

# 5. Summary, Conclusions, and Lessons Learned

## 5.1. General Background

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The economic performance and potential of rural America is of considerable interest and concern to a broad range of stakeholders, including the U.S. Economic Development Administration (EDA). In 2004, the EDA released a major report titled *Competitiveness in Rural U.S. Regions: Learning and Research Agenda* produced by Professor Michael Porter and the Institute for Strategy and Competitiveness at Harvard Business School. This initial report suggested the need for further work and analysis. Consequently, in 2005, EDA funded the present follow-up study, which involved a partnership among Purdue University, Indiana University, and the State of Indiana.

The study's overall purpose was to develop a database and methodology to help rural areas in the United States assess their regional economic competitiveness to support growth and development strategies. To accomplish this broad goal, the research team organized its efforts into two major projects.

The goals of Project 1 were to (a) build a comprehensive national database suitable for cluster studies and (b) analyze several selected issues using this database. Specifically, the research team examined three broad research issues:

- The linkages between cluster structure, degree of rurality, and economic performance
- The spatial clustering of industrial clusters and the interface between rural and metropolitan regions in emerging agglomeration economies
- Growth trajectories for counties that are differentiated by cluster makeup, degree of rurality and distance to metropolitan areas

The goals of Project 2 were to (a) use the database developed in Project 1 to analyze the cluster structure of a selected region, (b) supplement these secondary data with additional local knowledge, and (c) mobilize the regional constituency in a planning process that was grounded in both secondary data and localized primary data. In essence, Project 2 was a pilot study designed to create and document a prototype process for rural regional development planning and action – one that can be replicated in other rural regions of the country.

Research Project 1 relied exclusively on secondary data and included two distinct components. The first component involved the development of a comprehensive database suitable for cluster studies and the analysis of regional development issues for the state of Indiana, its counties and its regions. Unsuppressed data at the six-digit NAICS level were available for Indiana. The second component involved the development of a database and analytical approaches for use by regions elsewhere in

the nation to help in their evaluation of economic clusters and to support economic development strategies. Unfortunately, unsuppressed county-level data for the rest of the nation were unavailable. Because of this, the research team revised cluster definitions to use three-digit NAICS sectors wherever possible when operationalizing cluster definitions at the county-level for the national analysis. As noted (on page 29), there were particular difficulties with the education cluster in relation to suppression issues.

Major data components and sources were:

- (a) Quarterly Census of Employment and Wages from the Bureau of Labor Statistics
- (b) Longitudinal Employment and Household Dynamics from the U.S. Census Bureau
- (c) Demographics, educational attainment, occupation, housing, and income data from the decennial U.S. Census Bureau
- (d) Rural-Urban Continuum Codes and Urban Influence Codes from the USDA's Economic Research Service

Exploring the various research questions and relationships associated with Project 1 required operational definitions for some important constructs: rurality, cluster, and economic performance.

- **Rurality.** An Index of Relative Rurality (IRR) was constructed to provide a continuous measure of rurality for all U.S. counties. The rurality dimension indexes U.S. counties along a rural-urban continuum with values ranging from 0 to 1; higher values indicate greater rurality. Values on the IRR were also used to classify counties into seven different categories with three of the categories representing the "metropolitan sphere" of influence; three categories representing the "rural-metropolitan interface;" and the seventh category labeled as the "rural sphere" of influence:

#### **Metropolitan Sphere**

- A. Central counties with a population of at least 500,000
- B. Central counties with a population of less than 500,000
- C. Outlying metropolitan counties with an IRR < 0.4

#### **Rural-Metropolitan Interface**

- D. Outlying metropolitan counties with an IRR  $\geq 0.4$
- E. Non-metropolitan counties adjacent to metropolitan area with an IRR < 0.4
- F. Non-metropolitan counties adjacent to a metropolitan area with an IRR  $\geq 0.4$

#### **Rural Sphere**

- G. Non-metropolitan counties not adjacent to a metropolitan area

- **Cluster.** The research team used unsuppressed county-level data for Indiana to define 17 clusters at the six-digit NAICS code level. One of these clusters, manufacturing, was disaggregated into six more specialized subclusters.

