The Intersection of Community Assets – Using GIS and Indices of Rural Community Capital as a Means to Target Economic and Community Development

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Abstract

This project is to develop a set of indices of rural community capital (RCCI). The indices are research-based and use commonly available data sets. We are using regression analysis to test how well the indices predicted changing median incomes and population for rural communities in Louisiana and New York.

Key Points

What is the Rural Community Capacity Index (RCCI)?

The Rural Community Capacity Index is a measure of the inherent capacity of a rural community at a particular point in time relative to other rural communities. It allows policy makers to predict which communities are more likely to be economically viable based on seven key attributes: Human Capital, Social Capital, Political Capital, Natural Capital, Cultural Capital, Built Capital, and Financial Capital.

The RCCI has two primary benefits to users:

It uses existing data that are widely available so that it does not rely on additional data collection efforts such as surveys or case studies, which are cost prohibitive at the national level.

It incorporates factors into the model that are recognized as being important to community success, such as political effectiveness and social connections, as well as the traditional factors such as economic diversity, infrastructure and human capital.

Rural Community Economic Viability

For the purpose of developing and testing the RCCI, we have defined an economically viable rural community as one in which incomes are increasing and population is stable or growing. Because of vast regional differences in population change and to better capture those towns that are performing better or worse than their neighbors, our measure of population change is the difference between the percentage change in population in the community and the percentage change in population for the county in which the community resides. Population change alone is not a sufficient measure of economic viability. Although the number of jobs or new residents is often used as the measure of community development success, the incomes of the residents are vitally important to the viability of the community. O'Brien, et al. (1998) noted a falling viability index for a Missouri town after the installation of an industrial hog plant—the plant attracted many low wage workers to the town, but the town lost businesses. Flora, et al. (2004) notes that certain industries may bring jobs, but they "may not be quality jobs, that pay a livable wage." A community is economically viable only if it has the financial resources to provide services to its residents.

$$\text{Economic Viability} = \left[\left(\frac{P_2}{P_1}-1\right)-\left(\frac{CP_2}{CP_1}-1\right)\right]+\left(\frac{I_2}{I_1}-1\right)+\left(\frac{I_2/P_2}{I_1/P_1}-1\right)$$

P_1 = population of the community in period 1
P_2 = population of the community in period 2
CP_1 = population in the county in period 1
CP_2 = population in the county in period 2
I_1 = aggregate community income in period 1
I_2 = aggregate community income in period 2
I/P = per-capita income

The Design of the RCCI - Seven Community Capitals

The RCCI is a composite index number made up of seven sub-indices which are the "community capitals" proposed by Dr. Cornelia Flora. Flora has proposed that community outcomes are influenced by the different types of capital investments applied to that community. Some of these investments are easily measured and widely available, such as distance from the town to a major airport or metropolitan center, and some of them are not directly measurable and require readily available proxies if they are to be quantified. As Flora et al. (2004) remind us, "it takes more than just a bankroll to help projects succeed—it also takes vision."

The Design of the RCCI - Index Components

Index components, the specific pieces of data used to build the index, were selected based upon an extensive literature survey. We looked for components to build the index that were clearly factors in rural community success, based on research. We also looked for factors that were unambiguous in the direction of their impact on economic success. For example, the percentage of the population that votes in elections is often used as a measure of social capital. However, there was much variance in the literature about what voting rates actually mean, and what they ultimately say about a community. For example, wealthy homogenous communities were as likely as poor inner-city communities to see low voter turn out. In the former case, low turnout was thought to mean a high rate of satisfaction with government. In the latter it meant a high degree of political disengagement. We also looked for those factors that could be calculated from existing community-level data that are consistently collected around the country. Leadership skills, and the level and quality of local leadership, are clearly factors in rural community success. However leadership is not something tracked easily or consistently by normal data collection methods.

