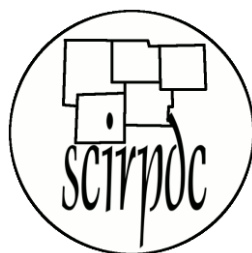

South Central Illinois Regional Industry Cluster Analysis



Industry Cluster Structure and Trends
2007-2016



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Section 1: Introduction

1.1 – Purpose of Industry Cluster Analysis

The South Central Illinois Industry Cluster Analysis was commissioned by the South Central Illinois Regional Planning & Development Commission (SCIRPDC) to provide local stakeholders in the five-county area of Clay, Effingham, Fayette, Jasper and Marion counties with the following:

- An assessment of regional economic strengths and assets
- A strengthened capacity to lead collaborative discussions about current and future needs for essential infrastructure and human capital with the region
- Assistance with developing plans and strategies for expanding the regional economy to its full potential

SCIRPDC, founded in 1972, is an Illinois Regional Planning Agency with responsibilities for the five-county jurisdiction of Clay, Effingham, Fayette, Jasper and Marion counties. Together, these five counties form a designated Economic Development District (EDD) of the U.S. Economic Development Administration (EDA), a unit of the U.S. Department of Commerce. The designation as both an Illinois Regional Planning Agency and EDD allows SCIRPDC, and each local governmental entity within, to apply for and be awarded numerous types of planning and development grants from both State and Federal agencies.

1.2 – Industry Cluster Analysis & Regional Economic Development

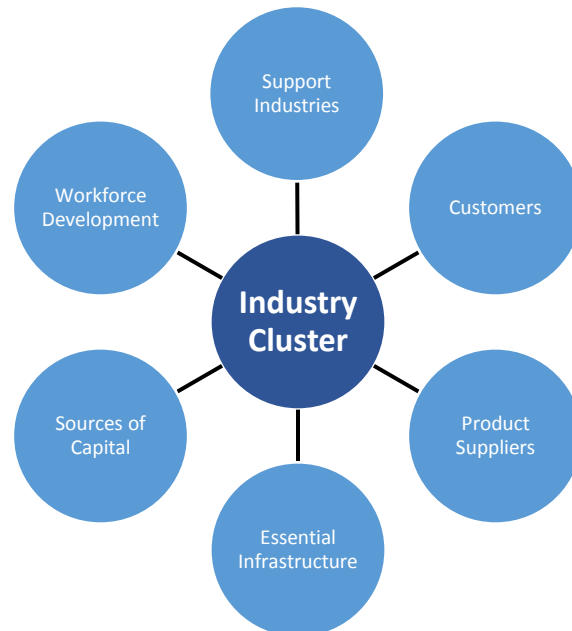
While definitions of an industry cluster abound, early and modern scholarship all define an industry cluster in a similar way. To summarize, an industry cluster can be described as a cluster or group of geographically bounded inter-related industrial firms that together drive wealth creation in a region through the production and exportation of goods and services (Czamanski and Abbas, 1979; Rosenfeld 1995; SANDAG, 1998). Industry clusters are utilized as a descriptive regional economic tool to provide a more meaningful representation of local industry drivers and regional dynamics than traditional methods.

Before further defining the application of an industry cluster analysis, it is important to make clear one common misconception. Simply stated, an industry cluster is not the same as an industry sector. While some literature will interchange these two terms, an industry sector describes only one particular segment of what we are calling an ‘industry cluster’. An industry cluster represents the entire value chain of a broadly defined industry from suppliers to end products, including also supporting services and specialized infrastructure (SANDAG, 1998).

Figure 1-1, located on the following page, provides a simplified illustration of how best to conceptualize the operation and functionality of an industry cluster. In order to ensure absolute clarity, while an industry sector may, for example, be composed of the specific production of an abrasive product, an industry cluster includes, (1) the manufacturing of the abrasive product, (2) the supply and purchase of specialized equipment necessary for that production to occur, (3) other industry sectors that would plausibly purchase

that product for their own manufacturing operations, and (4) the final customer that purchases, receives, or consumes the end product.

Figure 1-1: Conceptualization of an Industry Cluster



With the aforementioned industry cluster concept and framework in mind, we now move into a deeper examination of the significance of an industry cluster analysis and the types of valuable information that it can provide. Cluster-type analyses and cluster strategies have become an important component to regional economic development over the past few decades. These analyses, and the data within, have come to drive regional economic development plans by illustrating particular regional clusters of industries that currently have, or will have in the future, a competitive advantage in the national and global economies.

The industry cluster approach to regional economic development undertakes a sequence of steps that are designed to achieve the following:

- Identify and locate the industry clusters that are present in the relevant regional economy
- Analyze the cluster's strengths and weaknesses relative to national trends
- Create a framework for regional collaboration with the goal of:
 - Maintaining or increasing the competitive strength of the industry clusters present in the region by the specific and purposeful targeting of resources
 - Building new industry cluster strengths in the region through the identification and support of those clusters that are considered to be “emerging”

As noted previously, the industry cluster approach differs widely from traditional economic development methods that normally focus on one industry firm at a time, with the sole attention being on that firm's

individual wants and needs. The cluster approach offers a comprehensive information platform and framework for regional collaboration in order to:

- Solve the problems and issues commonly associated with larger groups of industries
- Locate and reveal groups of industries that may have similar workforce needs
- Create and sustain business-to-business connections to improve regional economic impact
- Provide local support and encouragement for regional innovation
- Invest through the targeting of resources and assist through stakeholder-business dialogue
- Enable more effective planning built on known regional strengths
- Create and develop a regional identity and furthermore improve marketing effectiveness

This analysis and accompanying narrative intends to focus on the dynamic relationships between industry and supply chains. The resultant formation of identifiable regional industry clusters will provide the data and information foundation necessary to ultimately achieve regional industry cluster growth through resource targeting such as, human capital, financial capital, workforce development, stakeholder collaboration, among others

The industry clustering method employed in this analysis is based on a set of seventeen industry cluster definitions developed by the Purdue University Center for Regional Development (PCRD), and further built upon during the course of research funded by the U.S. Economic Development Administration (EDA). The seventeen cluster definitions were developed to be equally useful for both urban and rural regions of the United States. One specific cluster, the manufacturing “supercluster”, was further subdivided into six manufacturing sub-clusters to provide additional detail to the expansive manufacturing portion of the U.S. economy.

Economic Modeling, LLC (EMSI) data is utilized for the cluster analysis portion of this study. EMSI combines covered employment data from the Quarterly Census of Employment and Wages (QCEW) produced by the U.S. Department of Labor with total employment data from the Regional Economic Information System (REIS) published by the Bureau of Economic Analysis (BEA), and augmented with County Business Patterns (CBP) and Nonemployer Statistics (NES) published by the U.S. Census Bureau.

This data was provided utilizing the North American Industry Classification (NAICS) as the foundation for data collection. This system of classification is used to define business establishments based on the types of activities in which they are primarily engaged. Using this data as the top-level source of information, SCIRPDC staff further divided this data into each individual industry cluster and conducted several types of economic analyses including most notably cluster analysis, location quotient analysis and shift share analysis. These analyses were utilized to further describe the relative importance of each industry cluster in the regional economy and determine how competitive those industry clusters have been in recent years relative to the nation as a whole.

1.3 – Executive Summary of Findings

- The SCIRPDC region is located in south-central Illinois and consists of the counties of Clay, Effingham, Fayette, Jasper and Marion. Both Effingham and Marion counties are classified as micropolitan statistical areas.
- In this study, the region was examined for evidence of cluster industry concentration, competitive cluster advantage, and cluster change in seventeen clusters and six manufacturing sub-clusters over the ten year period of 2007-2016.
- The five largest clusters in terms of employment in 2016 were energy (fossil & renewable); agribusiness, food processing & technology; biomedical/biotechnical (life sciences); followed by the manufacturing supercluster and business and financial services respectively.
- The overall change in total cluster employment from 2007-2016 was a net increase of 2,073 jobs. The largest cluster employment increase came from the energy (fossil & renewable) cluster with an increase of 2,833 jobs, followed by the agribusiness, food processing & technology cluster which had an increase of 953 jobs over the ten year study period. The largest decrease in jobs over the same time frame was in the chemicals and chemical based products cluster which illustrated a total loss of 771 cluster jobs.
- SCIRPDC regional clusters defined as “stars” with both a high and increasing location quotient in 2016 include:
 - Agribusiness, food processing & technology (LQ: 4.06)
 - Energy (fossil & renewable) (LQ: 1.81)
 - Forest & wood products (LQ: 1.67)
 - Manufacturing supercluster (LQ: 1.67)
 - Transportation equipment manufacturing (sub-cluster) (LQ: 3.92)
 - Machinery manufacturing (sub-cluster) (LQ: 1.29)
- The region’s 2016 “emerging” clusters, those with an increasing location quotient that is currently less than 1.2, include:
 - Primary Metal Manufacturing (sub-cluster)
 - Fabricated Metal Manufacturing (sub-cluster)
 - Business & Financial Services
 - Advanced Materials
 - Apparel & Textiles

- In terms of the regional clusters with the largest economic output in 2016, they include the following:
 - Energy (fossil & renewable) (\$457,764,555.03)
 - Agribusiness, food processing and technology (\$222,287,261.13)
 - Manufacturing Supercluster (\$216,417,179.03)
 - Biomedical/biotechnical (\$184,964,703.57)
 - Transportation and logistics (\$171,884,454.24)
- While the transportation and logistics cluster came in ranked fifth in overall economic output, this industry cluster had the highest earnings per worker average (\$62,731.00). The transportation and logistics cluster is followed by the manufacturing sub-cluster, namely, machinery, with an average earnings per worker of \$62,403.00. To round out the top five, these two aforementioned clusters were followed by energy (fossil & renewable) with an average of \$62,220.41, then the manufacturing sub-cluster fabricated metal products coming in at \$55,053.00, and lastly the advanced materials cluster with an average of \$54,631.69 earnings per worker.
- Shift share analysis was then conducted to evaluate which industry clusters has a positive competitive effect in the regional economy. The following five regional industry clusters and one manufacturing sub-cluster illustrated a competitive advantage when compared against national averages. They include, in order from largest positive competitive effect to smallest:
 - Energy (Fossil & Renewable) (Competitive Effect: 2,394)
 - Agribusiness, Food Processing & Technology (Competitive Effect: 758)
 - Manufacturing Supercluster (Competitive Effect: 481)
 - Advanced Materials (Competitive Effect: 311)
 - Fabricated Metal Manufacturing (sub-cluster) (Competitive Effect: 271)
 - Business & Financial Services (Competitive Effect: 88)
- Then, after analyzing and comparing multiple industry cluster indicators, the study determined that four industry clusters and two sub-clusters can be defined as the region's top performing and priority clusters. They include, in no meaningful order:
 - Energy (Fossil & Renewable)
 - Agribusiness
 - Advanced Materials
 - Fabricated Metal Manufacturing (sub-cluster)
 - Primary Metal Manufacturing (sub-cluster)
 - Manufacturing Supercluster

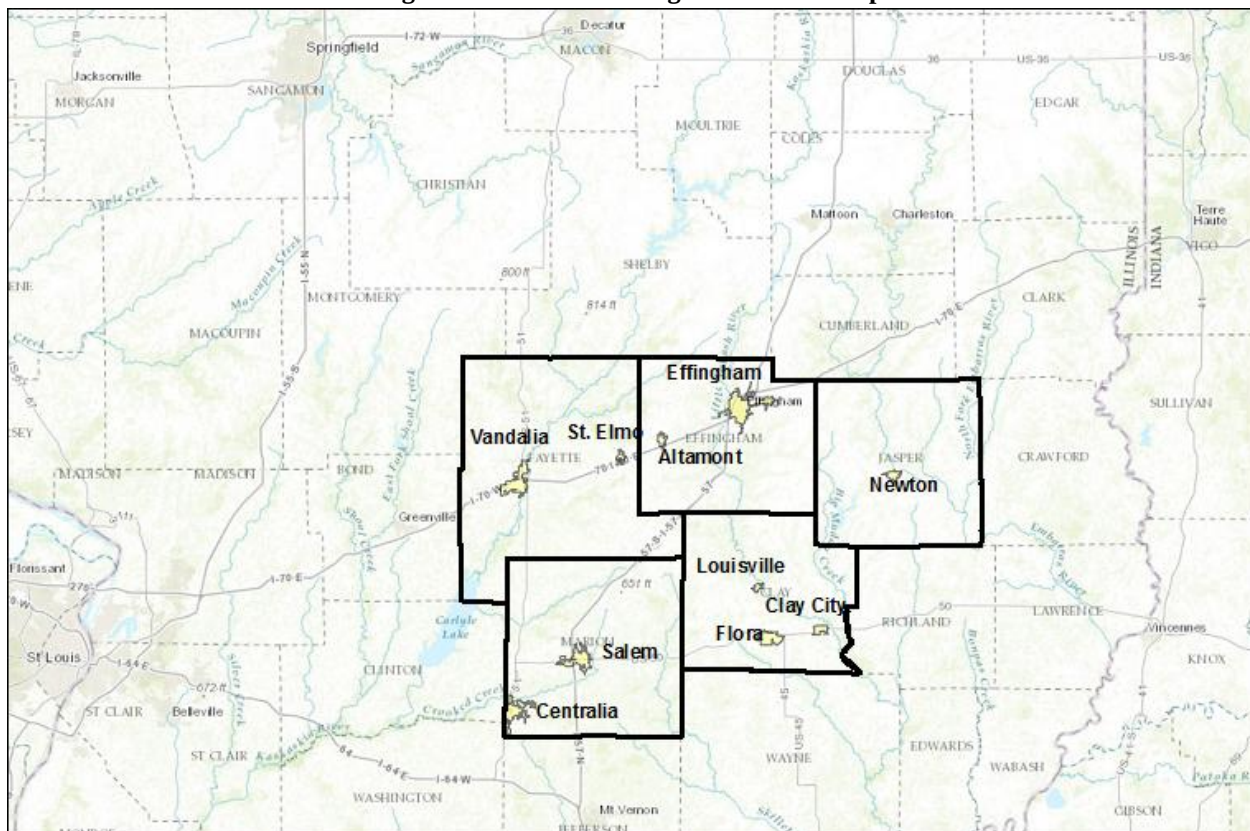
Section 2: Regional Profile

2.1 – Location Characteristics and Assets

This regional profile intends to offer context and background for the industry cluster analysis, with the central focus being on regional economic metrics benchmarked against the State of Illinois and the United States where it is deemed appropriate. This background information will hopefully allow for a deeper understanding of how the industry clusters analyzed in this study are interacting with the regional economic environment.