- **Economic Performance.** Composite measures of economic performance were constructed from five foundation variables: median household income, average wage, unemployment rate, poverty rate, and average annual change in employment.

Because of data suppression issues, rigorous hypothesis testing was not practical. The research team, however, gained several important insights using various research techniques, including (a) location quotients, (b) nearest neighbor analysis, (c) analyses involving correlations and comparisons of means, (d) multivariate regression analysis, and (e) extensive mapping techniques, which facilitated visual observations and insights.

Research Project 2 targeted Indiana’s Economic Growth Region 8. This eight-county region in southern Indiana includes four metropolitan and four non-metropolitan counties. Six of the counties are classified within the rural-metro interface level. As the research team engaged the local stakeholders in this eight-county region, they made extensive use of the secondary data compiled for Project 1. The research team also gathered primary data through surveys, focus groups, and interviews with key informants, including existing businesses, local economic development organizations, local and regional plan commissions, and other knowledgeable stakeholders in the eight counties. These data provided insights into the quality of the region’s business environment and generated an inventory of regional assets and liabilities. The process for constructing an economic development strategic plan in Economic Growth Region 8 followed the normal steps used for any strategic planning exercise – taking account of other plans in and around the region; gathering and analyzing pertinent data; communicating implications; developing a set of goals and strategies leading to an implementation plan; and establishing a benchmarking system for monitoring and evaluation of results.

## 5.2. National Analysis and Database (Project 1)

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### 5.2.1. Findings from National Analysis

1. **Different clusters are distributed in very different ways across the nation’s geography.** For example, very few counties have a significant concentration in the business and financial services cluster. In contrast, 38 percent of the nation’s counties have significant specialization in the agribusiness, food processing and technology cluster.
2. **Location patterns of the 17 clusters support common perceptions of regional variation in economic activity,** such as the manufacturing specialization in the Midwest and the concentration of the textile industry in the Southeast. As expected, over the three-year period analyzed, locational patterns were quite stable.
3. **For some clusters, specialization within an individual county level may reflect a larger regional specialization pattern; but in the case of other clusters this may not be so.** For example, nearest neighbor analysis indicates a regional clustering that transcends individual counties in the cases of the forest and wood products cluster, the agribusiness, food processing and technology cluster, and the apparel and textile cluster. In contrast, clusters that are confined to one county and/or operate across long distances include the following: information technology and telecommunications; business and financial services; printing and publishing; and advanced materials.

4. **There is considerable “co-location” of clusters that are significant within many regions.** Hence, the idea of considering certain regions in terms having a singular competitive advantage and labeling them by a single cluster or type of economic activity is both simplistic and misleading. In effect, what often appears is a pattern of “diversified specialization.”
5. **Most of the 17 clusters analyzed tend to be concentrated in urban counties.** Four of the 17 industry clusters are very strongly oriented toward urban locations: business and financial services; biomedical/biotechnology; information technology and telecommunications; and printing and publishing. Central metropolitan counties with a population of at least 500,000 are the type of urban county most likely to specialize in these four clusters. Four other clusters follow this same pattern to a slightly less pronounced degree: defense and security; arts, entertainment, recreation and visitor industries; advanced materials; and transportation and logistics. The glass and ceramics cluster also has an urban orientation that is not necessarily linked to the large metropolitan central counties. The manufacturing supercluster generally has an urban orientation, although non-metropolitan counties adjacent to a metropolitan county are the most specialized in the manufacturing supercluster. The chemicals and chemical-based products cluster has a similar orientation. The education and knowledge creation cluster was particularly strong in large metropolitan central counties; but beyond that particular type of county, other counties – rural and urban alike – were not easily differentiated in terms of this cluster. The apparel and textiles cluster and the energy cluster did not show any clear bias toward either rural or urban locations.

