

# Industry Cluster Analysis for Adams County and the OVRDC Region

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## Introduction

The research team identified industry employment in both Adams County and the Ohio Valley Regional Development Commission (OVRDC) region. Along with the industry employment, the research team also identified the Location Quotients (LQ), which is the relative strength of each industry compared to the industry's strength across all of Ohio. Once the industries and their strengths were pinpointed, appropriate recommendations could be made on how to either ensure the continued strength and growth of an industry or how to successfully invest in an industry to foster growth.

## Industry Employment by 3 Digit NAICS Code

This section examines the largest industries by employment in Adams County. It not only shows the change in employment, but also compares the relative strength of each industry as compared to Ohio. Figure 1 depicts the change in employment from 2012 to 2018 for the selected industries. While eight industries experienced growth in employment, thirteen industries experienced a decline in employment. Additionally, of the eleven industries that employed over 100 people in 2012, eight experienced a decline while three experienced a growth. Furthermore, the top five industries (Food Services & Drinking Places, Transportation Equipment Manufacturing, Social Services Assistance, General Merchandise Stores, and Hospitals) all experienced a decline in employment, accounting for the loss of 229 jobs. The largest declines were seen in Merchant, Wholesalers, and Durable Goods (-64%), Social Services Assistance (-35%), and Amusement, Gambling, and Recreation (-32%). The largest growths were seen in Specialty Trade Contractors (71%), Heavy/Civil Engineering (56%), and Ambulatory Health Care (39%).

Figure 2 shows the industries' Location Quotients (LQ), or the relative strength of each of industry as compared to the industry's strength in Ohio. Industries with a higher LQ are stronger or more concentrated in the county than in the state at large. This may indicate how specialized an industry is in Adams County. Industries with an LQ above 1 have a higher proportion of employees in that industry than the proportion in the industry at the state level. Likewise, industries with an LQ below 1 have a lower proportion of employees in that industry than at the state level. Additionally, figure 2 also shows the employment of the industries in 2018 and whether the industry experienced employment loss (light blue) or gain (dark blue) from 2012 to 2018. This may indicate whether the industries are growing or shrinking and may signal the need for investment dependent on the LQ of the industry.

Investments may yield a higher impact if:

The given industry is a large source of employment

The given industry has a high LQ, but is experiencing a loss in employment

The given industry is experiencing growth in employment, but still has a low LQ

Investments may yield a lower impact if:

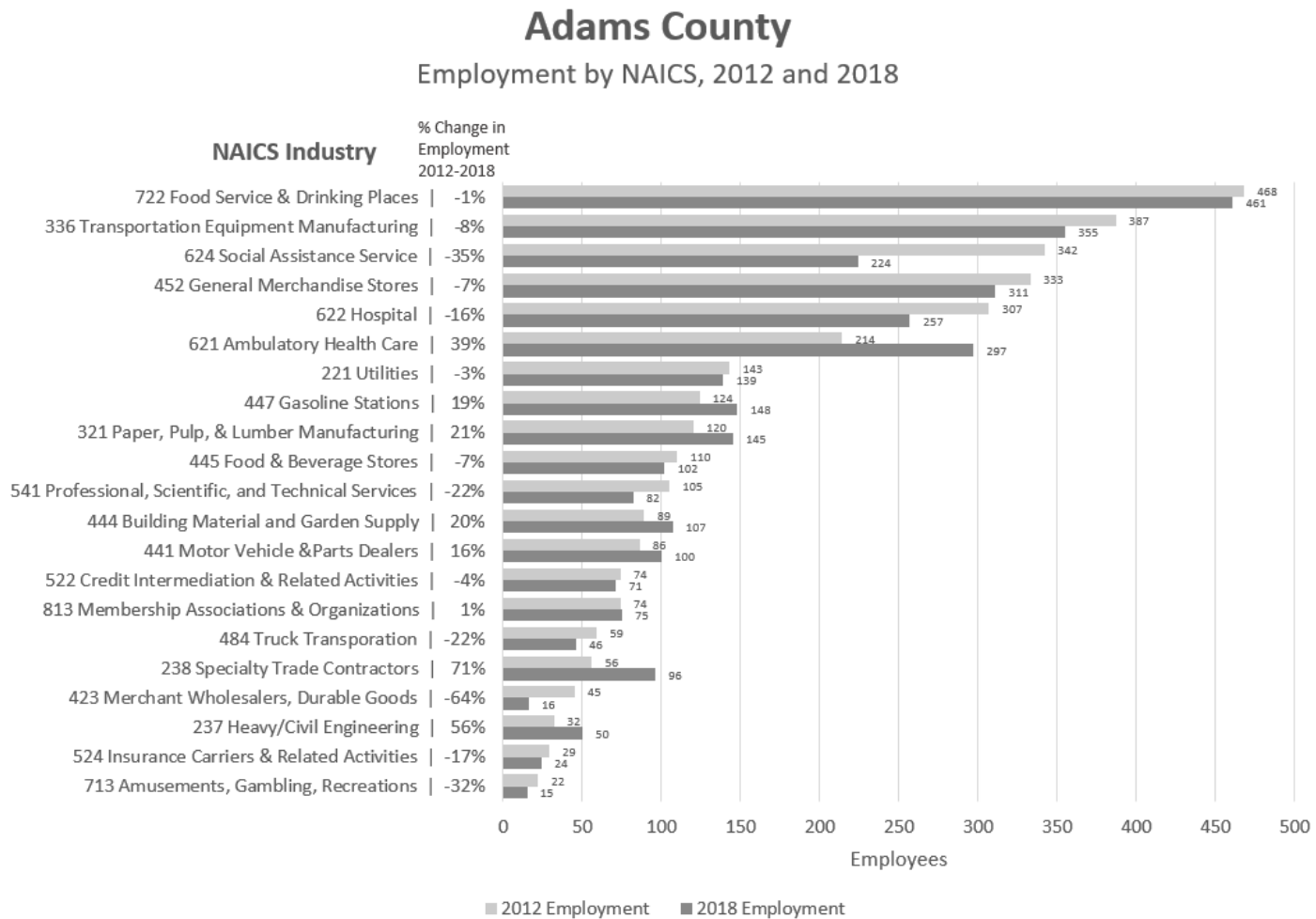
The given industry is a small source of employment

