55	0.53	1.02	0.00	27.59	18.19***
FDIC Deposits per Capita (log)	1.87	1.55	1.58	1.41	0.00	9.15	5.46***
Community Bank Branches per 10k	4.15	3.72	1.65	1.52	0.00	32.33	26.12***

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CDFIs per 10k	0.07	0.44	0.03	0.12	0.00	8.95	4.47***
CDFI Lending per Capita (log)	1.25	1.85	1.72	1.75	0.00	8.99	-7.31***
SBA Total Loans per 10k (log, 2016-18)	1.18	0.80	1.44	0.70	0.00	4.45	-9.46***
Venture Capital Raised per Capita (log, 2016-18)	0.00	0.00	0.00	0.00	0.00	0.01	-4.26***
Median Household Income (log)	10.72	0.33	10.89	0.35	0.00	11.82	-13.61***
Median Home Value (log)	11.61	0.47	12.00	0.56	0.00	13.87	-20.32***
Human Capital	-0.13	0.58	0.20	0.59	-2.02	2.35	-15.23***
% Bachelor's Degree or Higher	0.19	0.07	0.26	0.11	0.00	0.79	-21.87***
Average Years of Schooling	12.70	0.57	13.02	0.66	9.17	15.33	-13.66***
Labor Force Participation Rate (25-64)	0.72	0.10	0.75	0.08	0.00	0.93	-9.71***
K-12 Reading Score (grade-cohort scale)	5.24	0.80	5.53	0.78	0.17	7.79	-10.04***
Adult Literacy Level 3+ (%)	0.38	0.11	0.44	0.11	0.00	0.77	-15.56***
% Children Enrolled in Preschool	0.01	0.01	0.01	0.00	0.00	0.05	-2.90**
Disability Rate (18-64)	0.14	0.05	0.12	0.04	0.02	0.35	12.35***
Life Expectancy	77.01	3.11	78.12	2.67	62.44	97.97	-10.41***
Median Age	42.30	5.49	39.66	4.72	21.70	67.00	14.49***
Higher-Ed Institutions per 10k	0.18	0.37	0.17	0.18	0.00	4.35	1.58
Political Capital	0.03	0.55	-0.04	0.43	-1.39	8.96	3.92***
Presidential Voter Turnout (avg)	0.58	0.12	0.58	0.09	0.04	2.89	0.12
Political Organizations per 10k	0.10	1.88	0.23	1.70	0.00	79.12	-1.98*
Labor Organizations per 10k	1.81	4.97	2.90	5.50	0.00	112.64	-5.72***
Govt. FTE per 10k	140.78	137.87	103.53	97.36	0.00	1674.32	8.67***
Govt. Total Revenue per 10k (log)	11.01	0.49	10.87	0.38	8.45	13.71	9.14***

Two-tailed Welch t-test of rural minus nonrural means. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, + $p < 0.1$. Indicators are shown before reverse coding. Capital scales retain their original coding. Min and Max cover both groups.

Although a full sample of U.S. counties is the goal, data coverage varies across the seven capitals, since component indicators carry different reporting requirements and suppression rules. Table A1 reports the number of counties available for each capital. We estimate models that include all seven capitals on counties with complete data across every capital, and we standardize the indices on this common sample so that a one-unit change means the same thing in every model.

Missing data does not fall randomly across counties. Suppression and non-reporting concentrate in the smallest and most remote rural places, and the same pattern holds for the entrepreneurship index, where roughly 95 percent of the counties dropped for incomplete data are rural (Weinstein et al., forthcoming). Our results describe rural counties large enough to appear in federal administrative data.

Modeling the Relationship between Community Capitals and Entrepreneurship

We begin by estimating the relationship between the community capitals and entrepreneurship using ordinary least squares (OLS) regressions as a baseline, including state fixed effects to absorb differences in policy, institutions, and economic structure that operate at the state level, and clustering errors by state. In practice, this means we are identifying our estimates by comparing counties within the same state rather than across state lines. We also control for county characteristics that shape entrepreneurship but are not accounted for by the community capitals themselves, including county population (logged), industry concentration (Herfindahl-Hirschman Index), pre-existing self-employment share, and distance (logged) to the nearest metropolitan area.¹ Models estimated on all counties also include an indicator for rural status, defined using the Office of Management and Budget's nonmetropolitan county classification. Because the capitals are interdependent, we enter all seven together, which isolates what each one contributes once the others are accounted for.

$$E_i = a + \sum_{k=1}^7 \beta_k C_{ki} + \chi_i' \gamma + \delta_{s(i)} + \varepsilon_i$$

where E_i is the entrepreneurship index score for county i , C_{ki} is that county's score on capital k , χ_i is a vector of controls, and $\delta_{s(i)}$ is a fixed effect for the state containing county i . We also run a version entering each capital on its own, which tells us how strongly that capital is associated with entrepreneurship overall, including any part that operates indirectly through another capital. We estimate both for all counties

¹ We measure this separately for metros above 50,000 and above 500,000 residents.

and then separately for rural and nonrural counties, to explore how the capitals behave differently across geographies.

Table A3 reports the correlations among the seven capital indices. Most are modestly positive, with human and financial capital the most strongly related. Natural capital is the exception. Its correlations with built, social, financial, and human capital are near zero or slightly negative in both rural and nonrural counties, which is consistent with it being a largely fixed geographic endowment rather than something a community builds up alongside its other assets. In rural counties, it moves more closely with cultural capital.

