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Which Small Towns Attract Start-Ups and Why? Twenty Years of Evidence from Iowa

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Abstract

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Disciplines

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Comments

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Key words: agglomeration, firm location, human capital, rural.

JEL codes: M13, R11, R39.

Local economic growth has been tied to agglomeration economies, human capital, local fiscal policy, social capital, and natural amenities.[1] However, it is less clear whether these same factors are important for the growth of small rural towns. To address this concern, this study uses a unique longitudinal data set including ninety-eight small Iowa towns over twenty years to identify the relative importance of these factors in stimulating small town growth.

Small rural towns face economic distress. Figure 1 shows elements of that distress in nonmetro towns in the U.S.[2] Panel (a) represents smoothed changes from 2000 to 2016 in the self-employment rate, defined as the change in the share of total employment that are self-employed. This panel shows that business activities as measured by self-employment fell in all sizes of rural towns and that the decline was largest in small rural towns with a population of 10,000 or less.[3] Panel (b) shows the smoothed changes in the employment-to-population ratio for those same communities over the 2000–16 period. The employment rate fell in all sizes of rural towns, and the largest declines were in the smallest rural towns. Taking the two graphs together, the smallest towns experienced the

Georgeanne M. Artz (1974–2019) was an associate professor of economics at Iowa State University when this project began, and this is the last research project she initiated. She passed away before the final version was completed. Her work was partially funded by USDA-NIFA grant 2018-68006-27639. Younjun Kim is an associate professor of economics at Southern Connecticut State University. Peter F. Orazem is University professor of economics and director, Program for the Study of Midwest Markets and Entrepreneurship at Iowa State University. Peter J. Han is social science analyst at U.S. Department of Housing and Urban Development. We thank two anonymous reviewers and the editor for helpful comments and Timothy Parker for research assistance. Correspondence to be sent to: younjun7kim@gmail.com

[1]For a review, see Arauzo-Carod, Liviano-Solis, and Manjón-Antolín (2010), and Pender, Marré, and Reeder (2012).

[2]Data are obtained from the 2000 Census and the 2014–2018 American Community Survey. To obtain a time-consistent geographical unit of place (e.g. town or city), we converted 2010 Census Tracts to 2000 using a crosswalk developed by Logan, Xu, and Stults (2014). Then we allocated 2000 Tracts to places using a crosswalk from Missouri Census Data Center. Non-metro classifications are obtained from 2003 rural–urban continuum codes. We drop towns below 500 population in 2000 to obtain reliable statistics.

[3]Rural population started to decline in the early 2010s, the first recorded time period of rural population decline (Cromartie 2017).

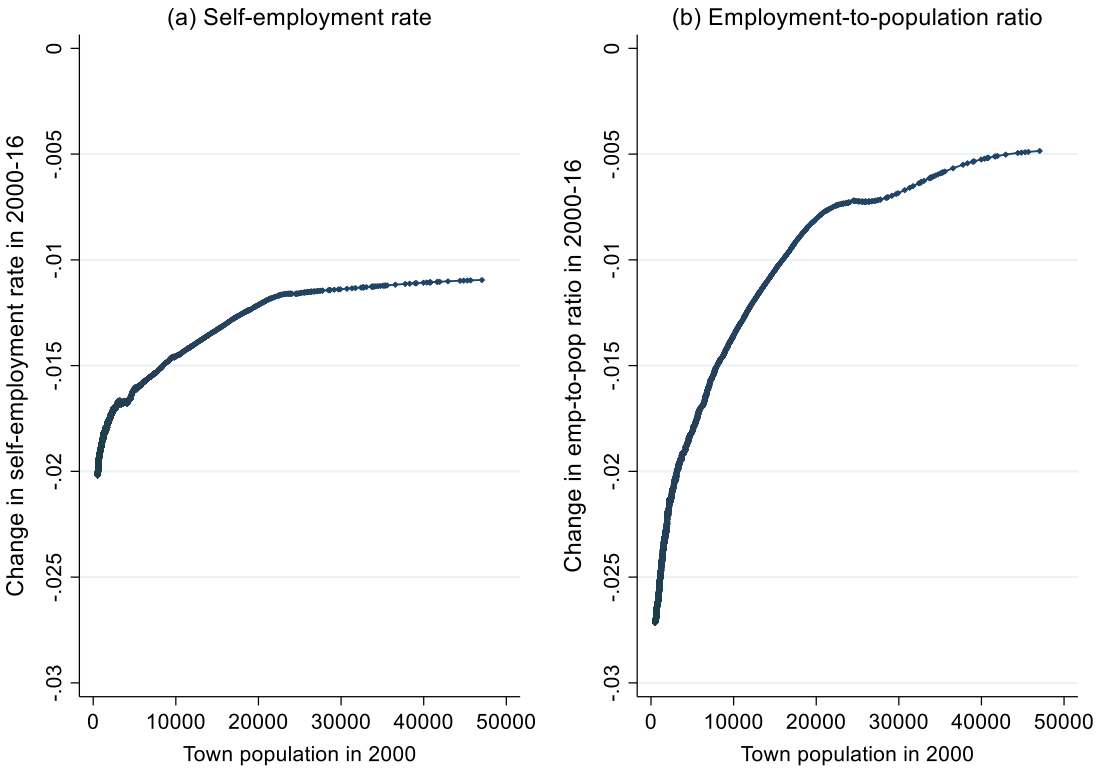

Figure 1. Smoothed changes in the self-employment rate and the employment-to-population ratio in U.S. non-metro towns from 2000 to 2016, by town population

largest declines in the rate of self-employment and an even greater decline in employment rates. These graphs indicate that the greatest economic distress is occurring in the smallest rural towns below 10,000 population. Our study will examine which factors encourage or discourage new firm entry in these small towns and suggest policy implications addressing economic distress in small rural towns.

Most previous studies of rural economic growth or decline are based on county-level analyses (e.g. Wu and Gopinath 2008) including studies examining the role of social capital on growth (e.g. Rupasingha, Goetz, and Freshwater 2006). Because counties contain many communities, and social capital is a local attribute, county-level analysis may miss the role of social capital at the community level. Examples of town-level social capital studies exist (Kilkenny, Nalbarte, and Besser 1999; Besser and Miller 2013), but the data cover a small number of towns or short time periods. Commonly used measures of aggregate growth in employment or population (Stephens and Partridge 2011; Rupasingha and Goetz 2013) may not be as responsive to changing local economic conditions because it is costly to move firm or residential location. Incumbent firms and households may remain despite diminishing prospects, even as entering firms are able to take changing local economic or social factors into account in deciding where to locate.

Our study has several advantages that will help to identify the key growth factors for small towns. First, we use social capital data consistently collected over two decades for a set of ninety-eight small towns in Iowa. These data are based on surveys of the local population that cover factors that are not typically available. If small towns have an advantage in social capital over more densely populated areas, and if social capital does attract new firm entry, then we should be able to observe its effects on entrepreneurship over such a long time span. We characterize social capital impact by comparing it across time or by the distance to closest metro areas. We conduct a robustness check with alternative social capital measures such as Olson-type (Olson 1982) and Putnam-type (Putnam 1993) group densities.

Our second advantage is that we use new firm location decisions as our indicator of local town growth. New firm location decisions are more sensitive to changes in local market

attributes than are aggregated growth measures such as employment or population growth because new firms are choosing from many alternative towns in deciding where to locate. In contrast, aggregate net employment or population growth will be dominated by the high fixed costs of changing location for incumbent firms and employees. The greater the costs of relocation, the more current location of decisions of incumbent firms will reflect past town attributes as opposed to current market attributes.

Third, local factors are predetermined at the time of new firm location decisions, which reduces the concern of reverse causality. Measures of social capital may reflect past firm entry as opposed to inducing the entry, for example, clouding the identification of the causal relationships. In addition, individual firms will be too small to alter measured aggregate market attributes, and so we can more clearly show how market factors affect firm entry than we can identify how market factors affect aggregate employment or population, which themselves would alter the measured market factors.

Fourth, we measure agglomeration economies with five different agglomeration measures: cluster specialization, local competition, access to upstream firms, access to downstream firms, and industrial diversity. These measures have been shown to affect firm entry in metropolitan areas and in rural counties (Artz, Kim, and Orazem 2016) but have not been tested for their importance to the growth of small rural towns.

