

IHS ECONOMICS

Volusia Regional Manufacturers Association

Manufacturing Sector Profile

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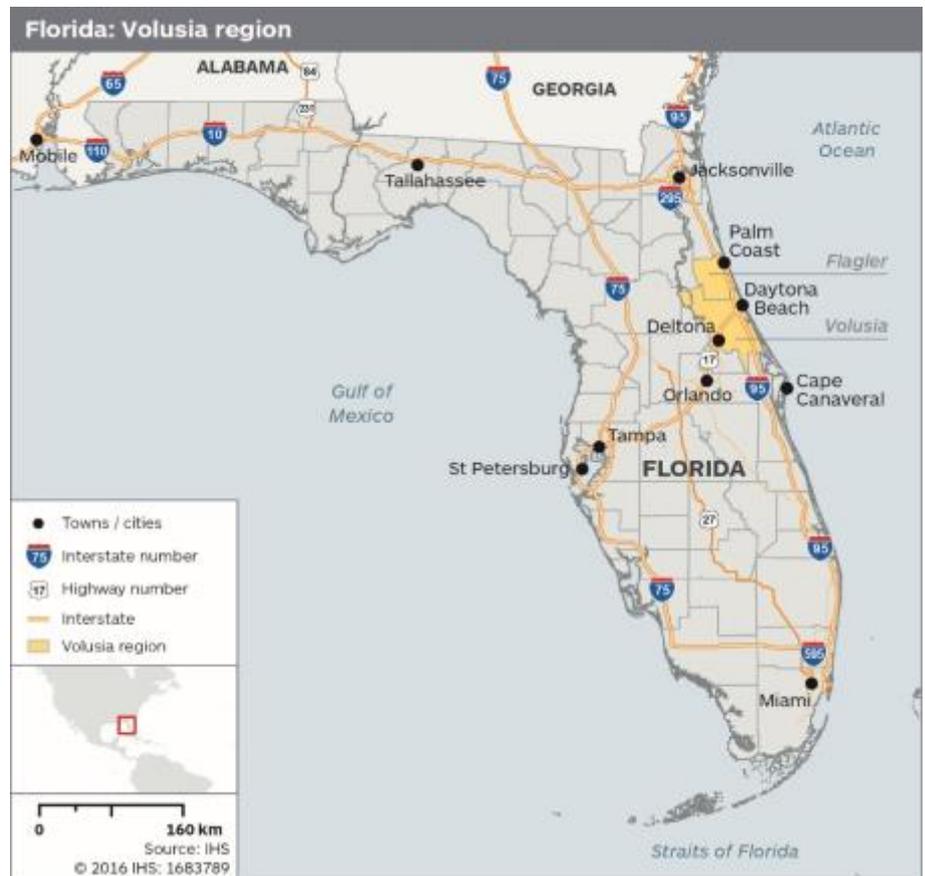
Volusia Regional Manufacturers Association Manufacturing Sector Profile

Introduction

As part of its mission, FloridaMakes is working to provide Florida’s regional manufacturers associations (RMAs) with actionable information that will help them support and increase the economic competitiveness of small- and medium-size manufacturers located in their service areas. Small and medium manufacturers are defined as companies having 500 or fewer workers at a single establishment with small manufacturers defined as those firms that have 50 or fewer employees. FloridaMakes has retained IHS to prepare an economic profile of the Volusia regional economy, with a focus on the characteristics of the manufacturing sector. IHS defines the manufacturing sector as consisting of establishments assigned to North American Industry Classification System (NAICS) codes 31, 32, and 33.

The Volusia region comprises two Florida counties: Volusia and Flagler¹. Both of the counties are situated within the Deltona-Daytona Beach-Ormond Beach, Florida, metropolitan statistical area (MSA). Deltona, within Volusia County, is the largest city in the regional economy.

In the following sections, findings of potential interest to policymakers are presented in **bold**.