The three clusters with the strongest rural orientations were agribusiness, food processing and technology; forest and wood products; and mining. Finally, remote rural counties (i.e., non-metropolitan counties not adjacent to a metropolitan county) were generally the most disadvantaged county type with respect to all 17 clusters. The agribusiness, food processing and technology cluster and mining cluster were the two exceptions to this general tendency.

6. In our baseline year (2000), **the higher the level of rurality the poorer the economic conditions.** However, when looking at the relationship between changes in economic indicators and rurality (from 2000-2004), a more promising picture emerges. For example, there is an inverse relationship between rurality and average annual changes in both unemployment and poverty. This suggests a possible narrowing of the gap between rural and urban economic performance.
7. **The clusters most strongly associated with higher levels of economic performance – particularly in the baseline year – are business and financial services; information technology and telecommunications; and printing and publishing.** A less robust but still relatively strong relationship exists with the following clusters: advanced materials; biomedical/biotechnology; chemicals and chemical-based products; defense and security; transportation and logistics; and manufacturing. These relationships were much stronger in the more urban counties than in the more rural counties.
8. Multiple regression analysis suggests **a future reduction in economic disparities among counties.** In other words, counties that are currently lagging economically will grow at a faster rate than counties already enjoying a higher economic standard. Results indicate **human capital (as measured by educational attainment) is the primary cause of differences in income growth among counties.** The regression model provided additional insights when estimated for each of the seven different categories of counties:

- (a) **Reduction in economic disparity is projected to occur most quickly in those counties comprising the rural sphere and in the most rural counties that are part of the rural-metropolitan interface** (levels E and G). Income growth in these two county types is very heavily influenced by human capital, reinforcing once again the need for rural counties to invest in their citizens' education.
- (b) **Within the rural sphere counties** (level G), income growth increases with increasing rurality. The results also suggest that within the rural sphere income growth is dampened by manufacturing employment but fostered by employment in the agribusiness, food processing and technology cluster.
- (c) **Industry mix has an important impact on growth rates within the metropolitan sphere (levels A and C)**: specialization in business and financial services is related to increased income growth rates, while specialization in information technology and telecommunications is related to decreased income growth rates in level-F counties of the rural-metropolitan interface (perhaps partly explained by sectoral differences in the economic downturn during the 2001 to 2004 period).
- (d) **At the other two levels of rural-metropolitan interface (D and E), neither the industry mix nor the degree of rurality plays a pivotal role in income growth.**

## 5.2.2. Interactive Database for Public Use to Foster Cluster Analysis and Strategy Development

The research team incorporated a wide variety of economic and demographic variables in this analysis. Two additional sets of information were created: the 17 industry clusters and the Index of Relative Rurality. An online interactive database, located at [www.ibrc.indiana.edu/innovation/data.html](http://www.ibrc.indiana.edu/innovation/data.html), provides these data for all counties in the United States (although it must be noted again that the cluster data are affected by the suppression imposed on the federal data).

The database's reporting capability gives users instant access to well-formatted data, while its exporting capability provides users with the flexibility needed to conduct further analysis. The IBRC will maintain and update the system as new data become available from federal sources, including the U.S. Census Bureau, U.S. Bureau of Labor Statistics, U.S. Bureau of Economic Analysis and the U.S. Department of Agriculture Economic and Research Statistics. In addition, the 17 clusters will continue to be updated with each new release of the quarterly census of employment and wages, providing an important measure of change. A guide to the database is available in **Appendix VI**.

## 5.3. Application in Indiana's Economic Growth Region 8 (Project 2)

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Although local and regional stakeholders ultimately drove Project 2, the research team wanted to begin the process of engaging these stakeholders by using the data and analysis from Project 1. Consequently, stakeholder involvement was not systematically initiated until the spring of 2006. A very intense process of stakeholder engagement was then launched.

