

Section 1 – Industry Clusters as an Economic Development Strategy

Industrial agglomeration is a concept that can be traced back over a century (Marshall, 1890) and remains an important component in the analysis of industrial location. Agglomeration economies are associated with the cost savings to a business resulting from the proximity to markets and to inputs (supplies, labor force etc.). More specifically, as additional firms locate in the same geographic area, the lower the cost of production that can be achieved from suppliers competing for business, a greater specialization of supporting firms, and a specialized labor force. Furthermore, the greater the number of firms located in an area, the greater the overall market to which a business can sell its goods or services.

In recent decades, many of the advantages inherent in agglomeration economies have been undercut by globalization and its associated factors of technology, easier mobility, and lower transportation and communication costs. However, Porter (2000) suggests competitive advantages still arise from agglomeration economies in the form of *industry clusters*. First put forth in *The Competitive Advantage of Nations* (1990), Porter's concept of industry clusters differs somewhat from agglomeration economies and has received growing attention from economic development professionals and researchers. Porter's recent definition of industry clusters (1998, p 197) describes them as “*geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions (e.g. universities, standards agencies, trade associations) in a particular field that compete but also cooperate.*”

Ultimately, an industry cluster is a *system of businesses and institutions* engaged with one another at various levels. Engagement allows individual businesses to increase their competitive advantage through the pooling of resources, knowledge and innovation. When properly implemented, industry clusters can also provide a competitive advantage for geographic regions. A basic understanding of how these competitive advantages can arise through clusters requires a more detailed explanation of several key terms used in Porter's definition:

Industry clusters involve interconnected companies, specialized suppliers, service providers and firms in related industries - The concept of clusters goes beyond the analysis or recognition of a single industry sector or classification. The concept of a cluster is rooted in recognizing the important connections among different business types that support one another through their buy/sell relationships. Having local, quality suppliers creates synergy by allowing firms to adapt quickly and lower transaction costs.

Industry clusters include associated institutions – Industry clusters are not solely comprised of private firms and industries. Industry clusters recognize the potential assistance and knowledge spillovers that universities, trade associations and government agencies can provide¹. The participation of these institutions can provide research, labor training, support, and advocacy for cluster establishments.

Industry clusters have a geographic concentration – Clusters and their associated components must be concentrated in a geographical area. Geographic concentration allows for interaction and efficiencies to be developed among associated companies and also provides access to a specialized division of labor. While, the exact geographic extent of concentration will depend on a variety of factors, industry clusters are often *regional* in nature. Porter (2000) suggests that the geographic scope of a cluster relates to the distance to which informational, transactional, incentive, and other efficiencies occur. *Whatever the scope, the geographic boundaries of clusters are defined by inter-company relationships and not political boundaries (Rosenfeld, 2001).*

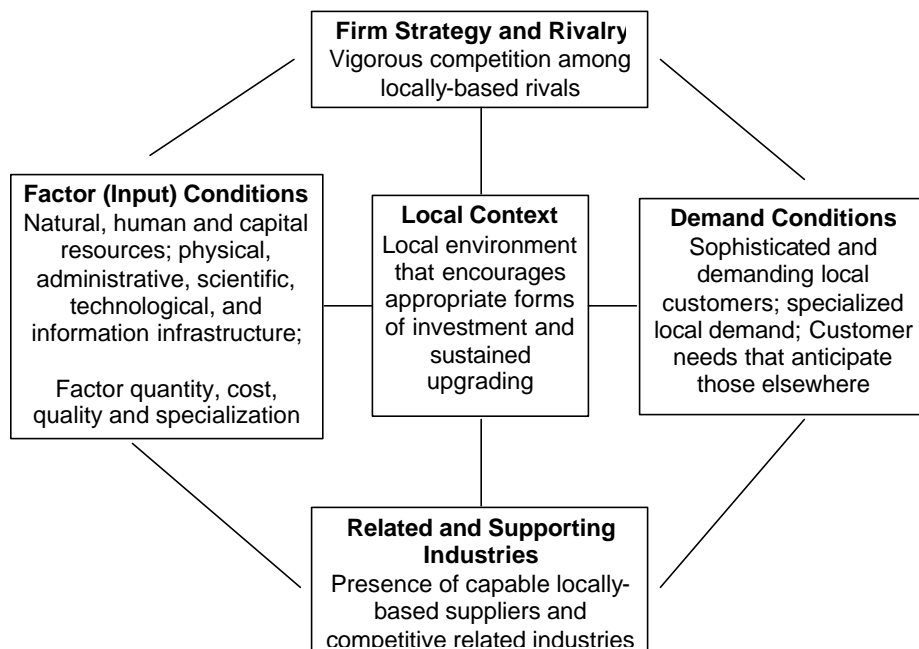
Companies within a cluster compete but also cooperate – Individual firms within an industry cluster are in competition, but also exhibit a level of cooperation. For businesses, thoughts on competition and strategy are often dominated by what goes on inside the organization. Clusters suggest that a good deal of competitive advantage lies outside companies (and even outside of their