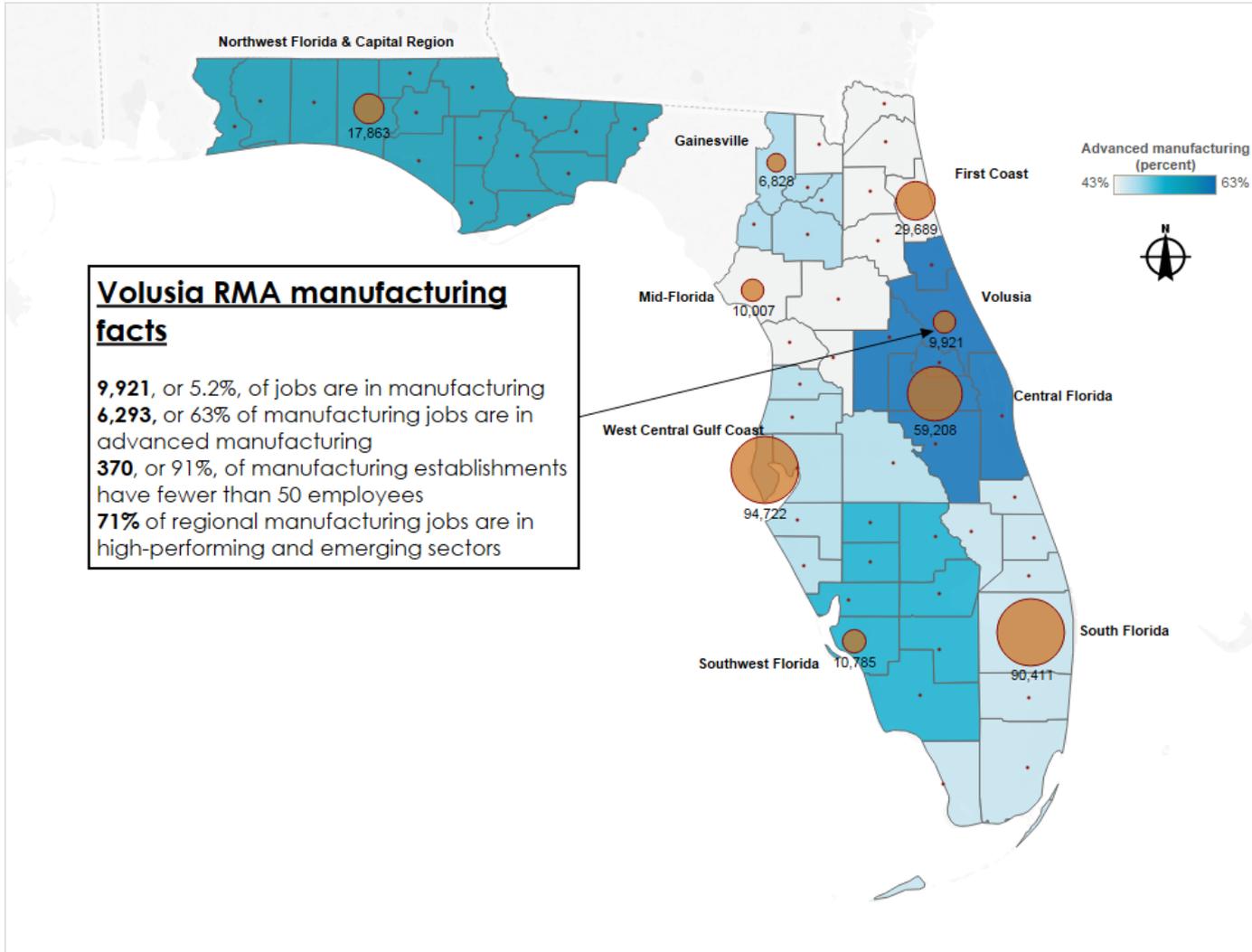


¹ While data for this study are presented for the two-county study area, they are available by county upon client request.