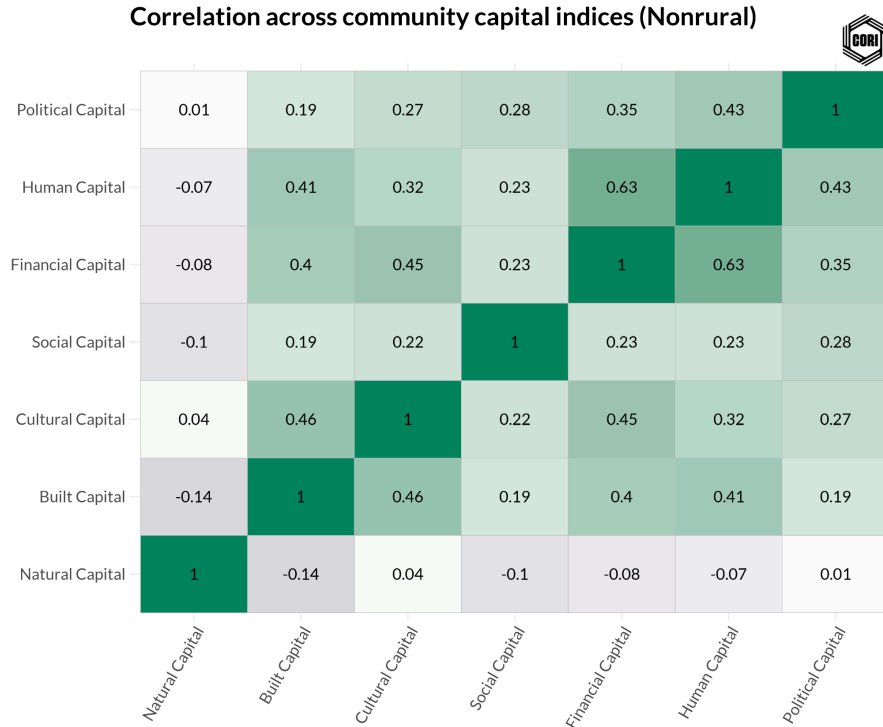
Table A3. Correlation across community capital indices

Correlation across community capital indices (Rural)



Political Capital	0.17	0.01	0.17	0.26	0.29	0.42	1
Human Capital	0	0.11	0.14	0.43	0.54	1	0.42
Financial Capital	-0.03	0.05	0.09	0.27	1	0.54	0.29
Social Capital	-0.08	0.06	-0.05	1	0.27	0.43	0.26
Cultural Capital	0.32	-0.09	1	-0.05	0.09	0.14	0.17
Built Capital	-0.03	1	-0.09	0.06	0.05	0.11	0.01
Natural Capital	1	-0.03	0.32	-0.08	-0.03	0	0.17
	Natural Capital	Built Capital	Cultural Capital	Social Capital	Financial Capital	Human Capital	Political Capital

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Entrepreneurship is not randomly distributed across space. Entrepreneurial activity is not perfectly confined to the county unit of analysis: business creation in one county has been shown to generate positive spillovers for growth in neighboring counties (Henderson & Weiler, 2010), and work applying the community capitals framework has found that capital stocks in surrounding counties are associated with local outcomes, sometimes more strongly than a county's own (Schmit et al., 2021). When counties this connected are treated as independent observations, as OLS assumes, the model understates uncertainty in the estimates and can bias the coefficients.

We test for this directly, and find substantial spatial autocorrelation in both entrepreneurship itself and in the residuals from our OLS models (Table A4). The diagnostics also tell us what kind of correction is needed. Under a queen contiguity weight matrix, where counties count as neighbors when they share a border, the test for a spatial lag is strongly significant while the test for spatially correlated errors is not. This suggests that a county's entrepreneurship moves with the entrepreneurship of neighboring counties, rather than reflecting an unmeasured factor that happens to be geographically clustered.

Table A4. Spatial autocorrelation diagnostics: Queen weights, by geography

Diagnostic	National	Rural	Nonrural
Moran's I (DV)	0.418***	0.367***	0.496***
Moran's I (residuals)	0.268***	0.263***	0.273***
Geary's C	0.565***	0.614***	0.474***
Anselin's LM-Lag Test	103.580***	33.190***	49.259***
Anselin's LM-Error Test	0.063	0.199	2.877+

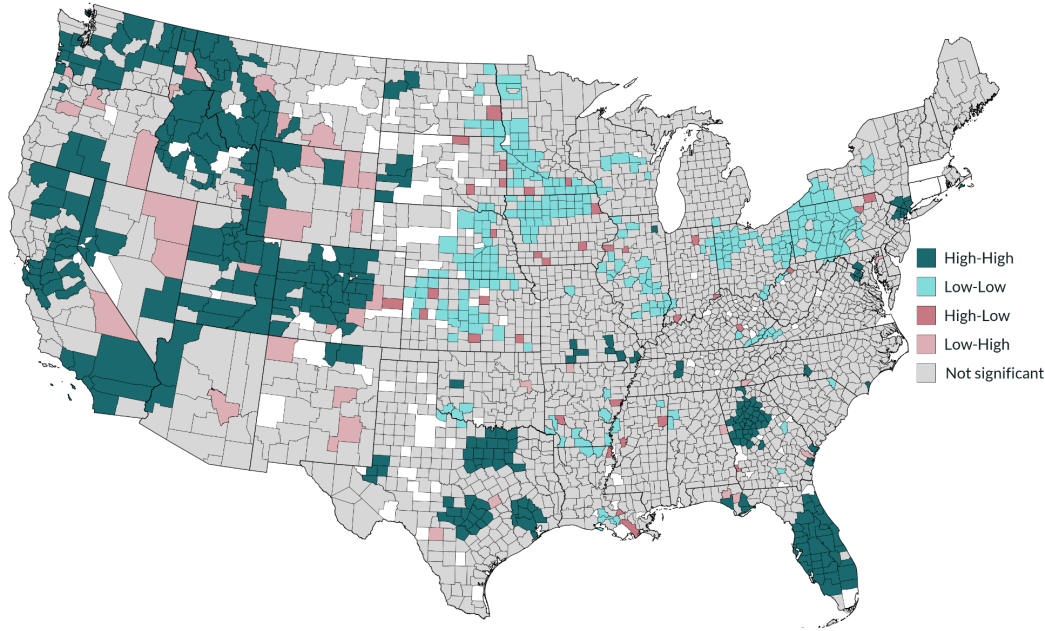
Moran's I *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, + $p < 0.1$

Figure A1 maps the spatial clusters our models correct for, showing where entrepreneurship runs high or low relative to surrounding counties. Counties are shaded according to whether they themselves are a high or low entrepreneurial county, relative to whether their neighbors are high or low entrepreneurial counties. Counties shaded as “high-high” sit in clusters of entrepreneurial activity, and “low-low” counties are in clusters where activity is limited. High-low counties show substantially more entrepreneurial activity than the counties around them, and vice versa for low-high counties. These outliers, particularly rural counties outperforming their neighbors, are the places national averages tend to obscure.