The given industry has a high LQ and is experiencing growth in employment

The given industry has a low LQ and is experiencing loss in employment

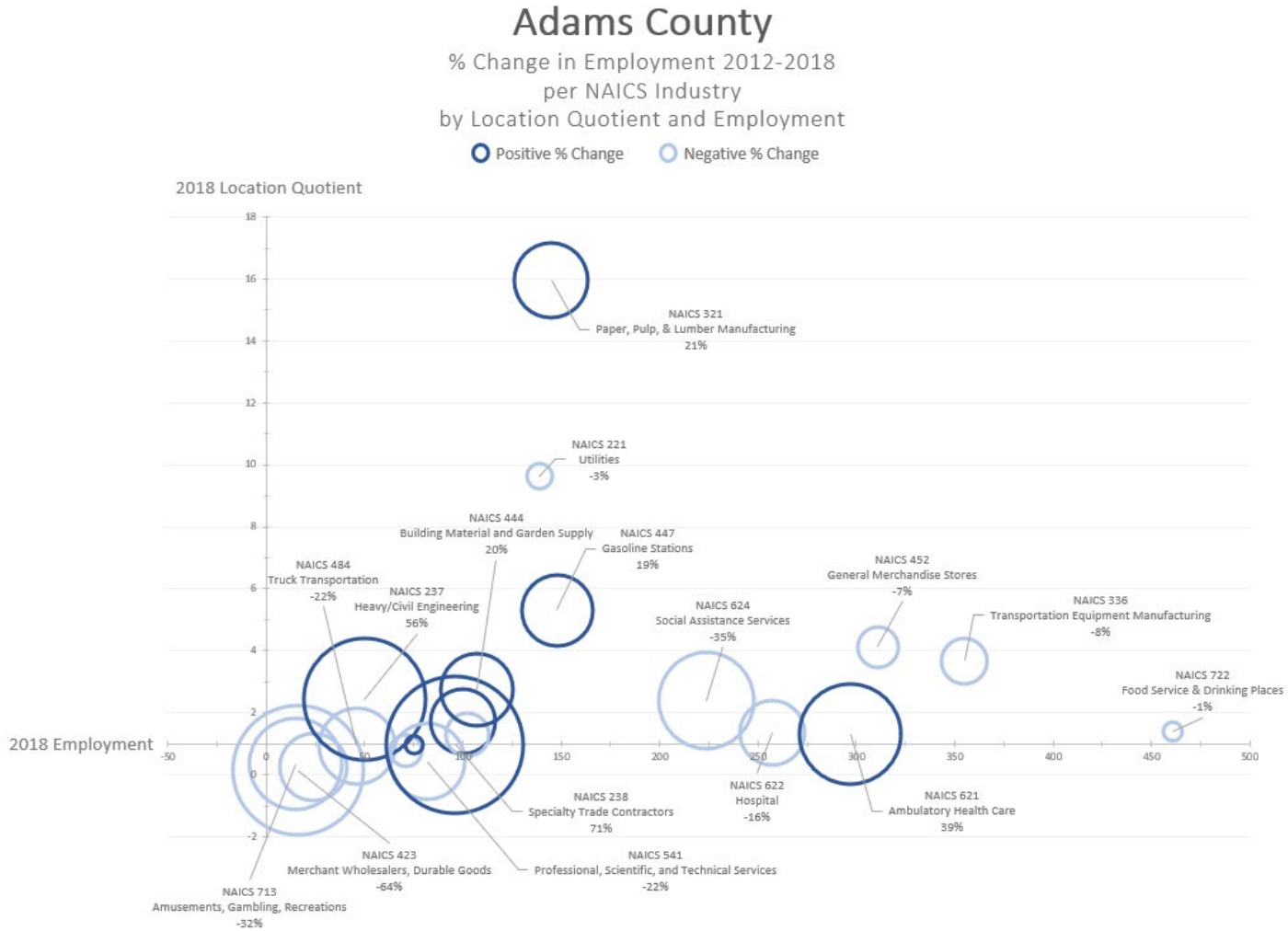
Table 1 shows how the industries fit into these categories. Bolded industries had at least 50 employees in 2018, while the italicized industries had fewer than 50 employees in 2018. The green categories indicate industries that may benefit more from investment. For category 2, this means using investment to counteract the loss of employment in an industry that is already strong in the county. For category 3, this means using investment to help specialize or strengthen the concentration of a currently growing industry in the county. The blue category indicates industries that may see less return on investment than those in the green categories. For category 5, this means industries that are both growing and strong in the county may continue along that trajectory without need of investment. For category 6, this means a substantial investment may be necessary to change both the loss of employment and to strengthen the industry in the county. This is not to say that investments should not be made in these two categories, but to acknowledge that to achieve the same results of an investment into a green category industry may require a much larger investment in the blue category industry.