### 5.3.1. The Analysis of Clusters in EGR 8

The concentrations and changes in concentration of EGR 8 clusters may be grasped most readily by grouping clusters with similar characteristics:

- The highest location quotients in EGR 8 were associated with six clusters: education and knowledge creation (LQ = 3.2); mining (LQ = 2.9); advanced materials (LQ = 1.7); biomedical/biotechnical (LQ = 1.2); chemicals and chemical-based products (LQ = 1.7); and forest and wood products (LQ = 1.2). Additionally, four of these clusters experienced an increase in their LQs from 2001 through 2004, with the LQs for the advanced materials and chemicals clusters increasing quite dramatically. On the other hand, the mining and forest and wood products clusters experienced a decline in their LQs.
- Five additional clusters showed increased specialization during this period but had relatively modest 2004 LQs: defense and security (LQ = 1.0); agribusiness, food processing and technology (LQ = 0.9); energy (LQ = 0.9); printing and publishing (LQ = 1.0); and business and financial services (LQ = 0.5). The increase in the LQ for the latter cluster was very significant, increasing by nearly 20 percent.
- Six clusters had relatively low LQs and had also seen their LQs decrease from 2000 through 2004: manufacturing supercluster (LQ = 1.0); arts, entertainment, recreation and visitor industries (LQ = 0.6); glass and ceramics (LQ = 0.6); transportation and logistics (LQ = 0.6); apparel and textiles (LQ = 0.5); and information technology and telecommunications (LQ = 0.4).

Many of the key assets in this eight-county region are located in Monroe County, the county with the largest population and home of Indiana University. When Monroe County is excluded from the analysis, the LQs change significantly for several clusters, indicating that the region is composed of two distinct sub-regions. Most noticeable is the decrease in the LQ of the education and knowledge creation cluster from 3.2 to 0.4. Conversely, the LQs for several clusters increased significantly: mining from 2.9 to 4.3; forestry and wood products from 1.2 to 2.2; defense and security from 1.0 to 1.7; agribusiness, food processing and technology from 0.9 to 1.7; and energy from 0.9 to 1.7. However, two of these clusters – mining and forest and wood products – experienced a small decline in their LQs in the seven-county area between 2000 and through 2004.

This two-stage analysis – with and without Monroe County – suggests an integrated two-pronged development strategy for EGR 8. One component would attempt to take advantage of existing cluster strengths in the more rural areas of the region. The other component would attempt to build stronger connections between the more rural counties in EGR 8 and the metropolitan assets and capacity in Monroe County.

### 5.3.2. Stakeholder Mobilization and Planning in EGR 8

The research team laid the groundwork for introducing the project and analysis in EGR 8 very deliberately and strategically. The key organizational component was the establishment of a Regional Advisory Committee (RAC) with 25 members from across the eight-county region. RAC participants were identified in March 2006 through interviews with local elected officials, economic development professionals, and other community leaders. The lead economic development official

of each of the eight counties served on the committee, as did eight members of the cooperative extension service from within the region. Other RAC members included representatives from business, government, regional planning organizations, and the nonprofit sector.

Prior to the formation of the RAC, the research team had conducted general networking and awareness building within the region. For example, in the fall of 2005 a media release was distributed announcing the EDA grant and encouraging anyone interested to respond to either Purdue's Center for Regional Development, the Indiana Business Research Center, or the Strategic Development Group. The research team also provided a briefing at a December 2005 BRAC forum in the region hosted by Lt. Governor Skillman.<sup>34</sup>

As the RAC was becoming operational, the planning team initiated additional outreach, including the development of informational flyer, a press release, and a letter from Governor Daniels. These items described the project, explained how local officials and the public could participate and encouraged such participation. All three of the informational materials were sent to presidents of all county commissions, presidents of town councils, clerk-treasurers, and mayors. The media release went to all print media and electronic media in EGR 8. In January 2006, the team interviewed selected community leaders to collect existing local and regional development plans and to obtain nominations for the RAC.

