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TARGETING INDUSTRY CLUSTERS FOR REGIONAL DEVELOPMENT:

AN OVERVIEW OF THE REDRL APPROACH

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1. Introduction

Industry targeting is the process of focusing industrial development programs and efforts at specific industries or clusters of related industries. The principal objectives of a industry targeting program is to identify: (1) industries that have a high potential for locating in the area, and (2) industries that provide attractive local economic development impacts in terms of future job growth, wages paid, and contributions to the local tax base. A targeting approach enables communities to focus their recruitment, retention and expansion, and small business development programs rather than provide assistance for many different industry types. Thus, targeting permits a more efficient use of the community's limited economic development resources.

2. Targeting Industry Clusters

An industry cluster is a geographically bounded collection of similar and/or related firms that together create competitive advantages for member firms and the local economy. Industry clusters generally include firms with significant *horizontal* and/or *vertical* linkages, or firms with similar resource and/or labor needs. Firms in an industry cluster may interact through purchase-sale relationships; interfirm collaboration in product development, marketing, or research; or a shared reliance on specialized services and labor markets.

The targeting of industrial development programs at specific industry clusters provides four principal advantages.

- The presence of an industry cluster in the area is evidence that the location is attractive to these types of manufacturers.
- The multiplier effects associated with attracting new firms to a cluster generally are greater than those resulting from noncluster firms.
- Members of industry clusters have stronger employment growth over time than firms that are not in clusters.
- Industry clusters have greater potential for new firm spin-offs than groupings of unrelated firms.

The remainder of this section provides the methods, data, and findings of our industry clusters targeting approach.

3. Selection Criteria for Industry Clusters

Anderson County. The industry targeting approach was applied to Anderson County, SC; a small, single county metropolitan area with total employment of approximately 50,000. Clusters of manufacturing establishments in Anderson County were targeted at the four-digit SIC level. To identify industry clusters with desired characteristics, five screening criteria were used:

1. Three or more establishments in Anderson County in 1996.
2. County industry employment was greater than 200 in 1996.
3. Industry employment in Anderson County increased from 1988 to 1996.

4. An industry specialization index--the Location Quotient (LQ)--for Anderson County exceeded 1.00 in 1996 or the LQ increased from 1988 to 1996.

5. An industry competitiveness index-- the Competitiveness Differential (CD) component of Shift-Share Analysis-- for Anderson County was positive for the period 1988 to 1996.

Screening criteria 1, 2, and 3 identify four-digit SIC manufacturing industries that had a significant presence in the County in 1996 and promising employment generation potential (based on 1988 to 1996 employment growth rates). The "Location Quotient" and "Competitiveness Differential" criteria are used to identify industries for which Anderson County has exhibited a competitive advantage in attracting or developing. A location quotient greater than one indicates that the region has been, over time, relatively successful in attracting or nurturing employment in a specific industry. An increase in an industry's LQ from 1988 to 1996 indicates that the industry has become more important to the local economy compared to the average county in the U.S. Thus, a high and increasing LQ implies the region has a competitive advantage in maintaining and attracting employment in that industry. The competitiveness differential (CD) provides an indicator of how well a local industry is performing over a specific time period relative to the nation as a whole. A positive competitiveness differential indicates that industry employment in the area grew at a more rapid rate than for the nation, or area industry employment declined at a less rapid rate than for the nation. A positive competitiveness differential, in conjunction with a positive area industry employment growth rate, indicates that the area had a competitive advantage in attracting and generating employment in that industry over the specified time period.

Upstate South Carolina. Large and expanding industry clusters in the other Upstate counties (Oconee, Pickens, Greenville, Laurens, Spartanburg, and Cherokee) may also be promising manufacturing industries for Anderson County. The presence of an industry cluster in the South Carolina Upstate indicates that the area provides locational characteristics that are attractive to members of these industries. In addition, the availability of Upstate clusters provides advantages to new cluster firms in terms of proximity to product markets and input suppliers, labor familiar with the industry's production process, and the availability of specialized business services.

Industry clusters in the South Carolina Upstate counties also were targeted at the four-digit SIC level. The screening criteria used to identify promising manufacturing clusters were:

1. Five or more establishments in the S.C. Upstate in 1996.
2. Upstate industry employment was greater than 1000 in 1996.
3. Industry employment in the Upstate counties increased from 1988 to 1996.
4. Industry Location Quotient (LQ) for the Upstate counties exceeded 1.00 in 1996 or increased from 1988 to 1996.
5. Industry Competitiveness Differential (CD) of Shift-Share Analysis for Upstate counties was positive for the period 1988 to 1996.

Selection Results. The screening methodology for Anderson County and the S.C. Upstate identified 22 industry clusters with high potentials for employment growth in the area - - four industry clusters that the Upstate and Anderson County have in common, four clusters unique to Anderson County, and 14 clusters unique to the Upstate counties.

4. Characteristics of Target Clusters

The 22 industry clusters selected for the Upstate and Anderson County are good prospects for industrial recruitment since the area provides a competitive advantage for these manufacturers. However, all 22 clusters may not be equally attractive prospects based on the expected economic and fiscal impacts on Anderson County. Insights into the potential county-level impacts associated with successfully recruiting an additional establishment were provided by comparing six characteristics for the cluster industries.