**Figure 1: Adams County Employment by NAICS Code, 2012 & 2018<sup>1</sup>**



<sup>1</sup> Source: U.S. Census Bureau, County Business Patterns, 2012 & 2018

**Figure 2: Adams County, Change in Employment by Location Quotient and Employment, 2012-2018<sup>2</sup>**



<sup>2</sup> Source: U.S. Census Bureau, County Business Patterns, 2012 & 2018

**Table 1: Adams County Industries by Investment Category**

	High LQ (LQ > 1)	Low LQ (LQ < 1)
Loss in Employment	(2) <b>Social Assistance Services</b> <b>Hospital</b> <b>General Merchandise Stores</b> <b>Utilities</b> <b>Transportation Equip.</b> <b>Manufacturing</b> <i>Truck Transportation</i> <b>Food Services and Drinking Places</b> <b>Food and Beverage Stores</b>	(6) <i>Amusement, Gambling, Recreation</i> <i>Merchant Wholesaler, Durable Goods</i> <b>Professional, Scientific, Technical Serv.</b> <b>Credit Intermediation, Related Activities</b> <i>Insurance Carriers, Related Activities</i>
Growth in Employment	(5) <b>Paper, Pulp, &amp; Lumber Manufacturing</b> <b>Heavy/Civil Engineering</b> <b>Ambulatory Health Care</b> <b>Building Materials &amp; Garden Supply</b> <b>Gas Stations</b> <b>Motor Vehicle and Parts Dealers</b>	(3) <b>Specialty Trade Contractors</b> <b>Membership Associations &amp; Orgs.</b>

Following the examination of the industries in Adams County, clusters of related industries were identified, and the analysis was performed at this more detailed level to gain more insights into the potential for Adams County. Additionally, the analysis was further extended to examine industry clusters in the entire OVRDC region.

## Methodology

For this task, the industry clusters being targeted were identified. Relevant NAICS codes were assigned to each industry. In the 2015 Adams County Economic Development/Tourism Plan, Adams County identified Healthcare, Retail, Manufacturing, Utilities, and Accommodations as sectors in which they planned to focus.

Adams County	NAICS Code
Healthcare	621, 622, 623
Retail	44-45
Manufacturing	31-33
Utilities	22
Accommodations	721

In the 2011 CEDS Performance Report, the OVRDC identified Agriculture, Healthcare, the Wood industry, and Manufacturing as the prominent clusters in the region. The OVRDC is made up of Adams, Brown, Clermont, Fayette, Gallia, Highland, Jackson, Lawrence, Pike, Ross, Scioto, and Vinton Counties.

OVRDC	NAICS Code
Agriculture Related Businesses	111, 112, 1151, 1152
Healthcare Related Businesses	621, 622, 623
Wood Industry and Related Businesses	321, 337110, 337121, 337122, 337127, 337211, 337212, 337215, 3379, 4232, 423310
Total Manufacturing Sector	31-33

According to the JobsOhio website, the targeted industries for Ohio are Advanced Manufacturing, Aerospace and Aviation, Automotive, Healthcare, Energy and Chemicals, Financial Services, Food and Agribusiness, Information Technology, and Logistics and Distribution. Further research into these sectors, revealed a document with nine industries and four business functions that JobsOhio focuses on as posted on the Ohio Department of Higher Education website. Additionally, this document listed the associated NAICS codes for each. These NAICS codes were used as a baseline for assigning NAICS codes.

JobsOhio Website	NAICS Code
Advanced Manufacturing	3272, 3279, 3311, 3312, 3314, 3324, 3329, 3332, 3339, 3351, 3352, 3353
Aerospace & Aviation	3345, 3364, 4811, 4812, 5174, 9271
Automotive	3336, 3361, 3362, 3363
Healthcare	621, 622, 623
Energy & Chemicals	2111, 2121, 2131, 2211, 2212, 3241, 2371, 3251, 3252, 3253, 3255, 3256, 3259, 3261, 3262
Financial Services	5221, 5222, 5223, 5231, 5232, 5239, 5241, 5251, 5259
Food & Agribusiness	111, 112, 1151, 1152, 311, 4244, 4245, 445
Information Technology	5112, 5182, 5191, 5415
Logistics & Distribution	4841, 4842, 4881, 4882, 4883, 4884, 4885, 4889, 4921, 4922, 4931
JobsOhio Document	NAICS Code
Aerospace & Aviation	3345, 3364, 4811, 4812, 5174, 9271
Automotive	3336, 3361, 3362, 3363
Financial Services	5221, 5222, 5223, 5231, 5232, 5239, 5241, 5251, 5259
Biohealth	3254, 334510, 334516, 334517, 3391
Advanced Manufacturing	3272, 3279, 3311, 3312, 3314, 3324, 3329, 3332, 3339, 3351, 3352, 3353
Energy	2111, 2121, 2131, 2211, 2212, 3241, 2371
Food Processing	3111, 3112, 3113, 3114, 3115, 3116, 3117, 3118, 3119, 3121
Information Technology and Services	5112, 5182, 5191, 5415
Polymers and Chemicals	3251, 3252, 3253, 3255, 3256, 3259, 3261, 3262
Headquarters and Consulting	5416, 5511
Back Office	5611, 5614

Logistics	4841, 4842, 4881, 4882, 4883, 4884, 4885, 4889, 4921, 4922, 4931
Research & Development	5417

To further explore the OVRDC region, the targeted industries from the three overlapping JobsOhio regions were identified. The majority of the OVRDC counties are located within the APEG region. They are Adams, Gallia, Highland, Jackson, Lawrence, Pike, Ross, Scioto, and Vinton Counties. According to the APEG website, the targeted industries in the region are Polymers & Plastics, Energy Production, Food Manufacturing, Automotive and Aerospace, Petrochemical, Hardwood Products Manufacturing, Metals Fabrication, Logistics, and Consumer Products. The REDI Cincinnati region contains two OVRDC counties: Brown and Clermont. The REDI Cincinnati website identifies the targeted industries as Aerospace, Advanced Manufacturing, Food and Flavoring, Information Technology, Shared Services, and Biohealth. The Dayton Development Coalition contains one OVRDC county: Fayette. Their website identifies Aerospace and Defense, Agriculture and Food Processing, Automotive, Bioscience, Cyber, and Logistics and Distribution as targeted industries.