The first meeting of the RAC was held March 28, 2006. This initial meeting introduced the project and the concept of cluster analysis. Subsequent meetings discussed the cluster results, how they could be helpful in launching a regional economic development strategy, and what a process for cluster activation might involve. The RAC also assisted in the design and process for gaining additional local input, including four focus groups and in-depth interviews with key stakeholders and decision-makers, such as local mayors.

Each of the four focus groups targeted a different set of cluster groupings: arts, entertainment, recreation and visitors industries; defense and information technology; biomed/biotech and advanced materials; and agribusiness, forest and wood products and natural resources. At the focus group meetings, the research team presented a series of questions for discussion, which resulted in a number of ideas for specific cluster-based projects that could be undertaken in EGR 8.

To supplement information gathered from Economic Growth Region 8 stakeholders via personal interviews and group meetings, the research team surveyed executives of businesses and other organizations in the region. This survey asked a number of questions about the region's business climate, its assets and liabilities as a place to do business, expectations for their firm's growth, and their views about industries or clusters worth targeting for economic development. Several different survey approaches were attempted (both online and with regular mail) before an adequate response rate was attained.

At the fourth meeting, the RAC agreed that the region did not have the resources to target all 17 clusters simultaneously. The RAC members felt they could narrow their focus by (a) having some additional analysis and information on the 17 clusters and (b) immersing themselves more fully in

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<sup>34</sup> One of EGR 8's largest employers is the Naval Surface Warfare Center–Crane, a technology-intensive facility that spans three counties and was under consideration for closure or downsizing in the federal Base Realignment and Closing (BRAC) process. Many economic development leaders from the EGR 8 attended this meeting to learn about the future of the base and the region's economy.

the results of the focus groups and the in-depth interviews that had been completed by the research team.

At the RAC's May 31 meeting, the RAC identified two groups of clusters and four separate clusters for further exploration:

- Energy; Agribusiness, Food Processing and Technology; Forest and Wood Products
- Biomedical/Biotechnology; Advanced Materials
- Arts, Entertainment, Recreation, and Visitor Industries
- Transportation and Logistics
- Defense and Security
- Business and Financial Services

Given the strength of the agribusiness, food processing and technology cluster and the emerging opportunities and demand for alternative energy – especially in biomass – the RAC saw potential for significant growth in this area. In the biomedical/biotechnical (life sciences) cluster, the RAC identified two potential projects. The first is activating a hospital/healthcare roundtable to help small local healthcare groups survive and thrive in a difficult rural environment. The second project is to explore helping small advanced materials and manufacturing firms retool to supply the growing biotechnology industrial sector in Monroe and Owen counties. Several possibilities were identified for the arts and entertainment cluster, ranging from a series of regional festivals to year-around exhibits of the work of regional artists and craftspeople.

The RAC views EGR 8's proximity to two Interstate highways (I-65 and I-64) and the planned continuation of I-69 through the region as holding considerable potential for the transportation and logistics cluster. The RAC believes this cluster can be a major focus in the future.

Because the NSWC Crane is the second largest employer in southwest Indiana, the defense and security cluster was seen as critical to the region's economic future. Three counties in the region have already pioneered a new technology park on the west side of NSWC Crane. At least one county is planning a similar park on the eastern side. Enabling all eight counties to gain from Crane's powerful economic engine was an important choice for the RAC.

The business and financial services sector, whose LQ had increased quite significantly from 2001 to 2004, was seen as a cluster with great potential. The RAC felt EGR 8 is underserved in this cluster and wants to see it develop.