Figure A1. Entrepreneurship spatial clusters, all counties

Entrepreneurship Spatial Clusters: All Counties

Queen weights (LISA)



We therefore estimate a spatial lag model as our preferred specification, report inverse distance weighting as a robustness check, and keep state fixed effects, state-clustered errors, and the same controls throughout. There is no theoretical basis for preferring one definition of neighbors over another, so we check whether the results hold under an alternative (Anselin, 2002). Under inverse distance weighting, which weights nearby counties more heavily than distant ones, the signs are unchanged, and the same capitals remain significant.

$$E_i = a + \rho \sum_j W_{ij} E_j + \sum_{k=1}^7 \beta_k C_{ki} + \chi_i' \gamma + \delta_{s(i)} + \varepsilon_i$$

where the new term is the weighted average of entrepreneurship in county i 's neighbors, and ρ tells us how much of a county's entrepreneurial activity moves with that of its neighbors. Each coefficient represents the change in a county's entrepreneurship score associated with a one-standard-deviation increase in that capital, holding the other terms in the model constant. In the spatial models, these are direct associations and do not include the additional effect that flows through neighboring counties.

Regression Results

Tables A5 through A7 report our main results for all counties, rural, and nonrural counties, respectively. Each shows the OLS baseline alongside the spatial lag and spatial error specifications, to illustrate the effect of correcting for spatial dependence. We take the spatial lag column as our preferred estimates, for the reasons described above. Across all three samples, natural capital shows the strongest positive association with entrepreneurship, and political capital is consistently negative. Social capital is negative in all three samples but is significant only in the pooled sample and weakly so in rural counties. The findings for the other four capitals vary by geography. In nonrural counties, built, cultural, financial, and human capital are all positively and significantly associated with entrepreneurship. In rural counties, however, none of these four reach statistical significance. The pooled estimates for built and human capital therefore largely reflect nonrural counties.

Once we account for spatial dependence, most coefficients get smaller but the direction of each relationship stays the same. Natural capital's coefficient falls by roughly 30 percent in the pooled sample and 20 percent in rural counties between the OLS and spatial lag specifications, and cultural capital loses its marginal significance in the pooled sample. No other capital changes significance under the correction. The spatial parameter is 0.297 in the pooled sample, 0.203 in rural counties, and 0.149 in nonrural counties, suggesting that part of what OLS attributes to local capital endowments is associated with entrepreneurial activity in neighboring counties.

Table A5. Community capitals and entrepreneurship, all counties

Community Capitals Spatial Autoregressive Models: Queen weights			
Term	OLS	Lag	Error
Natural capital	0.775*** (0.145)	0.544*** (0.140)	0.562*** (0.158)
Built capital	0.224** (0.076)	0.177* (0.074)	0.238** (0.078)
Cultural capital	0.151+ (0.079)	0.109 (0.076)	0.118 (0.079)
Social capital	-0.205** (0.079)	-0.189* (0.076)	-0.200** (0.077)
Financial capital	0.138 (0.086)	0.106 (0.083)	0.072 (0.085)
Human capital	0.237*** (0.065)	0.222*** (0.062)	0.240*** (0.064)
Political capital	-0.265*** (0.059)	-0.239*** (0.057)	-0.226*** (0.057)

Appendix: Roots of Prosperity

Log Population '18	0.049 (0.036)	-0.002 (0.035)	-0.034 (0.036)
Log Dist. to MSA 50k+	0.098*** (0.029)	0.070* (0.028)	0.063* (0.030)
Log Dist. to MSA 500k+	-0.284*** (0.040)	-0.238*** (0.039)	-0.343*** (0.046)
Industry HHI '18	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Self-Emp. Share '13 (lag)	7.003*** (0.752)	6.616*** (0.722)	7.093*** (0.749)
Rural (1 = Rural)	-0.512*** (0.059)	-0.506*** (0.056)	-0.528*** (0.058)
ρ		0.297	
λ			0.318
State FE	Yes	Yes	Yes
AIC	9072.1	8942.5	8953.3
N	2,887	2,887	2,887

State fixed effects included.

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, + $p < 0.1$.

Table A6. Community capitals and entrepreneurship, rural counties

Rural Counties Community Capitals Spatial Autoregressive Models: Queen weights			
Term	OLS	Lag	Error
Natural capital	1.003*** (0.190)	0.806*** (0.184)	0.799*** (0.197)
Built capital	0.041 (0.097)	0.032 (0.094)	0.038 (0.098)
Cultural capital	0.002 (0.114)	-0.026 (0.110)	-0.033 (0.114)
Social capital	-0.222+ (0.117)	-0.213+ (0.113)	-0.214+ (0.115)
Financial capital	0.043 (0.102)	0.025 (0.099)	0.006 (0.101)
Human capital	-0.009 (0.089)	-0.003 (0.086)	0.000 (0.089)
Political capital	-0.225** (0.075)	-0.213** (0.072)	-0.204** (0.072)
ρ		0.203	
λ			0.205

Appendix: Roots of Prosperity

Controls	Yes	Yes	Yes
State FE	Yes	Yes	Yes
AIC	5801.1	5757.5	5764.0
N	1,795	1,795	1,795