APEG	NAICS Code
Polymers & Plastics	3252, 3261, 3262
Energy Production	2111, 2121, 2131, 2211, 2212, 3241, 2371
Food Manufacturing	3111, 3112, 3113, 3114, 3115, 3116, 3117, 3118, 3119, 3121
Automotive & Aerospace	3336, 3361, 3362, 3363, 3345, 3364, 4811, 4812, 5174, 9271
Petrochemical	325110
Hardwood Products Manufacturing	321, 337110, 337121, 337122, 337127, 337211, 337212, 337215, 3379, 4232, 423310
Metals Fabrication	3321, 3322, 3223, 3324
Logistics	4841, 4842, 4881, 4882, 4883, 4884, 4885, 4889, 4921, 4922, 4931
Consumer Products	31-33 (businesses within codes that manufacture retail goods)

REDI Cincinnati	NAICS Code
Aerospace	3345, 3364, 4811, 4812, 5174, 9271
Advanced Manufacturing	3272, 3279, 3311, 3312, 3314, 3324, 3329, 3332, 3339, 3351, 3352, 3353
Food and Flavoring	3111, 3112, 3113, 3114, 3115, 3116, 3117, 3118, 3119, 3121
Information Technology	5112, 5182, 5191, 5415
Shared Services	521, 522, 523, 525, 54
Biohealth	3254, 334510, 334516, 334517, 3391

Dayton Development Coalition	NAICS Code
Aerospace and Defense	3345, 3364, 4811, 4812, 5174, 9271, 9281
Agriculture and Food Processing	111, 112, 1151, 1152, 311, 4244, 445, 3111, 3112, 3113, 3114, 3115, 3116, 3117, 3118, 3119, 3121
Automotive	3336, 3361, 3362, 3363



Bioscience	3254, 334510, 334516, 334517, 3391, 541714, 541715
Cyber (IT)	5112, 5182, 5191, 5415
Logistics and Distribution	4841, 4842, 4881, 4882, 4883, 4884, 4885, 4889, 4921, 4922, 4931

Next, using the JobsOhio document as a baseline, the different industries focused on by each entity were compared to see where there was overlap. Of the 13 industries focused on in the JobsOhio Document, ten of the industries overlap with at least two other entities. These industries are Advanced Manufacturing, Aerospace & Aviation, Automotive, Biohealth, Energy, Financial Services, Food Processing, Information Technology & Services, Logistics, and Polymers & Chemicals. Additionally, the Wood Industry also overlapped within three entities, specifically, Adams County, OVRDC, and APEG. Likewise, the Wood Industry had been brought up during interviews with Adams County residents and in conversations with the Adams County Economic and Community Development Director, Holly Johnson. Therefore, the Wood Industry was added to the ten industries previously identified. Five industries were identified as lacking overlap: Back Office, Headquarters & Consulting, Research & Development, Accommodations, and Retail. Therefore, these five industries will be left out of the cluster analysis.

JobsOhio Document	Adams County	OVRDC	JobsOhio Website	APEG	REDI Cincinnati	Dayton Development Coalition
Advanced Manufacturing	*Manufacturing	*Total Manufacturing Sector	Advanced Manufacturing	Consumer Products; Metals Fabrication	Advanced Manufacturing	
Aerospace & Aviation	*Manufacturing	*Total Manufacturing Sector	Aerospace & Aviation	*Automotive & Aerospace	Aerospace	Aerospace and Defense
Automotive	*Manufacturing	*Total Manufacturing Sector	Automotive	*Automotive & Aerospace		Automotive
Back Office						
Biohealth	Healthcare	Healthcare Related Businesses	Healthcare		Biohealth	Bioscience
Energy	Utilities		*Energy & Chemicals	Energy Production		
Financial Services			Financial Services		*Shared Services	
Food Processing		Agriculture Related Businesses	Food & Agribusiness	Food Manufacturing	Food and Flavoring	Agriculture and Food Processing
Headquarters & Consulting					*Shared Services	
Information Technology and Services			Information Technology		Information Technology	Cyber
Logistics			Logistics & Distribution	Logistics		Logistics and Distribution
Polymers and Chemicals	*Manufacturing	*Total Manufacturing Sector	*Energy & Chemicals	Petrochemical; Polymers & Plastics		
Research & Development						
	Accommodations					
	Retail					
	*Manufacturing	Wood Industry and Related Businesses		Hardwood Products Manufacturing		

\* Industry is repeated within column as it matches more than one category in "JobsOhio Document"

After narrowing down the industry clusters, data was retrieved for each from the County Business Patterns on number of establishments, paid employees, and annual wages. Data was retrieved for the United States, Ohio, the OVRDC region, and Adams County. The number of establishments was included in the data at every level. However, the number of paid employees and annual wages were often suppressed at the county level, due to a small number of establishments in the county. In these cases, the suppressed values were substituted for a reported value in a different year, conditional on the reported value year occurring within a 5-year window of the suppressed value year. For data that was still missing, estimates were created based on average employment by number of establishments, taking into consideration the industry cluster and the urban/rural status of counties. In the few cases, where there was not enough data for either of the previous methods to work, the median value of the range given by the County Business Patterns was used to estimate the suppressed number of paid employees.

