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

LOWER SOUTH CENTRAL REGION

MERIC
TIMELY TARGETED INTELLIGENT

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 Lower South Central region has a population of 123,393, which accounts for 2 percent of Missouri’s total population. Howell County, where West Plains is located, is the economic center of the region employing one in three area workers (34 percent). Just over 6 percent of region residents commute to Springfield for jobs.* The average wage in 2008 was $25,328, considerably lower than the state average of $40,710.

In 2008 non-farm employment for the area was 33,529, which includes public and private sectors. Manufacturing employed over 18 percent of area workers, a higher percentage than all but one of Missouri’s 12 economic regions. Manufacturing, combined with retail and healthcare sectors, employ nearly half of all workers. Although most employment in the primary farming sector is not captured by this measure, over 8,200 people were estimated to be either a farm owner or worker in 2007.** Many of these farmers may also have other jobs, but clearly agriculture in a significant part of this region’s economy.

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**The most accurate and timely industry employment numbers come from the Bureau of Labor Statistics, Quarterly Census of Employment and Wages program (QCEW). However, reporting requirements for this program excludes most farmers so the USDA 2007 Census of Agriculture is used as an alternative, non-comparative measure.
INDUSTRY PATTERNS

Industry pattern analysis revealed how important manufacturing is to the Lower South Central Region along with which subsectors were the most concentrated.

Manufacturing, from 2003 to 2009, employed 1 in 4 workers in the private sector. Four strong patterns of industry concentration were found in Wood Product, Apparel, Electrical Equipment, and Transportation Equipment Manufacturing. These combined pattern strengths employed 16 percent of the private sector.*

**Pattern Summary**

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Industry</td>
<td>Wood Product and Furniture Manufacturing, Forestry and Logging</td>
<td>Apparel Manufacturing (Spot Strength)</td>
<td>Electrical Equipment and Appliance Manufacturing (Spot Strength)</td>
<td>Transportation Equipment Manufacturing (Spot Strength)</td>
</tr>
<tr>
<td>Location Quotient</td>
<td>7.5</td>
<td>8.3</td>
<td>10.4</td>
<td>2.4</td>
</tr>
<tr>
<td>Employment</td>
<td>1,946</td>
<td>ND*</td>
<td>ND*</td>
<td>ND*</td>
</tr>
<tr>
<td>Avg. Wage</td>
<td>$24,414</td>
<td>ND*</td>
<td>ND*</td>
<td>ND*</td>
</tr>
<tr>
<td>Description</td>
<td>Cluster grows, harvest, and processes timber into a variety of wood products. Processes include sawmilling, wood treatment, design and production of wood and other materials into finished goods.</td>
<td>Producers of clothing include apparel contractors performing cutting/sewing operations, jobbers performing entrepreneurial apparel functions, and tailors producing custom indiv. garments.</td>
<td>Manufacture products that generate, distribute and use electrical power to include lighting, appliances, power distribution components, transformers, etc.</td>
<td>Produce and assemble metal, plastic, and other material components into finished transportation equipment. Includes the mfg. of road, rail, air, or water vehicles primarily used for transporting people or goods.</td>
</tr>
</tbody>
</table>

* Precise spot industry employment and wages are non-disclosable (ND) due to state and federal confidentiality requirements.
The Lower South Central region has a long history of producing wood products, thanks to an abundant supply of soft and hardwood trees located in Missouri’s Ozark Mountains. The state is a leading U.S. producer of wood pallets, which primarily come from this region. Pallet production fits well with the state’s strength as a logistical hub of the Midwest.

The Wood Products Cluster encompasses the growing, harvesting, and processing of timber into final goods for public or business consumption. This cluster has a very high LQ of 7.5 and is the largest employing pattern industry. Employment did decline in the region during the analysis period, mirroring national industry trends.

Companies in the cluster specialize in sawmill operations, pallet production, cabinet making, and flooring. The recession did impact these firms as the overall manufacturing and construction sectors were hit particularly hard. However, as of late 2009 this cluster was still the largest pattern employer. Hopefully the industry will see growth when the economy turns
around since the proximity to timber and basic logistic need for pallets will remain unchanged.

**Apparel Manufacturing Spot Strength**  
*Apparel Manufacturing (NAICS 315)*

Although one of the smaller pattern industries in the region, apparel manufacturing has an LQ over 8.0 and has bucked national industry trends with employment growth in the mid-2000s. While apparel manufacturing declined in the U.S. at an annual rate of 7.7 percent, firms in this region grew at an annual average of 5.5 percent from 2003-2007.

As a local spot strength amid the backdrop of a larger, changing U.S. apparel industry, these companies may have developed market niches that will hopefully enable continued growth into the future.

**Electrical Equipment Manufacturing Spot Strength**  
*Electrical Equipment and Appliance Manufacturing (NAICS 335)*

Electrical equipment manufacturing is a spot strength in this area with a very high LQ of 10.4 in 2007. Although the industry lost employment from 2003-2007, it did grow through the recession. By 2009 the industry’s regional LQ had grown to over 14 as national employment in electrical equipment manufacturing declined during the recession.

Firms in this region specialize in electric motors and utility components, just as the two regions north of it. This pattern strength is located in a number of areas throughout Missouri and combines into a statewide core cluster.

**Transportation Equipment Manufacturing Spot Strength**  
*Transportation Equipment Manufacturing (NAICS 336)*

Transportation equipment manufacturing has an LQ of 2.4 in the Lower South Central region. Although employment has declined since 2003, following national trends, this industry is still a large subsector of area manufacturing.

Local companies specialize in vehicle suspensions, power trains, and defense-related transportation products. Truck and van production has been an historical Missouri strength that recently underwent setbacks with the closing of assembly plants in St. Louis. These firms have specialties that may not be related to those production facilities.
INDUSTRY CONTRIBUTION IMPACT: FURNITURE MANUFACTURING

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

Furniture manufacturing consists of sawmills, wood preservation, reconstituted wood product manufacturing, veneer and plywood manufacturing, paint and coating manufacturing, and hardware manufacturing. The industry makes wooden furniture products sold in export markets, thereby bringing additional money into the regional economy.

An addition of 100 employees in furniture manufacturing creates an estimated total of 174 jobs paying $7.1 million in salaries and contributing over $9.8 million to the gross state product. The value-added per worker in furniture manufacturing and supporting industries is $56,322.

<table>
<thead>
<tr>
<th>Furniture Manufacturing 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>74</td>
<td>174</td>
</tr>
<tr>
<td>Labor Income*</td>
<td>$5.0M</td>
<td>$2.1M</td>
<td>$7.1M</td>
</tr>
<tr>
<td>Gross Domestic Product</td>
<td>$6.2M</td>
<td>$3.6M</td>
<td>$9.8M</td>
</tr>
</tbody>
</table>

*Labor income includes employee benefits and proprietors income.
INDUSTRY INTERLINKAGES: FURNITURE MANUFACTURING

Furniture manufacturing in the Lower South Central region is part of the Wood Products Cluster. Backward-linked (supply goods and raw materials to the industry) and forward-linked (produce value-added goods for consumers) activities display the interrelationship between various industries that add value to furniture manufacturing. While the backward linkages are between the suppliers of raw materials to the industry, forward linkages are between the industry and the consumers.
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/accommodation/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, third 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

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

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