PATTERN ANALYSIS
HIGHLIGHTING INDUSTRY PATTERNS THAT DRIVE NEW WEALTH IN A REGIONAL ECONOMY

KANSAS CITY REGION

MISSOURI
Department of Economic Development
AN INTRODUCTION TO INDUSTRY PATTERN ANALYSIS

Discovering patterns of connected industries can be difficult given the number of companies in an economy and the data available for analysis. Yet understanding the business patterns that drive wealth in a region is critical to designing effective development initiatives.

This report uses industry trend, concentration, and individual firm data to summarize two important patterns in a region’s economic core:

- **Spot Strengths** of large sector employment, typically in one or two firms, and

- **Core Clusters** of employment across a mix of similar or linked industries.

Recognizing spot strengths and core cluster patterns is important as these collectively large employers attract new income to a region. Knowing these industries, and the shared supply-chain and labor issues these companies have, can aid economic and workforce developers in crafting policies for the broadest impact.

Pattern analysis highlights the strengths and linkages of area industries and can serve as a starting point for understanding a regional economy. People familiar with company operations know that no two firms have the same business model. Pattern information should ultimately be enhanced by individuals with local business knowledge.

See the **NOTES** section for more details on industry pattern analysis and the methods used in this report.
What comes after “Pattern Recognition?”

Economic and workforce developers have been speaking the “cluster” language for a long time. However, just knowing that an industry pattern exists is only one step in the process. Here are some additional things to consider:

**Group Think**
While large, individual businesses will always be important and drive some policy actions, decision-makers can use pattern knowledge to focus efforts on the common problems that related businesses have. This approach makes the best use of limited resources by providing the biggest impact to the most companies.

**Customize Help**
One size does not fit all when it comes to supporting an industry pattern. Assisting a business cluster may involve specific projects like expanding utilities or broader actions such as helping attract additional knowledge workers. Whatever the needs, the pattern approach can help prioritize actions.

**Work on Workforce**
Many business location or expansion decisions revolve around issues of available labor. Workforce training geared toward supporting clusters can be very valuable as many of the firms hire workers with similar skill sets. Likewise, talented workers want to locate where clusters of similar businesses offer better odds at finding employment.

Career centers, community colleges, and universities can customize training programs to meet the need of cluster industries for specialized workers.

**Spread the Word**
Economic and workforce developers can tell the story of how a region’s industries and institutions create clusters of opportunity for existing companies, workers, and new investment. Examples such as the Animal Health Corridor (Missouri-Kansas) and the Plant and Medical Sciences Cluster (St. Louis) are excellent branding campaigns that highlight the combined strengths of businesses, universities, incubators, and workforce to form clusters of growth.

**Plan for the Future**
The current recession reminds everyone that major structural changes in the economy will occur from time to time. Missouri’s automotive industry is undergoing that change right now. Developers that understand a region’s pattern of industries will be better positioned to promote new opportunities of growth that fit well with an economy’s existing and transforming strengths.
INDUSTRY OVERVIEW

The Greater Kansas City region is the second most populated area in Missouri with 1,172,224 residents, which accounts for 20% of the entire state’s population. There are 544,639 employed people in the region, coming mostly from the Kansas City Metro Area.

This region has a strong mix of high-growth industries, including Computer Systems Design, Architectural and Engineering Services, and Data Processing, to name a few. It is also home to seven Fortune 1000 companies, as well as a number of other businesses that contribute greatly to the local, regional, and state economies.

As the national leader in the animal health and nutrition industry, KC area companies account for nearly 32% of total sales in the $19 billion global animal health market†. The region has a strong concentration in other key industries as well, such as Motor Vehicle Manufacturing, Telecommunications, and Data Processing.