Strategic Summary

What is the situation today?

Volusia RMA 2015 manufacturing and advanced manufacturing employment



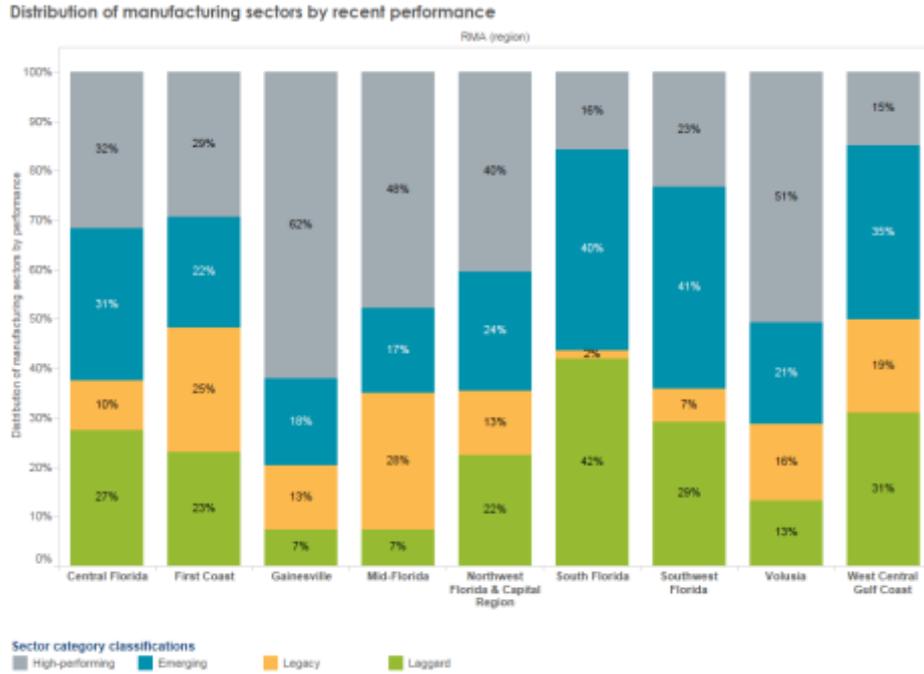
- The 2015 population of the Volusia RMA service area was 617,502 people, or just more than three percent the state of Florida.
- In April 2016, the labor market in the Volusia region roughly mirrored that of the United States overall and had more slack than in the state of Florida. Since 2011, the **average annual unemployment rate in the Volusia region has been higher than both the statewide and the national unemployment rates.**
- The **Volusia regional economy, while more diverse than many other regions of the state, is less diverse than the Florida economy overall, which is typical of small regional economies.** Of 22 major sectors in the Volusia region, more than half are less concentrated, based on employment, than they are in the United States.

- **Private, services-providing (PSP) sectors represent more than three-quarters of regional employment**, compared with the US share of 68.9 percent. The regional economy has significant dependence on service industries with health care and social assistance, retail trade, accommodation and food services, administrative and waste services, and professional and technical services accounting for more than half of the region's total employment.
- **The manufacturing sector in the Volusia region comprised just over 9,900 jobs in 2015, 5.2 percent of the region's total employment.** This figure is significantly below the US figure of 8.5 percent but above the figure for the state of Florida, where 4.1 percent of total 2015 employment was in manufacturing.
- **The transportation equipment, computer and electronic product, fabricated metal products, and miscellaneous manufacturing sectors** each offer more than 1,200 manufacturing jobs in the Volusia region, together **representing nearly 63 percent of regional manufacturing employment.**
- Of the region's four largest manufacturing sectors, only **transportation equipment manufacturing had a positive compound annual growth rate (CAGR) in employment** between 2000 and 2015.
- While much smaller in terms of employment, **the paper manufacturing sector showed the most positive manufacturing employment growth**, increasing the local workforce from two to 30 during the 15-year period (19.8 percent CAGR). **Textile product mills also experienced a 3.6 percent CAGR in this period**, increasing the size of its 2015 workforce to 395.
- Of the region's 15 largest manufacturing employers, the majority have more than 200 employees and the biggest, Sea Ray Boats, Inc., had 580 workers in 2015. However, **the vast majority of manufacturers in the region (91.4 percent) employ fewer than 50 workers, and almost three-fifths have fewer than 10 employees.**

What are our advantages?