State fixed effects included; OLS contains state clustered SEs

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, + $p < 0.1$

Table A7. Community capitals and entrepreneurship, nonrural counties

Nonrural Counties Community Capitals Spatial Autoregressive Models: Queen weights			
Term	OLS	Lag	Error
Natural capital	0.493* (0.218)	0.462* (0.209)	0.483* (0.222)
Built capital	0.517*** (0.120)	0.482*** (0.116)	0.560*** (0.120)
Cultural capital	0.225* (0.106)	0.204* (0.102)	0.209* (0.103)
Social capital	-0.134 (0.101)	-0.129 (0.097)	-0.152 (0.098)
Financial capital	0.420* (0.163)	0.369* (0.157)	0.335* (0.159)
Human capital	0.401*** (0.094)	0.416*** (0.091)	0.413*** (0.091)
Political capital	-0.490*** (0.100)	-0.479*** (0.096)	-0.465*** (0.095)
ρ		0.149	
λ			0.149
Controls	Yes	Yes	Yes
State FE	Yes	Yes	Yes
AIC	3093.9	3073.8	3080.0
N	1,092	1,092	1,092

State fixed effects included; OLS contains state clustered SEs

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, + $p < 0.1$

Appendix: Roots of Prosperity

The community capitals framework holds that capitals reinforce one another, which implies that what one capital contributes may depend on the level of another. We test this directly with interaction terms between pairs of capitals, reported in Tables A8 and A9. The clearest case is human and cultural capital, which is positive and significant in both rural and nonrural counties and improves model fit in each. In nonrural counties, cultural capital's own coefficient loses significance once the interaction is included, which suggests much of its apparent standalone association runs through an educated workforce. The other two pairings differ by geography. Social and cultural capital reinforce each other in rural counties and only marginally in nonrural counties. Built and financial capital reinforce each other in nonrural counties but show no interaction in rural counties. Adding these terms improves model fit over the base specification in most cases, which provides more evidence that the capitals do not act independently of one another.

Table A8. Community capitals spatial autoregressive models: interactions, rural counties

Term	Model 1	Model 2	Model 3	Model 4
Natural capital	0.806*** (0.184)	0.705*** (0.188)	0.802*** (0.184)	0.783*** (0.184)
Built capital	0.032 (0.094)	0.017 (0.094)	0.032 (0.094)	0.022 (0.094)
Cultural capital	-0.026 (0.110)	-0.013 (0.110)	-0.028 (0.110)	-0.002 (0.111)
Social capital	-0.213+ (0.113)	-0.226* (0.113)	-0.212+ (0.113)	-0.210+ (0.113)
Financial capital	0.025 (0.099)	0.022 (0.099)	0.040 (0.101)	0.023 (0.099)
Human capital	-0.003 (0.086)	-0.008 (0.086)	-0.005 (0.086)	-0.011 (0.086)
Political capital	-0.213** (0.072)	-0.204** (0.072)	-0.210** (0.073)	-0.202** (0.073)
Human * Cultural		0.400** (0.145)		
Built * Financial			0.118 (0.183)	
Social * Cultural				0.509* (0.253)
p	0.203	0.200	0.204	0.202
Controls	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
AIC	5757.5	5751.9	5759.1	5755.5
N	1,795	1,795	1,795	1,795

*State fixed effects included. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, + $p < 0.1$*

Appendix: Roots of Prosperity

Table A9. Community capitals spatial autoregressive models: interactions, nonrural counties

Term	Model 1	Model 2	Model 3	Model 4
Natural capital	0.462* (0.209)	0.461* (0.208)	0.429* (0.208)	0.472* (0.209)
Built capital	0.482*** (0.116)	0.441*** (0.116)	0.400*** (0.118)	0.463*** (0.117)
Cultural capital	0.204* (0.102)	0.078 (0.107)	0.124 (0.104)	0.196+ (0.102)
Social capital	-0.129 (0.097)	-0.147 (0.097)	-0.152 (0.097)	-0.233* (0.115)
Financial capital	0.369* (0.157)	0.252 (0.159)	0.186 (0.165)	0.366* (0.156)
Human capital	0.416*** (0.091)	0.387*** (0.090)	0.423*** (0.090)	0.420*** (0.090)
Political capital	-0.479*** (0.096)	-0.493*** (0.096)	-0.499*** (0.096)	-0.481*** (0.096)
Human * Cultural		0.402*** (0.111)		
Built * Financial			0.688*** (0.198)	
Social * Cultural				0.296+ (0.173)
ρ	0.149	0.149	0.147	0.149
Controls	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
AIC	3073.8	3062.7	3063.8	3072.8
N	1,092	1,092	1,092	1,092

*State fixed effects included. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, + $p < 0.1$*

Table A10 reports all 21 pairwise interactions for rural counties and nonrural counties, each estimated in the full seven-capital model. Nine are significant at conventional levels ($p < 0.05$) in rural counties, well beyond what chance alone would produce across that many tests. In nonrural counties, three are significant.

Table A10, Panel A. Pairwise capital interactions, rural counties

Pairwise Capital Interactions — Significance (Rural) DV: Entrepreneurship Index (2023)				
Capital_1	Capital_2	Estimate	p_value	Significant
Natural	Financial	2.191	0.0000	***
Natural	Political	1.316	0.0007	***
Built	Political	-0.399	0.0019	**
Cultural	Social	0.739	0.0047	**
Natural	Social	1.674	0.0056	**
Cultural	Human	0.577	0.0066	**
Natural	Human	0.925	0.0185	*
Social	Human	-0.624	0.0243	*
Built	Cultural	0.683	0.0250	*
Social	Financial	-0.900	0.0636	.
Natural	Cultural	0.672	0.1220	
Cultural	Financial	0.477	0.1887	
Financial	Political	-0.364	0.1956	
Built	Social	-0.349	0.2030	
Cultural	Political	0.250	0.3840	
Financial	Human	-0.093	0.5847	
Built	Human	-0.105	0.6107	
Built	Financial	0.109	0.6310	
Natural	Built	0.245	0.6724	
Social	Political	0.056	0.8243	
Human	Political	-0.029	0.8490	