In addition, the RAC recognized the need to focus on two key infrastructure foundations that undergird several of the priority clusters identified:

- Highway Corridors
- Broadband Telecommunications

"Connectivity" is the underlying theme adopted by the RAC. Whether through improving inter-county highways to connect to nearby interstates, developing trails that connect people within counties to improve quality of life, or ensuring that broadband access is available to connect businesses and residents to all parts of the region and global market, the RAC was clear in its desire to promote connectivity.

## 5.4. Lessons Learned and Future Directions

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Many lessons have been learned in the conduct of this study that may be helpful to rural areas seeking to plan and carry out regional economic development strategies. The more generally useful of these are summarized in this final section of the report.

### General Observations

- Clusters are a useful concept for strategic planning for rural regional economic development. However, many people are not at all familiar with cluster-based strategies, nor accustomed to thinking in regional terms.
- Contrary to traditional thinking, most rural economies are not dependent upon agriculture. Each region likely has clusters of strength or potential – most often in nonagricultural clusters – that warrant careful analysis and strategic planning. Often rural areas within a region will have existing specialization in some clusters or will have strengths and linkages to clusters in nearby metro areas.
- There is some evidence of potential “convergence” in economic indicators between lagging and high performing counties

### Technical Considerations in Conducting the Research

- Non-disclosure of employment and wage data at detailed NAICS levels for many counties is an obstacle to the finer-grained analysis that would be useful with the national database. Researchers throughout the nation have faced this challenge for many years in various contexts. In some states, state economic security or workforce agencies may be willing to collaborate with selected researchers (under carefully controlled conditions) by providing access to detailed data for the state. Such collaboration allowed the present research team to conduct a much more insightful analysis of cluster activity in Indiana and EGR 8 than would otherwise have been possible. If unsuppressed data were readily available for all U.S. counties, a variety of important research questions related to differences in cluster composition vis-à-vis variations in rurality, and many related questions, could be researched more effectively.
- With the success of the Local Employment Dynamics program and its synthetic estimation at the block group level and the significant strides made by the Bureau of Labor Statistics with its business employment dynamics data, the research team believes that over time the federal sources of establishment-based data will eventually provide the necessary level of detail for counties. However, users should take advantage of what is readily available.
- There is a metropolitan bias in the provision of federal data. While researchers are familiar with the problems of sample size for estimates, most economic development practitioners are not. The federal government and the statistical community at large has enhanced many data sets with the use of synthetic and other estimation techniques that provide the information needed without breaching confidentiality. Such data should be made available for all counties and regions, not just metro areas.
- The LQ maps are particularly helpful for portraying rural regions’ economies. Generating the numerous maps created for this study was time-consuming, but not overly difficult thanks to the use of standard GIS tools.

- The initial survey of regional business executives initially yielded a lower response rate than the researchers had expected, considering the importance of the subject matter to their economic future. Multiple survey efforts were undertaken to help increase the response rate and reasonable success was achieved. Nevertheless, this was a frustrating and challenging area for the research team in the pilot area.

### **Lessons Learned Regarding the *Process* of Working with Rural Regions for Economic Development**

- To carry out similar analysis and planning in other rural regions, the research team recommends allocating at least a full year to complete the project, including at least six months devoted to working directly with regional stakeholders in the planning process. It takes time to establish new relationships with regional partners in such an undertaking, develop operational procedures, obtain buy-in for the concept and to follow-through on recommendations. The present study benefited greatly from well-established connections in the target region. Even so, non-experts required significant time to understand and apply cluster analysis effectively.
- The concepts and techniques of cluster analysis appear to be a useful tool for regional leaders; however, an educational component on the front end of the project is essential. This type of analysis helps rural stakeholders become more comfortable with regional frameworks and rural-urban interdependencies – realities that may otherwise be difficult to embrace.
- The Regional Advisory Committee (RAC) established in Indiana’s EGR 8 has expressed its willingness and intention to continue the planning process begun under this EDA grant. Consequently, efforts are now underway to seek state and other support for implementing the strategies developed by the RAC.
- Although rural stakeholders may not be accustomed to thinking in regional frameworks, this, too, is a mental bridge that can be crossed. In this particular region, the research team did not encounter any resistance to its introduction.
- Rural stakeholders seeking to carry out a project such as this one need to be flexible in defining an appropriate region. They may start with one boundary in mind (which doesn’t need to coincide with a pre-existing administrative region), but then decide that some counties should be added or deleted from the original set as they examine the data and talk with stakeholders. In some cases, they might even define their region to include non-contiguous counties.
- Our experience in EGR 8 demonstrates that local community leaders from agriculture, economic development, business, and government can create effective regional strategies based on business clusters. Once regional representatives fully understood the data tools the research team brought to them, they fully bought in to the process.
- One key to our success was that the planning team’s planning facilitators gave the regional steering committee the ability and authority to create their strategy. Thus the planning effort was supported by – but not driven by – the facilitators. As a consequence, the plan has buy-in from community leaders in the region and will have a greater chance of being implemented.