Our analysis is based on new firm location decisions using NETS (National Establishment Time Series) data. Small towns find it difficult to attract new firm entry on average, but there is substantial variation in the pace of new firm entry across the ninety-eight towns in our sample. The new firm entry rate, measured as the number of new firms relative to incumbent firms, was 4% on average in the early 1990s, ranging from 1.4% to 11.4%. The average rose to 8% in the early 2000s. The firm entry rate declined to 2% by the early 2010s with a range of 0.2% to 5%.[4] We will use this variation to test which local factors are more important for new firm entry in these small rural towns and whether their impacts have changed over time. We find that human capital and market agglomeration are more conducive to new firm entry than are natural amenities, local fiscal policy, or social capital. The impact of local fiscal policy is too small to overcome the locational disadvantages from insufficient endowments of human capital and market agglomeration. These results are confirmed in a robustness check of testing whether actual decadal town employment growth is influenced by local factors that affect new firm location choices, finding that local factors that had stronger impacts on new firm entry still have significant impacts on employment growth. These results suggest that a rural development approach that encourages firm entry in rural towns with the largest endowments of human capital and market agglomeration would be more successful than trying to foster firm growth in all towns.

The next section explains the importance of entrepreneurship as a rural development strategy and reviews local factors related to local economic growth. Section 3 describes a model, and section 4 explains variables and data. Section 5 reports estimation results. The last section discusses implications of our results to rural development policies and combines them with recent findings in the economic development policy literature.

Literature Review

Entrepreneurship has received much attention from researchers as a rural development strategy (Deller and Goetz 2009). As the number of entrepreneurs and self-employed rise, rural areas also experience increased employment and income (Rupasingha and Goetz 2013). These impacts are confirmed in more distressed rural areas such as the Appalachian region (Stephens and Partridge 2011). Job creation is closely related to new firm births because the majority of jobs are created by new firms (Haltiwanger, Jarmin, and Miranda 2013). New firm entry may be critical to local income growth because new businesses improve aggregate productivity growth by facilitating the reallocation of workers across firms (Alon et al. 2018). Locally owned businesses may help stabilize local employment against economic shocks (Kolko and Neumark 2010). The success or failure of past entrepreneurs provides entrepreneurial marketplace information that informs subsequent

[4]In our calculations using the National Establishment Time Series (NETS) database, new firm entry rate in similarly sized small rural Iowa towns is lower than in large rural towns by 0.1 to 2 percentage points depending on the year. Five-year survival rates of new firms are higher in small rural towns than in large rural towns by 4 to 12 percentage points. Industry shares of new firms are similar in small and large rural towns. Employment per firm in small rural towns is about a half as many as in large rural towns.

entrepreneurs, and so current entrepreneurial entry endogenously influences future firm entry (Bunten et al. 2015). New businesses often provide goods and services that may not be otherwise available in their rural community. Therefore, it is important to identify the key factors affecting new firm entry for rural economic growth.

Local factors related to local economic growth are well documented in the literature. Agglomeration economies such as the local concentration of suppliers, customers, educated workers, technological innovators, and investors have proven extremely important for local economic growth and the rise of cites.[5] The economic benefits of agglomeration include lower transportation costs; greater labor productivity, a better matching between buyers and sellers or between firms and workers; and a faster diffusion of technology and information (Duranton and Puga 2014). The commonly used agglomeration measures we focus on include cluster specialization, local competition, access to upstream firms, access to downstream firms, and industrial diversity.[6] Marshall (1920) argued that cluster specialization raised profitability (i.e. more firms in a same industry) because it may increase knowledge spillover across firms and save transportation costs of materials. He also contended that the possibility of establishing a monopoly at entry because of the absence of any firms in the sector would also encourage entry due to the possibility of internalizing returns to innovation. Porter (1990) emphasized the roles of cluster specialization and access to upstream and downstream firms as fostering growth because these factors increase firm productivity through knowledge spillovers. In contrast to Marshall (1920), Porter emphasized local competition rather than local monopoly because competition may foster to the development and adoption of new technologies. Jacobs (1969) argued that industrial diversity was critical for growth in part because new technologies are often due to knowledge spillovers across sectors. All of these measures have been shown to affect firm entry in both urban and rural counties (Artz, Kim, and Orazem 2016) but have not been tested for their importance to the growth of small rural towns that have experienced the greatest proportional job loss in this century. Several studies have examined agglomeration effects in rural areas but have not used the full set of agglomeration measures (Henry and Drabenstott 1996; Gabe 2003).

Another possible reason that agglomeration measures appear to matter for growth in rural areas is that they are correlated with other factors not included in the analysis. Social capital has been claimed to be important for local economic growth because it may reduce transaction costs and promote the diffusion of information and knowledge (e.g. Putnam 1993; Knack and Keefer 1997). If a small town fosters interpersonal relationships characterized by trust and norms of reciprocity, there may be more sharing of information that could make up for the lack of agglomeration (Putnam 1993). Past studies have shown that social capital can foster innovation (Akçomak and ter Weel 2009), improve entrepreneurs' access to capital (Guiso, Sapienza, and Zingales 2004; Seghers, Manigart, and Vanacker 2012), lower default risk on loans (Feigenberg, Field, and Pande 2013), increase investment (Bottazzi, Da Rin, and Hellmann 2016), and reduce crime and poverty (Crandall and Weber 2004; Buonanno, Montolio, and Vanin 2009). These benefits can promote firm entry (De Blasio and Nuzzo 2010) and increase local economic growth (Rupasingha, Goetz, and Freshwater 2006; Bjørnskov 2012).

Kilkenny, Nalbarte, and Besser (1999) and Besser and Miller (2013) found that rural business success was associated with social capital. Social capital has been found more critical to rural businesses than to urban businesses, probably because of resource constraints and the lack of supporting institutions such as venture capital firms in rural areas. Social capital may improve access to resources and information in rural areas. Bauernschuster, Falck, and Heblich (2010) found that social capital increased the probability of being an entrepreneur in smaller towns more than in larger towns. Similar results are found in Westlund, Larsson, and Olsson (2014). Freire-Gibb and Nielsen (2014) found that social capital was important for business survival in rural areas but not in urban areas.

However, Westlund and Adam's (2010) meta-analysis found that estimated impacts of social capital on economic growth were mixed. A possible reason is the lack of consensus on how social capital is to be measured. Usually,

[5]For a review, see Duranton and Puga (2014) and Puga (2010).
[6]For more detailed explanations, see Glaeser et al. (1992) and Artz, Kim, and Orazem (2016).

social capital is measured in two ways: trust and associational involvement.[7] The former measures the sense of faith or common purpose that members of a community have for one another. The latter measures the number of associations, such as civic groups, sports clubs, and religious organization, to which a respondent belongs, or the total number of associations in the area. We include both conventional measures in this study. Our survey responses fit naturally into three different social capital measures: bonding, bridging within a community, and bridging across communities. Bonding capital connects people within homogeneous groups, whereas bridging capital connects people across diverse groups (Putnam 1993; Halstead and Deller 2015). Few studies have examined how social capital matters for new firm entry in small towns or whether bridging or bonding is more important.

Human capital has been found crucial for local economic growth because it improves labor productivity and promotes knowledge spillover across educated workers (Lucas 1988). Acs and Armington (2004) found that human capital increased the probability of opening a new business in industries normally requiring college-educated founders. Rauch (1993) and Moretti (2004) showed that knowledge spillover across educated workers exists. Glaeser and Maré (2001) found that wage growth was faster in urban areas than in rural areas, probably due to greater knowledge spillover across skilled workers in urban areas. Winters (2013) showed that the probability of being employed was higher in areas with a greater number of skilled workers.

Local fiscal policies—taxes and government expenditures—may affect new firm entry because taxes and government expenditures may influence firm profitability. However, Arauzo-Carod, Liviano-Solis, and Manjón-Antolín (2010) reviewed empirical studies and found that the impacts of taxes on business location decisions were ambiguous; some studies found modest negative impacts, but other studies did not. These ambiguous results might be due to a tradeoff between local taxes and government expenditures. Gabe and Bell (2004) found that high taxes may not slow local economic growth because public goods and services financed by taxes attract businesses to the area. In other words, the net impact of taxes and government expenditures on local economic growth may be positive.

Natural amenities attract workers and retirees (Graves 1979; Deller et al. 2001). Tourism may increase labor demand in high-amenity areas, which may promote local economic growth as well (Weiler and Seidl 2004). Educated workers may migrate toward high-amenity areas, which may promote the concentration of human capital in the areas (Whisler et al. 2008). However, these positive impacts of natural amenity on local economic growth may be attenuated as housing prices are bid up (Rickman and Rickman 2011).

Our strategy is to admit all of these factors into a model of firm entry and to let the data tell us which are most important for attracting new firm entry into small towns.

Model

We present a model of a firm's location decision to enter a particular local market in response to that location's attributes that would potentially affect firm profitability relative to its alternative locations. Assume that each new firm chooses one town j from a set of J potential small towns. They will choose the town that maximizes expected present value of profit.[8] The expected present value of profit for firm i in industry k, town j and year t is

$$\pi_{ikjt} = \boldsymbol{M}'_{\boldsymbol{kjt-1}}\boldsymbol{\gamma_M} + \boldsymbol{S}'_{\boldsymbol{jt-1}}\boldsymbol{\gamma_S} + F_{jt-1}\gamma_F + A_j\gamma_A + \varepsilon_i + \varepsilon_k + \varepsilon_t + u_{ikjt} \quad (1)$$

$\boldsymbol{M}_{\boldsymbol{kjt-1}}$ represents a vector of factors that are hypothesized to strengthen the local market for firm entry including measures of local market agglomeration, local demographic attributes such as education and household income, the distance to the nearest metropolitan area, and an indicator if the town is a county seat.[9] The

[7]Halstead and Deller (2015) provide a good review of these issues.