After estimating the employment data, the location quotient for each industry cluster was calculated. A location quotient of 1 signifies that the selected region is equally as strong in the industry as the comparison region. A location quotient above 1 signifies the industry is stronger and below 1 signifies the industry is weaker.

## Results for Adams County

The following graphs show the relationship between the growth in the industry (percent change in employment since 2010) and the relative strength or concentration of the industry cluster (the location quotient). This relationship can be divided into four categories: Mature, Star, Transforming, and Emerging. Mature industries have a strong concentration but need investment to reverse downward growth trends. Star industries have strong growth and concentration. Star industries are the strength of the community. Transforming industries have low concentration and negative growth. Only a large investment could help change these trends and might be better invested into an industry in another category. Emerging industries have a low concentration, but high growth. These industries are poised for future growth and can use investment for support and strengthen the concentration of the industry. The graphs also show the relative number employed in the industry cluster by the size of the bubble.

Figures 3, 4, and 5 show the comparison of Adams County to the OVRDC region, Ohio, and the United States from 2010 to 2016, respectively. In all three cases, Aerospace is Adams County's highest concentrated industry. The Aerospace industry is almost 30 times stronger in Adams County than in the entire OVRDC region. Likewise, the Aerospace industry is over 14 times stronger compared to Ohio and over 9 times stronger compared to the United States. Because of the suppressed data and because the number of establishments have not changed from 2010 to 2016, the Aerospace industry is the one industry where the direction of growth could not be determined. However, investments in this industry could help spur growth whether the industry is considered mature or star.

Likewise, figure 3 shows that Advanced Manufacturing, Energy, Information Technology, and Logistics are considered star industries for Adams County compared to the OVRDC region from 2010 to 2016. However, when compared to Ohio, Advanced Manufacturing was categorized as emerging. This signifies that Advanced Manufacturing in Adams County is stronger than in other parts of the OVRDC and the US, but weaker than some other parts of Ohio. Also, it is important to note is that the percent growth for

Advanced Manufacturing is infinite as there were no establishments present in 2010. Similarly, Information Technology was classified as emerging when compared to Ohio and to the US.

Figure 3 also shows that the Wood industry and Financial Services are considered mature, while the Polymers industry was considered transforming when compared to the OVRDC region from 2010 to 2016. While the Wood industry was still considered mature when comparing to Ohio and to the US, Financial Services were considered transforming, and the Polymers industry was considered mature. As seen in figures 3, 4, and 5, Financial Services and the Polymers industry are positioned closer to x-axis or a location quotient of 1.

Additionally, it is important to note that three of the eleven industry clusters do not show up on figures 3, 4, or 5. The Automotive industry and Food Processing industry do not show up because no establishments were found in 2010 or 2016. The Biohealth industry does not show because there were no establishments in 2016 even though there were establishments in 2010 indicating that all Biohealth establishments had closed. It is also important to note that the data used was from before the two Dayton Power and Light plant closings in Adams County in 2018. Therefore, it is predicted that the size of the Energy industry bubble will shrink dramatically and that the Energy industry will be reclassified as mature or transforming depending on the remaining strength or concentration of other energy sector jobs in the county.

Figure 3:

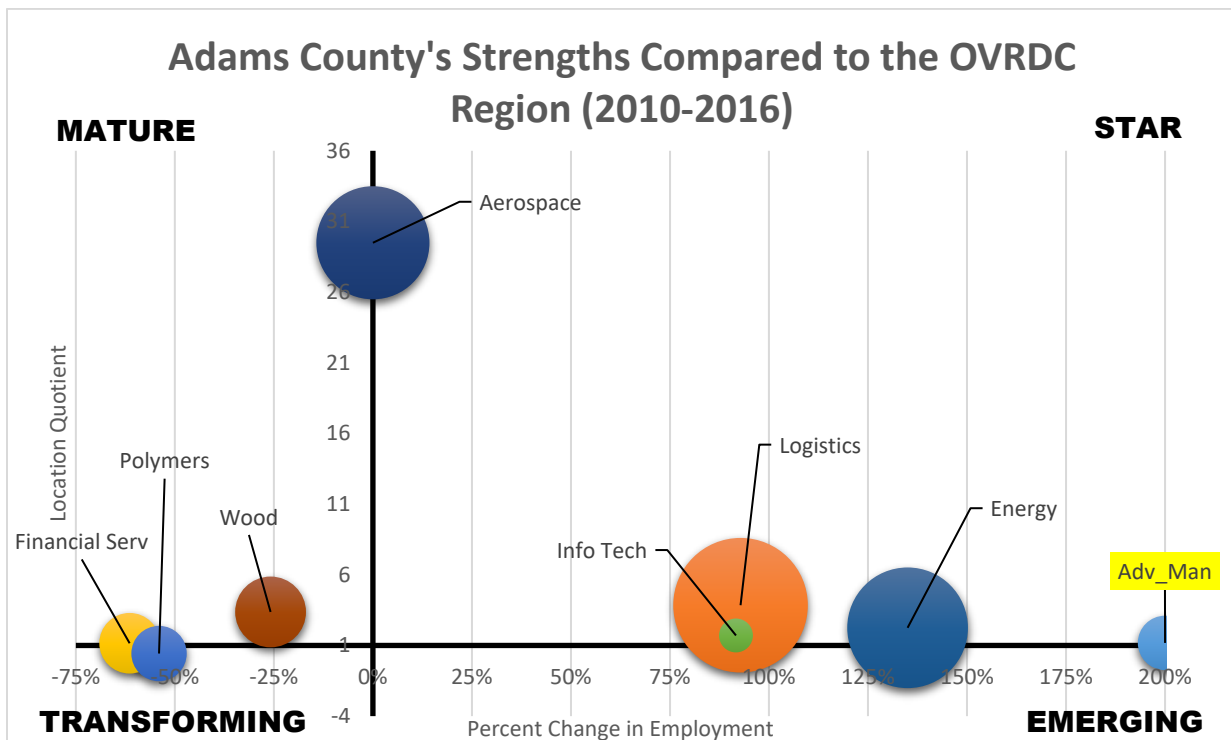


Figure 4:

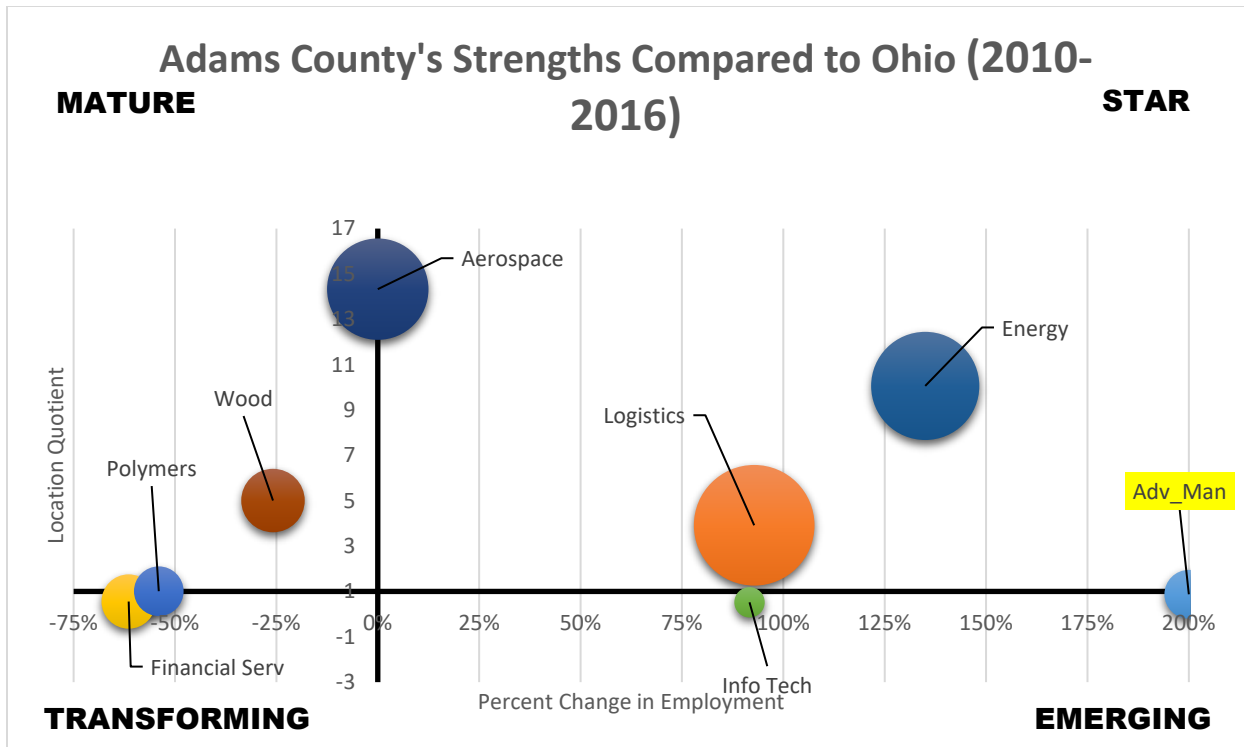
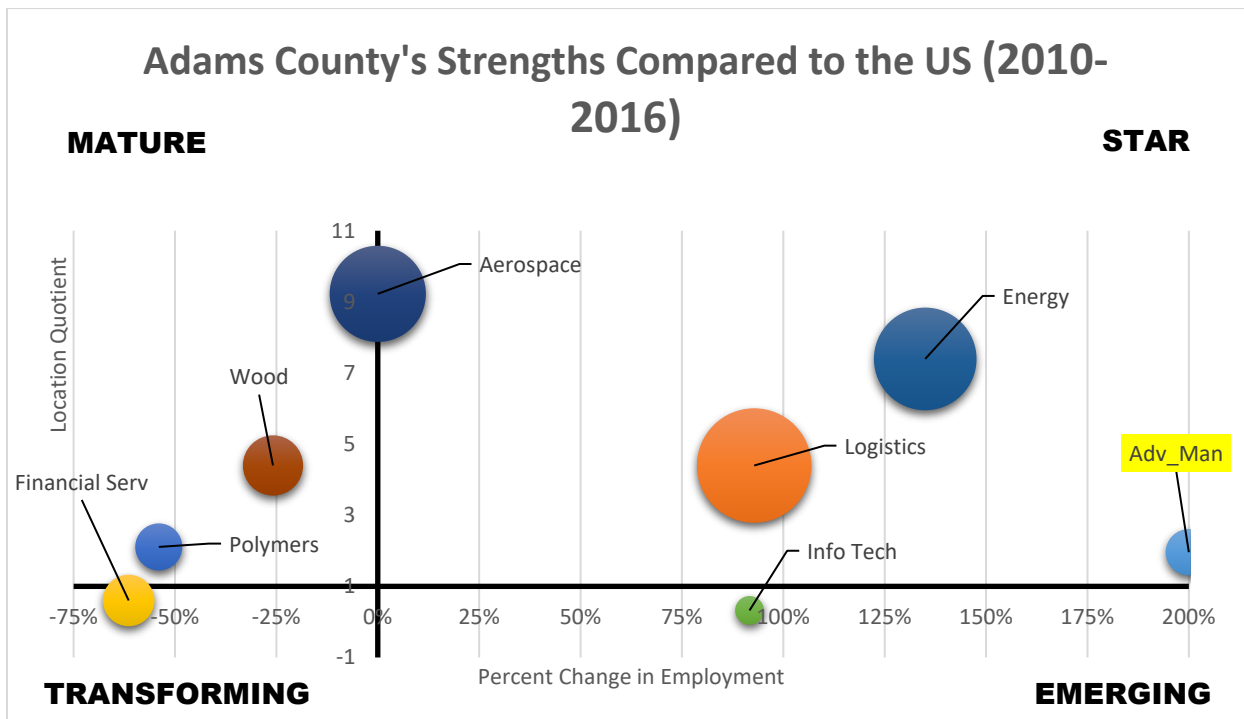