To begin, the South Central Illinois Regional Planning and Development Commission (SCIRPDC) five-county region encompasses a total land area of 2,749 square miles, while total water coverage equates to approximately 18.7 square miles, according to the U.S. Census Bureau. The region is contiguous with the spreading St. Louis metropolitan area to the west and is within a two hour drive time of several other large metropolitan areas including Terre Haute, Indiana; Champaign-Urbana, Illinois; Decatur, Illinois; and Springfield, Illinois. **Figure 2-1** below illustrates the region's locale relative to nearby metropolitan areas.

Figure 2-1: SCIRPDC Region Location Map

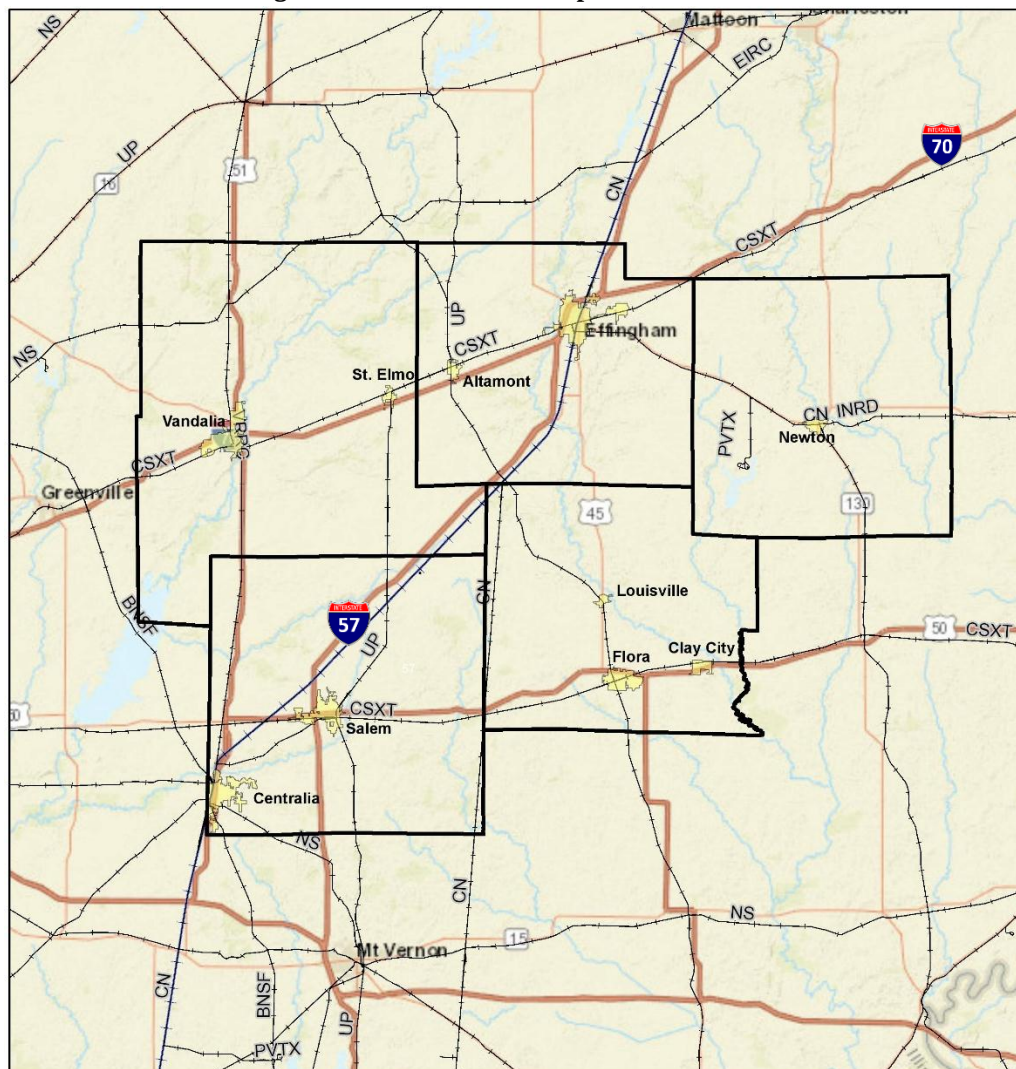


Produced by SCIRPDC

Two of the five counties within the region, Effingham and Marion, are classified as micropolitan statistical areas with the cities of Effingham and Centralia serving as the principle micropolitan cities respectively. There are 44 incorporated municipalities within the region with the largest cities being the City of Centralia (Marion County) and the City of Effingham (Effingham County), each with over 10,000 in population (13,032 and 12,328 in 2010 respectively). These largest cities are followed by the City of Salem (7,485), Vandalia (7,042) and Flora (5,070) according to the 2010 U.S. Census. Despite the micropolitan status of the two aforementioned counties, the five-county SCIRPDC region is predominantly rural in nature.

Furthermore, the SCIRPDC region lies within easy accessibility to three major metropolitan markets including, St. Louis to the west; Indianapolis to the east; and Chicago to the north. This centralized and relatively close proximity to these major markets provides the region with a strong advantages given the local regional transportation assets. **Figure 2-2** displays the SCIRPDC regional transportation network.

Figure 2-2: SCIRPDC Transportation Network



Produced by SCIRPDC

The region has direct access to both I-57 and I-70 which provide connections to large metropolitan markets all across the county. The region is also fortunate to have U.S. Highway Routes 40, 45, 50 and 51 which provide additional means of ground transportation for the region and linkages to other important intermediate desitations within Illinois and neighboring states. Additionally, the area is serviced by no less than eight major railroad companies providing main line service. Some of these companies include, Burlington Northern/Sante Fe, CSX System, Canadian National, Norfolk Southern Corp., and Union Pacific. This network of railroad lines stretches approximately 500 miles long, and includes four intermodal facilities located in Effingham County. Moreover, there are 11 airports located within the SCIRPDC region, five of which are public airports located in Centralia, Effingham, Flora, Salem and Vandalia.

2.2 – Demographic Indicators

The examination of population and demographic characteristics of the region provide important determinants of current and future regional development. The people located within the the five-county area make up the entrepreneurs, labor force, business and political leaders that define the region’s potential for economic development. Furthermore, the skills, knowledge and education of the workforce directly influences the potential for regional innovation and national competitiveness.

Likewise, the growth and concentration of the regional population, as well as age structures, undoubtedly affect the likelihood of business success. Whether it is a business start-up, expansion or relocation, the demographic indicators directly impact the success or failure of these business endeavors. Additionally, and from a slightly alternate perspective, a healthy growing economic sector increases the likelihood of attracting new demographic groups to the region and retaining the current population. In sum, a stable or growing population is a positive economic indicator, while a declining population tends to suggest some form of economic downturn may occur in the near future.

2.2.1 – Regional Population Trends

The most important portions of **Table 2-1**, located on the next page, are the annual growth rate and the accompanying population projections. These two specific statistics illustrate best the current population trends over the past several decades as well as what to expect in the future based upon this trends. First, from 1990 to 2016, only two of the five SCIRPDC counties have seen a positive annual growth rate, Effingham and Fayette. The remaining three counties have each seen large decreases in population over the past 25 years, most notably in Marion County which has seen a decrease of about 2,500 people from 2000-2016. It is Marion County’s decreasing population that accounts for a majority of the population decline within the SCIRPDC region.

Overall, the region is projected to continually experience a fairly stable growth rate, calculated to a positive rate of 0.006% per year. At this rate the population is expected to slightly increase to 120,211in 2030, an increase of about 650 persons from the 2016 population. Interesting, the County of Effingham is projected to overtake Marion County as the most populous county in the region by 2030. While this population trend is based on the annual growth from 1990-2016, it cannot be expected to occur without continued strong regional development efforts. Effingham County’s strong growth rate of 0.73% annually is what is projected to keep the population level at a stable level, however, projections are just that, projections. There

are many different natural and man-made ‘shocks’ that can occur and quickly alter these projections. These “shocks” could include things such as large business or educational institution closings, or possibly an unexpected increase of outmigration of younger demographic groups to larger metropolitan areas.

Table 2-1: Population Estimates

Population Estimates					Annual Growth Rate	Projections	
	1990	2000	2010	2016	-	2020	2030
Clay	14,460	14,560	13,815	13,648	-0.35%	13,457	12,986
Effingham	31,704	34,264	34,242	35,413	0.73%	36,447	39,108
Fayette	20,893	21,802	22,140	21,600	0.21%	21,781	22,238
Jasper	10,609	10,117	9,698	9,657	-0.56%	9,441	8,912
Marion	41,561	41,691	39,437	39,020	-0.38%	38,427	36,967
SCIRPDC	119,227	122,434	119,332	119,338	0.006%	119,553	120,211
Illinois	11,430,602	12,419,293	12,830,632	13,022,485	0.87%	13,475,667	14,648,050
U.S.	248,710,000	281,422,000	309,330,000	322,921,516	1.86%	*343,500,00	*359,400,000

U.S. Census Bureau, ESRI Business Analyst Online

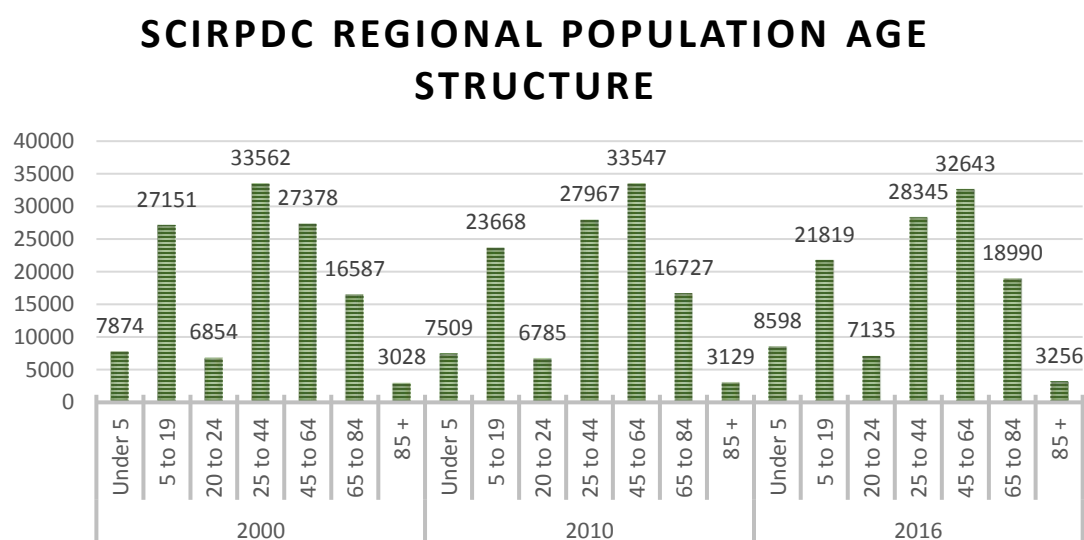
Population projections estimated using Annual Growth Rate percent

* U.S. projections based on Census projection modeling data due to variability with national growth rates

2.2.2 – Population Age Structure

Another aspect of the regional population that is important to consider is the current age structure. The trending population age structure directly influences both regional stakeholder and business decision making.

Figure 2-3: Regional Age Structure



U.S. Census Bureau; ESRI Business Analyst Online; Chart produced by SCIRPDC

While understanding that regional age structure information can definitely play a role in assisting stakeholders in making more informed investment decisions, businesses may also use age structure data

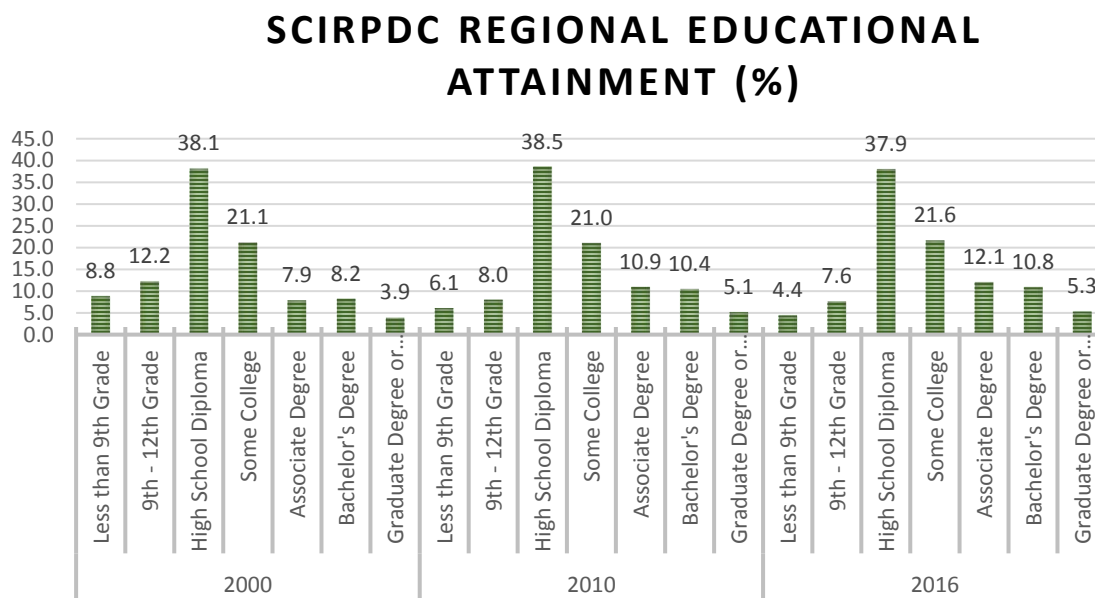
as part of their decision-making process on whether to locate or expand within the SCIRPDC region. For example, a business may be making their location decision partly based upon the demographic makeup of the area and will either locate in the region or go elsewhere to find the demographics that are more suitable for their particular business.