[8]New firm entry would affect local wages or rents in a way to reduce local profitability to zero, and the spatial equilibrium would be achieved. However, if local factors increase local profitability persistently, new firms will continue to enter the area.

[9]We do not include area population because population variations in the sample towns were limited. Sample towns were picked from small towns with a population of between 500 and 10,000. Moreover, population, or at least in migration, would be an alternative dependent variable and would cause endogeneity bias if included as a regressor.

distance to the nearest metropolitan area is used to capture the potential benefits or costs of proximity to a larger market. Larger neighbors could provide complementary public goods to firms in the small town, but they also present potential competition with those same firms. The information is lagged by one year to signify that the information is known at the time of entry rather than responding to current firm entry decisions.

Social capital measures make up the vector $\boldsymbol{S_{jt-1}}$. Local fiscal variable F_{jt-1}, and natural amenities A_j also shape the firm's expectations of the town's relative prospects. The error term, ε_i, is an unobserved firm-*i*-specific profitability that reflects the entrepreneur's skills, which will be common across all markets. ε_k represents industry-*k*-specific factors that will be common across all locations. The temporal shock, ε_t, is a common cyclical shock for all firms entering business in year *t*. The last term u_{ikjt} is a random shock to profits for firm *i* in town *j* that is assumed to be uncorrelated with all other factors.

Firms will choose town *j* to maximize expected net present value of profit, and so the chosen town will satisfy the condition

$$(2)\quad \pi_{ikjt}-\pi_{ikj't}=\left(\boldsymbol{M'_{kjt-1}}-\boldsymbol{M'_{kj't-1}}\right)\boldsymbol{\gamma_M}+\left(\boldsymbol{S'_{jt-1}}-\boldsymbol{S'_{j't-1}}\right)\boldsymbol{\gamma_S}+\left(F_{jt-1}-F_{j't-1}\right)\gamma_F+\left(A_j-A_{j'}\right)\gamma_A+\left(u_{ikjt}-u_{ikj't}\right)>0,\forall j'\neq j.$$

Notice that the unobserved firm- and sector-specific unobserved effects and the common cyclical effect are differenced away. The equation can be estimated using the conditional logit model by assuming that the difference in the error term $u_{ikjt}-u_{ikj't}$ follows the type-1 extreme value distribution. However, for practical convenience, we estimate the equation using the Poisson regression with group dummy variables (i.e. sector-year dummy variables). Guimarães, Figueiredo, and Woodward (2004) show that estimation results from this method are the same as from the conditional logit estimation.

Our estimation may be biased by omitted location-specific variables. For example, if a certain industry is likely to be located near a highway or airport, our coefficient for cluster specialization may be overestimated without controlling for highway or airport proximity. However, this concern is less pressing in a study focusing on small Iowa towns. Had access to a highway or airport been substantially large on small-town growth, the town would have grown too large to be included in our sample.

Data

We base our analysis on a unique longitudinal database composed of ninety-eight small towns in Iowa. One town with a population of between 500 and 10,000 was selected from each of Iowa's ninety-nine counties.[10] Towns that share a border with a metropolitan city were not included. Each town was surveyed in 1994 and then resurveyed in 2004 and 2014.[11] One town was dropped from the analysis because the town was not surveyed in both subsequent waves. We define each town by its zip code. Our universe of firms is defined by all firms entering any one of those ninety-eight zip codes in 1995, 2005, or 2014.[12] These ninety-eight small towns have local characteristics typical of small towns in Iowa as we will show later. Our operating hypothesis is that each of these firms had decided to enter a small Iowa town and could have entered any of the ninety-eight options in our sample of towns.[13] Each picked one of the ninety-eight and rejected the other ninety-seven towns. The firm data were obtained from the National Establishment Time Series (NETS) database. The sample was restricted to firms with a clear profit motive. We excluded government agencies, nonprofit organizations, and firms with a public service purpose such as historical sites or museums. We also excluded firms in agriculture and mining because their entry decisions are affected by site-specific land or resource availability.[14] We have 4,774 new establishments in our sample.

[10]Estimation is conducted at the zip code level rather than the place level in order to link the firm address to the town. The population of sample zip codes ranges from 500 to 12,000 because some zip codes include residents in the vicinity of the sample town.

[11]This data collection project is described in Besser, Harcey, and Peoples (2015).

[12]We use 2014 rather than 2015 because new firm entry is available up to 2014 in our dataset.

[13]To test this hypothesis, we extend our sample to all small nonmetro towns in Iowa and run an estimation without social capital measures. We find that the signs of estimates are comparable to our main results in table 3. Estimation results are reported in the appendix A.

[14]The excluded industries are as follows: Agriculture (two-digit NAICS: 11); Mining (21); Postal Service (three-digit NAICS 491); Monetary Authorities-Central Bank (521); Nursing and Residential Care Facilities (623); Social Assistance (624); Museums, Historical Sites, and Similar Institutions (712); Religious, Grantmaking, Civic, Professional and Similar Organizations (813); Private Households (814); and Public Administration (92).

NETS has the advantage that it reports the zip code of each firm and so we could locate the firms in the ninety-eight small towns. An alternative not open to us was to get restricted use individual firm data accessible at a Census Data Center. NETS has limitations compared to Census Bureau business data. Barnatchez, Crane, and Decker (2017) compare NETS with Census Bureau business data (county business patterns, and non-employer statistics) and find that the former includes fewer businesses than the latter. However, the authors report that NETS has a high degree of consistency with Census Bureau business data in terms of the geographic distribution of businesses. Crane and Decker (2019) compare NETS with another Census Bureau business data (business dynamics statistics) in terms of new firm entry rate (i.e., share of new establishment count to existing establishment count) and find that the rates are comparable in both datasets in our sample years. To sum up, although NETS does not cover the universe of businesses in the United States, NETS mimics official business data in terms of geographic distribution of businesses and entry rate.

Table 1 provides summary statistics for all the variables we use to explain incentives to enter a market. For each town, a random sample of 150 households was selected from telephone directories in 1994, 2004, and 2014. The response rates were 72%, 67%, and 41.5%, respectively. Social capital was measured with same survey questions over the two decades. Questions address work, shopping, and entertainment decisions as well as attitudes toward their town and their fellow citizens. These questions provide us a long-term evolution of commonly used measures of social capital in these cities rather than the single cross section typically available in past studies. The twelve survey questions used to measure the evolution of social capital in the ninety-eight towns are summarized in Table 2.[15] Principal component analysis of the twelve items determined that their covariance could be adequately summarized with three linear combinations of the data. The variables were grouped rather naturally into three categories that corresponded with the literature on social capital. *Bonding* was composed of questions that measured the extent of close personal and group relationships in each town. *Bridging within community* combines measures of how easily members of the community can cooperate with each other. *Bridging across communities* combines items that reflect openness to new people or ideas.[16] If social capital raises local firm profitability, towns with more social capital will have a faster pace of new firm entry.

We created several different measures of local market agglomeration using the NETS data. By aggregating across firms within four-digit North American Industry Classification System (NAICS) codes for each firm and zip code, we are able to derive measures of cluster specialization, local competition, access to upstream firms, access to downstream firms, and industrial diversity.[17] These measures are industry-zip code-specific and constructed using various aggregations of the firm-level data in the NETS database. Cluster specialization (CLU_{kj}) is measured as the relative size of the proportion of establishments in industry k in zip code j to the proportion of establishments in industry k in Iowa:

$$(3) \quad CLU_{kj} = \frac{Establishments\ in\ k,j}{All\ establishments\ in\ j} \Big/ \frac{Establishments\ in\ k\ in\ Iowa}{All\ establishments\ in\ Iowa}.$$

The local competition index (COM_{kj}) takes a value of 1 if zip code area j has any incumbent firms in industry k, and 0 otherwise. Access to upstream (UP_{kj}) or downstream ($DOWN_{kj}$) firms measures the relative availability of suppliers and customers in industry k in zip code j.

$$(4) \quad UP_{kj} \equiv \sum\nolimits_s \frac{N_{sj}}{N_s} \cdot \frac{Input_{s \to k}}{Input_k} \cdot 100 \ \ \forall s \neq k$$

where N_{sj} is the number of establishments in an upstream industry s in zip code j, and N_s is

[15]More details about the survey questions are available in the appendix B.

[16]Although the combination of questions into the three groups appeared logical, principal component analysis applied to each subgroup also showed that the elements of each group were closely related to one another. The first principal component for bonding, bridging within community, and bridging across communities explained 65%, 73%, and 78% of its covariance, respectively.