¹ Knowledge spillovers can also occur among individual firms in an industry cluster.

industries), residing instead in the locations at which their firms are based (Porter, 2000). Cooperation in an area allows firms to engage in activities such as joint-contract bidding, developing custom labor force training programs, providing a unified voice on industry-wide issues and improving their industry's visibility. The condition of cooperation requires that private industry stakeholders, or industry champions, have a lead role in the potential success of industry clusters. *Without cooperation, a region does not have an industry cluster, so much as an industry concentration.*

Another way to envision how these factors combine to create competitive advantage is through Porter's competitive diamond metaphor (Figure 1.1 as based on Porter, 1998). When the aspects of the diamond are combined in a geographic region, these features form a competitive advantage for interrelated companies in a cluster.

Figure 1.1 – Porter's Competitive Diamond and Sources of Advantage



The industry cluster components and connections will be become more apparent throughout this analysis of the Northern EDGE Region. In general, the following cluster analysis should be thought of as both an *outcome* and a *process* for thinking about the Northern EDGE's regional economy (Rosenfeld, 2001). The ultimate desired outcome of the cluster analysis is a critical mass of more competitive and associated industries within the Northern EDGE region. Equally important is the process used to analyze the industry structure in the Northern EDGE Region. *Regardless of the outcome, the process of analyzing industry clusters should help both the region and individual industries understand their connections, discover potential sources of competitive advantage, and determine opportunities to develop new strategies for business retention, expansion and recruitment.*

Advantages and Disadvantages of a Cluster-Based Approach to Regional Economic Development

Despite the increasing popularity of industry clusters, employing a cluster-based strategy is not a panacea for regional economic success. *If implemented, industry clusters should be but one part of a broader based series of economic development strategies.* Furthermore, industry clusters may be not appropriate for all industries or all regions. Before adopting a cluster-based strategy, there are advantages and disadvantages to be considered by local policy makers and economic development practitioners. Each of these considerations will have various levels of impact depending on the industry or region of interest.

Advantages to Industry Clustering

Despite the impacts of the global economy, many competitive advantages remain heavily localized and arise from concentrations of highly specialized skills and knowledge, institutions, rivalry, related businesses and sophisticated customers (Porter, 1998). Several of these advantages arising from industry clusters can include:

1. *Clustering strengthens local economies and can result in cost savings to firms in the industry cluster – As previously suggested, cost savings can arise from a greater availability of specialized suppliers and support services; a larger pool of highly-trained workers; public infrastructure investments better targeted towards*

the needs of specific industries; financial institutions familiar with an industry; and a greater potential for inter-firm technology and information transfers (Barkley and Henry, 2001).