As illustrated on **Figure 2-3** on the previous page, the regional population age structure has had some significant changes recently. From 2000 to 2010, the largest demographic change occurred among those persons identified as 25-44 years of age and 45-64 years of age. During this ten year time period, 25-44 year olds decreased substantially, while 45-64 year olds increased in the same manner. This pattern is consistent with 2016 estimates and illustrates that overall the regional population age demographic is aging rapidly without an influx of the younger demographic age groups. In sum, this age profile indicates a decline in the economically active population and a corresponding increase in the proportion of elderly dependents. This changing population structure has strong implications for service provision in terms of educational, social, health and recreational facilities as well as the current and future workforce development.

2.2.3 – Educational Attainment

Each of the region’s five counties has at least one community college satellite office, but the region only has one full-sized college within its boundaries, Kaskaskia Community College located in the City of Centralia in the County of Marion. However, several universities are located within fairly close proximity to the five-county region including the University of Illinois at Urbana-Champaign, Southern Illinois University in Carbondale and Edwardsville, Eastern Illinois University in Charleston as well as Indiana State University in Terre Haute, Indiana.

Figure 2-4: Regional Educational Attainment



U.S. Census Bureau; ESRI Business Analyst Online; Chart produced by SCIRPDC

Figure 2-4 on the previous page illustrates the recent educational attainment trend within the SCIRPDC region. While not illustrated in the figure shown, the region does trail behind state and national educational attainment trends. Undoubtedly this should be at least a minor concern moving forward with regional development practices due to the fact that educational attainment has long been linked to a stronger workforce, increased employment opportunities as well as an overall higher regional quality of life.

However, on a more positive note, the region has shown a strong, and arguably exponential, growth in the number of persons with a college degree. In 2000, 20.0% of the total population in the region had an associate degree or higher. Presently, as is shown in the 2016 estimates, this number has grown to 28.2% of the total regional population. This equates to about 0.5% growth per year over the past sixteen years which can and should be considered a strong positive trend. Continued and increased growth can occur if regional school districts, community colleges, and employers work together to enhance workforce development and curriculum goals that provide area students with the proper education and skills to fill regional employment needs.

Section 3: Regional Economic Structure

3.1– Income and Earnings

Income and earnings are also important and strong indicators of the economic well-being of a local area. Individual earnings, especially those earnings that are received from industries that export products and in turn bring in “new money” from external markets into the region, can strengthen the regional economy. **Table 3-1** displays data on both per capita personal income and the average earnings per job for employees in the SCIRPDC region versus State of Illinois averages.

Beginning with the average earnings per job, it becomes apparent that while there was a strong increase in average earnings from 2000 to 2010, the last five years have indicated a decreasing trend. Additionally, the large disparity between Illinois average earnings and the region’s average earnings should throw up a red flag to local stakeholders. Simply stated, it appears that the five-county SCIRPDC region currently does not have access to higher-paid employment opportunities relative to other parts of the State. Furthermore, although it is not necessarily a causal relationship, the lack of higher-paid jobs can be at the very least loosely associated with a lack of higher-skilled jobs as well. While casting aspersions on the entire region does not adequately account for the numerous types of jobs available in each county and municipality, overall the region is not performing well relative to State averages. Yes, factors such as cost of living may indeed account for a portion of the lagging numbers seen here, but in sum, these relatively low average earnings should not be ignored.

Table 3-1: Income and Earnings

	Per Capita Personal Income			Average Earnings Per Job		
	2000	2010	2015	2000	2010	2015
Clay	\$31,249	\$36,104	\$35,024	\$35,146	\$41,107	\$34,515
Effingham	\$35,630	\$42,731	\$43,505	\$38,675	\$44,630	\$42,160
Fayette	\$27,359	\$30,528	\$30,031	\$32,193	\$35,503	\$32,188
Jasper	\$31,800	\$38,075	\$38,778	\$35,424	\$40,956	\$36,787
Marion	\$32,190	\$37,595	\$39,411	\$38,177	\$42,462	\$42,341
SCIRPDC	\$32,148	\$37,624	\$38,299	\$36,665	\$41,188	\$39,043
Illinois	\$46,608	\$46,226	\$51,295	\$61,137	\$60,186	\$62,871

BEA: Regional and State Economic Profiles; Dollar amounts are adjusted to 2016 dollars and adjusted for inflation to improve comparability

Moreover, per capita personal income includes all types of income received by individuals residing in the region and is furthermore divided by the total population to then obtain the per capita income statistic. This particular wealth measurement, while still trailing the State of Illinois, shows a much more positive trend of growth. However, somewhat similar to the average earnings per job indicator, after strong growth from 2000 to 2010, wealth accumulation has stalled somewhat. While growth is still occurring, it has slowed down quite dramatically when compared against the trend of the previous decade.

3.2 – Regional Labor Force

Unemployment and underemployment lie at the core of poverty. For the poor, labor is often the only asset they can use to improve their well-being. Hence the reason the creation of productive employment opportunities is essential for achieving poverty reduction and sustainable economic and social development. It is crucial to provide decent jobs that both secure a higher income and empower the underserved and less affluent.

Tables 3-2 and 3-3 provide critical data metrics that help determine the current regional employment trends. To begin, from 2000-2015 the regional population in the labor force as well as the overall number of employed individuals in the five-county area has continually decreased. This is at least correlated with the continually aging population of the region as was illustrated in section 2.2.2. Due to that fact, these statistics should be a cause of concern because the lack of a growing labor force indicates a stagnant economic environment. With the aging population understandably being one reason for this decreasing labor force population, others may include the lack of employment opportunities, and a deficiency in properly skilled and educated work-ready individuals.

Table 3-2: Labor Force Employment

	Population in Labor Force			Employed Individuals		
	2000	2010	2015	2000	2010	2015
Clay	7,231	6,820	6,662	6,824	6,054	6,190
Effingham	18,507	18,648	18,519	17,744	17,194	17,620
Fayette	10,323	11,280	9,763	9,722	10,110	9,130
Jasper	5,378	5,103	4,678	5,127	4,646	4,381
Marion	20,892	19,392	18,083	19,780	17,295	16,841
SCIRPDC	62,331	61,243	57,705	59,197	55,299	54,162
Illinois	6,493,466	6,625,321	6,512,386	6,211,404	5,937,047	6,126,307

BLS, LAUS

The unemployment trend from 1990-2016, shown on **Table 3-3** on the following page, displays a strong fluctuation both regionally and statewide, with the most recent recession likely causing the spike in unemployment in 2010. While this statistic does provide valuable information regarding the regional employment trend, its dependence on several different local, regional and national employment trends make it difficult to form broad generalizations based on unemployment alone.

However, in conjunction with the aforementioned labor force information, the unemployment trend does provide an additional angle of the employment story. While over the past five years unemployment has decreased quite substantially, this decrease appears to be occurring predominantly due to increased labor force deficiencies rather than being caused by more individuals ascertaining jobs. In other words, it suffices to say that there are less regional residents in the labor force pool today than there were in previous years.

Table 3-3: Unemployment Rate

	Unemployment Rate (%)			
	1990	2000	2010	2016
Clay	9.4	5.6	11.2	6.4
Effingham	6.5	4.1	7.8	4.7
Fayette	8.6	5.8	10.4	6.8
Jasper	5.6	4.7	9.0	6.0
Marion	11.0	5.3	10.8	6.1
SCIRPDC	8.6	5.0	9.8	5.8
Illinois	6.1	4.3	10.4	5.6

BLS, LAUS

3.3 – Regional Employment Structure

Every region of the country has its own unique particular economic configuration as well as a few specific employment areas where it is more specialized than other regions, or even the nation as a whole. It is most often these specialized regions that provide the region in question with a competitive advantage. **Table 3-4** clearly illustrates four specific industry sectors that can be said to have this competitive advantage when compared against the State and nation.

Table 3-4: 2016 NAICS Employment

NAICS	Description	SCIRPDC		Illinois	U.S.
		2016 Jobs	% of Total	% of Total	% of Total
11	Crop and Animal Production	5,261	8.0	1.2	1.9
21	Mining, Quarrying, and Oil and Gas Extract.	4,578	7.0	0.4	0.8
22	Utilities	346	0.5	0.3	0.3
23	Construction	2,947	4.5	4.4	5.3
31	Manufacturing	7,682	11.7	7.7	6.8
42	Wholesale Trade	2,386	3.6	4.1	3.4
44	Retail Trade	6,841	10.4	9.5	10.0
48	Transportation and Warehousing	2,970	4.5	4.6	3.5
51	Information	887	1.3	1.5	1.8
52	Finance and Insurance	2,993	4.5	6.5	5.3
53	Real Estate and Rental and Leasing	1,333	2.0	3.7	4.4
54	Professional, Scientific, and Technical Services	1,372	2.1	7.6	7.0
55	Management of Companies and Enterprises	143	0.2	1.3	1.3
56	Administrative and Support and Waste Management and Remediation Services	1,907	2.9	7.0	6.3
61	Educational Services	365	0.6	2.7	2.5
62	Health Care and Social Assistance	8,678	13.2	11.5	11.4
71	Arts, Entertainment, and Recreation	729	1.1	2.2	2.3
72	Accommodation and Food Services	4,364	6.6	6.8	7.4
81	Other Services (except Public Administration)	3,794	5.8	5.8	5.5
90	Government	6,243	9.5	11.1	12.7
99	Unclassified Industries	32	0.04	0.1	0.1
	Industry Sector Totals	65,850	100.0	100.0	100.0

EMSI Developer, 2016; Industry sectors **bolded blue** are performing at substantially greater levels than both the State and the Nation

These four specific industry sectors, bolded in blue in **Table 3-4**, include:

- Crop and Animal Production
- Mining, Quarrying, and Oil and Gas Extraction;
- Manufacturing; and
- Health and Social Assistance

The abovementioned industry sectors have a significantly larger share of the regional economy than they do in the State of Illinois or the U.S. as a whole. Conversely, the region is much less specialized than the state or the nation in a large number of higher-level service industries including information; finance and insurance; real estate, rental and leasing; professional, scientific and technical services; management of companies and enterprises; administrative, support, waste management and remediation services; education services; and arts, entertainment, and recreation.

To examine the regional employment structure in even more detail, **Table 3-5** below illustrates the previous decade's industry sector employment trend. Overall, the past ten years has shown an overall balanced employment structure that includes both strong increases as well as substantial decreases in a few sectors.

Table 3-5: 2007-2016 NAICS Employment Change

NAICS	Description	2007 Jobs	2016 Jobs	Change	% Change
11	Crop and Animal Production	4,491	5,261	770	17
21	Mining, Quarrying, and Oil and Gas Extract.	2,107	4,578	2,471	117
22	Utilities	371	346	(25)	(7)
23	Construction	3,463	2,947	(516)	(15)
31	Manufacturing	9,692	7,682	(2,010)	(21)
42	Wholesale Trade	2,691	2,386	(305)	(11)
44	Retail Trade	7,213	6,841	(372)	(5)
48	Transportation and Warehousing	3,253	2,970	(283)	(9)
51	Information	795	887	92	12
52	Finance and Insurance	2,261	2,993	732	32
53	Real Estate and Rental and Leasing	1,251	1,333	82	7
54	Professional, Scientific, and Technical Services	1,434	1,372	(62)	(4)
55	Management of Companies and Enterprises	148	143	(5)	(3)
56	Administrative and Support and Waste Management and Remediation Services	1,903	1,907	4	0
61	Educational Services	348	365	17	5
62	Health Care and Social Assistance	8,132	8,678	546	7
71	Arts, Entertainment, and Recreation	657	729	72	11
72	Accommodation and Food Services	4,335	4,364	29	1
81	Other Services (except Public Administration)	3,396	3,794	(142)	(4)
90	Government	6,850	6,243	(607)	(9)
99	Unclassified Industries	0	32	32	100
	Industry Sector Totals	65,330	65,850	520	0.80

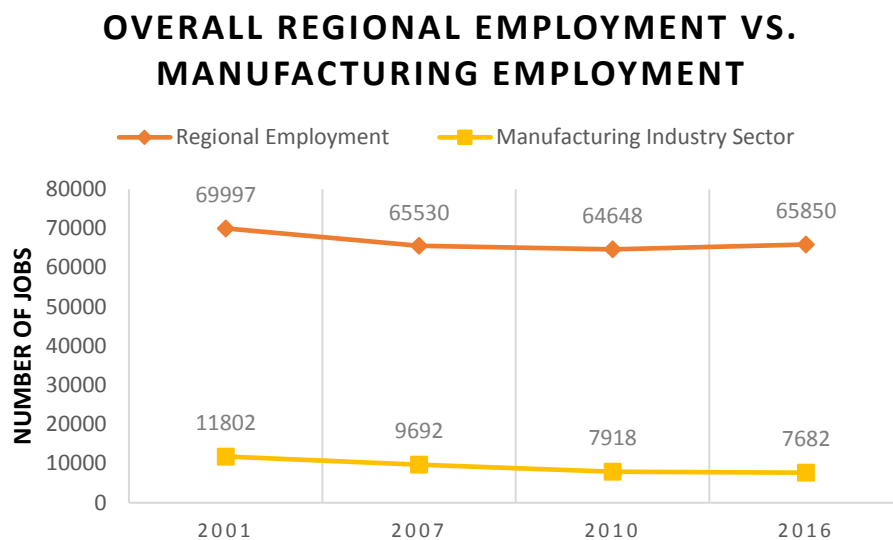
EMSI Developer, 2016

Note: For a county by county view of total NAICS employment trends please see Appendix A at the end of this study

Most notably are the 117% (2,471 jobs) increase in the mining industry sector and the -21% (-2,010 jobs) decrease in the manufacturing industry sector. Furthermore, the region also saw a significant increase in the finance and insurance sector of 32%, or 732 jobs, and a decrease in the government industry sector of -9%, or 607 jobs. What is arguably the most important finding though is the continued downward trend of the region's all important manufacturing industry sector.