[17]This industrial grouping is based on the 1997 input–output table from the Bureau of Economic Analysis. It has 126 industry groups, but only those with at least one new firm entry in a given sample year are used in estimations. The number of industry groups in our sample is 67, 76, and 58 in 1995, 2005, and 2014, respectively.

Table 1. Summary Statistics

New firm entry year	(1) 1995	(2) 2005	(3) 2014	(4) Pooled
Agglomeration measures				
Cluster specialization	0.68 (2.00)	0.78 (2.69)	0.85 (2.41)	0.77 (2.40)
Local competition	0.40 (0.49)	0.42 (0.49)	0.53 (0.50)	0.44 (0.50)
Industrial diversity	0.87 (0.04)	0.90 (0.04)	0.90 (0.03)	0.89 (0.04)
Proximity to upstream firms	0.05 (0.11)	0.04 (0.10)	0.05 (0.09)	0.05 (0.10)
Proximity to downstream firms	0.05 (0.20)	0.04 (0.09)	0.05 (0.09)	0.04 (0.14)
Human capital				
Share of adults (25+) with at least associate college degree	0.18 (0.05)	0.21 (0.06)	0.29 (0.07)	0.23 (0.07)
Median household income (2013$, $1,000)	45.03 (7.80)	51.39 (8.77)	55.08 (10.48)	50.34 (9.86)
Social capital measures				
Bonding social capital	6.39 (1.46)	5.83 (1.35)	4.78 (1.46)	5.71 (1.56)
Bridging within community	7.88 (2.01)	6.78 (2.06)	7.94 (2.25)	7.48 (2.17)
Bridging across communities	7.15 (0.86)	6.48 (0.97)	4.88 (1.51)	6.24 (1.45)
Other market measures				
Government expenditure-to-tax ratio in county	2.30 (0.39)	2.99 (0.79)	3.26 (1.03)	2.84 (0.87)
Amenity index		2.24 (1.06)		
Distance to closest MSA (1,000 miles)		0.05 (0.02)		
Share of towns with county seat		0.21 (0.41)		
# of sector–zip code cells	6,566	7,448	5,684	19,698

Note: The number of towns is ninety-eight. Standard deviations are reported in parentheses. Most covariates are one-year lagged. Education and income are five-year lagged in the first and second columns. Government expenditure-to-tax ratio was three-year lagged in the first column.

Table 2. Construction of Social Capital Measures

Survey questions	Mean	Weights	% of covariance explained by first principal component
Bonding social capital			
1. About what proportion of the adults living in this community would you say you know by name?	2.47	0.37	65%
2. About what proportion of your close personal adult FRIENDS live in this community?	3.70	0.67	
3. (From a list provided), about how many local groups in total do you belong to in this community?	1.61	0.65	
Bridging within a community			
1. Rate (town), 1 = unfriendly and 7 = friendly	4.47	0.42	73%
2. Rate (town), 1 = indifferent and 7 = supportive	3.91	0.43	
3. Rate (town), 1 = not trusting and 7 = trusting	4.02	0.44	
4. Being a resident in this community is like being with a group of close friends.[a]	3.42	0.38	
5. I believe that "every person for themselves" is a good description of this community.[a] (reverse coded)	3.50	0.40	
6. When something needs to get done here, the whole community gets behind it.[a]	3.29	0.37	
Bridging across communities			
1. Rate (town), 1 = prejudiced and 7 = tolerant	4.17	0.58	78%
2. Rate (town), 1 = rejecting of new ideas and 7 = open to new ideas	4.00	0.62	
3. Residents in this community are receptive to new residents taking leadership positions.[a]	3.15	0.53	

[a]: 1 = strongly disagree and 5 = strongly agree. Weights are derived from the first principal component in each group. The means and the principal component analysis are weighted by town population.

the number of establishments in industry s in Iowa. The second term is the proportion of input purchases made by firms in industry k from industry s. Similarly, the proximity to downstream firms is:

$$(5) \quad DOWN_{kj} \equiv \sum_s \frac{N_{sj}}{N_s} \cdot \frac{Output_{k \to s}}{Output_k} \cdot 100 \ \forall s \neq k$$

where N_{sj} is the number of establishments in a downstream industry s in zip code j, and N_s is the number of establishments in industry s in Iowa. The second term is the proportion of output purchases made by firms in industry s from industry k. The input–output linkages are obtained from 1997 Standard Use Table from the Bureau of Economic Analysis.

The last measure, industrial diversity (DIV_j) is measured by

$$(6) \quad DIV_j = 1 - \left(\sum_{k=1}^{K} S_{kj}^2 \right)$$

where $S_{kj} \in [0, 1]$ is the share of all zip code j establishments that are in sector k. The term in parentheses on the right-hand-side is a Herfindahl–Hirschman Index of industrial concentration computed as the sum of squared establishment count shares. DIV_j is the opposite of the Herfindahl–Hirschman Index, and so it reflects the opposite of concentration. DIV_j ranges in values from 0 to 1, where values closer to one indicate greater industrial diversity.

The measure of incumbent competitors in the market could encourage or discourage entry depending on whether it signals a local comparative advantage in the sector or the possibility of exploiting a monopoly opportunity. The other agglomeration measures should all encourage entry based on past empirical and theoretical studies. Concentrations of human capital are also considered an advantage to new firms seeking a ready supply of skilled labor and consumers with purchasing power. We include two indicators of local human capital. Average education (EDU_j) is measured by the proportion of residents over age twenty-five with at least a two-year college degree in the zip code. High average marginal products in the local population is indicated by zip code-level median household income. All demographic information was obtained from the Decennial Census and the 2009–2013 American Community Survey (Manson et al. 2019).

Education and income levels in our sample of towns are typical of similarly sized Iowa towns. In the first column of table 1, the average share (0.18) of adults with at least an associate's degree for sample towns in 1990 is the same as for other small towns in Iowa. The average median household income ($45K) is close to the average ($47.5K) for other small towns in Iowa. We compare other local characteristics not listed in table 1, such as old population share, white population share, and manufacturing employment share, and find that sample towns are representative of small Iowa towns in general.

Local fiscal policy (F_j) is measured by the ratio of government expenditures to taxes in the county, which is obtained from the Annual Survey of State and Local Government Finances, U.S. Census Bureau. The ratio can be greater than one due to intergovernmental transfers from the federal government to a local government or debt financing. Areas that receive more public expenditures than they pay for using local taxes would be more attractive to entrants. Natural amenities (A_j) are measured by the Economic Research Service at U.S. Department of Agriculture (McGranahan 1999). A better endowment of amenities will attract entry. The distance to the nearest metropolitan area is obtained from the authors' calculation using geographic information system software. Proximity to a metropolitan area could raise or lower profitability depending on whether the adverse effects of added competition is dominated by the greater access to customers. We also include a dummy variable indicating whether the town is a county seat.

Results

Estimation results are reported in table 3. All estimated coefficients in the agglomeration group except for cluster specialization are positive and significant. Consistent with Marshall and Porter, proximity to upstream and downstream firms in the sector attracts entry. In these small towns, having at least one incumbent firm in the sector (competition dummy) attracts entry. This is partially consistent with Porter in that local competition raises new firm entry, although Porter argued that greater

Table 3. New Firm Location Choices among Ninety-Eight Small Iowa Towns in 1995, 2005, and 2014

Dependent variable: # of new businesses in year–sector–zip code cell	(1) Estimates	(2) Grouped impact of a one-standard deviation increase in each factor
Agglomeration		
Cluster specialization	<0.001 (0.020)	0.15
Local competition	0.520 (0.092)***	
Industrial diversity	6.787 (0.616)***	
Proximity to upstream firms	1.196 (0.139)***	
Proximity to downstream firms	0.366 (0.059)***	
Human capital		
Education	2.870 (0.345)***	0.22
Median Income	0.020 (0.003)***	
Social capital		
Bonding social capital	0.143 (0.019)***	0.03
Bridging within community	−0.043 (0.011)***	
Bridging across communities	−0.043 (0.021)**	
Other market factors		
Govt. expenditure-to-tax ratio	0.056 (0.020)***	0.05
Amenity	0.059 (0.016)***	0.06
Distance to closest MSA	−0.416 (0.831)	—
County seat	0.349 (0.047)***	—
Log-likelihood	−5,621.41	—
# of sector–zip code–year cells	19,698	

Note: Poisson estimates are reported. Standard errors are in parentheses. The model includes sector-year dummy variables. The second column reports the average proportional change in new firm entry probability when each factor increases by one standard deviation reported in table 1.
***Significant at 1%.
**Significant at 5%.
*Significant at 10%.

concentration of incumbents should make a difference, but the cluster measure does not affect entry. Jacobs' idea that a mix of sectors attracts firms is supported by the positive effect of our industrial diversity measure.