U. S. Employment Growth Rate. Establishments in industries with rapid national employment growth are more likely to expand and create new jobs more rapidly than establishments in slow growth or declining industries.

Average Establishment Size. Industries with large average establishment employment provide greater potential for immediate job generation than industries whose operations require, on average, fewer employees.

Average Production Worker Wages. Other establishment characteristics held equal, a manufacturing plant paying high wages will provide greater local economic development impacts than a manufacturing establishment offering primarily low wage jobs.

Fixed Assets Per Employee. The local fiscal impacts of a new manufacturing establishment are related to (1) the establishment's contribution to public revenues through property taxes paid and (2) public expenditures through increased services required by the establishment's employees. Establishments that contribute much to public

revenues relative to public expenditures will be preferred to those that add much to public costs relative to tax revenues.

Industry Multipliers. Income multipliers for the 22 industries were estimated for the Upstate counties using IMPLAN. The multipliers provide a means of comparing the relative cumulative effect of additional income generated by the cluster industry.

Import Substitution. A location consideration for many manufacturing industries is the size of the local market for the manufacturer's product. One measure of potential local market size is the dollar value of imports of the manufacturer's product to the region. The potential to substitute for Upstate imports may make Anderson County an attractive location for manufacturers. Total Upstate imports by four-digit SIC industry for the 22 manufacturing clusters were estimated using IMPLAN. Total imports were divided by average establishment size to provide an estimate of the number of new local establishments, by industry, the Upstate counties could support based on import substitution.

Summary Index of Industry Characteristics. Comparisons among industry characteristics are complicated by the fact that an industry may "rate" high on one characteristic and "rate" low on another. For example, establishments in the yarn spinning mills industry (SIC 2281) have large average plant sizes but pay relatively low wages to production workers, while establishments in the pharmaceutical preparations industry provide, on average, large plant size and high wages. Thus, from a community development standpoint, adding a pharmaceutical preparations plant would be preferred to the attraction of a new yarn spinning mill (everything else held equal).

A ranking of the 22 cluster industries based on the industry characteristics is provided through the calculation of a summary index. This index is estimated as follows:

1. The national averages for the industry establishment characteristics are standardized. That is, the 22 values for each characteristic are treated as observations from a standard normal distribution (a distribution with a mean of 0.0 and standard deviation of 1.0). Standardization of characteristic data permits comparisons across characteristics that have different measures (for example, employment vs. wages vs. assets).

2. The actual value for the characteristic is replaced by its corresponding standardized value. This standardized value is the number of standard deviations above (+) or below (-) the mean for the 22 industries. Standardized values near 0.0 reflect actual values near the average for the 22 industries. Negative standardized values reflect below average actual values and positive standardized values represent above average actual values. The larger the standardized value (+ or -) the further above or below the characteristic mean. For example, a standardized value of +1.00 or higher places the industry in approximately the top 15 percent of the 22 industries, while a value of -1.00 or lower places the industry in the bottom 15 percent. Or, an alternative perspective is that the middle 50 percent of the industries will have standardized values between approximately -.70 and +.70.

3. The standardized values for the industry characteristics are summed for each industry.

This sum represents an unweighted total, that is, each of the industry characteristics is given equal weight in construction of the index. The reader should note that the index rankings reflect the relative potential impacts of only the 22 selected industry clusters. All 22 industries were selected as good candidates for industrial recruitment based on the presence of a growing industry cluster in Anderson County or the Upstate. However, the rankings indicate that some of the 22 industries may be "more desirable" than others based on potential economic and fiscal impacts on the host region.

Weighted Index of Industry Characteristics. The index calculated above treats the industry characteristics as equally important to the local economy. Anderson County indicated that establishment wage rates and assets per employee should be given twice the importance of the remaining characteristics. Thus, a weighted index was calculated with the standardized values for wage rate and assets per employee multiplied by 2.00 while the values for the other characteristics remained unchanged. The weighted index rankings are very similar to those derived without weights.

5. Conclusions

Twenty-two 4-digit SIC manufacturing industries were selected based on the targeted industry clusters approach. Seven of the industries were in Textiles (SIC 222) or Apparel (SIC 23), five industries were in industrial and commercial machinery (SIC 35), and three industries were in chemicals and allied products (SIC 28). The remaining seven industry clusters were in

plastics (SIC 30), paper products (SIC 26), printing and publishing (SIC 27), electronic equipment (SIC 36), and automobile parts and assembly (SIC 37). All 22 industry clusters are promising targets for industrial recruitment based on recent employment growth and the attractiveness of Anderson County and the South Carolina Upstate as locations for their production activities. However, establishments in the 22 industries will provide different economic and fiscal impacts for Anderson County. Based on the selected industry characteristics, the manufacturing clusters with the most favorable economic and fiscal impact potentials for Anderson County were:

- motor vehicle parts and accessories (3714)
- nonwoven fabrics (2297)
- pharmaceutical preparations (2834)
- surface active agents (2843)
- plastic products, NEC (3089)
- turbines and turbine generator sets (3511)

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