2. *Clustering permits better focusing of resources* – Viewing a local economy through the lens of a cluster allows a better alignment with the nature of competition and the appropriate roles of government. Clusters are broader than traditional industry categorizations and capture important linkages, complementaries and spillovers in terms of technology, skills, information, marketing and customer needs that cut across firms and industries. These potential connections create a possible rationale for collective action and a role for government (Porter, 1998). Furthermore, the linkages among firms in a cluster suggest that programs supporting specific businesses will also have relatively large multiplier effects. The total employment and income gains from recruiting and retaining cluster firms will likely exceed those associated with non-cluster firms of similar size (Barkley and Henry, 2001).
3. *Facilitation of Industry Reorganization* – Global competition and the creation of new production technologies have encouraged a transition from large firms involved in mass production to smaller firms with a focus on specialization. Adoption of new technologies and product specialization are more prominent and easily attained by firms in industry clusters (especially small firms). The proximity among these specialized firms, their input suppliers and their product markets enhances the flow of goods through the production system; enables firms to quickly adapt to market changes; and provides a pool of skilled labor (Barkley and Henry, 2001).
4. *Clustering encourages networking among firms* - Networking allows firms to take advantage of complementaries, exploit new markets, integrate activities, and pool resources or knowledge. Surveys of manufacturing networks suggest that establishments engaged in networks find significant advantages through cooperation with their counterparts. Networking firms also report that their competitiveness and profitability are enhanced by inter-firm cooperation and collaboration (Barkley and Henry, 2001). The formation of industry clusters can assist in creating and nurturing the networking process.

5. *Clusters can facilitate the commercialization of innovation* – Clusters can lower the entry barriers for new firms whether they be start-ups, spin-offs or new business lines of established firms. According to Porter (2004), starting a new business within a business cluster is easier as most of the needed inputs are available locally. Furthermore, commercialization can also be eased by cluster awareness and expertise among lenders and venture capitalists.

Disadvantages to Industry Clustering

1. *Industry clusters have a broad definition* – Despite their popularity, there is little consensus on the boundaries for an industry cluster (both geographic and industrial boundaries). More specifically, there are no rules on how strong linkages need to be among industries, the geographic concentration that clusters require, or what level of industrial specialization is necessary (Martin and Sunley, 2003). The popularity of industry clusters and its broad based definition has somewhat diluted its meaning and there is a risk that industry clusters will be used to describe every industrial structure in every region. Furthermore, if policies are used to support clusters, then all industries will seek assistance as a cluster, whether or not they do in fact constitute a legitimate cluster (Colgan and Baker, 2003).
2. *Regions will have difficulty determining the industries best suited for clustering* – Developing an industry cluster requires identifying a region's competitive advantage based on its labor force, unique regional characteristics, availability and quality of infrastructure and proximity to markets. While a detailed analysis of a region's economy can assist in this process, there are many factors critical to future success that cannot be measured. In particular, industry growth projections and future market forces are difficult to assess (Barkley and Henry, 2001).
3. *Trust and supportive institutions are not easily established* – Industry clusters require trust and cooperation among firms and organizations. Creating trust and encouraging collaboration may seem counterintuitive to many firms as it may appear to undermine a company's internal strategy and sales potential. Many economists are doubtful that appropriate institutional arrangements will emerge as cooperation is limited by incomplete

information, rivalries and opportunistic behavior. Accordingly, these researchers suggest that a consensus for promoting joint economic development will only occur when the total gains are expected to be large; when the distribution of costs and benefits are clear; and when the region can reach an agreement on helping those who may be harmed (Barkley and Henry, 2001).

The Potential for Industry Clusters in the Northern EDGE Region

Wisconsin is currently pursuing a statewide industry cluster initiative. The Department of Commerce has identified a series of ten clusters that encompass some of Wisconsin’s key established industries, as well as selected emerging industries with growth potential in the State (Table 1.1). These clusters were identified due to their strengths in the Wisconsin economy, their potential for growth, and the possible competitive advantages they bring to the State.

Table 1.1 – Wisconsin’s Current Industry Clusters

Established Clusters	Emerging Clusters
Dairy Food Products and Processing Paper Plastics Printing Small Engine Manufacturing Tourism	Biotechnology Information Technology Medical Devices