Higher concentrations of educated people and higher median household income attract firm entry. Numerous theoretical papers have argued that greater concentrations of human capital can lead to persistent growth which should attract form entry.[18] Higher education levels also leads to greater disposable income, which improves the local customer base.

The social capital measures have a less consistent effect on new firm entry. The estimated coefficient for bonding social capital is significant and positive. In small towns, greater bonding social capital would provide a supply of friends and local organizations with similar backgrounds to the entrepreneur who may help launch a fledgling venture entry. In contrast, the estimated coefficients for the two bridging measures are negative. Apparently connections across groups or across communities are not important for firm entry in small towns.

The rest of the factors are more consistent. Government expenditure-to-tax ratio is significant and positive, which suggests that localities that can attract more resources than they pay for through local taxes will attract new form entry. Localities that have greater endowments of natural amenities also attract new firms. County seats are more attractive than other small towns. However, distance to a metro market does not significantly affect firm entry. The latter result may reflect the sample strategy of only including small towns that are more distant from metros, and so the variation in distance only includes relatively large distance with a mean of fifty miles.

To see which variables are more important to new firm entry in small rural towns, we calculate the average proportional change in new firm entry probability when each factor increases by one standard deviation. We first

[18]See Romer (1986) and Lucas (1988) for two early examples.

calculate a firm entry probability when a factor increases by one standard deviation reported in the last column of table 1. Then we divide this probability by 1/98, which is a proportional change in new firm entry probability. Recall that our sample has ninety-eight towns. We repeat this calculation for each factor and take the average by variable group. As reported in the last column of table 3, human capital, measured by education and income, has the largest effect. Agglomeration has the second largest effect. Evaluated at sample means, concentrations of human capital and agglomeration raise the probability of firm entry by 37%. Other factors, such as natural amenities and local fiscal policy raise probability of firm entry by an additional 11%. Because of the mixed impacts of the social capital measures, they only raise firm entry by 3%. As a result, social capital has too small an effect to outweigh the importance of agglomeration, human capital, amenities, or intergovernmental transfers.

We test whether location choices of new manufacturing businesses are different from other new businesses by interacting explanatory variables with a dummy variable for new manufacturing businesses. Location choices of manufacturing businesses might be less sensitive to local consumer demand and suppliers because manufacturing inputs can be sourced more broadly and outputs can be sold to more remote customers. The baseline is location choices of new nonmanufacturing businesses, which are reported in the first column of table 4. Differences in location choices between manufacturing and non-manufacturing businesses are captured by estimates in the second column. A null hypothesis that all interaction term coefficients are zero is rejected at the 1% significance level in the likelihood-ratio test. Estimated elasticities or proportional entry probability changes are reported in table 5.[19] Location choices of manufacturing businesses are similar to other businesses overall. However, local consumer demand measured by income is less important for new manufacturers than for nonmanufacturing businesses. Proximity to upstream suppliers is less critical for new manufacturers than for other businesses, but the elasticity difference is small. New manufacturers are more attracted by a larger pool of educated residents, by local fiscal policy, and by county-seat towns.

To see whether the importance of local factors on small town firm entry has changed over time, we interact explanatory variables with year dummy variables. The baseline is new firm location choices in 1995, which are reported in the first column of table 6. Differences in location choices between 1995 and 2005 are captured by estimates in the second column. Differences in location choices between 1995 and 2014 are caught by estimates in the third column. A null hypothesis that all interaction term coefficients are zero is rejected at the 1% significance level in the likelihood-ratio test. Estimated elasticities are provided in table 7. Most agglomeration and education estimates are significant and positive throughout the sample period, and their elasticities are stable. These results suggest that agglomeration and human capital retain their prominent role in encouraging firm entry over the entire twenty-year period. Among three social capital measures, bridging within community estimate is significant and negative through the sample period, which suggests that the bridging social capital has discouraged new firm entry over the entire twenty-year period. Other social capital estimates are not significant. Amenities increase in importance over time. It did not play a role in new firm entry in small towns in 1995. However, by 2014, its estimate becomes weakly significant, influencing the choice of which small town to enter.

Social capital might be more important for towns that are more remotely sited and so more reliant on their own culture or social capital than on a nearby larger town. Moreover, it is possible that social capital makes up for missing agglomeration, and so social capital would increase in importance as agglomeration declines. To test these possibilities, we interact social capital measures with the distance. This interaction term allows us to calculate the threshold distance where the sign of social-capital impact is flipped. In the first column of table 8, the interaction term of bonding social capital with the distance has a significant and positive estimated coefficient, whereas bonding social capital itself does not. These results suggest that the impact of bonding social capital is positive regardless of the distance to metro area and its impact is greater in more remote towns. Social network with

[19]Elasticities are calculated from the Poisson model. Elasticities from the Poisson model go closer to ones from the conditional logit model as the number of choice alternatives increases (Schmidheiny and Brülhart 2011).

Table 4. New Firm Location Choices: Manufacturing versus Non-Manufacturing, Estimates

Dependent variable: # of new businesses in sector–zip code–year cell	(1) Baseline: New non-mfg. businesses	(2) Estimates for explanatory variables interacted with a dummy for new mfg. businesses
Cluster specialization	0.022 (0.019)	−0.064 (0.059)
Local competition	0.522 (0.095)***	−0.010 (0.348)
Industrial diversity	6.737 (0.626)***	−4.577 (3.762)
Proximity to upstream firms	1.366 (0.148)***	−1.635 (0.670)**
Proximity to downstream firms	0.365 (0.060)***	0.114 (0.387)
Education	2.638 (0.352)***	6.711 (2.134)***
Income	0.020 (0.003)***	−0.053 (0.020)***
Bonding social capital	0.142 (0.019)***	<0.001 (0.130)
Bridging within community	−0.042 (0.012)***	0.038 (0.077)
Bridging across communities	−0.043 (0.021)**	−0.149 (0.136)
Government expenditure-to-tax ratio	0.047 (0.020)**	0.227 (0.109)**
Amenity	0.062 (0.017)***	−0.199 (0.112)*
Distance to closest MSA	−0.272 (0.841)	−4.624 (5.395)
County seat	0.315 (0.048)***	0.839 (0.317)***
Log-likelihood		−5,597.04
# of sector–zip code–year cells		19,698

Note: Poisson estimates are reported. Standard errors are in parentheses. The model includes sector-year dummy variables. A null hypothesis that all interaction term coefficients are zero is rejected in the likelihood-ratio test: $\chi^2(14) = 48.74$, p-value < 0.01.
***Significant at 1%.
**Significant at 5%.
*Significant at 10%.

Table 5. New Firm Location Choices: Manufacturing versus Non-manufacturing, Elasticities

Variables	New non-manufacturing businesses	New manufacturing businesses
Cluster specialization	0.02	−0.03
Local competition	[0.52]	[0.51]
Industrial diversity	5.99	1.92
Proximity to upstream firms	0.08	−0.01
Proximity to downstream firms	0.02	0.01
Education	0.61	2.03
Income	1.02	−1.62
Bonding social capital	0.80	0.83
Bridging within community	−0.31	−0.03
Bridging across communities	−0.26	−1.23
Government expenditure-to-tax ratio	0.13	0.76
Amenity	0.14	−0.31
Distance to closest MSA	−0.01	−0.24
County seat	[0.32]	[1.15]

Note: For local competition (county seat), proportional changes in firm entry probability going from the absence of a competitor (county seat designation) to the presence of a competitor (county seat designation) in the town-sector market are reported in a bracket.

friends and local groups may become more critical in opening businesses in more remote towns because remote towns may have greater constraints on resources and information for businesses. Bridging within the community has a negative effect in closer proximity to the metro. Its effect eventually turns positive as distance from the closest metro area increases beyond 111 miles (0.084/0.757 × 1,000). Because the mean distance is fifty miles, bridging within the community would have a negative impact on most towns in our sample. We do the same analysis on bridging across communities. Its impact is positive up to thirty-one miles from the closest metro area but turns negative beyond that distance. Thus, bridging across communities would have a negative impact on many towns in our sample.