In 2001, the SCIRPDC manufacturing sector totalled 11,802 jobs. This means that in the past 15 years this critical industry sector has accounted for a loss of 4,120 jobs. Even with these substantial decreases, the manufacturing industry sector still accounts for 11% of total regional employment as of 2016, and is still considered to be outperforming state and national trends as indicated in **Table 3-4**. Interestingly, from 2001 to 2016, total regional employment losses aggregated to 4,147 jobs, almost identical to the manufacturing job losses over this same time frame. Therefore, it can be said that while other industry sectors have seen fairly stable ebb and flow in recent years, the manufacturing sector has seen a continual job decrease accounting for nearly all of recent regional employment losses. **Figure 3-1** below displays the overall regional employment trend from 2001- 2016 compared against the manufacturing industry sector over the same time period.

Figure 3-1: Regional Employment Vs. Manufacturing Employment



EMSI Complete Employment, 2011 & EMSI Developer, 2016; Chart produced by SCIRPDC

As is apparent from the above figure, the regional employment trend closely follows the employment trend of the manufacturing sector. While the two employment trends do differ somewhat, such as the recent growth in overall regional employment from 2010-2016, over the past 15 years, as goes the manufacturing industry sector, so goes overall regional employment. Due to this fact, continued investment of resources, both financial capital and human capital, in the manufacturing industry sector is important to the health of the employment portion of the overall regional economy.

However, it must be noted that solely investing in an ever decreasing industry sector, such as, according to recent trends, the manufacturing industry sector, is a economically dangerous proposition. The

manufacturing industry sector has seen continual employment losses across the entire nation for some time. The reasons for these losses have been politically debated for over a decade, but one thing that is for certain is that a rebirth of manufacturing employment is likely to only be short-term fix because as manufacturing technological advancements continue to increase, the number of necessary manufacturing employees is bound to decrease.

So, while it is vital to continue to engage the manufacturing industry on a regional level, especially in terms of research and development, strong emphasis must be put on on the diffusion of resources amongst numerous industry sectors that are both currently performing at high levels and those that are expected to emerge as performing industry sectors in the years to come.

Section 4: Industry Cluster Analysis

4.1 – Industry Cluster Analysis Methodology

Industry cluster analysis uses two principle methods to evaluate the relative importance of each individual industry cluster in a regional economy, location quotient analysis (LQ) and shift-share analysis.

LQ analysis is essentially a way of quantifying how concentrated a particular industry, cluster, occupation, demographic group, etc. is in a region as compared to the nation. The central objective of LQ analysis is to reveal what makes a particular region “unique” in comparison to the national average. In more specific terms, LQ is a ratio that compares one region to a larger reference region according to a particular characteristic or asset. **Table 4-1** below summarizes both how the LQ is determined and some basic implications depending on the subsequent value of the LQ.

Table 4-1: Location Quotient Analysis

Equation	Value	Implication
$LQ = \frac{\left(\frac{\text{Regional Industry Employment}}{\text{Regional Total Employment}} \right)}{\left(\frac{\text{National Industry Employment}}{\text{National Total Employment}} \right)}$	LQ > 1	Region has proportionally more workers employed in the specific industry cluster than the larger comparison area
	LQ ≥ 1.2	Regional industry cluster has the potential to be classified as an exporter
	LQ < 1	May indicate an opportunity to develop businesses in the local area

The central limitation of LQ analysis is that it describes the regional economy as if it were only a singular moment in time. For this reason shift share analysis provides the LQ with an excellent counterpart. Shift-share analysis gives life, so to speak, to the regional economy by providing a more malleable picture of the regional economy. Specifically, shift-share analysis seeks to explain changes in an economy by examining actual changes that have occurred into three main sources:

1. The influence of national growth (or decline) on an industry cluster. This is called the national growth effect. For example, if total employment in the United States grew by 4% percent from 2007-2016, the national share factor would apply this 4% to cluster employment in the base year and estimate how local employment would be expected to change if the national influence had equally affected every industry in the cluster.
2. The influence of industry share (also known as the industry mix effect) on the growth (or decline) of an industry cluster. Industry mix reflects the rate of change in each individual industry at the national level, for example, how much employment changed in all manufacturing industries throughout the nation from 2007 to 2016. It indicates how much of a local change in employment can be attributed to national growth or decline of the industry in question. As with the national

component, the percent change in employment by the industry nationally is applied to the total change in local employment in the industry.

3. The regional competitive effect on growth or decline of an industry cluster. The national growth and the industry mix reveal the changes that would have occurred in the local economy if it corresponded exactly to national and industrial trends. When these two computed shares are subtracted from the actual shift in employment locally, a residual change remains. This is the change in employment that cannot be explained by either general economic conditions (the national share) or industrial trends (the industry share). This change, the regional share, reveals the effects of region-specific factors on local employment. The regional competitive effect shows which clusters might have a competitive advantage in the regional economy, resulting from factors such as labor force skills, access to transportation, excellent supply chains, effective and efficient service delivery, etc.

In addition to the size of LQs and their direction of growth, as well as the regional share effect, other factors that should be considered when evaluating the relative strength and potential of industry clusters include: the size of the cluster (number of employees); the average rate of pay in the cluster, its performance over time, and any available forecasts as to future demand for the goods and services that the cluster supplies. More recently, the levels of skill and knowledge embedded in industry clusters by reason of the occupational mix they utilize and the levels of training and education required from employees is becoming important for estimating capacity for innovation in the clusters.

4.2 – Industry Cluster Employment

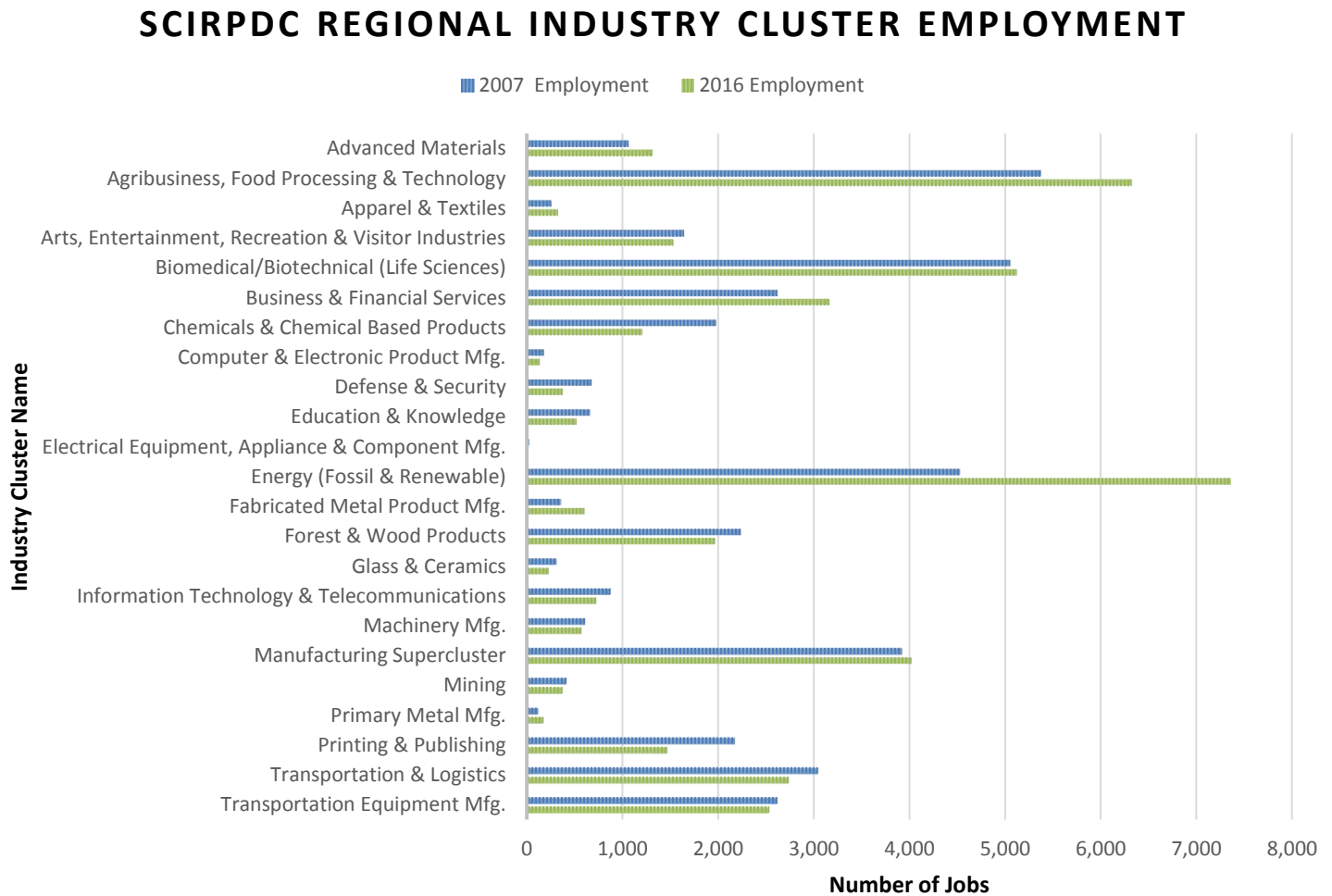
Figure 4-1 shows the relative size of each cluster in the region and graphically displays the number of jobs in each regional cluster in 2007 and again in 2016, together with changes that have occurred over the period. **Table 4-2** provides a more detailed look at the changes in employment over the same time period.

The largest clusters as of 2016 include the energy (fossil & renewable); agribusiness, food processing & technology; biomedical/biotechnical (life sciences); followed by the manufacturing supercluster and business and financial services.

The top increasing industry clusters in terms of employment include energy (fossil & renewable); agribusiness, food processing & technology; and business and financial services. Each of these three industry clusters had an employment increase of over 500 total jobs with the energy (fossil & renewable) leading the way with an overwhelming ten year increase of 2,833 total new jobs.

In terms of industry cluster employment decreases, the chemicals and chemical based products took the biggest loss of jobs over the time frame with nearly 800 jobs lost from 2007-2016. The printing and publishing cluster also took a large job loss over this time frame with just over 700 jobs lost. However, one important note to make is that while trends from 2000-2010 have shown continual decreases for the region's all important manufacturing supercluster, over the past ten years (2007-2016) manufacturing cluster jobs have rose with 105 new jobs being created.

Figure 4-1: Regional Industry Cluster Employment



EMSI Developer, 2016; Chart produced by SCIRPDC

Altogether, the SCIRPDC region experienced a total cluster employment increase of 2,073 jobs from 2007 to 2016. This is a tremendous trend change from the last industry cluster analysis conducted for years 2001-2010 which illustrated extreme job losses throughout the large majority of clusters numbering into the thousands in several cases. This alteration in cluster employment growth may indicate that the region hit a cluster employment low point period during the first decade of the 2000s, but is now on a positive track toward increased employment throughout the regional cluster groups.

In all, seven industry clusters and two manufacturing sub-clusters indicated employment growth from 2007-2016, while the remaining ten industry clusters and four manufacturing sub-clusters indicated a decrease in employment growth.

Comparative analysis will help create a clearer picture of the current industry cluster trends in the region relative to the nation. However, prior to doing those analyses, the next step is to examine the industry cluster average earnings for the SCIRPDC jurisdiction.

Table 4-2: 2007-2016 Regional Industry Cluster Employment

Cluster Name	2007 Jobs	2016 Jobs	Change	% Change
Advanced Materials	1,066	1,320	254	23.8
Agribusiness, Food Processing, & Tech.	5,371	6,324	953	17.7
Apparel & Textiles	257	329	72	28.0
Arts, Entertain., Recreat. & Visitor Ind.	1,643	1,531	(112)	(6.8)
Biomedical/Biotechnical	5,050	5,123	73	1.5
Business & Financial Services	2,619	3,165	546	20.9
Chemicals & Chemical Based Products	1,981	1,210	(771)	(38.9)
Computer & Electronic Product Mfg.	180	136	(44)	(24.4)
Defense & Security	676	378	(298)	(44.1)
Education & Knowledge	665	519	(146)	(22.0)
Electrical Equip., Appli. & Comp.Mfg.	24	0	(24)	(100.0)
Energy (Fossil & Renewable)	4,524	7,357	2,833	62.6
Fabricated Metal Product Mfg.	360	603	243	67.5
Forest & Wood Products	2,239	1,973	(266)	(11.6)
Glass & Ceramics	314	235	(79)	(25.2)
Information Tech. & Telecomm.	876	729	(147)	(16.8)
Machinery Mfg.	614	574	(40)	(6.5)
Manufacturing Supercluster	3,921	4,026	105	2.7
Mining	416	375	(41)	(9.9)
Primary Metal Mfg.	123	175	52	42.3
Printing & Publishing	2,178	1,475	(703)	(32.3)
Transportation & Logistics	3,044	2,740	(304)	(10.0)
Transportation Equipment Mfg.	2,620	2,537	(83)	(3.2)
Regional Cluster Totals	40,761	42,834	2,073	5.1

EMSI Developer, 2016; Clusters with names **bolded** are the six sub-clusters of the manufacturing supercluster

4.3 – Industry Cluster Earnings

Due to the fact that some industry sectors may belong to one or more industry clusters it is not possible to estimate the average pay per worker for all clusters in the region. Therefore, the average earnings per worker must only be considered on a cluster by cluster basis. In most cases, within each individual cluster itself average pay will also vary depending on the industry sector and skill level that is required for the occupational work within the cluster.