Figure 5:



## Recommendations for Adams County

Aerospace has a strong concentration in Adams County and is a major employer for the county. Investment should be made wisely to ensure future growth in current operations and in growing and supporting supply chain businesses.

Logistics is another major employer and investment could be made to increase strength of industry.

Advance Manufacturing is on the border of being considered a star industry by all three comparisons but employs less than the previous two industries. Investments could be made to grow existing businesses and increase employment in the industry.

The Wood industry is relatively strong in Adams County but needs investment to reverse the downward trend in growth. It would be beneficial to reverse the downward trend before there is a loss of concentration of the industry in Adams County.

Information Technology is also on the border of being a star industry but employs even less people.

Investment in this industry may also require broadband or fiber and other infrastructure to support the industry. Investment may be more cost effective in the previous four industries.

Depending on the remaining concentration in the Energy industry, investment in the industry could be beneficial. However, if the concentration is low, the size of the investment may outweigh benefits to the community.

## Results for OVRDC Region

Figures 6 and 7 show the comparison of the OVRDC region to Ohio and the United States from 2010 to 2016, respectively. Figure 6 shows that the three industries employing the most people, the Energy, Automotive, and Polymers industries, are categorized as star industries. Additionally, Figure 6 classifies Advanced Manufacturing as an emerging industry when compared to the state, but figure 7 classifies Advanced Manufacturing as a star industry when compared to the nation.

Furthermore, Figures 6 and 7 classify Food Processing, Logistics, and the Wood industry as mature industries. Food Processing and Logistics are the next two largest employers of the industries looked at in this analysis. Likewise, Figures 6 and 7 show that Aerospace, Information Technology, Financial Services, and Biohealth are considered transforming industries. Additionally, Biohealth, Aerospace, and Information Technology employ the least amount of people in the region.