## Directions for Future Research and Related Activities

The research team identified the following areas as promising for future research and related activities:

- The Index of Relative Rurality (IRR) developed for this study has proved to be a very useful tool in analyzing rural economies. Further research with the IRR is encouraged to evaluate the range of its utility and to validate it in other contexts.
- Much of the analysis of rural America has been overly simplistic. GIS tools and more advanced spatial analysis techniques are not commonly used. It is important that greater use of these more powerful approaches be applied to a wide range of issues facing rural America and its synergies with urban America.
- Analyzing per capita income across the United States without first taking into account cost of living differences can be problematic; thus, it would be beneficial to explore per capita income nationwide after making adjustments for cost of living. This is no small task and it is important to be aware of related work underway that can be most helpful in this regard. For example, the Self-Sufficiency Standard, developed by the University of Washington and the national organization Wider Opportunities for Women, takes into account county-level differences in cost of living (see **Appendix IV**). However, these data are only available for 35 states currently. Additionally, a recent study from the U. S. Department of Agriculture adjusts poverty rates to account for differences in the cost-of-living.<sup>35</sup>
- More research into the effects of data suppression on the accuracy of local and regional cluster descriptions would be beneficial to future cluster analysts and policy-makers.
- Continuing the work in EGR 8:
  - The RAC will seek funding from various sources to support implementation of the strategies developed under this project.
  - The EDA should consider supporting follow-up research in EGR 8 to study how a rural cluster strategy plays out as it moves from the planning to the implementation phase.
  - The research team may establish a blog for EGR 8 to enable interested parties to share their thoughts on the planning process and its implementation.
- There is a need to develop a user-friendly community guidebook (both hard copy and electronic) that will describe step-by-step, in straightforward language, how the planning process was initiated and conducted in EGR 8. The target for this guidebook would be local economic development officials and other community leaders interested in regional economic strategy development and implementation that is grounded in a combination of secondary data, local intelligence, and leadership to mobilize and implement regional efforts.
- To assess the generalizability of this work to other rural areas, similar projects should be conducted in rural regions with characteristics different from EGR 8.
- The time-series data used in the cluster analysis were of limited duration, because the new NAICS codes were first introduced in 2001, and at the time of this study the latest year

<sup>35</sup> Department of Agriculture, Economic Research Service, *The Cost of Living and the Geographic Distribution of Poverty*, Economic Research Reports, no. 26. Available online at <http://www.ers.usda.gov/Publications/ERR26/>.

available was 2004. Gaining economic insights and examining structural and spatial shifts will be enriched substantially if the analysis undertaken here can be extended over a longer time frame. Given the lag in release of data, a five-year analysis (2001-2006) should be planned for 2008.

- Operationalizing innovation potential is a challenge. More refined measures of educational attainment, such as degrees awarded in sciences and engineering, could be explored. However, these data are not available for workers by county, and data on degrees awarded by school do not reveal where those graduates are working. Further research on effective county-level measures of innovation and human capital is recommended.