*Each row: full 7-capital model + one interaction. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, . $p < 0.1$. State FE, SEs clustered by state.*

Table A10, Panel B. Pairwise capital interactions, nonrural counties

Pairwise Capital Interactions — Significance (Nonrural) DV: Entrepreneurship Index (2023)				
Capital_1	Capital_2	Estimate	p_value	Significant
Cultural	Social	0.480	0.0173	*
Built	Cultural	0.556	0.0465	*
Built	Financial	0.591	0.0498	*
Built	Social	0.412	0.0720	.
Built	Human	0.326	0.0758	.
Social	Political	0.306	0.1134	
Natural	Cultural	-0.758	0.1147	
Cultural	Human	0.258	0.1192	
Cultural	Financial	0.355	0.1258	
Social	Financial	0.270	0.2549	
Cultural	Political	0.238	0.2760	
Natural	Built	-0.581	0.3005	
Human	Political	0.172	0.3412	
Natural	Human	0.318	0.4230	
Financial	Human	0.154	0.4678	
Financial	Political	0.224	0.5680	
Natural	Social	0.212	0.6710	
Natural	Financial	0.257	0.7036	
Social	Human	-0.074	0.7561	
Built	Political	-0.040	0.8976	
Natural	Political	0.045	0.9486	

Each row: full 7-capital model + one interaction. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, . $p < 0.1$. State FE, SEs clustered by state.

Table A11. Indicator-level regressions by capital, rural counties and nonrural counties

Panel A: Natural capital indicators DV: Entrepreneurship Index (2023)		
	Rural	Nonrural
January Temperature (z-score)	0.135 (0.159)	0.002 (0.194)
January Sunlight (z-score)	-0.051 (0.106)	0.191+ (0.105)
July Temperature (z-score, reverse-coded)	-0.214* (0.095)	-0.246** (0.086)
July Humidity (z-score, reverse-coded)	-0.338+ (0.179)	-0.294* (0.129)
Topographic Variation (z-score)	0.172** (0.063)	-0.091+ (0.048)
Water Area (z-score)	0.226*** (0.061)	0.030 (0.035)
AQI Days with Good PM2.5	-0.003 (0.002)	-0.002 (0.002)
Recreation Businesses per 10k	-0.000 (0.000)	0.000 (0.001)
Public / Protected Land (% of county)	0.003 (0.003)	0.015*** (0.004)
Mean Elevation (m)	0.000 (0.000)	-0.001* (0.000)
FEMA Natural Hazard Risk Score (rev)	-0.001 (0.003)	0.009* (0.003)
Distance to Coast (km, rev)	0.000 (0.000)	0.000 (0.000)
(Control) Log Population '18	-0.393** (0.124)	0.410*** (0.097)
(Control) Log Dist. to MSA 50k+	-0.085 (0.060)	0.212*** (0.041)
(Control) Log Dist. to MSA 500k+	-0.120 (0.096)	-0.311*** (0.061)
(Control) Industry HHI '18	-0.000 (0.000)	0.000+ (0.000)
(Control) Self-Emp. Share '13 (lag)	5.271***	13.193***

Appendix: Roots of Prosperity

	(1.409)	(1.970)
N	1844	1167
State FE	✓	✓
R ²	0.38	0.52

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

State fixed effects included; SEs clustered by state

Panel B: Human capital indicators DV: Entrepreneurship Index (2023)

	Rural	Nonrural
Higher-Ed Institutions per 10k	-0.322*** (0.083)	-1.154*** (0.251)
% Bachelor's Degree or Higher	3.118* (1.472)	1.439 (1.192)
Average Years of Schooling	-0.148 (0.246)	0.098 (0.219)
Labor Force Participation Rate (25-64)	-2.197** (0.695)	-2.020* (0.852)
K-12 Reading Score (grade-cohort scale)	-0.158 (0.097)	-0.193+ (0.097)
Adult Literacy Level 3+ (%)	2.373+ (1.314)	1.252 (1.824)
% Children Enrolled in Preschool	-17.679** (5.900)	13.669 (11.267)
Disability Rate (18-64) (reverse-coded)	-1.548 (1.690)	1.234 (1.495)
Life Expectancy	0.013 (0.026)	0.080* (0.035)
Median Age	0.026+ (0.015)	0.002 (0.011)
(Control) Log Population '18	-0.091 (0.074)	0.179*** (0.048)
(Control) Log Dist. to MSA 50k+	-0.027 (0.043)	0.206*** (0.037)
(Control) Log Dist. to MSA 500k+	-0.194* (0.086)	-0.266*** (0.050)
(Control) Industry HHI '18	0.000 (0.000)	0.000 (0.000)
(Control) Self-Emp. Share '13 (lag)	5.118**	8.550***

Appendix: Roots of Prosperity

	(1.562)	(1.992)
N	1838	1173
State FE	✓	✓
R ²	0.38	0.55

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

State fixed effects included; SEs clustered by state

Panel C: Cultural capital indicators DV: Entrepreneurship Index (2023)

	Rural	Nonrural
Public Library Outlets per 10k	-0.009 (0.034)	0.050 (0.073)
Museums per 10k	0.005 (0.004)	-0.002*** (0.000)
Historical Sites per 10k	-0.001 (0.006)	-0.010 (0.016)
Arts & Entertainment Venues per 10k	0.007+ (0.004)	0.001 (0.002)
Bohemian Index	0.270+ (0.157)	0.268* (0.128)
Racial/Ethnic Diversity (Herfindahl)	-0.400 (0.471)	0.768+ (0.448)
% Non-English Spoken at Home	-1.468** (0.542)	-1.885* (0.826)
% Foreign Born	0.786 (1.356)	5.160** (1.645)
(Control) Log Population '18	-0.350** (0.119)	0.131* (0.055)
(Control) Log Dist. to MSA 50k+	-0.084 (0.065)	0.270*** (0.047)
(Control) Log Dist. to MSA 500k+	-0.159+ (0.093)	-0.303*** (0.060)
(Control) Industry HHI '18	-0.000 (0.000)	0.000 (0.000)
(Control) Self-Emp. Share '13 (lag)	5.690*** (1.496)	11.664*** (2.234)
N	1868	1174
State FE	✓	✓
R ²	0.35	0.52