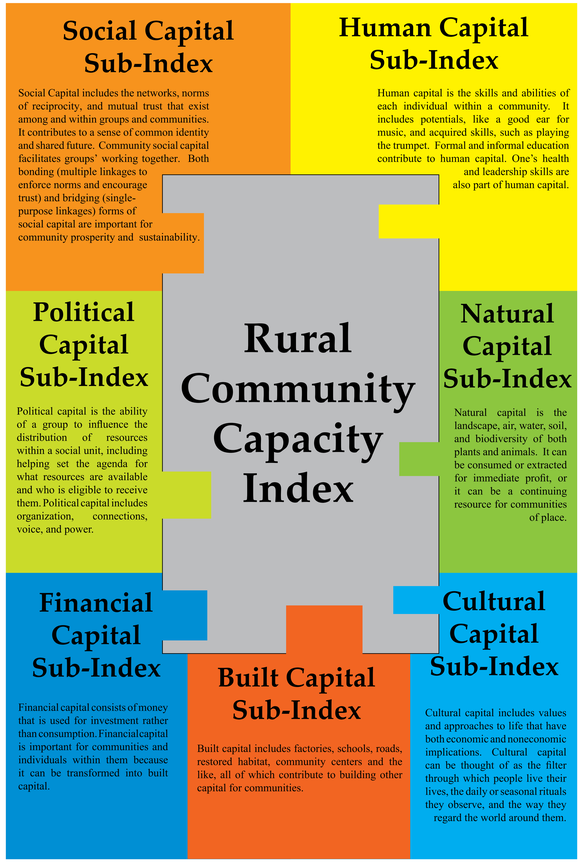
Application of the RCCI to Rural Policy and Programs

The Rural Community Capacity Index (RCCI) is a simple tool that policy makers can use to target economic and community development assistance programs to communities.

The use of indices to compare communities is not a new idea. We found many examples of indices in our literature review (O'Brien et al., 1998; Florida, 2002; Haynes, 2003; Herrera-Ulloa et al., 2003; Schlossberg and Zimmerman, 2003). Zoeteman (2000) observed that indices provide an indispensable oversight for policy-makers. Schlossberg and Zimmerman (2003) noted that scores for each index give quick-hit pieces of data that are tailor made for short information media. The simple structure of an index is convenient for communicating with policy-makers and legislators, since indexing provides a big-picture understanding of the issue in a matter of minutes.

Does the index work?

We will test the explanatory power of the RCCI by developing an index with 15 year old data and comparing the index numbers of rural communities in two states (Louisiana and New York) against the actual change in income and population that occurred in the communities over the 15 year period. This will be finished by June, 2006.



