Which Community Capitals Drive Rural Entrepreneurship? Evidence from U.S. Counties

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Extended Abstract
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Motivation

Entrepreneurship varies dramatically across U.S. counties. This variation exists against a backdrop of decades-long decline in U.S. business dynamism, evident across industries, regions, and firm size classes (Decker et al., 2016; Hathaway & Litan, 2014). Traditional export-sector development strategies have not reversed this trend in rural areas (Kilkenny & Partridge, 2009). While a growing body of empirical work examines individual dimensions of place - such as access to capital, broadband availability, or human capital - few studies integrate these dimensions into a unified framework or link them jointly to entrepreneurship outcomes. This limits our understanding of why some rural communities generate new businesses while structurally similar ones do not. It also limits our ability to design effective interventions.

The Community Capitals Framework (CCF) (Emery & Flora, 2006; Flora & Flora, 2008; Flora, Flora, & Gasteyer, 2018) decomposes "place" into seven distinct asset categories: natural, cultural, human, social, political, financial, and built capital. This framework is

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widely used in community development research but has had limited uptake in economics. Prior empirical applications have used a range of approaches to index construction, qualitative case studies, and outcome measures that vary in scope. To our knowledge, no study to date has linked all seven capitals to a comprehensive, multidimensional measure of entrepreneurship with explicit attention to rural-nonrural differences.

Contribution and Approach

We estimate the association between community capitals and entrepreneurship across U.S. counties, with attention to how these relationships differ between rural and nonrural places. The paper makes four contributions. First, we use a novel entrepreneurship index developed by the Center on Rural Innovation (Weinstein et al., 2026) that captures the rate, scale, and scope of new business formation. This improves on single-indicator measures like establishment births or self-employment rates, which miss important dimensions of local entrepreneurial ecosystems.

Second, we construct county-level indices for all seven community capitals using principal component analysis (PCA). This directly addresses a methodological gap in the existing CCF literature. Taylor et al. (2025) construct indices by averaging z-scores across indicators within each capital. We build on this approach by using factor analysis to assess dimensionality and account for differential weighting across indicators, anticipating the use of PCA following Schmit et al. (2021) and Jablonski et al. (2023).

Third, we examine rural-nonrural heterogeneity as a central research question rather than a secondary check. Prior CCF studies either pool all counties or focus exclusively on rural areas without a comparison group. Even in models focused on nonmetro counties, Taylor et al. (2025) find that community capitals leave a substantial share of variation in economic outcomes unexplained. Understanding which capitals matter differently for rural versus nonrural entrepreneurship has direct implications for policy design.

Fourth, we explore how the relationship between community capitals and entrepreneurship varies across demographic dimensions, including racial and ethnic composition and income distribution. Existing quantitative CCF studies have largely focused on rural-nonrural differences rather than variation across demographic dimensions. Yet structural barriers to entrepreneurship — including differential access to capital, networks, and institutional support — vary systematically by race, ethnicity, and income (Fairlie & Robb, 2010; Bates, 2011). If the relationship between community capitals and entrepreneurship differs across demographic groups, place-based policies that ignore this variation risk reinforcing existing disparities rather than addressing them.

Relationship to the Literature

The paper draws on two literatures that have developed largely in parallel. The entrepreneurship ecosystem literature (Isenberg, 2010; Stam, 2015; Spigel, 2017; Roundy, 2017; Stam & van de Ven, 2021) identifies place-based conditions that support new business formation but lacks a unified empirical framework for measuring those conditions at scale across communities. In the economics literature, Glaeser, Kerr, and Kerr (2015) and Chatterji, Glaeser, and Kerr (2014) establish that place-based conditions such as human capital, industry structure, and local entrepreneurial supply shape spatial variation in new firm formation, but these studies focus primarily on metropolitan areas and do not draw on a unified framework linking multiple community-level assets. The CCF (Flora & Flora, 2008; Flora, Flora, & Gasteyer, 2018) offers a systematic approach to measuring these conditions but has operated largely outside the economics literature. Recent quantitative applications include Schmit et al. (2021), who link PCA-based capital indices to food system outcomes across metro and nonmetro counties, and Jablonski et al. (2023), who estimate the relationship between capital stocks and value-added food and agriculture sector growth using similar methods and the National Establishment Time Series (NETS) data. Taylor et al. (2025) is the closest predecessor. They estimate all seven capitals against county-level economic growth outcomes, including job growth, population change, and per capita income growth, across 1,442 counties from 2010 to 2019, finding heterogeneous associations that differ between

metro and nonmetro subsamples. Our study focuses specifically on entrepreneurship, allowing for more targeted policy implications.