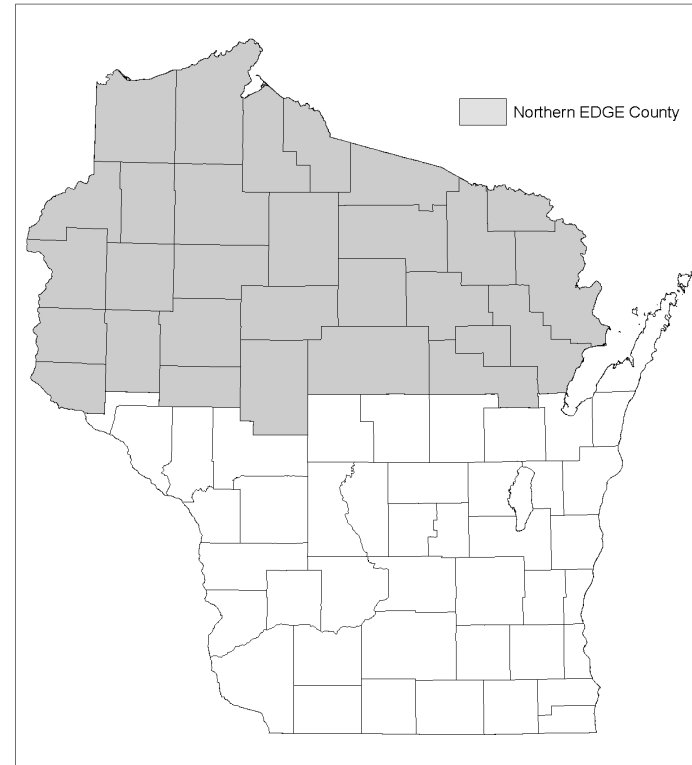
Source: WI Department of Commerce

While these ten clusters are at the center of the State’s efforts, the Department of Commerce notes that this focus will not preclude any regional efforts to support additional industry clusters. In fact, the Department of Commerce encourages other regions to examine their own economies and determine those industries that have critical mass (Nettles, 2003). Accordingly, the focus of this analysis is to analyze the Northern EDGE region for those industries that may provide strengths for the overall region and possibly create sources of regional competitive advantage.

The Northern EDGE region includes 29 of the State’s northern tier counties (Map 1.1). In the year 2000, 24 of these 29 counties were located outside of a Metropolitan Statistical Area (MSA). Accordingly,

the Northern EDGE region is primarily rural in nature. As previously noted, industry clusters require a geographic concentration of suppliers, services, competition and other resources. Given the relative dispersal of economic activity in most rural areas, this condition could suggest that industry clusters are primarily an urban occurrence.

Map 1.1 – Northern EDGE Region



Despite the potential urban orientation of clusters, anecdotal and empirical evidence over the past decade note the existence of successful rural industry clusters (Munnich et al, 2002). Furthermore, a 1998 study of rural industry clusters showed that rural industry clusters had a notable positive impact on wages for rural workers (Gibbs and Bernat, 1998). Porter (2004) also suggests that clusters work in rural economies and has compiled a number of rural industry cluster case studies and initiatives (Table 1.2)

Table 1.2 – Case Studies of Rural Clusters

Study	Authors
Retirement, Hospitality and Tourism in McCormick County, SC	Barkley and Henry
Wireless Technologies in Mankato, MN	Munnich, Schrock and Cook
Automation Technologies in Alexandria MN	Munnich, Schrock and Cook
Recreational Transportation Equipment in MN	Munnich, Schrock and Cook
Carpet Industry in Dalton, GA	Rosenfeld
Recreational Vehicles and Manufactured Housing in Northern IN	Rosenfeld
Furniture in Tupelo, MS	Rosenfeld
Furniture in North Carolina	Rosenfeld
Fishing Gear in Woodland, WA	Cortright
Houseboats in Southern Kentucky	Rosenfeld

Source: Porter, 2004

Regardless of the existence of rural industry clusters, Barkley and Henry (2001) note that rural regions and communities do need to consider the advisability of pursuing a cluster-based strategy. Communities and regions with no distinct industry cluster (or a cluster in a declining industry) will likely find little success in pursuing a cluster strategy. Rural regions with small industry clusters or those located near metro areas with industry clusters may wish to pursue industry clusters if it is not too costly to provide necessary support services and infrastructure. For those rural regions with a well-developed cluster, programs to expand the cluster could be a good strategy for industry development. While this analysis will help provide insight, the ultimate decisions about whether or not to pursue a cluster-based economic development strategy will fall on regional leaders (both public and private).