<table>
<thead>
<tr>
<th>NAICS</th>
<th>Industry</th>
<th>Annual Average Emp.</th>
<th>Percent Total Emp.</th>
<th>Annual Average Wage</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Agriculture, Forestry, Fishing, and Hunting</td>
<td>810</td>
<td>0.1%</td>
<td>$30,637</td>
</tr>
<tr>
<td>21</td>
<td>Mining</td>
<td>326</td>
<td>0.1%</td>
<td>$57,346</td>
</tr>
<tr>
<td>22</td>
<td>Utilities</td>
<td>4,324</td>
<td>0.8%</td>
<td>$73,177</td>
</tr>
<tr>
<td>23</td>
<td>Construction</td>
<td>29,515</td>
<td>5.4%</td>
<td>$52,120</td>
</tr>
<tr>
<td>31-33</td>
<td>Manufacturing</td>
<td>44,718</td>
<td>8.2%</td>
<td>$52,102</td>
</tr>
<tr>
<td>42</td>
<td>Wholesale Trade</td>
<td>24,748</td>
<td>4.5%</td>
<td>$54,440</td>
</tr>
<tr>
<td>44-45</td>
<td>Retail Trade</td>
<td>59,244</td>
<td>10.9%</td>
<td>$24,926</td>
</tr>
<tr>
<td>48-49</td>
<td>Transportation and Warehousing</td>
<td>25,997</td>
<td>4.8%</td>
<td>$40,706</td>
</tr>
<tr>
<td>51</td>
<td>Information</td>
<td>21,110</td>
<td>3.9%</td>
<td>$56,110</td>
</tr>
<tr>
<td>52</td>
<td>Finance and Insurance</td>
<td>29,453</td>
<td>5.4%</td>
<td>$62,036</td>
</tr>
<tr>
<td>53</td>
<td>Real Estate and Rental and Leasing</td>
<td>10,151</td>
<td>1.9%</td>
<td>$34,479</td>
</tr>
<tr>
<td>54</td>
<td>Professional, Scientific, and Technical Services</td>
<td>36,003</td>
<td>6.6%</td>
<td>$71,669</td>
</tr>
<tr>
<td>55</td>
<td>Management of Companies and Enterprises</td>
<td>10,604</td>
<td>1.9%</td>
<td>$77,463</td>
</tr>
<tr>
<td>56</td>
<td>Administrative and Support Services</td>
<td>28,811</td>
<td>5.3%</td>
<td>$28,858</td>
</tr>
<tr>
<td>61</td>
<td>Educational Services</td>
<td>42,313</td>
<td>7.8%</td>
<td>$37,858</td>
</tr>
<tr>
<td>62</td>
<td>Health Care and Social Assistance</td>
<td>69,296</td>
<td>12.7%</td>
<td>$43,606</td>
</tr>
<tr>
<td>71</td>
<td>Arts, Entertainment, and Recreation</td>
<td>12,594</td>
<td>2.3%</td>
<td>$35,115</td>
</tr>
<tr>
<td>72</td>
<td>Accommodation and Food Services</td>
<td>48,895</td>
<td>9.0%</td>
<td>$15,773</td>
</tr>
<tr>
<td>81</td>
<td>Other Services</td>
<td>16,869</td>
<td>3.1%</td>
<td>$28,858</td>
</tr>
<tr>
<td>92</td>
<td>Public Administration</td>
<td>28,860</td>
<td>5.3%</td>
<td>$52,011</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>544,639</strong></td>
<td></td>
<td><strong>$43,194</strong></td>
</tr>
</tbody>
</table>

* Local Employment Dynamics, U.S. Census Bureau, 2008
† Source: Kansas City Area Development Council
INDUSTRY PATTERNS

The Kansas City region, with its diverse economy, is well-suited for supporting a number of industries.

While new and emerging technologies are highly targeted by local development groups, a number of core industries continue to support the base of Kansas City’s economy. Even though some of these industries have been affected by the recession, they still represent a significant portion of the region’s total employment at 49,845. Collectively these ten industry patterns make up nearly 10 percent of the Kansas City region’s private employment.

<table>
<thead>
<tr>
<th>Industry Pattern Type and Location Quotient (LQ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE</td>
</tr>
<tr>
<td>Cluster</td>
</tr>
<tr>
<td>Cluster</td>
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<tr>
<td>Spot</td>
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<td>Spot</td>
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<tr>
<td>Spot</td>
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<tr>
<td>Cluster</td>
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<tr>
<td>Cluster</td>
</tr>
</tbody>
</table>

Kansas City Region Top Location Quotient Patterns
**Paper Products Core Cluster**
*Converted Paper Product Manufacturing (NAICS 3222)*  
*Printing and Related Support Activities (NAICS 3231)*  
*Newspaper, Periodical, Book, and Directory Publishers (NAICS 5111)* - **SPOT STRENGTH**  
*Subgroup of Firms in:*  
*Company Management (NAICS 5511)*

The Paper Products Core Cluster consists of three distinct NAICS groupings that have common industry linkages and together employ over 13,000 workers. Converted Paper Product Manufacturing consists of companies engaged in converting paper or paperboard into boxes and containers without actually manufacturing paper or paperboard. Companies in Printing and Related Support Activities primarily engage in printing on apparel and textile products, paper, metal, glass, plastics and other materials. These establishments do not manufacture the stock that they print.

Newspaper, Periodical, Book, and Directory Publishers is the largest and most concentrated industry in the Paper Products core cluster, and by itself is a spot strength. Greeting card publishers are included in this industry, and are a major contributor to the region’s economy. This industry had employment losses that exceeded the national average between 2003 and 2007 in the Kansas City Region. With the recession causing a drop in ad revenues for newspapers and magazines, parts of this industry could continue to see a decline in employment. This is currently an industry in transition as many print publications begin to rely more heavily on web content.