Appendix: Roots of Prosperity

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

State fixed effects included; SEs clustered by state

Panel D: Social capital indicators DV: Entrepreneurship Index (2023)

	Rural	Nonrural
Religious Organizations per 10k	-0.006*** (0.002)	-0.005** (0.002)
Civic Organizations per 10k	-0.010** (0.003)	-0.009 (0.006)
Business Associations per 10k	0.024*** (0.007)	-0.000 (0.006)
Professional Organizations per 10k	0.000 (0.001)	0.005* (0.002)
Sports Teams & Clubs per 10k	0.184** (0.065)	0.040* (0.015)
Nonprofits per 10k	0.006** (0.002)	0.000 (0.001)
% Born in State	-1.700*** (0.376)	-1.965*** (0.425)
% Veterans	7.700*** (1.332)	0.333 (1.727)
(Control) Log Population '18	-0.242* (0.115)	0.209** (0.061)
(Control) Log Dist. to MSA 50k+	-0.085 (0.063)	0.236*** (0.044)
(Control) Log Dist. to MSA 500k+	-0.151+ (0.084)	-0.296*** (0.062)
(Control) Industry HHI '18	-0.000 (0.000)	0.000 (0.000)
(Control) Self-Emp. Share '13 (lag)	4.218** (1.437)	12.084*** (2.029)
N	1869	1174
State FE	✓	✓
R ²	0.39	0.53

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

State fixed effects included; SEs clustered by state

Appendix: Roots of Prosperity

Panel E: Built capital indicators DV: Entrepreneurship Index (2023)

	Rural	Nonrural
% Population with Broadband $\geq 25/3$ Mbps	-0.142 (0.172)	-0.403* (0.175)
% Population with Fiber Broadband	-0.291 (0.180)	0.445* (0.211)
Median Housing Age (reverse-coded)	0.053*** (0.006)	0.043*** (0.006)
Interstate & Arterial Highway Density	0.001 (0.001)	0.001*** (0.000)
Distance to Hub Airport (km, reverse-coded)	-0.001 (0.000)	0.001 (0.001)
Local Capital Spending per 10k (Highways + Utilities + Capital Outlays)	-0.000 (0.000)	0.000 (0.000)
(Control) Log Population '18	-0.518*** (0.103)	0.166** (0.050)
(Control) Log Dist. to MSA 50k+	-0.144* (0.059)	0.147*** (0.032)
(Control) Log Dist. to MSA 500k+	-0.218** (0.073)	-0.220*** (0.058)
(Control) Industry HHI '18	-0.000 (0.000)	0.000+ (0.000)
(Control) Self-Emp. Share '13 (lag)	6.524*** (1.324)	12.023*** (2.102)
N	1865	1168
State FE	✓	✓
R ²	0.39	0.56

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

State fixed effects included; SEs clustered by state

Panel F: Financial capital indicators DV: Entrepreneurship Index (2023)

	Rural	Nonrural
FDIC-Insured Banks per 10k	-0.069+ (0.034)	0.071 (0.051)
FDIC Deposits per Capita (log)	-0.000 (0.033)	-0.083** (0.027)
Community Bank Branches per 10k	-0.033	-0.011

Appendix: Roots of Prosperity

	(0.023)	(0.048)
CDFIs per 10k	0.045	0.074
	(0.081)	(0.265)
CDFI Lending per Capita (log)	0.048*	0.039+
	(0.021)	(0.023)
SBA Total Loans per 10k (log, 2016-18)	-0.049	0.164
	(0.056)	(0.128)
Venture Capital Raised per Capita (log, 2016-18)	138.937	336.954***
	(236.079)	(64.497)
Median Household Income (log)	-0.220	0.088
	(0.206)	(0.428)
Median Home Value (log)	1.228***	1.227***
	(0.200)	(0.307)
(Control) Log Population '18	-0.534***	0.072
	(0.102)	(0.049)
(Control) Log Dist. to MSA 50k+	-0.089+	0.188***
	(0.051)	(0.036)
(Control) Log Dist. to MSA 500k+	-0.118	-0.240***
	(0.079)	(0.058)
(Control) Industry HHI '18	0.000	0.000**
	(0.000)	(0.000)
(Control) Self-Emp. Share '13 (lag)	5.840***	6.594***
	(1.252)	(1.556)
N	1858	1168
State FE	✓	✓
R ²	0.41	0.57

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

State fixed effects included; SEs clustered by state

Panel G: Political capital indicators DV: Entrepreneurship Index (2023)

	Rural	Nonrural
Labor Organizations per 10k	-0.020**	-0.039***
	(0.006)	(0.010)
Presidential Voter Turnout (avg)	1.625+	1.772*
	(0.861)	(0.774)
Political Organizations per 10k	-0.014**	-0.021+
	(0.004)	(0.012)
Govt. FTE per 10k	0.000	-0.001

Appendix: Roots of Prosperity

	(0.000)	(0.001)
Govt. Total Revenue per 10k (log)	-0.266+	-0.095
	(0.147)	(0.129)
(Control) Log Population '18	-0.268*	0.303***
	(0.104)	(0.040)
(Control) Log Dist. to MSA 50k+	-0.106	0.206***
	(0.066)	(0.037)
(Control) Log Dist. to MSA 500k+	-0.086	-0.289***
	(0.088)	(0.055)
(Control) Industry HHI '18	-0.000	0.000*
	(0.000)	(0.000)
(Control) Self-Emp. Share '13 (lag)	4.553**	10.978***
	(1.508)	(2.133)
N	1829	1100
State FE	✓	✓
R ²	0.34	0.52

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

State fixed effects included; SEs clustered by state

Robustness Checks

We test how the results hold up under alternative specifications and measures. These supplementary analyses, including the indicator-level breakouts reported for individual capitals, are estimated by OLS with state fixed effects and errors clustered by state rather than by the spatial lag specification we prefer for the main models. They are diagnostic rather than confirmatory, and we read them for the direction and relative precision of individual indicators rather than for the size of any single coefficient.