Table 6. New Firm Location Choices: 1995 versus 2005 versus 2014, Estimates

Dependent variable: # of new firms in sector–zip code–year cell	(1) Baseline: Year 1995	(2) Estimates for explanatory variables interacted with a year dummy for 2005	(3) Estimates for explanatory variables interacted with a year dummy for 2014
Cluster specialization	−0.034 (0.059)	0.036 (0.065)	0.048 (0.066)
Local competition	0.389 (0.186)**	0.216 (0.223)	−0.137 (0.291)
Industrial diversity	6.853 (1.466)***	−0.174 (1.644)	−1.217 (2.888)
Proximity to upstream firms	0.916 (0.301)***	−0.026 (0.361)	1.597 (0.589)***
Proximity to downstream firms	0.296 (0.071)***	0.563 (0.250)**	1.408 (0.497)***
Education	4.426 (0.977)***	−2.507 (1.074)**	−1.052 (1.265)
Income	0.010 (0.008)	0.014 (0.009)	0.004 (0.011)
Bonding social capital	0.069 (0.048)	0.083 (0.054)	0.106 (0.072)
Bridging within community	−0.068 (0.032)**	0.047 (0.034)	−0.055 (0.052)
Bridging across communities	0.034 (0.065)	−0.101 (0.070)	0.009 (0.088)
Government expenditure-to-tax ratio	0.082 (0.101)	−0.019 (0.104)	−0.025 (0.108)
Amenity	0.014 (0.044)	0.032 (0.048)	0.127 (0.065)*
Distance to closest MSA	2.221 (2.321)	−2.448 (2.519)	−6.363 (3.410)*
County seat	0.446 (0.124)***	−0.125 (0.137)	−0.400 (0.190)**
Log-likelihood		−5,576.87	
# of sector–zip code–year cells		19,698	

Note: Poisson estimates are reported. Standard errors are in parentheses. The model includes sector-year dummy variables. A null hypothesis that all interaction term coefficients are zero is rejected in the likelihood-ratio test: $\chi^2(28) = 89.08$, p-value < 0.01.

***Significant at 1%.

**Significant at 5%.

*Significant at 10%.

Table 7. New Firm Location Choices: 1995 versus 2005 versus 2014, Elasticities

Variables	(1) 1995	(2) 2005	(3) 2014
Cluster specialization	−0.02	<0.01	0.01
Local competition	[0.39]	[0.61]	[0.25]
Industrial diversity	5.95	5.99	5.08
Proximity to upstream firms	0.04	0.04	0.13
Proximity to downstream firms	0.01	0.04	0.08
Education	0.81	0.41	0.99
Income	0.43	1.22	0.77
Bonding social capital	0.44	0.89	0.84
Bridging within community	−0.54	−0.14	−0.98
Bridging across communities	0.24	−0.44	0.21
Government expenditure-to-tax ratio	0.19	0.19	0.19
Amenity	0.03	0.10	0.32
Distance to closest MSA	0.11	−0.01	−0.20
County seat	[0.45]	[0.32]	[0.05]

Note: For local competition (county seat), proportional changes in firm entry probability going from the absence of a competitor (county seat designation) to the presence of a competitor (county seat designation) in the town-sector market are reported in a bracket.

We conduct a robustness test for social capital by using two association density variables following Rupasingha, Goetz, and Freshwater (2006). One is an Olson-type group density, and the other is a Putnam-type group density. The Olson-type groups are rent-seeking organizations, including political organizations, labor organizations, business organizations, and professional organizations (Olson 1982). In contrast, the Putnam-type groups are social interaction groups, including civic organizations, bowling centers, golf clubs, fitness centers, sports organizations, and religious organizations (Putnam 1993). Estimation results are reported in the second column of table 8. The estimated coefficient for the Olson-type group density (0.041) is insignificantly positive, whereas the corresponding

Table 8. New Firm Location Choices: Interactions of Social Capital Measures with the Distance to Closest Metro Area, and Alternative Social Capital Measures

Dependent variable: # of new businesses in sector–zip code–year cell	(1) Interactions of social capital measures with the distance to closest metro area	(2) Alternative social capital measures
Cluster specialization	−0.008 (0.022)	−0.020 (0.023)
Local competition	0.543 (0.093)***	0.647 (0.092)***
Industrial diversity	6.183 (0.621)***	6.643 (0.611)***
Proximity to upstream firms	1.169 (0.140)***	1.283 (0.138)***
Proximity to downstream firms	0.344 (0.059)***	0.401 (0.058)***
Education	2.865 (0.351)***	2.206 (0.330)***
Income	0.012 (0.003)***	0.008 (0.003)***
Bonding social capital	−0.006 (0.030)	—
Bridging within community	−0.084 (0.020)***	—
Bridging across communities	0.075 (0.038)*	—
Distance × Bonding	3.501 (0.536)***	—
Distance × Bridging within community	0.757 (0.333)**	—
Distance × Bridging across communities	−2.456 (0.619)***	—
Olson-type group per 1,000 people	—	0.041 (0.032)
Putnam-type group per 1,000 people	—	−0.029 (0.009)***
Government expenditure-to-tax ratio	0.086 (0.020)***	0.025 (0.020)
Amenity	0.038 (0.017)**	0.036 (0.016)**
Distance to closest MSA	−13.535 (4.537)***	0.902 (0.811)
County seat	0.370 (0.048)***	0.552 (0.042)***
Log-likelihood	−5595.18	−5,649.63
# of sector–zip code–year cells	19,698	

Note: Poisson estimates are reported. Standard errors are in parentheses. All models include sector-year dummy variables.
***Significant at 1%.
**Significant at 5%.
*Significant at 10%.

estimate for the Putman-type group (−0.029) is significantly negative. These results seem quite consistent with the original results in table 3 if the Olson-type groups are related to bonding social capital, and the Putnam-type groups are related to bridging social capital.

Local Factors and Decadal Employment Growth

As a robustness test, we examine whether local factors used in our model affect employment growth over next ten years. The dependent variable is a dummy variable indicating whether employment is increased in sector–zip code pair in 1994–2004 (or 2004–2014) rather than the employment growth rate because there are many sector–zip code pairs with zero existing employment in the start year. Probit estimates are reported in table 9. The first column is for 1994–2004, and the second column is for 2004–2014. Estimated coefficients for most agglomeration measures and human capital are significant persistently, which suggests that local factors that had stronger impacts on new firm entry still have significant impacts on employment growth. Recall that agglomeration and human capital variables had stronger impacts on new firm entry than other variables in table 3.

Discussion

Small towns are finding it increasingly difficult to attract new firm entry, but there is substantial variation in the pace of new firm entry. Consistently over twenty years, the towns attracting the most entrants were the ones with the greatest endowment of human capital and high levels of agglomeration. Coupled with local natural amenities whose importance on firm entry has been growing over time, there are no policy options that are sufficiently effective to reverse the disadvantages of weak human capital and natural endowments or the lack of agglomeration advantages. Local

Table 9. Impacts of Local Factors on Decadal Employment Growth

Dependent variable: Whether employment was increased in sector–zip code pair in the indicated time period	(1) 1994–2004	(2) 2004–2014
Cluster specialization	0.081 (0.012)***	0.061 (0.007)***
Local competition	0.165 (0.063)***	—
Industrial diversity	2.147 (0.542)***	1.358 (0.766)*
Proximity to upstream firms	−0.307 (0.217)	1.811 (0.275)***
Proximity to downstream firms	0.325 (0.193)*	1.400 (0.312)***
Education	1.408 (0.419)***	1.238 (0.518)**
Income	0.007 (0.003)**	0.006 (0.004)
Bonding social capital	0.065 (0.020)***	0.138 (0.026)***
Bridging within community	−0.039 (0.014)***	−0.016 (0.016)
Bridging across communities	−0.012 (0.027)	−0.060 (0.033)*
Government expenditure-to-tax ratio	0.041 (0.047)	−0.012 (0.029)
Amenity	−0.048 (0.018)***	0.024 (0.023)
Distance to closest MSA	−2.143 (1.100)*	−1.793 (1.250)
County seat	0.171 (0.061)***	−0.099 (0.074)
Log-likelihood	−3,478.07	−2,194.12
# of sector–zip code pairs	6,566	6,566

Note: Probit estimates are reported. Standard errors are in parentheses. All models include sector dummy variables. In the second column, local competition is excluded due to its perfect prediction for the dependent variable in some sector–zip code pairs.
***Significant at 1%.
**Significant at 5%.
*Significant at 10%.

governments that can attract intergovernmental transfers have an advantage in attracting new start-ups, but the impact is too small to make up for the locational disadvantages. Similarly, social capital has a net positive effect, but even smaller than that of intergovernmental transfers.

These results suggest a regional rural development approach that encourages firm entry in rural towns with greater endowments of human capital and local agglomeration would be more successful than trying to promote firm entry in all rural towns. This approach relies on human capital and market agglomeration in bigger towns. It seems that smaller rural towns could band together with a larger town to have a coordinated labor shed strategy where the focus is to bring jobs to the regional labor market hub that would employ workers from all the surrounding small towns. All the towns may benefit when their residents can access jobs within the commuting area and not just the residents in the town housing the jobs. Khan, Orazem, and Otto (2001) showed that county populations respond positively to job growth within a two-county radius, not just to job growth in the county itself. Job creation in bigger rural towns would provide job opportunities to residents in the smaller surrounding towns, help the surrounding towns retain population, and thus reduce the overall population decline in rural areas.[20] Testing whether bigger rural towns have a labor-shed commuting relationship with smaller surrounding towns remains for future research.