To summarize the findings shown on **Table 4-3** on the following page, the transportation and logistics cluster had the highest earnings per worker at \$62,731.21, followed closely by the machinery manufacturing sub-cluster (\$62,403.00) and the energy cluster (\$62,220.41). These three clusters were then followed by the fabricated metal manufacturing sub-cluster and advanced materials to round out the top five.

The industry cluster with the most economic output in terms of total regional earnings was the energy industry cluster, totalling \$457,764,555.03 in total output. Again, to round out the top five, the energy cluster was followed by agribusiness, food processing and technology (\$222,287,261.13), the manufacturing super cluster (\$216,417,179.03), biomedical/biotechnical (\$184,964,703.57), and transportation and logistics (\$171,884,454.24).

Table 4-3: 2016 Regional Industry Cluster Earnings

Cluster Name	2016 Jobs	Earnings Per Worker	Total Earnings
Advanced Materials	1,320	\$54,631.39	\$72,128,353.86
Agribusiness, Food Processing, & Tech.	6,324	\$35,152.14	\$222,287,261.13
Apparel & Textiles	329	\$41,494.22	\$13,666,367.13
Arts, Entertain., Recreat. & Visitor Ind.	1,531	\$25,881.24	\$39,632,244.72
Biomedical/Biotechnical	5,123	\$36,102.00	\$184,964,703.57
Business & Financial Services	3,165	\$33,902.91	\$107,299,749.23
Chemicals & Chemical Based Products	1,210	\$52,187.60	\$63,154,029.46
Computer & Electronic Product Mfg.	136	\$44,142.00	\$6,008,330.44
Defense & Security	378	\$34,146.57	\$12,917,548.86
Education & Knowledge	519	\$22,132.20	\$11,485,176.34
Electrical Equip., Appli. & Comp.Mfg.	0	-	-
Energy (Fossil & Renewable)	7,357	\$62,220.41	\$457,764,555.03
Fabricated Metal Product Mfg.	603	\$55,053.00	\$33,210,437.04
Forest & Wood Products	1,973	\$42,485.60	\$83,808,376.18
Glass & Ceramics	235	\$48,864.58	\$11,464,209.76
Information Tech. & Telecomm.	729	\$45,344.64	\$33,033,675.45
Machinery Mfg.	574	\$62,403.00	\$35,840,512.38
Manufacturing Supercluster	4,026	\$53,755.28	\$216,417,179.03
Mining	375	\$50,513.24	\$1,895,333.66
Primary Metal Mfg.	175	\$54,400.00	\$9,544,994.64
Printing & Publishing	1,475	\$37,523.24	\$55,346,125.35
Transportation & Logistics	2,740	\$62,731.21	\$171,884,454.24
Transportation Equipment Mfg.	2,537	\$52,778.00	\$133,887,922.35
Regional Cluster Totals	42,834		

EMSI Developer, 2016; Clusters with names **bolded** are the six sub-clusters of the manufacturing supercluster

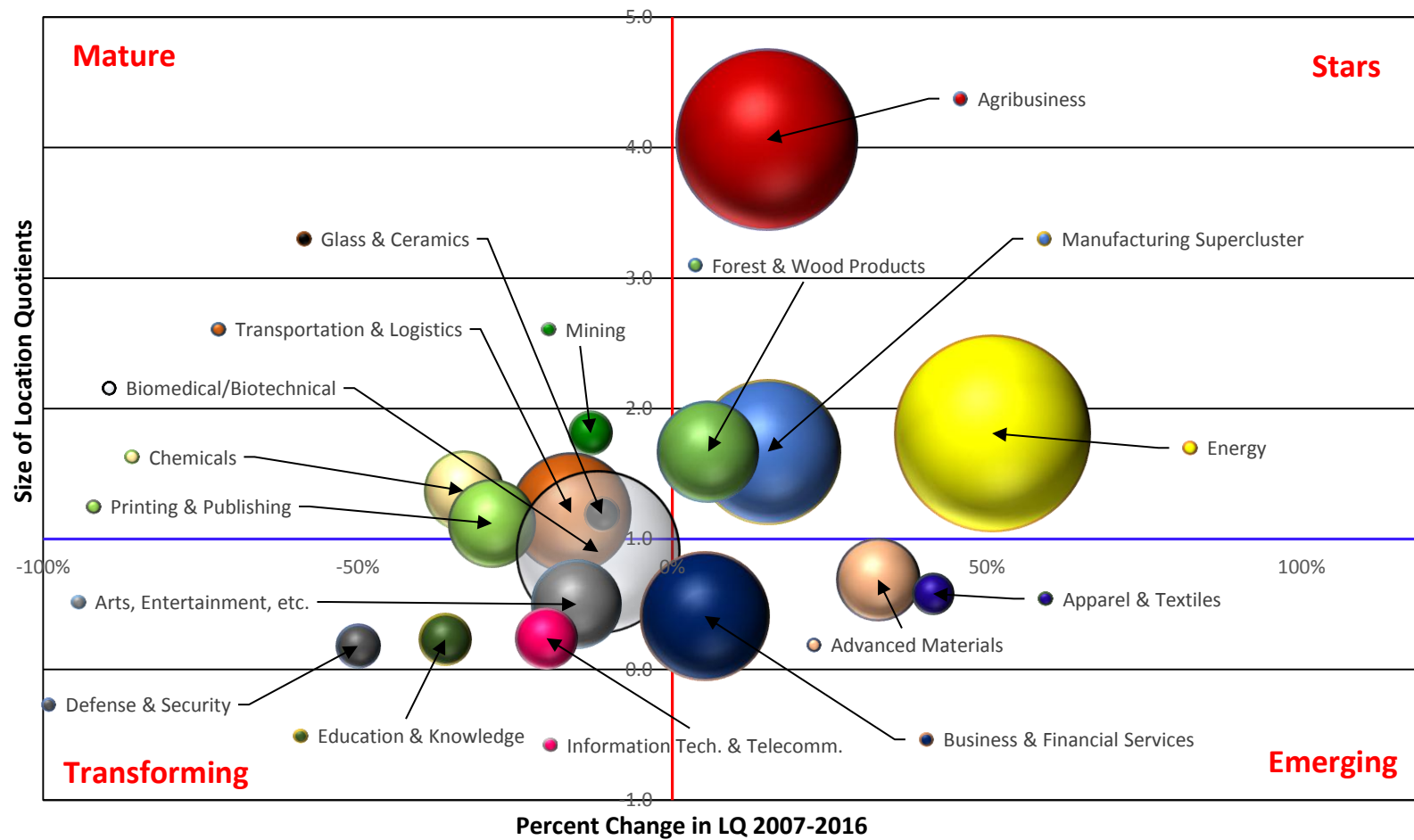
4.4 – Industry Cluster Analysis – Location Quotients and Competitive Advantage

Figures 4-2 and 4-3 are bubble charts based upon the Boston Consulting Group matrix which allows a view of the region's industry cluster LQs and cluster size, as well as the kind of change that has occurred to the size of the LQs over the dates of the study period, in this case 2007-2016. These bubble charts on the following two pages allow for a quick visual scan of each industry cluster and manufacturing sub-cluster's relative regional strength in four specifically defined quadrants. **Table 4-4** below defines each of these four quadrants.

Table 4-4: Location Quotient Analysis

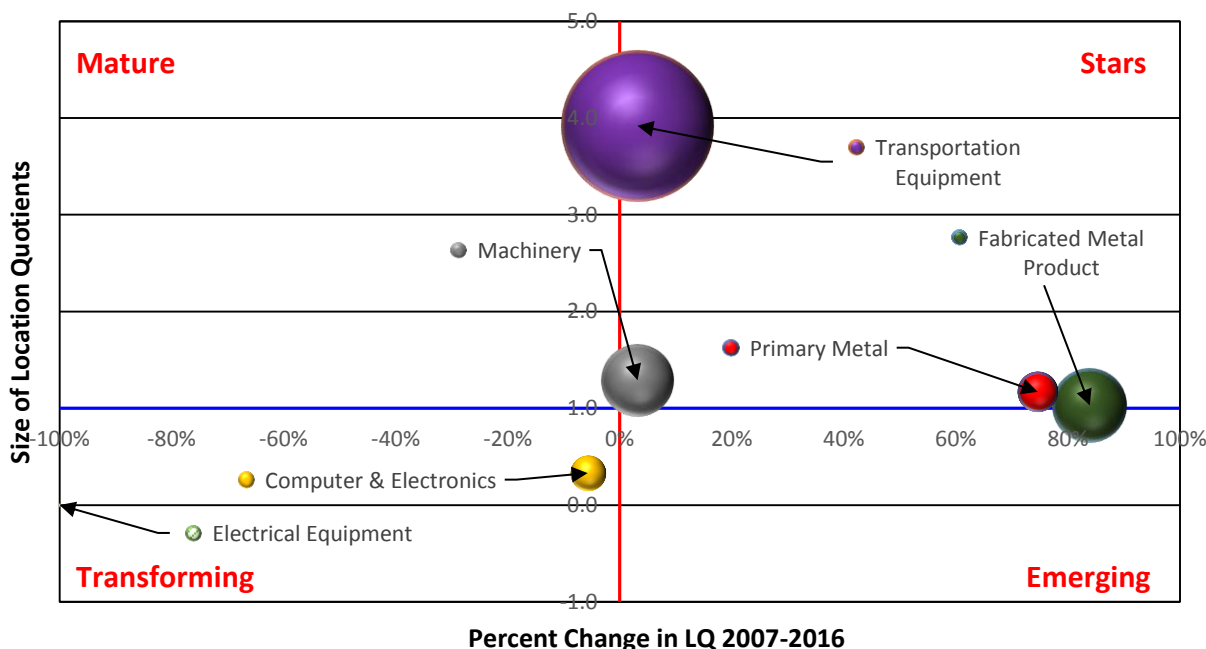
Mature	Stars
Location Quotients are greater than 1.2 and steadily decreasing	Location Quotients are greater than 1.2 and steadily increasing
Transforming	Emerging
Location Quotient is less than 1.2 and steadily decreasing	Location Quotient is less than 1.2 and steadily increasing

FIGURE 4-2: REGIONAL CLUSTER SIZE, LQs & LQ CHANGE 2007-2016



Note: **Figure 4-2** above does not include manufacturing sub-clusters

FIGURE 4-3: MANUFACTURING SUB-CLUSTER SIZE, LQs & LQ CHANGE 2007-2016



Note: **Figure 4-3** above only includes manufacturing sub-clusters

Figure 4-2 shows the seventeen main clusters, while **Figure 4-3** shows a breakout of the manufacturing super cluster into its six component sub-clusters. **Table 4-5** is provided to show, in detail, the number of jobs in each cluster in 2016, the size of the location quotients in 2016, as well as the percent change in the location quotients of each cluster from 2007 to 2016.

Nine clusters and four of the manufacturing sub-clusters in the SCIRPDC region have location quotients greater than 1.2. These thirteen clusters are further divided by the direction of change in their LQs, which are either increasing or decreasing over time: these two subsets of highly specialized clusters form the right and left quadrants of the matrix which is the basis of Bubble Charts in **Figures 4-2** and **4-3**, as well as **Table 4-5**. On the right are specialized clusters who's LQs are increasing compared to the U.S. ("stars"); to the left are specialized clusters whose LQs are decreasing ("mature") relative to the nation.

While decreasing LQs are always a negative indicator, increasing LQs are not necessarily always a positive indicator as they may be increasing only because the national share of the cluster industries has decreased faster than the regional share of the cluster.

The SCIRPDC region's "star" clusters as of 2016 are agribusiness; energy; forest & wood products; the manufacturing supercluster; as well as the manufacturing sub-clusters of transportation equipment and machinery. However, as **Figure 4-2** illustrates, transportation equipment and machinery are nearly falling in the mature quadrant. Additionally, because fabricated metal products and primary metal products had LQs below 1.2 in 2007, they are considered to be "emerging" rather than "stars"

Five clusters fall into the mature category. These clusters include printing and publishing; chemicals; mining; glass & ceramics; and transportation & logistics. At times, clusters will fall into this status due to “life-cycle” effects. For example, a company offering a new product or service will likely go through a period where its product is in very high demand due to its novelty and relative scarcity. This is the super-profit period. Gradually, this high-demand period diminishes and smooths out and other companies join in the competition to sell the product, prices even out, and the industry becomes mature. The cluster may go into decline and die after a while, as demand for its products and services dwindle because of changes in taste or technology. Life-cycle effects also apply to individual industries.