All three industries in this cluster lost employment between 2003 and 2007. However, these industries still have concentrations higher than the national average, and should continue to be considered a key part of Kansas City’s regional economy.

**Fabricated Metal Product Manufacturing Spot Strength**
*Other Fabricated Metal Product Manufacturing (NAICS 3329)*

A **spot strength** for the Kansas City region, Fabricated Metal Product Manufacturing is made up of one industry. Other Fabricated Metal Product Manufacturing has the 2nd highest concentration of all spot/cluster industries and was 4th in terms of average annual employment growth. A significant portion of this spot strength is dedicated to supplying defense and national security markets.

**Warehousing and Storage**
*Warehousing and Storage (NAICS 4931)*

Warehousing and Storage companies act as a crucial support element to a wide variety of industries, ranging from department stores and food distribution to office supplies and musical instruments. The logistics services they offer can include labeling, packaging,
inventory control, and transportation arrangement. While they don’t manufacture or sell any of the goods they handle, they provide the means by which these goods make it to the consumer. This industry typically pays annual wages over $30,000.

**Transportation Equipment Manufacturing Spot Strength**

*Motor Vehicle Manufacturing (NAICS 3361)*
*Other Transportation Equipment Manufacturing (NAICS 3369)*

Subgroup of Firms in:
*Company Management (NAICS 5511)*

Motor Vehicle Manufacturing and Other Transportation Equipment Manufacturing combine to make up the Transportation Equipment Manufacturing pattern. Since Transportation Equipment Manufacturing has so few companies that make up the majority of employment, it is considered a spot strength.

While overall numbers are strong, this spot strength has been vulnerable to recessionary effects. Between 2003 and 2007, Motor Vehicle Manufacturing for the region lost over 20 percent of its employment. Even with this loss, and with Other Transportation Equipment Manufacturing holding steady, this spot strength currently maintains a concentration over 5 times that of the national average.

Motor Vehicle Manufacturing has been on the decline nationwide, but continues to look toward emerging trends for future growth opportunities. In September of 2009, the U.S. Department of Energy awarded the Ford Motor Company a loan for $5.9 billion dollars. The loan is part of the Advanced Technology Vehicles Manufacturing program, and will help Ford produce more fuel-efficient vehicles. This will enable the company to remain competitive in a global market that is increasingly more mindful of the harmful effects of vehicle emissions.

**Information Services Core Cluster**

*Wired Telecommunications Carriers (NAICS 5171) SPOT STRENGTH*
*Data Processing, Hosting, and Related Services (NAICS 5182) SPOT STRENGTH*

Subgroup of Firms in:
*Company Management (NAICS 5511)*

Though it’s not the most concentrated of the core clusters, Information Services does have a significant employment impact in the Kansas City Region. This core cluster contains a mix of traditional and more modern means of conveying information.

Wired Telecommunications Carriers includes companies that operate, maintain, or provide access to facilities for transmission of voice, data, text, sounds, and video using wired networks. Local and long-distance telephone carriers fall into this category. Between 2003 and 2007, the Kansas City region has seen a decrease in employment and in concentration. Nevertheless, this industry’s strong regional presence and high concentration in a few companies continues to make it a regional spot strength. A subgroup of firms in Company Management further bolsters this industry’s regional strength.
Data Processing, Hosting, and Related Services establishments engage in providing infrastructure for hosting or data processing services. This includes web hosting, media streaming services, and computer time rental. This industry gained employment and showed an increase in concentration between 2003 and 2007. Average annual wages in this industry’s subsector are over $60,000 for the region. Markets served by this industry include financial services, communications, and healthcare industries.

INDUSTRY CONTRIBUTION IMPACT: DATA PROCESSING

Pattern recognition is important since changes to business production can have broad regional impacts across a range of linked industries and institutions. Data processing is analyzed in this example of how those connections positively influence the area’s economy.

Data processing consists of internet, fiber-optics, communication networking, multimedia software, hardware, media storage and data security. The industry primarily processes data that are typically inputs to other final products and services sold on internet and export markets, thereby bringing additional money into the regional economy.

Data processing workers enjoy wages that are above the regional average. An addition of 100 employees in data processing creates an estimated total of 232 jobs paying $11.9 million in salaries and contributing over $17.4 million to the gross state product. The value-added per worker in data processing and supporting industries is $74,871.