Rural development is funded by all levels of governments. Among federal government agencies, the U.S. Department of Agriculture is the lead agency for rural development and provides funds for rural business development and rural infrastructure including broadband deployment. However, a small portion of 2018 Farm Bill expenditures is allocated for rural development. The share of projected outlays in Rural Development Title under the 2018 Farm Act, 2019–2023 is less than 1%.[21] Although some other titles provide funds for rural development (for example, Farmers Market Promotion Program and Local Food Promotion Program in Horticulture Title), the aggregate expenditure share for rural development is still small.

[20]Our approach is different from Olfert and Partridge's (2010) relying on urban agglomeration economies. They argue that improving rural residents' access to urban labor markets through better commuting opportunities from rural towns to urban areas would promote rural economic growth. However, their approach is not applicable to small rural towns that do not have urban areas within a commutable distance. In contrast, our approach is applicable to these remote towns by binding them with a larger town.

[21]https://www.ers.usda.gov/agriculture-improvement-act-of-2018-highlights-and-implications (accessed on May 23, 2020).

Some resources are available for rural development from other federal agencies, such as the Economic Development Administration and Small Business Administration. State and local governments have rural development programs, which are likely to be business tax incentives and other cash incentives.[22] More than 90% of state and local economic development program expenditures are in the form of business tax incentives and other cash incentives (Bartik 2019).

Bartik's (2020) review of estimated economic impacts of place-based policies finds that the benefit–cost ratios of local development policies are greatest in distressed areas, which suggests that the net benefits of our rural development approach would be substantially large. Recall the economic distress in rural towns illustrated in figure 1. His review also finds that the job creation cost for public services to businesses (e.g. infrastructure, job training, and business advice) is much smaller than for business incentives, which suggests that rural development policies need to rely more on public services to businesses.[23] However, the composition of rural development packages should be customized based on local conditions. For example, some towns need more infrastructure, whereas others need more business advice.

To sum up, rural development policy should focus on bigger rural towns with higher human capital endowment and agglomeration, and provide employment opportunities to residents in surrounding small rural towns. Rural development policy should use public services to businesses more often than business incentives. This line of rural development policy would be more effective than focusing on every single rural town and using business incentives only.

Supplementary Material

Supplementary material are available at *American Journal of Agricultural Economics* online.

[22]The list of state legislative rural development councils is available at the National Conference of State Legislatures website (https://www.ncsl.org/research/agriculture-and-rural-development/state-legislative-rural-development-efforts.aspx, accessed on May 22, 2020).

[23]This does not necessarily mean that business incentives should not be used. Public services to businesses have limits to attract big firms.

References

Acs, Zoltan J, and Catherine Armington. 2004. The Impact of Geographic Differences in Human Capital on Service Firm Formation Rates. *Journal of Urban Economics* 56(2): 244–78. https://doi.org/10.1016/j.jue.2004.03.008.

Akçomak, İ Semih, and Bas ter Weel. 2009. Social Capital, Innovation and Growth: Evidence from Europe. *European Economic Review* 53(5): 544–67. https://doi.org/10.1016/j.euroecorev.2008.10.001.

Alon, Titan, David Berger, Robert Dent, and Benjamin Pugsley. 2018. Older and Slower: The Startup Deficit's Lasting Effects on Aggregate Productivity Growth. *Journal of Monetary Economics* 93: 68–85. https://doi.org/10.1016/j.jmoneco.2017.10.004.

Arauzo-Carod, Josep-Maria, Daniel Liviano-Solis, and Miguel Manjón-Antolín. 2010. Empirical Studies in Industrial Location: An Assessment of Their Methods and Results. *Journal of Regional Science* 50 (3): 685–711. https://doi.org/10.1111/j.1467-9787.2009.00625.x.

Artz, Georgeanne M, Younjun Kim, and Peter F Orazem. 2016. Does Agglomeration Matter Everywhere?: New Firm Location Decisions in Rural and Urban Markets. *Journal of Regional Science* 56(1): 72–95. https://doi.org/10.1111/jors.12202.

Barnatchez, Keith, Leland D Crane, and Ryan Decker. 2017. An Assessment of the National Establishment Time Series (NETS) Database. In *Finance and Economics Discussion Series 2017–110*. Washington, DC: Board of Governors of the Federal Reserve System. https://doi.org/10.17016/FEDS.2017.110.

Bartik, Timothy J. 2019. Should Place-Based Jobs Policies Be Used to Help Distressed Communities? Upjohn Institute Working Paper 19-308. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research. https://doi.org/10.17848/wp19-308

Bartik, Timothy J. 2020. Place-Based Policy: An Essay in Two Parts. Policy Paper No. 2020-021. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research. Available at: https://doi.org/10.17848/pol2020-021

Bauernschuster, Stefan, Oliver Falck, and Stephan Heblich. 2010. Social Capital Access and Entrepreneurship. *Journal of*

Economic Behavior & Organization 76 (3): 821–33. https://doi.org/10.1016/j.jebo.2010.09.014.

Besser, Terry L, and Sela Harcey Crystal Peoples. 2015. Sigma: A Profile of Iowa Small Towns 1994 to 2014. College of Agriculture and Life Science, Iowa State University, Ames, Iowa.

Besser, Terry L, and Nancy J Miller. 2013. Community Matters: Successful Entrepreneurship in Remote Rural US Locations. *International Journal of Entrepreneurship and Innovation* 14(1): 15–27. https://doi.org/10.5367/ijei.2013.0104.

Bjørnskov, Christian. 2012. How Does Social Trust Affect Economic Growth? *Southern Economic Journal* 78(4): 1346–68. https://doi.org/10.4284/0038-4038-78.4.1346.

Bottazzi, Laura, Marco Da Rin, and Thomas Hellmann. 2016. The Importance of Trust for Investment: Evidence from Venture Capital. *Review of Financial Studies* 29 (9): 2283–318. http://doi.org/10.1093/rfs/hhw023.

Bunten, Devin, Stephan Weiler, Eric Thompson, and Sammy Zahran. 2015. Entrepreneurship, Information, and Growth. *Journal of Regional Science* 55 (4): 560–84. https://doi.org/10.1111/jors.12157.

Buonanno, Paolo, Daniel Montolio, and Paolo Vanin. 2009. Does Social Capital Reduce Crime? *Journal of Law and Economics* 52(1): 145–70. https://doi.org/10.1086/595698.

Crandall, Mindy S, and Buce A Weber. 2004. Local Social and Economic Conditions, Spatial Concentrations of Poverty, and Poverty Dynamics. *American Journal of Agricultural Economics* 86(5): 1276–81. https://doi.org/10.1111/j.0002-9092.2004.00677.x.

Crane, Leland, and Ryan Decker. 2019. Business Dynamics in the National Establishment Time Series (NETS). In *Finance and Economics Discussion Series 2019-034*. Washington, DC: Board of Governors of the Federal Reserve System. https://doi.org/10.17016/FEDS.2019.034.

Cromartie, John 2017. Rural America at a Glance: 2017 Edition. Economic Information Bulletin 182. Washington, DC: U.S. Department of Agriculture, Economic Research Service.

De Blasio, Guido, and Giorgio Nuzzo. 2010. Historical Traditions of Civicness and Local Economic Development. *Journal of Regional Science* 50(4): 833–57. http://doi.org/10.1111/j.1467-9787.2009.00624.x.

Deller, Steven C, Tsung-Hsiu (Sue) Tsai, David W Marcouiller, and Donald BK English. 2001. The Role of Amenities and Quality of Life in Rural Economic Growth. *American Journal of Agricultural Economics* 83(2): 352–65. http://doi.org/10.1111/0002-9092.00161.

Deller, Steven C, and Stephan Goetz. 2009. Historical Description of Economic Development Policy. In *Targeting Regional Economic Development*, ed. Stephan Goetz, Steven Deller and Thomas Harris, 17–34. London: Routledge Publishing.

Duranton, Gilles, and Puga, Diego. 2014. Chapter 5 - The Growth of Cities. In *Handbook of Economic Growth*, ed. Phillippe Aghion and Steven Durlauf, 781–853. Princeton, NJ: North Holland. https://doi.org/10.1016/B978-0-444-53540-5.00005-7.

Feigenberg, Benjamin, Erica Field, and Rohini Pande. 2013. The Economic Returns to Social Interaction: Experimental Evidence from Microfinance. *Review of Economic Studies* 80(4): 1459–83. http://doi.org/10.1093/restud/rdt016.

Freire-Gibb, Lucio Carlos, and Kristian Nielsen. 2014. Entrepreneurship within Urban and Rural Areas: Creative People and Social Networks. *Regional Studies* 48 (1): 139–53. https://doi.org/10.1080/00343404.2013.808322.

Gabe, Todd. 2003. Local Industry Agglomeration and New Business Activity. *Growth and Change* 34(1): 17–39. https://doi.org/10.1111/1468-2257.00197.