We build on this literature in four ways: a richer and more comprehensive entrepreneurship outcome, systematic index construction, explicit rural-nonrural comparison, and examination of demographic heterogeneity within a single empirical framework.

Data and Methods

Outcome variable. Our dependent variable is the *Entrepreneurship Index,* a county-level composite constructed from a series of indicators using principal component analysis (Weinstein, Dewbury, Elliott, Gonzalez, Hall, & Rosebush, 2026). It captures multiple dimensions of business formation activity across U.S. counties as of 2023.

Community capital indices. For each capital, we begin with individual indicator variables and use factor analysis to assess dimensionality and extract composite indices, anticipating the use of PCA following Schmit et al. (2021) and Jablonski et al. (2023). We report factor loadings and reliability diagnostics for each index. Capital measures are drawn from 2016, 2018, and 2020, predating the outcome period. Table 1 summarizes the variables included in each capital index, along with data sources and reference years. We continue to refine variable selection and measurement as we assess dimensionality, internal consistency, construct validity, and distributional properties across indicators. Briefly, each capital is operationalized as follows:

- **Natural capital:** Climate, topography, and water area from the USDA Natural Amenities Scale (McGranahan, 1999), supplemented by National Forests acreage (Schmit, et al. 2021).
- **Human capital:** Educational attainment from the American Community Survey and population health measures derived from County Health Rankings and Robert Wood Johnson Foundation datasets.

- **Social capital:** County-level network structure indicators from the Social Capital Atlas (Chetty et al., 2022), capturing both bridging ties across income groups and bonding ties within local networks.
- **Political capital:** Civic engagement indicators from the Social Capital Atlas (Chetty et al., 2022), including volunteering rates and civic organization density. Prior work finds this capital is frequently insignificant (Taylor et al., 2025), in part because it is difficult to measure consistently across communities (Turner, 1999). We therefore test whether constructing a composite index using PCA improves measurement relative to prior single-indicator approaches.
- **Financial capital:** FDIC Summary of Deposits data capturing financial infrastructure and liquidity, including bank branch density and bank deposits per capita, supplemented by Census American Community Survey measures of housing wealth, including the share of homeowners without a mortgage (Taylor et al., 2025), and Form D filings capturing private capital access (as in Weinstein & Dewbury, 2023).
- **Built capital:** Infrastructure and economic production indicators capturing local physical and industrial capacity, including broadband access and subscription measures from the American Community Survey, median housing age, and manufacturing establishment density derived from County Business Patterns data (Schmit et al., 2021; Jablonski et al., 2023).
- **Cultural capital:** Density of museums, historical sites, and arts venues from County Business Patterns (Eckert, et al. 2021), as well as demographic diversity measures derived from the American Community Survey (Flora, Flora, & Gasteyer, 2018; Markusen & Gadwa, 2010; Taylor et al., 2025). This capital remains the least well-operationalized in the quantitative literature (Flora, Flora, & Gasteyer, 2018; Markusen & Gadwa, 2010) and we will document our construction choices transparently.

Empirical approach. Our baseline specification is OLS regression estimating the relationship between community capital indices and the entrepreneurship index, following Taylor et al. (2025). We include state fixed effects to account for unobserved

variation in policy environments, infrastructure, and institutional conditions that influence entrepreneurship. Lagged capital measures further reduce simultaneity concerns (Card & DiNardo, 2000). Sensitivity analyses include VIF diagnostics for multicollinearity, particularly between financial and built capital and between social and political capital, which prior work shows are empirically entangled. We test robustness across alternative rural classification schemes. As a sensitivity check, we also separately estimate the relationship between community capitals and individual components of the entrepreneurship index, including business entry rates and self-employment rates, to assess whether results are driven by specific dimensions of entrepreneurial activity and to benchmark against more common single-indicator measures used in the literature. To examine demographic heterogeneity, we interact capital indices with county-level demographic characteristics drawn from the ACS, including racial and ethnic composition and income distribution. We also estimate models separately for county subsamples defined by these characteristics.

Early diagnostics from PCA suggest that several capitals are multidimensional in ways that may enrich index construction. Social capital indicators reveal a tension between bonding ties (local network density and support) and bridging ties (cross-group economic connectedness), consistent with theoretical distinctions in the social capital literature. Built capital is dominated by broadband access and subscription measures, with manufacturing and housing age contributing minimally, suggesting that this capital may primarily capture digital connectivity rather than a broad infrastructure composite. We are continuing to assess dimensionality across all seven capitals, including relationships between the capitals.