<table>
<thead>
<tr>
<th>Data Processing Impact: Addition of 100 employees</th>
<th>Direct Impact</th>
<th>Indirect Impact</th>
<th>Total Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employment</td>
<td>100</td>
<td>132.4</td>
<td>232.4</td>
</tr>
<tr>
<td>Labor Income†</td>
<td>$6.4M</td>
<td>$5.5M</td>
<td>$11.9M</td>
</tr>
<tr>
<td>Gross Domestic Product</td>
<td>$8.3M</td>
<td>$9.1M</td>
<td>$17.4M</td>
</tr>
</tbody>
</table>

†Labor income includes employee benefits and proprietors income.
INDUSTRY INTERLINKAGES: DATA PROCESSING

Data processing employment in the Kansas City region is highly concentrated at over four times the national average. Backward-linked (supply goods and services to the industry) and forward-linked (produce value-added services for consumers) activities display the interrelationship between various industries that add value to data processing. While the backward linkages are between the suppliers of raw materials to the industry, forward linkages are between the industry and the consumers.

Backward Linkages
- Internet, fiber optics and communication networking
- Software, audio, video and other multimedia
- Computer hardware, memory, & storage
- Data security, semiconductor devices and anti-virus

Forward Linkages
- Software, data storage and web tools for customers
- Value-added computer & business services
- Domestic & International E-Commerce
- Videos, music, games and multimedia entertainment
NOTES

Industry Analysis of a Region’s Economic Core

While a business is classified by the primary service or product it creates, another distinction is the market it serves. Companies that target customers outside a region are considered export-based, or core, whereas other businesses mainly serve local customers. Grocery stores, retailers, and doctor’s offices are typical examples of local market firms. The distinction between export and local market businesses is important when considering long range economic viability and development.

Export-market industries, by serving customers outside a region, bring new dollars into an economy and form the economic core of the community. Think of manufacturers and large-scale farming. Both industries serve national and global markets and therefore attract new income into the region that is paid out in wages, interests, rents, and profits. By contrast, a local market industry largely churns existing dollars within a region. While local services are absolutely important to a thriving community, seldom can an area’s population maintain a robust economy by only selling things to each other; it has to export goods and services to bring in new wealth.

Defining Export-Market Industries

Although some businesses are commonly thought of as exporters, location quotient (LQ) analysis provides a more comprehensive approach. This quotient indicates how concentrated an industry’s employment is in a certain area as compared to the U.S. average. If an industry has an LQ of 2.0 then it is twice as concentrated in employment as the U.S. average.

Location quotients can help identify regional industries that may be exporting a substantial amount of goods and services to outside markets. If an industry is much more concentrated than the national average, firms are likely creating more products than the local economy can consume. Industries typically considered as primary exporters include:

**Large Agriculture and Forestry Operations**
**Mining**
**Manufacturing**
**Management Headquarters**
**Tourism**
*High retail/accommodations/restaurant LQ associated with destination spots.*
The list of primary exporters should be supplemented with LQ analysis to determine other industries that may be generating a large amount of income from outside a region. Services such as information technology, design and engineering, and research are often examples in metropolitan areas.

**Identifying Industry Patterns**

The industries with the highest LQ and combined employment were analyzed in the context of the region’s economy and knowledge of individual firms to determine if an industry pattern existed. Employment from 2003-2007 was analyzed to coincide with Missouri’s growth period during the last business cycle and to control for more recent recessionary effects. However, first quarter 2009 employment and business closures were reviewed to see if a pattern had greatly diminished due to major structural changes after the period of primary analysis.

**Spot Strengths** were identified as high LQ and employment sectors where 3 or fewer companies employed over 80 percent of the industry’s workforce. Spot firm employment or wage information cannot be disclosed due to confidentiality restrictions in the QCEW program. However, this report does try to identify those firm’s connections to larger clusters where applicable.

Spot firms employ a large percentage of workers and attract supply chain industries. These businesses are so prominent in a local economy, think of “factory towns,” that the firms can overshadow other regional industries. If a Spot business moves out of an area then the industry concentration (LQ) leaves with it, thereby introducing a vulnerability to the region’s economy.

**Core Cluster** patterns takes into account the number of businesses and employment within the region that make up an industry concentration. Cluster businesses are more diversified in firm count. Three or less firms do not account for over 80 percent of industry employment.

Core clusters benefit from the transfer of knowledge and a shared, skilled workforce that close proximity brings. Supply chains develop to serve these companies and competition keeps prices down. Experienced industry entrepreneurs periodically dream up better products, spin-off new local firms, and grow the economic core of a community.

While all companies are influenced by larger economic trends, having a number of similar businesses in an area helps diversify the risk and rewards as each company focuses on specialized products. These core cluster businesses collectively benefit from supporting services and workforce training that is tailored to common industry needs.
SOURCES

4. IMPLAN Economic Impact Model, 2007, MIG Inc.

Winter 2010

Primary Research: Tom Reichart
Graphic Design: Maggie Lear

Missouri Economic Research and Information Center
Department of Economic Development, Division of Business and Community Services