We report population-weighted models in Tables A12 and A13 for rural and nonrural counties, respectively. Each table shows the weighted and unweighted version for comparison, as recommended by Solon, Haider, and Wooldridge (2015). Large differences between these two approaches could signal either misspecification or a relationship that genuinely differs by county size. As shown, weighting shifts the magnitude of most coefficients, but changes significance in only a handful of cases, all of them in nonrural counties. Natural, cultural, social, and financial capital each become significant once nonrural counties are population-weighted, while human capital no longer is. In rural counties, natural and political capital remain significant with and without population weights, and the other five capitals remain insignificant

at conventional levels, though built and social capital become marginally significant once weighted.

Table A12. Population-weighted model, rural counties

	Unweighted	Population-weighted
Natural capital	1.003** (0.319)	1.029*** (0.278)
Built capital	0.041 (0.164)	0.264+ (0.137)
Cultural capital	0.002 (0.125)	0.064 (0.144)
Social capital	-0.222 (0.136)	-0.424+ (0.222)
Financial capital	0.043 (0.108)	0.175 (0.124)
Human capital	-0.009 (0.132)	0.113 (0.127)
Political capital	-0.225*** (0.057)	-0.250** (0.074)
Log Population '18	-0.115 (0.085)	0.009 (0.080)
Log Dist. to MSA 50k+	-0.072 (0.044)	0.001 (0.030)
Log Dist. to MSA 500k+	-0.163 (0.108)	-0.093 (0.080)
Industry HHI '18	0.000 (0.000)	0.000 (0.000)
Self-Emp. Share '13 (lag)	6.705*** (1.308)	8.458*** (1.219)
N	1793	1793
State FE	✓	✓
R ²	0.35	0.45

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Weight = county population (PEP 2018). State fixed effects included. SEs clustered by state.

Table A13. Population-weighted model, nonrural counties

	Unweighted	Population-weighted
Natural capital	0.493+	0.566**
	(0.283)	(0.193)
Built capital	0.517**	0.638***
	(0.177)	(0.151)
Cultural capital	0.225	0.366**
	(0.180)	(0.109)
Social capital	-0.134	-0.256*
	(0.096)	(0.101)
Financial capital	0.420+	0.457***
	(0.213)	(0.118)
Human capital	0.401***	0.341
	(0.103)	(0.232)
Political capital	-0.490***	-0.425***
	(0.111)	(0.101)
Log Population '18	0.013	0.152+
	(0.052)	(0.076)
Log Dist. to MSA 50k+	0.208***	0.214***
	(0.043)	(0.045)
Log Dist. to MSA 500k+	-0.245***	-0.173***
	(0.057)	(0.039)
Industry HHI '18	0.000	0.000
	(0.000)	(0.000)
Self-Emp. Share '13 (lag)	6.462**	4.319*
	(1.910)	(1.913)
N	1092	1092
State FE	✓	✓
R ²	0.55	0.79

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Weight = county population (PEP 2018). State fixed effects included. SEs clustered by state.

We also add controls for agricultural, mining, and manufacturing employment shares. Natural capital is the only capital that loses significance in all three samples, with its rural OLS coefficient falling from 1.00 to 0.54 in rural counties. Human capital loses significance in the pooled sample, while social capital moves in the

opposite direction, strengthening in all three samples, and financial capital becomes significant in nonrural counties. Leaving built, cultural, and political capital unchanged.

The community capitals framework suggests that balance across the capitals should matter, not just their overall level, so we replace the seven indices with a measure of a county's average capital portfolio (Table A14). We use the mean of a county's seven capital scores to capture its overall level and the standard deviation across them to capture how unevenly they are distributed. Across all counties, a higher average across the seven capitals is associated with less entrepreneurship, while a wider spread across them is associated with more. In nonrural counties, the average shows no association, and the spread remains positive and significant.

A third specification replaces both measures with a county's single lowest capital score. That measure is negative and significant in every sample, and it produces the best model fit of the three. Taken together, these results provide more nuanced results of how the community capitals work across communities. Holding the overall level constant, unevenness across the capitals is associated with more entrepreneurship, not less, which suggests specialization does more than balance. But a county's weakest capital still drags on entrepreneurship independently.

Appendix: Roots of Prosperity

Table A14, Panel A. Community capitals as a portfolio, all counties

Community Capitals as a Portfolio DV: Entrepreneurship Index (2023)			
	Mean only	Balance (Mean+SD)	Weakest link (Min)
Mean of 7 capitals (total stock)	-0.524	-0.852*	
	(0.399)	(0.414)	
SD of 7 capitals (imbalance)		0.982***	
		(0.235)	
Min of 7 capitals (weakest link)			-0.825***
			(0.225)
(Control) Log Population '18	0.345***	0.358***	0.355***
	(0.059)	(0.059)	(0.046)
(Control) Log Dist. to MSA 50k+	0.214***	0.197***	0.189***
	(0.051)	(0.050)	(0.050)
(Control) Log Dist. to MSA 500k+	-0.163*	-0.158*	-0.162*
	(0.064)	(0.062)	(0.061)
(Control) Industry HHI '18	0.000**	0.000*	0.000*
	(0.000)	(0.000)	(0.000)
(Control) Self-Emp. Share '13 (lag)	11.671***	12.137***	12.216***
	(1.760)	(1.710)	(1.838)
(Control) Rural (1 = Rural)	-0.687***	-0.686***	-0.692***
	(0.097)	(0.096)	(0.095)
Constant	-4.916***	-5.213***	-5.073***
	(1.218)	(1.198)	(1.125)
N	2887	2887	2887
R ²	0.157	0.166	0.170
AIC	10013.6	9986.9	9967.9
BIC	10061.3	10040.6	10015.7

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

State fixed effects included. SEs clustered by state.