Table 4-5: Industry Cluster LQs, Strengths and Direction of Growth

Cluster Name	2016 Jobs	2007 LQ	2016 LQ	Percent Change in LQ
Stars (LQ>1.2 and increasing)				
Agribusiness, etc.	6,324	3.53	4.06	15%
Energy	7,357	1.20	1.81	51%
Forest & Wood Products	1,973	1.58	1.67	6%
Manufacturing Supercluster	4,026	1.45	1.67	15%
Transportation Equip.	2,537	3.80	3.92	3%
Machinery	574	1.25	1.29	3%
Emerging (LQ<1.2 and increasing)				
Primary Metal	175	0.67	1.17	75%
Fabricated Metal	603	0.56	1.03	84%
Business & Financial Serv.	3,165	0.39	0.41	5%
Advanced Materials	1,320	0.52	0.69	33%
Apparel & Textiles	329	0.41	0.58	41%
Mature (LQ >1.2 and decreasing)				
Printing & Publishing	1,475	1.57	1.12	-29%
Chemicals	1,210	2.05	1.37	-33%
Mining	375	2.08	1.81	-13%
Glass & Ceramics	235	1.34	1.18	-11%
Transportation & Logistics	2,740	1.43	1.20	-16%
Transforming (LQ<1.2 and decreasing)				
Biomedical/Biotechnical	5,123	1.02	0.90	-12%
Arts, Entertainment, etc.	1,531	0.59	0.50	-15%
Defense & Security	378	0.36	0.18	-50%
Education & Knowledge	519	0.36	0.23	-36%
Information, Tech., & Telecomm.	729	0.30	0.24	-20%
Computer & Electronics	136	0.35	0.33	-6%
Electrical Equipment	0	0.14	0.00	-100%

Clusters with names **bolded** are the six sub-clusters of the manufacturing supercluster

Eight clusters and two manufacturing sub-clusters have location quotients less than 1.2, and fall into the lower right and left-hand quadrants of the bubble chart matrix. The lower right-hand quadrant includes clusters with lower LQs (not big enough to be termed specialized or concentrated) which nevertheless are increasing in size compared to the nation. These can be seen as “emerging” or at least potentially emerging clusters which may eventually become specialized in the region. In the SCIRPDC region, these clusters include business & financial services; advanced materials; and apparel and textiles. Also included in the “emerging” category are two other manufacturing sub-clusters that had low 2007 LQs, but much higher 2016 LQs. These sub-clusters are fabricated metal products and primary metal products. Again, caution

must be used in targeting emerging clusters based on changes in location quotients relative to the nation because the clusters in this category may be overreacting due to overall cluster decreases in the nation as a whole.

Finally, five clusters and two manufacturing sub-clusters fall into the “transforming” category in the left-hand quadrant of the bubble chart. “Transforming,” in this case, generally means that the cluster is in decline. These include the manufacturing sub-clusters of computer & electronics; electrical equipment, which had a net zero jobs in 2016 hence the lack of a visible bubble, and five clusters including biomedical/biotechnical; arts, entertainment, etc.; defense and security; education and knowledge; and information technology & telecommunications.

Policies and strategies developed for clusters that fall into any of these four categories will obviously vary, depending not only upon the location quotient position but also upon several other indicators as well as such not-so-easily measured factors as business, government and public support, sentiment and ideas.

4.5 – Industry Cluster Shift Share Analysis

As noted previously, shift share analysis is a useful addition to location quotient analysis as it can help determine how much of regional job change can be attributed to national trends and how much is due to unique regional factors. The “regional competitive effect” column in **Table 4-6** on the following page, which is equal to the difference between the “expected change” in employment based on industry and national trends and the total actual “job change” in the regional economy, is the focal point of the shift share analysis. A positive “competitive effect” may indicate a unique competitive advantage for regional clusters. It is important to note that a cluster can lose jobs and still have a positive “competitive effect” if the loss is less than the “expected change.” Additionally, an industry cluster may indicate overall job growth, but have a negative “competitive effect” because national trends are outpacing the regional job growth indicator.

Six clusters and four sub-clusters had a positive competitive effect at the end of the study period. The energy cluster was by far the largest of these with a competitive effect of 2,394, followed by agribusiness; the manufacturing supercluster; advanced materials; fabricated metal products; and business & financial services. The competitive advantage in these clusters and sub-clusters occur due to area resources, transportation advantages, the workforce population, among many others. Although some advantages for certain clusters can be somewhat obvious, such as energy or agribusiness likely occurring due to the large amount of petroleum and agricultural resources in the region, others such as business and financial services may not be immediately apparent.

Manufacturing sub-clusters having a positive competitive effect include fabricated metal products; primary metals; machinery manufacturing; and transportation equipment manufacturing. Further investigation into the nature of these sub-sectors might reveal possibilities for synergies with other clusters in the region, for example linkages between the transportation & logistics cluster and the transportation equipment manufacturing sub-cluster.

Table 4-6: 2007-2016 Industry Cluster Competitive Effect

Cluster Name	Job Change	National Growth Effect	Industry Mix Effect	Expected Change	Regional Competitive Effect
Energy (Fossil & Renewable)	2,833	296	143	439	2,394
Agribusiness, Food Processing & Tech.	953	351	-156	195	758
Business & Financial Services	546	171	286	458	88
Advanced Materials	254	70	-127	-57	311
Fabricated Metal Product Mfg.	243	24	-52	-28	271
Manufacturing Supercluster	105	256	-633	-376	481
Biomedical/Biotechnical	73	330	497	827	-754
Apparel & Textiles	72	17	-40	-23	95
Primary Metal Mfg.	52	8	-30	-22	74
Electrical Equipment, etc.	-24	2	-3	-2	-22
Machinery Mfg.	-40	40	-87	-47	7
Mining	-41	27	-8	19	-60
Computer & Electronic Product Mfg.	-44	12	-43	-32	-12
Glass & Ceramics	-79	21	-65	-45	-34
Transportation Equipment Mfg.	-83	171	-299	-127	44
Arts, Entertainment, etc.	-112	107	79	187	-299
Education & Knowledge	-146	43	93	137	-283
Information Technology & Telecom.	-147	57	-20	37	-184
Forest & Wood Products	-266	146	-499	-353	87
Defense & Security	-268	44	62	106	-404
Transportation & Logistics	-304	199	85	284	-588
Printing & Publishing	-703	142	-225	-82	-621
Chemicals & Chemical Based Products	-771	130	-268	-138	-633

EMSI Developer, 2016 Cluster names **bolded** are the six sub-clusters of the manufacturing supercluster

Table 4-7 on the following page provides a table illustrating key indicators for a deeper examination of the SCIRPDC industry clusters. Those clusters that are bolded in blue display the region's priority clusters, or those clusters that are currently performing consistently well within the region as well as compared to the nation. Those clusters that are bolded in red are currently underperforming within the region as well as compared to the nation as a whole.

The top performing and priority clusters for the region, indicated on **Table 4-7**, include advanced materials, agribusiness; energy; the fabricated metal products manufacturing sub-cluster; the manufacturing supercluster; and the primary metal products manufacturing sub-cluster. These clusters all illustrate positive regional competitive effects, meaning relative to the clusters nationally they are performing well-above expectations. Additionally, each of these specific clusters have experienced excellent regional growth when compared to the nation as a whole.

Table 4-7: Indicators for Selecting and Prioritizing Clusters

Cluster Name	2016 Cluster Jobs	% Change in Regional Employment	% Change in National Employment	2016 LQ	Percent Change in LQ	Regional Competitive Effect	2016 EPW
Advanced Materials	1,320	23.8%	-5.4%	0.69	33%	311	\$55,646.50
Agribusiness	6,324	17.7%	3.6%	4.06	15%	758	\$33,010.87
Apparel & Textiles	329	28.0%	-8.9%	0.58	41%	95	\$59,984.42
Arts, Entertainment, etc.	1,531	-6.8%	11.4%	0.50	-15%	-299	\$22,581.49
Biomedical/Biotechnical	5,123	1.4%	16.4%	0.90	-12%	-754	\$39,634.03
Business & Financial	3,165	20.8%	17.5%	0.41	5%	88	\$39,528.70
Chemicals	1,210	-38.9%	-7.0%	1.37	-33%	-633	\$53,273.56
Comp. & Electronic Mfg.	136	-24.4%	-17.6%	0.33	-6%	-12	\$44,142.00
Defense & Security	378	-44.1%	15.7%	0.18	-50%	-404	\$34,398.55
Education & Knowledge	519	-22.0%	20.6%	0.23	-36%	-283	\$20,925.64
Electrical Equip., Mfg.	0	-100.0%	-7.7%	0.00	-100%	-22	\$0.00
Energy	7,357	62.6%	9.7%	1.81	51%	2394	\$46,972.07
Fabricated Metal Mfg.	603	67.5%	-7.8%	1.03	84%	271	\$55,053.00
Forest & Wood Products	1,973	-11.9%	-15.8%	1.67	6%	87	\$50,326.75
Glass & Ceramics	235	-25.2%	-14.2%	1.19	-11%	-34	\$50,267.83
Inform. Tech. & Telecom.	729	-16.8%	4.2%	0.24	-20%	-184	\$50,841.96
Machinery Mfg.	574	-6.5%	-7.6%	1.29	3%	7	\$62,403.00
Mfg. Supercluster	4,026	2.7%	-9.6%	1.67	15%	481	\$54,270.57
Mining	375	-9.9%	4.5%	1.81	-13%	-60	\$79,048.59
Primary Metal Mfg.	175	42.3%	-18.2%	1.17	75%	74	\$54,400.00
Printing & Publishing	1,475	-32.3%	-3.8%	1.12	-29%	-621	\$42,444.33
Transport. & Logistics	2,740	-10.0%	9.3%	1.20	-16%	-588	\$58,369.56
Transport. Equip. Mfg.	2,537	-3.2%	-4.9%	3.92	3%	44	\$52,778.00

EMSI Developer, 2016; Clusters names *italicized* are the six sub-clusters of the manufacturing supercluster; **Blue** displays performing/priority clusters; **Red** displays clusters currently underperforming.

On the other side of the spectrum, the underperforming clusters include arts, entertainment, etc.; biomedical/biotechnical; chemicals; the computer & electronic product manufacturing sub-cluster; defense and security; education and knowledge; information technology; printing and publishing; and transportation & logistics. These clusters are determined to be underperforming due most notably to their very low regional competitive effect scores and lack of regional growth over the past ten years.

Those clusters and sub-clusters identified as priority and performing through the 2016 Industry Cluster Analysis should be considered as current employment sectors that are likely to continue to grow and blossom with continued regional investment and prioritization. While trends do change from decade to decade, and investments should be made throughout every single industry cluster and sub-cluster, the noted top performing clusters are, as of 2016, the most likely to yield the greatest benefit in terms of cluster employment growth.

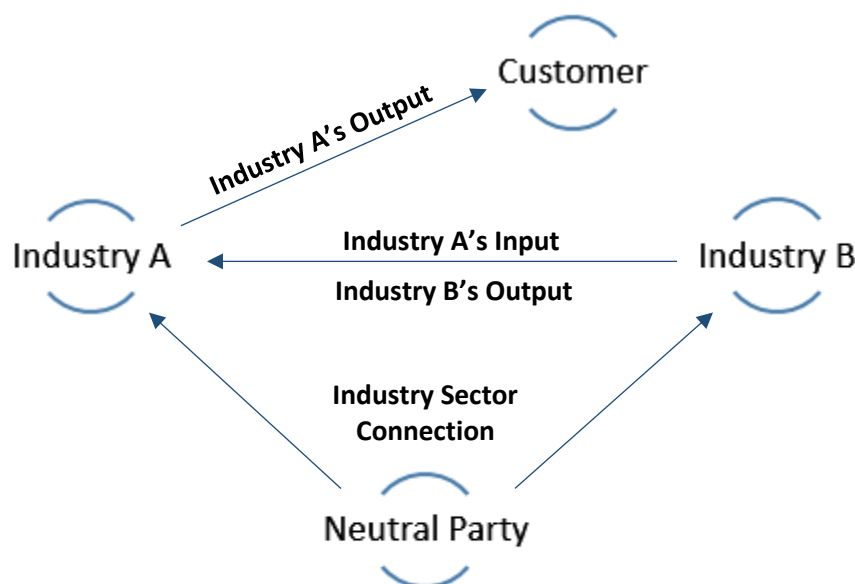
4.6 – Industry Cluster Self-Awareness

The central component of a successful industry cluster is the ability of the interconnected industry sectors to support and supply one another with goods and services (inputs). This concept was illustrated best by **Figure 1-1** on page two. The sectors within a cluster can be numerous and vary widely, which in turn means that not all of them can be expected to be found within a particular geographic region, such as south central Illinois. Moreover, if some supply industry sectors are not located within the region then its easily inferred that these inputs must be imported into the region from external markets. Additionally, even if a supply industry is present and located within the region, it may not be capable of filling regional demand fully, necessitating product imports either to the supply industry itself, or the receiving industry sector.

Furthermore, there is no way to compel any of a region’s industries to purchase their inputs solely within the local region (i.e. south central Illinois). It is sometimes the case that a specific industry located within the region may chose to import their goods and services from an outside market due to a ongoing strategic relationship or cost effectiveness determination. This can even occur if in-region goods are readily available for purchase. While sometimes industries located within the region specifically choose to import their goods from outside of the region, it is often the case that they are simply unaware of the fact that suppliers of those goods are located in-region and may actually be more cost effective and strategically judicious.

In sum, while promoting cluster self-awareness can seem overly complicated at times, it is often as simple as a “Netural Party” indicating to “Industry A” that “Industry B” may be able supply them with their needed goods and services (inputs) more effectively than importing those inputs from outside of the region. In essence, these industry interconnected relationships is what creates regional industry cluster growth. **Figure 4-4** below is an attempt to illustrate this connection in simpler terms. In this illustration “Industry A” and “Industry B” are both within the same regional industry cluster, and the “Neutral Party”, such as a regional or local stakeholder, mayor, village official, economic development staff member, etc., initates the interaction between the two industry sectors.

Figure 4-4: Creating Regional Industry Cluster Self-Awareness



Section 5: Industry Cluster Trends by County

5.1 – Priority Industry Cluster Trend Analysis

With the industry cluster analysis finalized and the concept of regional industry cluster self-awareness in place, the next important step is to understand where and how regional industry clusters can continue to grow into the future. This section, among other things, estimates the number of cluster jobs located within each of the south central Illinois five-counties specifically, and projects cluster employment into the future.

As an aside, it must be noted that since it is rare that there is enough activities and jobs sufficient to sustain an industry cluster at the county level, this can only really occur in large metropolitan areas, this study does not examine industry clusters at the county level. This section simply estimates how many employees from each county make up the individual regional industry cluster.