**Figure 6:**

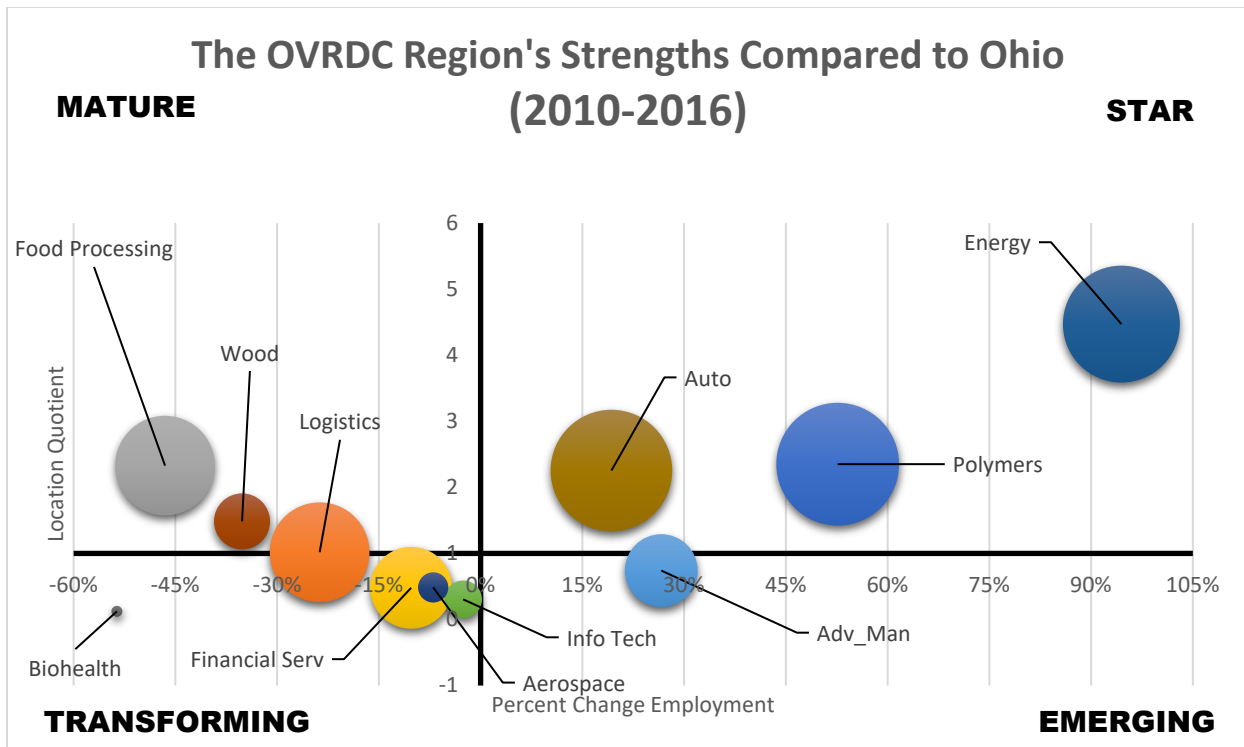
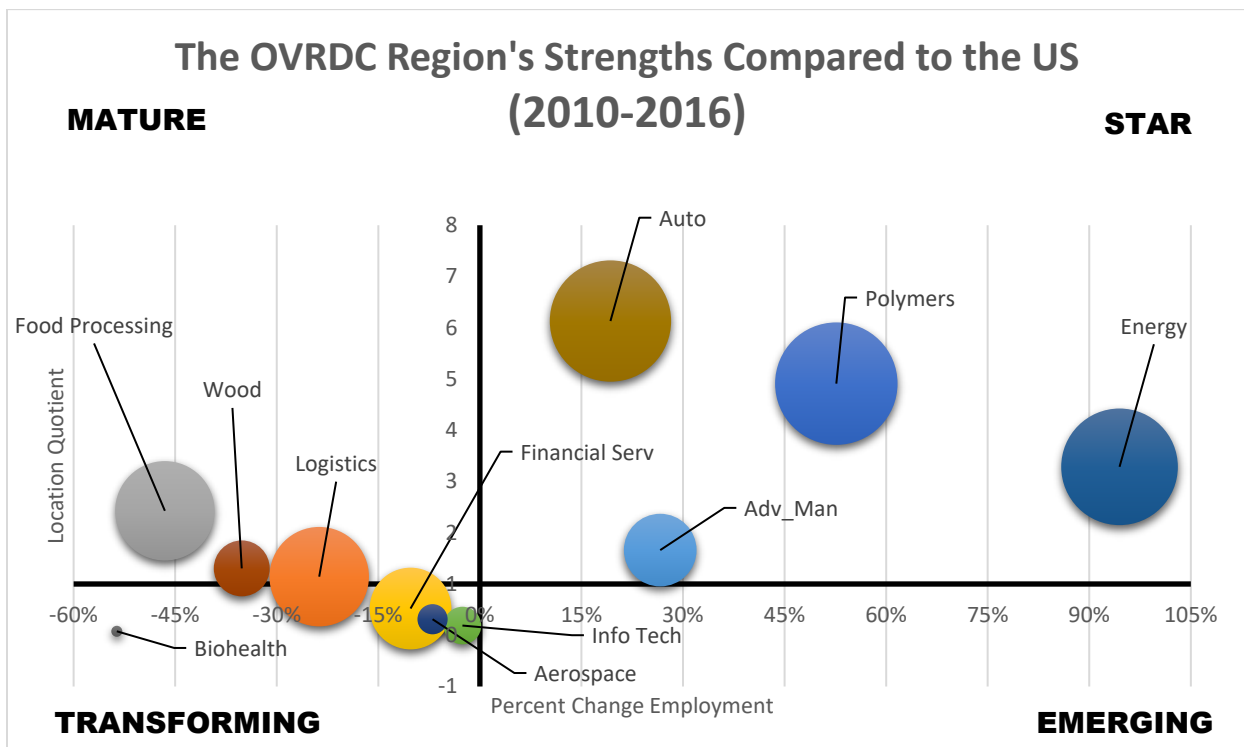


Figure 7:



## Recommendations for the OVRDC Region

The Food Processing and Logistics industries are both relatively large employers for the region. Investments should be made while the concentration of the industries exist in the region to reverse the downward growth trend.

Advance Manufacturing businesses should be invested in and supported to continue growth and further spur the concentration of the industry.

The Wood Industry would also benefit from investments to reverse the downward growth trend, but as the industry employs less people than the previously mentioned industries, may be given lower priority in terms of investments.

The Automotive, Polymers, and Energy industries are major employers. There should be continued support for these industries and for new supply chain business to maintain growth and concentration in these industries.

## Summary

Adams County, from 2012 to 2018 had eight industries experience a growth in employment while thirteen experienced a decline. The top five industries interestingly happened to be a part of the industries that experienced declines. Therefore, when determining the size of any investments, it is important to look at the location quotient of each industry since they each vary.

Regarding the methodology, for Adams County five industries and their corresponding NAICS codes were identified: Healthcare, Retail, Manufacturing, Utilities, and Accommodations. The same method was applied to the OVRDC region and the 2011 CEDS Performance Report identified the prominent clusters in the region as Agriculture, Healthcare, the Wood Industry, and Manufacturing. Once the industry clusters were narrowed down, data on the number of establishments, paid employees, and annual wages was retrieved, leading to results and recommendations for both Adams County and the OVRDC region.

Aerospace is Adams County's concentrated industry; it is nearly 30 times stronger in Adams County than in the entire OVRDC region, nearly 14 times stronger compared to all of Ohio, and over 9 times stronger compared to the entire United States. Advanced Manufacturing, Energy, Information Technology, and Logistics are considered stars in Adams County. Along with that, the Wood Industry and Financial Services are considered mature, but the Polymers industry was considered transforming. There were six recommendations made for Adams County. Regarding keeping their top industry, Aerospace, thriving, wise investments should continue to ensure future growth. In order to increase the information Technology Industry, investments may include broadband, fiber, and other infrastructure to support it.

In the OVRDC region, from 2010 to 2016 there were three primary industries that employed the most people: Energy, Automotive, and Polymer. Food Processing and Logistics are the next two largest employers, while Biohealth, Aerospace, and Information Technology employ the least amount of people in the region. Similarly, to the Adams County Analysis, there were recommendations on how to foster or sustain growth across all the industries. Even though the Food Processing and Logistics industries are relatively large employers throughout the region, there still must be investments made to reverse the downward growth trend. Concerning Automotive, Polymers, and Energy Industries there should be continued support to ensure growth.