Expected Contributions and Policy Relevance

This paper will produce a county-level decomposition of which community assets are most strongly associated with entrepreneurship, and where those relationships differ between rural and nonrural places. The results will inform how place-based entrepreneurship policies should be tailored to community-level asset profiles.

If, for example, bridging social capital matters more than financial capital for rural entrepreneurship, that suggests investing in regional networks and inter-community cooperation rather than concentrating resources on capital access programs alone. If built capital (particularly broadband infrastructure) operates as a necessary condition rather than a sufficient one, that reframes how policymakers should sequence investments. The rural-nonrural comparison will identify whether the same policy levers apply across community types or whether differentiated strategies are warranted. Examining variation by demographic composition will further clarify whether place-based entrepreneurship strategies need to account for differences in how communities with different histories and populations access and leverage their existing assets.

More broadly, the paper demonstrates whether the Community Capitals Framework — widely used in applied community development — can serve as a rigorous, empirically grounded tool for the place-based policy literature in economics. A positive answer would open a productive channel between two research communities that have operated largely in parallel.

Table 1: Variables included in principal component analysis to produce county-level capital stock indices

Variable	Year	Description	Source	Reference
Built Capital				
Food & beverage manufacturing establishments per 10,000 residents	2016	Density of food and beverage manufacturing establishments	County Business Patterns	Schmit, et al. (2021)
Other manufacturing establishments per 10,000 residents	2016	Density of non-food manufacturing establishments	County Business Patterns	Schmit, et al. (2021)
% households with cable, fiber, or DSL internet	2020	Share of households with wired broadband infrastructure	American Community Survey	Schmit, et al. (2021)
% households with broadband subscription	2020	Share of households with broadband subscription	American Community Survey	Jablonski, et al. (2023)
Median housing age	2020	Median year housing structures were built	American Community Survey	Taylor, et al. (2025)
Cultural Capital				
Museums per 10,000 residents	2016	Density of museum establishments	County Business Patterns	Taylor, et al. (2025)
Historical sites per 10,000 residents	2016	Density of historical and heritage sites	County Business Patterns	Author Derived
Arts venues per 10,000 residents	2016	Density of performing arts establishments	County Business Patterns	Taylor, et al. (2025)
Share of population identifying as BIPOC	2020	Population share identifying as non-white or Hispanic	American Community Survey	Taylor, et al. (2025)
Human Capital				
% population with bachelor's degree or higher	2020	Share of adult population with bachelor's degree or higher	American Community Survey	Schmit, et al. (2021)
Average math grade performance	2020	Average student math achievement score	Robert Wood Johnson Foundation	Author Derived
Life expectancy	2020	Average life expectancy at birth	Robert Wood Johnson Foundation	Author Derived
Primary care physicians per 10,000 residents	2020	Availability of primary care physicians	Robert Wood Johnson Foundation	Schmit, et al. (2021)
% insured population	2020	Share of population with health insurance	Robert Wood Johnson Foundation	Schmit, et al. (2021)
% food insecure population	2020	Share of population lacking reliable access to food	Robert Wood Johnson Foundation	Jablonski, et al. (2023)
Health Outcomes	2020	Health Outcome Z-Score	Robert Wood Johnson Foundation	Schmit, et al. (2021)
Health Factors	2020	Health Factor Z-Score	Robert Wood Johnson Foundation	Schmit, et al. (2021)
Political Capital				
Volunteering rate	2018	Share of residents engaged in volunteer activity	Social Capital Atlas	Chetty, et al. (2022)
Civic organizations per capita	2018	Density of civic and community organizations	Social Capital Atlas	Chetty, et al. (2022)
Social Capital				
Economic connectedness	2018	Economic Connectedness Index	Social Capital Atlas	Chetty, et al. (2022)
Social Cohesiveness	2018	Social Cohesiveness Index	Social Capital Atlas	Chetty, et al. (2022)
Financial Capital				
Bank branches per 10,000 residents	2020	Density of FDIC-insured bank branches	FDIC Summary of Deposits	Taylor, et al. (2025)
Bank deposits per capita	2020	Total bank deposits normalized by population	FDIC Summary of Deposits	Taylor, et al. (2025)
% Home owners without mortgage	2020	Share of homeowner population without a mortgage	American Community Survey	Taylor, et al. (2025)
Natural Capital				
Forest land share	2015	Share of county land area classified as forest	US Forest Service FIA	Taylor, et al. (2025)
Natural amenities index	1999	Composite index of climate, topography, and water amenities	USDA Economic Research Service	McGranahan (1999)

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