Table A14, Panel B. Community capitals as a portfolio, rural counties

Community Capitals as a Portfolio (Rural) DV: Entrepreneurship Index (2023)			
	Mean only	Balance (Mean+SD)	Weakest link (Min)
Mean of 7 capitals (total stock)	-0.972+	-1.121*	
	(0.513)	(0.527)	
SD of 7 capitals (imbalance)		0.541+	
		(0.269)	
Min of 7 capitals (weakest link)			-0.745**
			(0.264)
(Control) Log Population '18	0.124	0.151	0.158+
	(0.091)	(0.093)	(0.093)
(Control) Log Dist. to MSA 50k+	0.020	0.021	0.017
	(0.061)	(0.060)	(0.060)
(Control) Log Dist. to MSA 500k+	-0.004	-0.010	-0.039
	(0.103)	(0.100)	(0.097)
(Control) Industry HHI '18	0.000*	0.000*	0.000*
	(0.000)	(0.000)	(0.000)
(Control) Self-Emp. Share '13 (lag)	9.245***	9.614***	9.060***
	(1.801)	(1.752)	(1.846)
Constant	-2.859	-3.255+	-2.988
	(1.892)	(1.910)	(1.836)
N	1795	1795	1795
R ²	0.070	0.073	0.072
AIC	6353.2	6349.9	6349.4
BIC	6391.6	6393.8	6387.9

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

State fixed effects included. SEs clustered by state.

Table A14, Panel C. Community capitals as a portfolio, nonrural counties

Community Capitals as a Portfolio (Nonrural) DV: Entrepreneurship Index (2023)			
	Mean only	Balance (Mean+SD)	Weakest link (Min)
Mean of 7 capitals (total stock)	0.040	-0.410	
	(0.311)	(0.348)	
SD of 7 capitals (imbalance)		1.188**	
		(0.411)	
Min of 7 capitals (weakest link)			-0.821**
			(0.243)
(Control) Log Population '18	0.391***	0.389***	0.438***
	(0.059)	(0.060)	(0.041)
(Control) Log Dist. to MSA 50k+	0.374***	0.346***	0.348***
	(0.065)	(0.067)	(0.065)
(Control) Log Dist. to MSA 500k+	-0.171**	-0.167**	-0.181**
	(0.059)	(0.058)	(0.057)
(Control) Industry HHI '18	0.000*	0.000	0.000
	(0.000)	(0.000)	(0.000)
(Control) Self-Emp. Share '13 (lag)	20.041***	20.219***	21.372***
	(2.837)	(2.826)	(2.784)
Constant	-7.794***	-7.754***	-8.181***
	(1.389)	(1.339)	(1.278)
N	1092	1092	1092
R ²	0.256	0.267	0.270
AIC	3536.2	3521.5	3515.5
BIC	3571.2	3561.4	3550.5

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

State fixed effects included. SEs clustered by state.

Because our social capital index draws on organizational density and residential stability, we test measures built on a different foundation. Chetty et al. (2022) separate connections across social divides from network closure and civic engagement. In rural counties, the closure measures carry the negative association most clearly, with the support ratio strongly negative in both specifications and clustering negative but weaker (Table A15). Connections across social divides are negative on their own and indistinguishable from zero once the other capitals are included. The civic engagement measures split, with Chetty's count of civic organizations positively associated with entrepreneurship and volunteering showing no relationship. The pattern points to network closure rather than to social capital as a whole, though it does not line up cleanly with our own indicator-level results, where civic organizations are negatively associated.

Table A15. Robustness: Chetty social capital indicators

Rural: Social capital replaced by Chetty measures		
DV: Entrepreneurship Index (2023)		
	Chetty measures only	All
Economic Connectedness (Chetty)	-0.871+	-0.028
	(0.446)	(0.428)
Clustering (Chetty)	-6.638+	-4.448
	(3.502)	(3.376)
Civic Organizations (Chetty)	19.628**	19.287**
	(5.911)	(5.758)
Volunteering Rate (Chetty)	0.590	0.761
	(0.923)	(0.862)
Support Ratio (Chetty)	-54.968***	-60.202***
	(10.739)	(10.073)
Natural capital		1.073***
		(0.271)
Built capital		-0.009
		(0.152)
Cultural capital		-0.046
		(0.093)
Financial capital		0.122
		(0.122)
Human capital		-0.402**
		(0.119)
Political capital		-0.182***
		(0.050)
(Control) Log Population '18	-0.206**	-0.084
	(0.072)	(0.069)
(Control) Log Dist. to MSA 50k+	0.024	0.012
	(0.039)	(0.039)
(Control) Log Dist. to MSA 500k+	-0.084	-0.020
	(0.098)	(0.092)
(Control) Industry HHI '18	0.000	0.000
	(0.000)	(0.000)
(Control) Self-Emp. Share '13 (lag)	6.291***	5.771***
	(1.429)	(1.325)
N	1812	1775
State FE	✓	✓
R ²	0.39	0.40

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

State fixed effects included. SEs clustered by state.

We also estimate the models on alternative measures of entrepreneurship, including self-employment, job creation, and business entry rates. Natural capital remains the strongest predictor across all three. Social capital's negative relationship holds for business entry and job creation but reverses for self-employment. Overall, the main patterns hold across outcome measures, with social capital as the main exception. These tables are not reported but are available upon request.