An Outline for Analyzing Potential Industry Clusters

An introduction to cluster-based economic development from the Economic Development Administration (EDA) was prepared by Information Design Associates and ICF Kaiser (1997). The introduction was intended as a primer for regions considering industry clusters and outlined four stages to developing a cluster strategy:

Stage 1: Mobilization – Building interest and participation among different constituencies needed to carry out the cluster initiative.

Stage 2: Diagnosis – Assessing the industry clusters that comprise the economy and the economic infrastructure that supports cluster performance.

Stage 3: Collaborative Strategy - Convening stakeholders (companies in each cluster, as well as public and private supporting economic institutions) into working groups. The intent is to identify priority challenges and action initiatives that can address shared problems.

Stage 4: Implementation – Building commitment of cluster working group participants and regional stakeholders to actions. Additional implementation activities included the identification or creation of an organization to sustain implementation.

The intent of this analysis is clearly *Stage 2 – Diagnosis*. However, Martin and Sunley (2003) suggest that one of the shortcomings of industry clusters is the lack of an agreed method for identifying or mapping clusters. In particular, what variables should be measured and what procedures should be used? The variety of approaches used in recent industry cluster studies confirms this observation (see Table 1.2 for a sample of these studies).

Given the lack of a widely accepted approach, this analysis of the Northern EDGE region is built on measures and approaches used in previous cluster analyses, without adopting one specific approach. Rosenfeld (2001) suggests that the most common measures used to determine industry clusters are:

- The number of employees and establishments
- Location quotients
- Input-output tables that estimate industry linkages
- Growth rates

In addition to these measures, a variety of other data sets and techniques will be employed throughout this analysis. In particular geographic information systems (GIS) will play a large role in determining national industry concentrations and potential cluster borders.

The Northern EDGE region is a large area to perform this type of analysis. While this study examines the overall region as a single unit for potential industry clusters, there may also be more localized industry concentrations in smaller regions of the Northern EDGE study area (i.e. – computer product manufacturing in the Chippewa Valley Region). Furthermore, there may be a number of industry sectors that are important to the, but are not logical extensions of the cluster model (i.e. gasoline stations).

To analyze the Northern EDGE for potential industry clusters, the remaining sections are included in this report:

Section 2: Identifying Potential Driver Industries in the Northern EDGE Region

The competitive advantage of a region is best understood by the competitive advantages of its most prominent industry (NGA 2002). These most prominent industries are export oriented, provide a center for building a cluster and have been referred to as the “lead industry group” (Colgan and Baker, 2003) or “driver industries” (Hill and Brennan, 2000). Accordingly, Section 2 employs a number of measures to define potential driver industries within the Northern EDGE region. *Note that the selection of these driver industries does not attempt to discount the importance of other industries or “pick winners” within the region.*

Section 3 – Northern EDGE Driver Industry Descriptions and Geographic Distribution

As previously suggested, a necessary condition for cluster formation is a geographic concentration of competitive firms in the driver industry categories. Surprisingly, an analysis of geographic concentration is secondary in most cluster studies (if it is performed at all). In overcoming this deficiency, this study provides a geographic analysis of driver industries to determine other regions of potential competition

and geographic cluster boundaries. Section 3 also further details the types of specific industries present in the broader driver industry category.

Section 4 – Northern EDGE Driver Industry Linkages and Potential Cluster Diagrams

Porter (2000) notes that clusters are defined too broadly if they are aggregates such as manufacturing, services, consumer goods, or high-tech. Furthermore, likening a cluster to one single industry misses the crucial interconnections with other industries and institutions that strongly affect competitiveness. To describe these connections, Section 4 examines the linkages between driver industries in the Northern EDGE and other supporting or connected industries.

Section 5 – Strategies for Organizing Industry Clusters

As noted by Martin and Sunley (2003), the types of analyses used here can at best only suggest the existence and location of possible clusters. The four stage cluster analysis process previously noted suggests that local organization and leadership initiatives need to supplement the information provided in this report. In particular, local leaders and institutions in the Northern EDGE will need to convene stakeholders (both public and private) and create actionable ideas and programs. Section 5 suggests several quantitative and qualitative methods for implementing local cluster-based initiatives and refining the information in this report.

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