The trend analyses presented here examines the four industry clusters found to be a regional priority, and/or outperforming national trends, following both the industry cluster analysis and the shift share analysis shown in section 4.5. The two manufacturing sub-clusters are not included in this particular trend analysis due to their relatively small size, and the fact that the manufacturing supercluster contains both aforementioned sub-clusters. The four regional priority industry clusters include the following:

- Advanced materials
- Agribusiness, food processing & technology;
- Energy (fossil & renewable); and
- Manufacturing supercluster

5.1.1 – Advanced Materials

Table 5-1: Advanced Materials Cluster Employment: County Estimates

County	2007 Jobs	2016 Jobs	2007-2016 Change	2007-2016 % Change	2016 Payrolled Businesses	2026 Jobs Projection
Clay	527	561	34	6.4	9	621
Effingham	130	225	96	73.9	21	249
Fayette	54	23	-31	-58.0	2	25
Jasper	6	11	5	74.9	3	12
Marion	349	500	151	43.2	21	553
SCIRPDC	1,066	1,320	254	23.8	56	1,461

Source: EMSI 2016; County estimates developed utilizing raw NAICS data. Projections based off of historical growth rates

Table 5-1 displays employment of the advanced materials industry cluster by county. Clay County leads the way in terms of total cluster jobs from 2007-2016, on through to the year 2026. While this specific cluster does not have an overwhelming number of jobs relative to the other regional priority clusters

illustrated in this section, when compared against national averages, the regional advanced materials industry cluster is greatly outperforming the rest of the nation.

5.1.2 – Agribusiness, Food Processing & Technology

Table 5-2: Agribusiness Cluster Employment: County Estimates

County	2007 Jobs	2016 Jobs	2007-2016 Change	2007-2016 % Change	2016 Payrolled Businesses	2026 Jobs Projection
Clay	705	913	208	29.5	26	1,100
Effingham	1,489	1,724	236	15.8	41	1,982
Fayette	1,220	1,352	132	10.8	34	1,585
Jasper	909	970	60	6.7	29	1,118
Marion	1,048	1,365	317	30.2	25	1,665
SCIRPDC	5,371	6,324	953	17.7	155	7,450

Source: EMSI 2016; County estimates developed utilizing raw NAICS data. Projections based off of EMSI Modeling

Table 5-2 illustrates estimates for county cluster employment for the agribusiness, food processing & technology regional industry cluster. This industry cluster has been identified as the second largest cluster in terms of total employment for the region in 2016. As illustrated below, the County of Effingham has the largest total cluster employment for this particular regional industry cluster as well as the most payrolled businesses. Over the past ten years, however, Marion County has seen the largest increase in cluster employment, with an increase of 317. Projecting cluster employment into the future displays a total of 7,745 jobs in 2026, a projected increase of 1,126 jobs over the next decade. This indicates that this particular “star” cluster will continue to be essential to regional economic development well into the future.

5.1.3 – Energy (Fossil & Renewable)

Table 5-3: Energy Cluster Employment: County Estimates

County	2007 Jobs	2016 Jobs	2007-2016 Change	2007-2016 % Change	2016 Payrolled Businesses	2026 Jobs Projection
Clay	822	1,289	467	56.9	59	1,547
Effingham	1,530	2,166	636	41.5	97	2,597
Fayette	501	814	313	62.4	52	1,012
Jasper	554	1,076	522	94.2	22	1,284
Marion	1,117	2,012	896	80.2	84	2,441
SCIRPDC	4,525	7,357	2,833	62.6	314	8,881

Source: EMSI 2016; County estimates developed utilizing raw NAICS data. Projections based off of EMSI Modeling

Table 5-3 above illustrates estimates for county cluster employment for the energy (fossil & renewable) regional industry cluster, the largest in terms of total employment in 2016. Just as was shown with the previous cluster, agribusiness, the County of Effingham again has the largest total cluster employment for this particular regional industry cluster as well as the most payrolled businesses. However, each of the five

counties have shown dramatic increases in total employment for this particular cluster, this is especially the case with Marion County which indicate a increase in cluster jobs of around 900 in the last ten years. When examining the projected cluster employment, while the energy cluster is expected to continue to grow, the rate of growth is expected to slow down in the next decade, when compared against the previous decade.

5.1.4 –Manufacturing Supercluster

Table 5-4: Manufacturing Cluster Employment: County Estimates

County	2007 Jobs	2016 Jobs	2007-2016 Change	2007-2016 % Change	2016 Payrolled Businesses	2026 Jobs Projection
Clay	1,669	1,515	-154	-9.2	7	1,497
Effingham	832	913	80	9.6	25	1,180
Fayette	30	5	-25	-83.5	3	3
Jasper	46	10	-33	-77.0	1	2
Marion	1,346	1,583	237	17.6	23	1,983
SCIRPDC	3,921	4,026	105	2.7	59	4,665

Source: EMSI 2016; County estimates developed utilizing raw NAICS data. Projections based off of EMSI Modeling

Table 5-4 illustrates estimates for county cluster employment for the manufacturing supercluster. While manufacturing jobs, by NAICS code, have seen a fairly steady decrease for the past 15 years, as shown on **Figure 3-1** on page 16 of this study, overall industry cluster employment has seen an increase in the past decade. While three of the five south central Illinois counties have seen a decrease, those being Clay, Fayette and Jasper, the increases of manufacturing cluster employment in Effingham and Marion counties counterweight those decreases, and actually illustrate regional growth. While manufacturing has struck difficult times nationwide, the south central Illinois five-county region is faring quite well, relatively speaking. So much so that the manufacturing supercluster is projected to increase from 4,026 jobs to 4,665 jobs in the next decade, a difference of 639 jobs.

5.2 – Emerging, Maturing & Transforming Industry Cluster Trends

This section examines three additional regional industry clusters in a similar manner as to what was done in the previous section. However, in this particular section one emerging industry cluster, one mature, or maturing, industry cluster, and one transforming industry cluster are detailed. The three clusters chosen are the largest in their particular category in terms of total cluster employment for the region. The three industry clusters chosen include:

- Business and financial services (Emerging);
- Transportation and Logistics (Maturing); and
- Biomedical / Biotechnical (Transforming)

5.2.1 – Business and Financial Services Emerging Industry Cluster

The business and financial services industry sector was found to be one of the five “emerging” industry clusters, or sub-clusters, in earlier analysis. Meaning that this particular cluster is likely to become a “star” industry cluster in the coming years. As is shown in **Table 5-5** on the following page, 2026 projections show an increase of 1,386 jobs in the next decade. If these projections follow suit, this particular industry cluster will likely become one of the region’s “star” clusters in the not so distant future.

Table 5-5: Business and Financial Services Cluster Employment: County Estimates

County	2007 Jobs	2016 Jobs	2007-2016 Change	2007-2016 % Change	2016 Payrolled Businesses	2026 Jobs Projection
Clay	124	155	31	24.6	34	228
Effingham	1,515	1,605	89	5.9	108	2,074
Fayette	195	328	133	68.4	45	545
Jasper	111	202	91	82.3	17	343
Marion	674	875	201	29.9	99	1,361
SCIRPDC	2,619	3,165	546	20.8	303	4,551

Source: EMSI 2016; County estimates developed utilizing raw NAICS data. Projections based off of EMSI Modeling

5.2.2 – Transportation and Logistics Maturing Industry Cluster

In 2012, the year the most recent Industry Cluster Analysis was completed, the transportation and logistics cluster was identified as one of the “star” industry clusters for the south central Illinois region. However, since that time, new data is illustrating that this particular cluster has now matured or peaked in terms of employment. With that said, **Table 5-6** below does project that this cluster will rebound and by 2026 show a decade of employment growth from 2017-2026. While Marion County has been the central hub of this particular industry cluster in past, it appears that in the future Effingham County will overtake Marion in terms of total cluster employment.

Table 5-6: Transportation and Logistics Cluster Employment: County Estimates

County	2007 Jobs	2016 Jobs	2007-2016 Change	2007-2016 % Change	2016 Payrolled Businesses	2026 Jobs Projection
Clay	165	145	-20	-12.0	22	175
Effingham	1,024	1,102	79	7.7	60	1,494
Fayette	355	228	-127	-35.7	42	236
Jasper	155	112	-43	-27.6	22	119
Marion	1,345	1,151	-193	-14.4	42	1,351
SCIRPDC	3,044	2,740	-304	-10.0	188	3,375

Source: EMSI 2016; County estimates developed utilizing raw NAICS data. Projections based off of EMSI Modeling

5.2.3 – Biomedical / Biotechnical Transforming Industry Cluster

As was shown in the industry cluster analysis section of this study, and is further shown in **Table 5-7** on the next page, the biomedical/biotechnical industry cluster is one of the region’s largest in total employment. However, it is seen as transforming because, despite continual projected employment growth, it is greatly lagging behind national trends. Specifically, the cluster shift share analysis shown previously illustrated that the biomedical/biotechnical industry cluster has the smallest regional “competitive effect” (**-754**) of any of the 23 clusters and sub-clusters in this analysis. This negative “competitive effect” is what displays the industry clusters relative lack of growth when compared against the rest of the nation.

Table 5-7: Biomedical / Biotechnical Cluster Employment: County Estimates

County	2007 Jobs	2016 Jobs	2007-2016 Change	2007-2016 % Change	2016 Payrolled Businesses	2026 Jobs Projection
Clay	376	266	-109	-29.1	10	247
Effingham	1,729	2,028	299	17.3	43	2,323
Fayette	594	543	-51	-8.6	13	548
Jasper	67	50	-17	-25.3	4	45
Marion	2,284	2,236	-48	-2.1	38	2,231
SCIRPDC	5,050	5,123	73	1.4	108	5,394

Source: EMSI 2016; County estimates developed utilizing raw NAICS data. Projections based off of EMSI Modeling

Section 6: Summary and Conclusions

6.1 – Priority Industry Cluster Summary and Next Steps

This study has revealed four industry clusters and two sub-clusters that can be defined as the region's top performing and priority clusters. They include the following:

Table 6-1: Priority Clusters and Sub-Clusters

Major Clusters	Sub-Clusters
Advanced Materials Agribusiness Energy (Fossil & Renewable) Manufacturing Supercluster	Fabricated Metal Manufacturing Primary Metal Manufacturing

The cluster analysis portion of this study indicated that each of these clusters and sub-clusters had increasing location quotients as well as positive regional competitive effects in the shift share analysis. These two indicators are what separates these particular industry groups from the rest of the pack and furthermore illustrate that among all of the regional clusters and sub-clusters, the six noted in **Table 6-1** are performing at high levels both regionally and nationally. While some may be indicating strong cluster employment growth (i.e. agribusiness and energy), others are determined to be priority due to mostly regional versus national trends (i.e. advanced materials; fabricated metal manufacturing; manufacturing supercluster; and primary metal manufacturing).

Either way, these six clusters and sub-clusters should be prioritized regionally as the most common sense areas for continued resource investment. On the cautionary side, four of the six aforementioned industry groups are manufacturing based and one is based on oil and gas, which of course is a finite resource. Therefore, five of these six priority clusters are substantially influenced by external factors. More specifically, manufacturing is influenced by constantly changing equipment technology, as noted earlier in the study, one of the causes of a regional and national decreasing manufacturing workforce. While the energy industry cluster is solely dependent upon the availability of a limited resource, oil.

With these issues in mind, regional stakeholders cannot be narrowly investing time in these priority clusters solely, but must also look ahead and realize that gains in these areas, while accomplishing some shorter term goals, does not necessarily aid to growth decades into the future. Investments in other regionally strong industry clusters such as business and financial services, forest and wood products, transportation equipment, and others as they arise, are critical to long-term regional economic success.

Appendix A

A.1 – NAICS Employment By County

Clay County 2016 NAICS Employment

NAICS	Description	Clay County		Illinois	U.S.
		2016 Jobs	% of Total	% of Total	% of Total
11	Agriculture, Forestry, Fishing and Hunting	829	9.5	1.2	1.9
21	Mining, Quarrying, and Oil and Gas Extract.	1,440	16.4	0.4	0.8
22	Utilities	0	0.0	0.3	0.3
23	Construction	226	2.6	4.4	5.3
31	Manufacturing	1,769	20.2	7.7	6.8
42	Wholesale Trade	464	5.3	4.1	3.4
44	Retail Trade	655	7.5	9.5	10.0
48	Transportation and Warehousing	162	1.8	4.6	3.5
51	Information	92	1.0	1.5	1.8
52	Finance and Insurance	359	4.1	6.5	5.3
53	Real Estate and Rental and Leasing	171	1.9	3.7	4.4
54	Professional, Scientific, and Technical Services	100	1.1	7.6	7.0
55	Management of Companies and Enterprises	23	0.3	1.3	1.3
56	Administrative and Support and Waste Management and Remediation Services	285	3.3	7.0	6.3
61	Educational Services	32	0.4	2.7	2.5
62	Health Care and Social Assistance	464	5.3	11.5	11.4
71	Arts, Entertainment, and Recreation	53	0.6	2.2	2.3
72	Accommodation and Food Services	268	3.1	6.8	7.4
81	Other Services (except Public Administration)	468	5.3	5.8	5.5
90	Government	912	10.4	11.1	12.7
99	Unclassified Industries	0	0.0	0.1	0.1
Total		8,772	100.0	100.0	100.0

EMSI Developer, 2016; Industry sectors **bolded red** are performing at substantially greater levels than both the State and the Nation