Index Component / Supporting Literature

Index Component	Supporting Literature
Social Capital	
Percentage of family households headed by adults that are middle aged (35-54).	Putnam (1966),Coleman (1998b), O'Brien et al. (1998), Renzulli et al. (2000), Cotter (2002), Glaeser (2002), Liu and Besser (2003)
Percentage of people who have moved into the community from another state or abroad in the last 5 years.	Granovetter (1973), O'Brien et al. (1998), Renzulli et al (2000), Schneider (2004)
Percentage of householders who have lived in the same unit (either owned or rented) for more than 10 years.	Putnam (1966), Coleman (1998b), O'Brien et al. (1998),Wall et al. (1998), DiPasquale and Glaeser (1999), Oliver (1999), Tolbert et al. (2002)
Political Capital	
Racial homogeneity - using a Herfindahl index of race categories from U.S. Census.	Alesina and La Ferrara (2000), Rice and Steel (2001)
Located in the district of a Member of the U.S. House or Senate who serves on either the Agriculture or Appropriations Committees.	Ferejohn (1974), Moore and Hibbing (1996), Alvarez and Saving (1997), Heithusen (2001)
Having a local newspaper, and/or located within a 30 mile radius of a community with a regional/national newspaper.	Helliwell and Putnam (1995), Brehn and Rahn (1997), Flora (1998), Prakash (2000)
Human Capital	
Quality of the public schools serving the community, measured by the high school graduation rates and percentage of teachers with advanced degrees.	Brehm and Rahn (1997), Fisher (1997), Temple and Johnson (1998), Oliver (1999), Kodrzycki (2001), Beaulieu (2002), Huang (2002), Knack (2002), Tolbert et al (2002), Herrero-Ulloa (2003), Parisi et al. (2003), Weiss (2004)
The percentage of the population that has at least a 4-year college degree.	Aldrich and Kusmin (1997), O'Brien et al.(1998), Tolbert et al. (1998), Renzulli et al. (2000), Rice and Steele (2001), Cotter (2002), Goe (2002), Schlossberg and Zimmerman (2003)
Financial Capital	
Diversity of the local employment base. A Herfindahl index number is generated using the number of persons employed in the five highest employment categories in a community.	Aldrich and Kusmin (1997), Johnson and Beal (1998), Tolbert et al. (1998), Bollman (1999), Ostry (1999), Bray et al. (2002), Cotter (2002), Peters (2002), Stedman et al. (2002), Tickamyer (1992), Tolbert et al. (2002), Haynes (2003), Parisi (2003), Parkins et al. (2003), Schlossberg and Zimmerman (2003), Wilson (2004)
Degree of income inequality. Calculate the income earned by each fifth of the population (multiplying the number of persons in each income category by the midpoint of that income category). A Gini coefficient of the five numbers is the final measure.	Brehm and Rahn (1997), Tolbert et al. (1998), Aghion et al. (1999), Benabou (2000), Knack (2002), McLaughlin (2002), Schlossberg and Zimmerman (2003)
Built Capital	
Interstate highway access.	Carlino and Mills (1987), Aldrich and Kusmin (1997), Fisher (1997), Johnson and Beale (1998), Goe (2002), Huang (2002)
Proximity to an airport.	Aldrich and Kusmin (1997), Goe (2002)
A hospital is located in the community.	Doelker and Bedics (1989), Grafton et al. (2004)
Natural Capital	
Number of family-sized farms in the county.	O'Brien et al. (1998), Tolbert et al. (1998), Tolbert et al. (2002), Peters (2002), Stedman et al. (2002), Schlossberg and Zimmerman (2003)
Located in the sunbelt region.	Carlino and Mills (1987), Aldrich and Kusmin (1997), Brehm and Rahn (1997), Oliver (1999), Tolbert et al. (2002), Parisi (2003)
Cultural Capital	
The presence of an established farmer's market in the community.	Sommer et al. (1980), Wismer (1999), French and Wechsler (2004)
Official State Historic Site within a 30 mile radius.	Schlossberg and Zimmerman (2003), Gatewood and Cameron (2004)
National Historic District or "Main Street" program in town.	Russell (2002), Wolf (2004)

Project Timeline (2003-2006)

Phase 1 Literature Review (2003-2005)

In the first phase of the project we conducted a review of literature on factors that contributed to the long term viability of rural communities. We reviewed over 100 articles and books (and are still finding more resources). Flora's work on "community capitals" provided the framework for our review. We are in the process of editing this review into a publication.

Phase 2 Model Development (2005-2006)

In the second phase of the project we sorted through all of the literature examined in phase 1 to identify 3-4 factors for each of the seven "community capitals" that (a) consistently seemed to be related to rural community economic success, (b) could be quantified consistently, and (c) were based on data that are collected nationally but at the community level.

Phase 3 - Database Development and Regression (2006)

In this phase we are building the RCCI for rural communities in the States of Louisiana and New York. We are building two RCCIs, one with 15 year old data (1990 census) and one with current data (2005-2006). We will use our measure of economic viability to see how well the 15 year old RCCI predicted the economic outcomes of the communities. We will also look to see how the direction of change in the index numbers corresponds to change in economic viability.