Gabe, Todd M, and Kathleen P Bell. 2004. Tradeoffs between Local Taxes and Government Spending as Determinants of Business Location. *Journal of Regional Science* 44(1): 21–41. http://doi.org/10.1111/j.1085-9489.2004.00326.x.

Glaeser, Edward L, Harvard D Kallal, Jose A Scheinkman, and Andrei Shleifer. 1992. Growth in Cities. *Journal of Political Economy* 100(6): 1126–52. https://doi.org/10.1086/261856.

Glaeser, Edward L, and David C Maré. 2001. Cities and Skills. *Journal of Labor Economics* 19(2): 316–42. https://doi.org/10.1086/319563.

Graves, Philip E. 1979. A Life-Cycle Empirical Analysis of Migration and Climate,

by Race. *Journal of Urban Economics* 6 (2): 135–47. https://doi.org/10.1016/0094-1190(79)90001-9.

Guimarães, Paulo, Octávio Figueiredo, and Douglas Woodward. 2004. Industrial Location Modeling: Extending the Random Utility Framework. *Journal of Regional Science* 44(1): 1–20. https://doi.org/10.1111/j.1085-9489.2004.00325.x.

Guiso, Luigi, Paolo Sapienza, and Luigi Zingales. 2004. The Role of Social Capital in Financial Development. *American Economic Review* 94(3): 526–56. https://doi.org/10.1257/0002828041464498.

Halstead, John M, and Steven C Deller. 2015. *Social Capital at the Community Level: An Applied Interdisciplinary Perspective*. New York: Routledge.

Haltiwanger, John, Ron S Jarmin, and Javier Miranda. 2013. Who Creates Jobs? Small versus Large versus Young. *Review of Economics and Statistics* 95(2): 347–61. https://doi.org/10.1162/REST_a_00288.

Henry, Mark, and Mark Drabenstott. 1996. A New Micro View of the U.S. Rural Economy. *Economic Review, Federal Reserve Bank of Kansas City* 81: 53–70.

Jacobs, Jane. 1969. *The Economy of Cities*. New York: Random House.

Khan, Romana, Peter F Orazem, and Daniel M Otto. 2001. Deriving Empirical Definitions of Spatial Labor Markets: The Roles of Competing versus Complementary Growth. *Journal of Regional Science* 41 (4): 735–56. https://doi.org/10.1111/0022-4146.00241.

Kilkenny, Maureen, Laura Nalbarte, and Terry Besser. 1999. Reciprocated Community Support and Small Town - Small Business Success. *Entrepreneurship & Regional Development* 11(3): 231–46. https://doi.org/10.1080/089856299283182.

Knack, Stephen, and Philip Keefer. 1997. Does Social Capital Have an Economic Payoff? A Cross-Country Investigation. *Quarterly Journal of Economics* 112(4): 1251–88. https://doi.org/10.1162/003355300555475.

Kolko, Jed, and David Neumark. 2010. Does Local Business Ownership Insulate Cities from Economic Shocks? *Journal of Urban Economics* 67(1): 103–15. https://doi.org/10.1016/j.jue.2009.08.006.

Logan, John R, Zengwang Xu, and Brian Stults. 2014. Interpolating US Decennial Census Tract Data from as Early as 1970 to 2010: A Longitudinal Tract Database. *Professional Geographer* 66(3): 412–20. https://doi.org/10.1080/00330124.2014.905156.

Lucas, Robert E. 1988. On the Mechanics of Economic Development. *Journal of Monetary Economics* 22(1): 3–42. https://doi.org/10.1016/0304-3932(88)90168-7.

Manson, Steven, Jonathan Schroeder, David Van Riper, and Steven Ruggles. 2019. "IPUMS National Historical Geographic Information System: Version 14.0" [Database]. Available at: https://nhgis.org/

Marshall, Alfred. 1920. *Principles of Economics*. London: Macmillan.

McGranahan, David. 1999. Natural Amenities Scale [Data file]. Available at: https://www.ers.usda.gov/data-products/natural-amenities-scale/.

Moretti, Enrico. 2004. Workers' Education, Spillovers, and Productivity: Evidence from Plant-Level Production Functions. *American Economic Review* 94(3): 656–90. https://doi.org/10.1257/0002828041464623.

Olfert, M Rose, and Mark D Partridge. 2010. Best Practices in Twenty-First-Century Rural Development and Policy. *Growth and Change* 41(2): 147–64. https://doi.org/10.1111/j.1468-2257.2010.00523.x.

Olson, Mancur. 1982. *The Rise and Decline of Nations*. New Haven: Yale University Press.

Pender, John, Alexander Marré, and R Reeder. 2012. Rural Wealth Creation: Concepts, Strategies, and Measures. In *Economic Research Report 131*. Washington, DC: U.S. Department of Agriculture Economic Research Service.

Porter, Michael. 1990. *The Competitive Advantage of Nations*. New York: Free Press.

Puga, Diego. 2010. The Magnitude and Causes of Agglomeration Economies. *Journal of Regional Science* 50(1): 203–19. http://doi.org/10.1111/j.1467-9787.2009.00657.x.

Putnam, Robert. 1993. *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton, NJ: Princeton University Press.

Rauch, James E. 1993. Productivity Gains from Geographic Concentration of Human Capital: Evidence from the Cities. *Journal of Urban Economics* 34(3): 380–400. https://doi.org/10.1006/juec.1993.1042.

Rickman, Dan S, and Shane D Rickman. 2011. Population Growth in High-Amenity Nonmetropolitan Areas: What's the Prognosis? *Journal of Regional Science* 51(5): 863–79. http://doi.org/10.1111/j.1467-9787.2011.00734.x.

Romer, Paul M. 1986. Increasing Returns and Long-Run Growth. *Journal of Political Economy* 94(5): 1002–37. https://doi.org/10.1086/261420.

Rupasingha, Anil, and Stephan J. Goetz. 2013. Self-Employment and Local Economic Performance: Evidence from US Counties. *Papers in Regional Science* 92 (1): 141–61. https://doi.org/10.1111/j.1435-5957.2011.00396.x.

Rupasingha, Anil, Stephan J. Goetz, and David Freshwater. 2006. Social Capital and Economic Growth: A County-Level Analysis. *Journal of Agricultural and Applied Economics* 32(3): 565–72. https://doi.org/10.1017/S1074070800020654.

Rupasingha, Anil, Goetz, Stephan J., and Freshwater, David. 2006. The Production of Social Capital in US Counties. *Journal of Socio-Economics* 35(1): 83–101. https://doi.org/10.1016/j.socec.2005.11.001.

Schmidheiny, Kurt, and Marius Brülhart. 2011. On the Equivalence of Location Choice Models: Conditional Logit, Nested Logit and Poisson. *Journal of Urban Economics* 69(2): 214–22. https://doi.org/10.1016/j.jue.2010.09.004.

Seghers, Arnout, Sophie Manigart, and Tom Vanacker. 2012. The Impact of Human and Social Capital on Entrepreneurs' Knowledge of Finance Alternatives. *Journal of Small Business Management* 50(1): 63–86. http://doi.org/10.1111/j.1540-627X.2011.00344.x.

Stephens, Heather M, and Mark D Partridge. 2011. Do Entrepreneurs Enhance Economic Growth in Lagging Regions? *Growth and Change* 42(4): 431–65. https://doi.org/10.1111/j.1468-2257.2011.00563.x.

Weiler, Stephan, and Andrew Seidl. 2004. What's in a Name? Extracting Econometric Drivers to Assess the Impact of National Park Designation. *Journal of Regional Science* 44(2): 245–62. http://doi.org/10.1111/j.0022-4146.2004.00336.x.

Westlund, Hans, and Frane Adam. 2010. Social Capital and Economic Performance: A Meta-Analysis of 65 Studies. *European Planning Studies* 18(6): 893–919. https://doi.org/10.1080/09654311003701431.

Westlund, Hans, Johan P Larsson, and Amy Rader Olsson. 2014. Start-Ups and Local Entrepreneurial Social Capital in the Municipalities of Sweden. *Regional Studies* 48(6): 974–94. https://doi.org/10.1080/00343404.2013.865836.

Whisler, Ronald, Brigitte Waldorf, Gordon Mulligan, and D Plane. 2008. Quality of Life and the Migration of the College-Educated: A Life-Course Approach. *Growth and Change* 39(1): 58–94. http://doi.org/10.1111/j.1468-2257.2007.00405.x.

Winters, John V.. 2013. Human Capital Externalities and Employment Differences across Metropolitan Areas of the USA. *Journal of Economic Geography* 13(5): 799–822. https://doi.org/10.1093/jeg/lbs046.

Wu, JunJie, and Munisamy Gopinath. 2008. What Causes Spatial Variations in Economic Development in the United States? *American Journal of Agricultural Economics* 90(2): 392–408. https://doi.org/10.1111/j.1467-8276.2007.01126.x.