Clay County 2007-2016 NAICS Employment Change

NAICS	Description	2007 Jobs	2016 Jobs	Change	% Change
11	Agriculture, Forestry, Fishing and Hunting	673	829	156	23
21	Mining, Quarrying, and Oil and Gas Extract.	716	1,440	724	101
22	Utilities	10	0	(10)	(100)
23	Construction	306	226	(80)	(26)
31	Manufacturing	2,043	1,769	(274)	(13)
42	Wholesale Trade	377	464	87	23
44	Retail Trade	699	655	(44)	(6)
48	Transportation and Warehousing	199	162	(37)	(19)
51	Information	97	92	(5)	(5)
52	Finance and Insurance	320	359	39	12
53	Real Estate and Rental and Leasing	153	171	18	12
54	Professional, Scientific, and Technical Services	139	100	(39)	(28)
55	Management of Companies and Enterprises	0	23	23	100
56	Administrative and Support and Waste Management and Remediation Services	248	285	37	15
61	Educational Services	0	32	32	100
62	Health Care and Social Assistance	646	464	(182)	(28)
71	Arts, Entertainment, and Recreation	50	53	3	6
72	Accommodation and Food Services	256	268	12	5
81	Other Services (except Public Administration)	403	468	65	16
90	Government	956	912	(44)	(5)
99	Unclassified Industries	0	0	0	0
	Total	8,292	8,772	480	6

EMSI Developer, 2016

Effingham County 2016 NAICS Employment

NAICS	Description	Effingham County		Illinois	U.S.
		2016 Jobs	% of Total	% of Total	% of Total
11	Agriculture, Forestry, Fishing and Hunting	1,280	4.9	1.2	1.9
21	Mining, Quarrying, and Oil and Gas Extract.	775	3.0	0.4	0.8
22	Utilities	99	0.4	0.3	0.3
23	Construction	1,365	5.3	4.4	5.3
31	Manufacturing	2,824	10.9	7.7	6.8
42	Wholesale Trade	983	3.8	4.1	3.4
44	Retail Trade	3,341	12.9	9.5	10.0
48	Transportation and Warehousing	1,193	4.6	4.6	3.5
51	Information	552	2.1	1.5	1.8
52	Finance and Insurance	1,243	4.8	6.5	5.3
53	Real Estate and Rental and Leasing	684	2.6	3.7	4.4
54	Professional, Scientific, and Technical Services	601	2.3	7.6	7.0
55	Management of Companies and Enterprises	52	0.2	1.3	1.3
56	Administrative and Support and Waste Management and Remediation Services	790	3.0	7.0	6.3
61	Educational Services	202	0.8	2.7	2.5
62	Health Care and Social Assistance	4,187	16.2	11.5	11.4
71	Arts, Entertainment, and Recreation	355	1.4	2.2	2.3
72	Accommodation and Food Services	2,329	9.0	6.8	7.4
81	Other Services (except Public Administration)	1,541	5.9	5.8	5.5
90	Government	1,505	5.8	11.1	12.7
99	Unclassified Industries	12	0.05	0.1	0.1
Total		25,913	100.0	100.0	100.0

EMSI Developer, 2016; Industry sectors **bolded red** are performing at substantially greater levels than both the State and the Nation

Effingham County 2007-2016 NAICS Employment Change

NAICS	Description	2007 Jobs	2016 Jobs	Change	% Change
11	Agriculture, Forestry, Fishing and Hunting	1,097	1,280	183	17
21	Mining, Quarrying, and Oil and Gas Extract.	329	775	446	136
22	Utilities	111	99	(12)	(11)
23	Construction	1,557	1,365	(192)	(12)
31	Manufacturing	3,939	2,824	(1,115)	(28)
42	Wholesale Trade	1,173	983	(190)	(16)
44	Retail Trade	3,473	3,341	(132)	(4)
48	Transportation and Warehousing	1,106	1,193	87	8
51	Information	297	552	255	86
52	Finance and Insurance	899	1,243	344	38
53	Real Estate and Rental and Leasing	522	684	162	31
54	Professional, Scientific, and Technical Services	552	601	49	9
55	Management of Companies and Enterprises	83	52	(31)	(37)
56	Administrative and Support and Waste Management and Remediation Services	771	790	19	2
61	Educational Services	212	202	(10)	(5)
62	Health Care and Social Assistance	3,414	4,187	773	23
71	Arts, Entertainment, and Recreation	221	355	134	61
72	Accommodation and Food Services	2,358	2,329	(29)	(1)
81	Other Services (except Public Administration)	1,592	1,541	(51)	(3)
90	Government	1,791	1,505	(286)	(16)
99	Unclassified Industries	0	12	12	100
	Total	25,498	25,913	827	6

EMSI Developer, 2016

Fayette County 2016 NAICS Employment

NAICS	Description	Fayette County		Illinois	U.S.
		2016 Jobs	% of Total	% of Total	% of Total
11	Agriculture, Forestry, Fishing and Hunting	1,142	12.4	1.2	1.9
21	Mining, Quarrying, and Oil and Gas Extract.	638	7.0	0.4	0.8
22	Utilities	44	0.5	0.3	0.3
23	Construction	478	5.2	4.4	5.3
31	Manufacturing	396	4.3	7.7	6.8
42	Wholesale Trade	462	5.0	4.1	3.4
44	Retail Trade	1,016	11.1	9.5	10.0
48	Transportation and Warehousing	232	2.5	4.6	3.5
51	Information	68	0.7	1.5	1.8
52	Finance and Insurance	385	4.2	6.5	5.3
53	Real Estate and Rental and Leasing	187	2.0	3.7	4.4
54	Professional, Scientific, and Technical Services	225	2.5	7.6	7.0
55	Management of Companies and Enterprises	0	0.0	1.3	1.3
56	Administrative and Support and Waste Management and Remediation Services	344	3.7	7.0	6.3
61	Educational Services	27	0.3	2.7	2.5
62	Health Care and Social Assistance	950	10.3	11.5	11.4
71	Arts, Entertainment, and Recreation	44	0.5	2.2	2.3
72	Accommodation and Food Services	614	6.7	6.8	7.4
81	Other Services (except Public Administration)	531	5.8	5.8	5.5
90	Government	1,396	15.2	11.1	12.7
99	Unclassified Industries	0	0.0	0.1	0.1
Total		9,177	100.0	100.0	100.0

EMSI Developer, 2016; Industry sectors **bolded red** are performing at substantially greater levels than both the State and the Nation

Fayette County 2007-2016 NAICS Employment Change

NAICS	Description	2007 Jobs	2016 Jobs	Change	% Change
11	Agriculture, Forestry, Fishing and Hunting	994	1,142	148	15
21	Mining, Quarrying, and Oil and Gas Extract.	345	638	293	85
22	Utilities	0	44	44	0
23	Construction	527	478	(49)	(9)
31	Manufacturing	811	396	(415)	(51)
42	Wholesale Trade	550	462	(88)	(16)
44	Retail Trade	1,077	1,016	(61)	(6)
48	Transportation and Warehousing	274	232	(42)	(15)
51	Information	71	68	(3)	(4)
52	Finance and Insurance	308	385	77	25
53	Real Estate and Rental and Leasing	208	187	(21)	(10)
54	Professional, Scientific, and Technical Services	222	225	3	1
55	Management of Companies and Enterprises	0	0	0	0
56	Administrative and Support and Waste Management and Remediation Services	373	344	(29)	(8)
61	Educational Services	33	27	(6)	(18)
62	Health Care and Social Assistance	1,002	950	(52)	(5)
71	Arts, Entertainment, and Recreation	80	44	(36)	(45)
72	Accommodation and Food Services	596	614	18	3
81	Other Services (except Public Administration)	609	531	(78)	(13)
90	Government	1,142	1,396	254	22
99	Unclassified Industries	0	0	0	0
	Total	9,223	9,177	(96)	(0.5)

EMSI Developer, 2016

Jasper County 2016 NAICS Employment

NAICS	Description	Jasper County		Illinois	U.S.
		2016 Jobs	% of Total	% of Total	% of Total
11	Agriculture, Forestry, Fishing and Hunting	916	20.2	1.2	1.9
21	Mining, Quarrying, and Oil and Gas Extract.	817	18.1	0.4	0.8
22	Utilities	159	3.5	0.3	0.3
23	Construction	194	4.3	4.4	5.3
31	Manufacturing	176	3.9	7.7	6.8
42	Wholesale Trade	185	4.1	4.1	3.4
44	Retail Trade	341	7.5	9.5	10.0
48	Transportation and Warehousing	137	3.0	4.6	3.5
51	Information	13	0.3	1.5	1.8
52	Finance and Insurance	233	5.2	6.5	5.3
53	Real Estate and Rental and Leasing	46	1.0	3.7	4.4
54	Professional, Scientific, and Technical Services	97	2.1	7.6	7.0
55	Management of Companies and Enterprises	0	0.0	1.3	1.3
56	Administrative and Support and Waste Management and Remediation Services	80	1.8	7.0	6.3
61	Educational Services	18	0.4	2.7	2.5
62	Health Care and Social Assistance	88	1.9	11.5	11.4
71	Arts, Entertainment, and Recreation	57	1.3	2.2	2.3
72	Accommodation and Food Services	161	3.6	6.8	7.4
81	Other Services (except Public Administration)	290	6.4	5.8	5.5
90	Government	518	11.5	11.1	12.7
99	Unclassified Industries	0	0.0	0.1	0.1
Total		4,527	100.0	100.0	100.0

EMSI Developer, 2016; Industry sectors **bolded red** are performing at substantially greater levels than both the State and the Nation

Jasper County 2007-2016 NAICS Employment Change

NAICS	Description	2007 Jobs	2016 Jobs	Change	% Change
11	Agriculture, Forestry, Fishing and Hunting	824	916	92	11
21	Mining, Quarrying, and Oil and Gas Extract.	236	817	581	246
22	Utilities	228	159	(69)	(30)
23	Construction	233	194	(39)	(17)
31	Manufacturing	177	176	(1)	(1)
42	Wholesale Trade	207	185	(22)	(11)
44	Retail Trade	319	341	22	7
48	Transportation and Warehousing	168	137	(31)	(18)
51	Information	80	13	(67)	(84)
52	Finance and Insurance	141	233	92	65
53	Real Estate and Rental and Leasing	57	46	(11)	(19)
54	Professional, Scientific, and Technical Services	48	97	49	102
55	Management of Companies and Enterprises	0	0	0	0
56	Administrative and Support and Waste Management and Remediation Services	91	80	(11)	(12)
61	Educational Services	34	18	(16)	(47)
62	Health Care and Social Assistance	155	88	(67)	(43)
71	Arts, Entertainment, and Recreation	76	57	(19)	(25)
72	Accommodation and Food Services	112	161	49	44
81	Other Services (except Public Administration)	297	290	(7)	(2)
90	Government	733	518	(215)	(29)
99	Unclassified Industries	0	0	0	0
	Total	4,216	4,527	310	7

EMSI Developer, 2016

Marion County 2016 NAICS Employment

NAICS	Description	Marion County		Illinois	U.S.
		2016 Jobs	% of Total	% of Total	% of Total
11	Agriculture, Forestry, Fishing and Hunting	1,095	6.3	1.2	1.9
21	Mining, Quarrying, and Oil and Gas Extract.	907	5.2	0.4	0.8
22	Utilities	35	0.2	0.3	0.3
23	Construction	685	3.9	4.4	5.3
31	Manufacturing	2,516	14.4	7.7	6.8
42	Wholesale Trade	292	1.7	4.1	3.4
44	Retail Trade	1,488	8.5	9.5	10.0
48	Transportation and Warehousing	1,247	7.2	4.6	3.5
51	Information	163	0.9	1.5	1.8
52	Finance and Insurance	773	4.4	6.5	5.3
53	Real Estate and Rental and Leasing	244	1.4	3.7	4.4
54	Professional, Scientific, and Technical Services	349	2.0	7.6	7.0
55	Management of Companies and Enterprises	67	0.4	1.3	1.3
56	Administrative and Support and Waste Management and Remediation Services	408	2.3	7.0	6.3
61	Educational Services	85	0.5	2.7	2.5
62	Health Care and Social Assistance	2,990	17.2	11.5	11.4
71	Arts, Entertainment, and Recreation	219	1.3	2.2	2.3
72	Accommodation and Food Services	992	5.7	6.8	7.4
81	Other Services (except Public Administration)	964	5.5	5.8	5.5
90	Government	1,912	11.0	11.1	12.7
99	Unclassified Industries	0	0.0	0.1	0.1
Total		17,431	100.0	100.0	100.0

EMSI Developer, 2016; Industry sectors **bolded red** are performing at substantially greater levels than both the State and the Nation

Marion County 2007-2016 NAICS Employment Change

NAICS	Description	2007 Jobs	2016 Jobs	Change	% Change
11	Agriculture, Forestry, Fishing and Hunting	903	1,095	192	21
21	Mining, Quarrying, and Oil and Gas Extract.	480	907	427	89
22	Utilities	13	35	22	169
23	Construction	841	685	(156)	(19)
31	Manufacturing	2,722	2,516	(206)	(8)
42	Wholesale Trade	384	292	(92)	(24)
44	Retail Trade	1,644	1,488	(156)	(9)
48	Transportation and Warehousing	1,505	1,247	(258)	(17)
51	Information	250	163	(87)	(35)
52	Finance and Insurance	593	773	180	30
53	Real Estate and Rental and Leasing	311	244	(67)	(22)
54	Professional, Scientific, and Technical Services	473	349	(124)	(26)
55	Management of Companies and Enterprises	60	67	7	12
56	Administrative and Support and Waste Management and Remediation Services	418	408	(10)	(2)
61	Educational Services	59	85	26	44
62	Health Care and Social Assistance	2,915	2,990	75	3
71	Arts, Entertainment, and Recreation	231	219	(12)	(5)
72	Accommodation and Food Services	1,014	992	(22)	(2)
81	Other Services (except Public Administration)	1,035	964	(71)	(7)
90	Government	2,227	1,912	(315)	(14)
99	Unclassified Industries	0	0	0	0
	Total	18,079	17,431	(647)	(4)

EMSI Developer, 2016

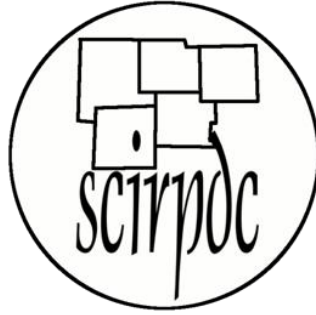
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