- The region's **textile product mills** are particularly notable for their **positive employment growth, higher-than-average concentration of employment, and relatively large number of jobs.**
- **A whopping 71.4 percent of the Volusia region's manufacturing industry is composed of high-performing and emerging sectors²** (which means state and local economic development organizations such as FloridaMakes have a significant opportunity to support sectors with existing strengths).
- **Eight of the Volusia region's high-performing manufacturing sectors are more highly concentrated in the region than they are nationally and had higher-than-average employment growth between 2000 and 2015.** Representing more than 50 percent of regional employment, these include:
 - Ship and boat building
 - Medical equipment and supplies
 - Navigational, measuring, electromedical, and control instruments
 - Cement and concrete product
 - Soap, cleaning compound, and toilet preparation
 - Other textile product mills
 - Industrial machinery
 - Textile and fabric finishing and fabric coating mills
 - Audio and video equipment

² See the "Shift-share analysis" section for definitions used to categorize sectors as high-performing or emerging, as well as other sector category classifications.



- The Volusia region **has 16 emerging sectors that, while not highly concentrated, performed better than their peers nationally in terms of annual employment growth** and comprise more than 20 percent of regional employment. Those providing more than 100 jobs each include:
 - Machine shops; turned product; and screw, nut, and bolt
 - Architectural and structural metals
 - Other fabricated metal product
 - Fruit and vegetable preserving and specialty food
 - Household and institutional furniture and kitchen cabinet
 - Pharmaceutical and medicine
- The Volusia region has **nearly two-thirds (63 percent) of its manufacturing industry employment in advanced manufacturing,³ known for its high-skill, high-wage jobs.** This share is much greater than the US and Florida shares of 46.8 percent and 49.7 percent, respectively.
- The share of the region’s workforce in *durable*⁴ manufacturing sectors (79.2 percent) is above Florida’s durable manufacturing jobs share of 67.9 percent. Having a **higher-than-average share of the manufacturing workforce in durable manufacturing subsectors** is desirable since these sectors typically pay higher annual wages, require more highly skilled and educated workers, are slightly more labor intensive (i.e., generate more direct jobs per \$1 million in additional output), and have higher levels of productivity (measured in output per worker) than the nondurable sectors.
- The Volusia region has a **competitive advantage both nationally and statewide in terms of labor costs for the manufacturing industry.** For the major occupational categories of the manufacturing industry⁵, workers in the Volusia region typically make between 10 percent and 26 percent less than their counterparts nationally.
- Three of the region’s fastest-growing sectors (food, nonmetallic mineral, and transportation equipment manufacturing) all have **IHS composite sector risk ratings that are lower than that of the overall US**

³ See definition in “Advanced manufacturing” section.

⁴ Durables, or hard goods, are defined as those that are not totally consumed during their immediate or first use.

⁵ See “Wages in manufacturing occupations” section for more detail.

manufacturing sector.⁶ In fact, food and beverage manufacturing has the lowest IHS composite risk score among all manufacturing industry subsectors.

⁶ See definition in "Risk rating by industry sector" section.

Where should we be concerned?

- **Of the region’s manufacturing subsectors, 13 of 19 experienced job losses between 2000 and 2015.** A few of the most significant include:
 - Computer and electronic product manufacturing had a decline of 675 jobs.
 - Miscellaneous manufacturing lost more than 10 percent of regional employment.
 - Electrical equipment and appliance manufacturing witnessed a workforce reduction of nearly 60 percent, leaving only 324 workers in the sector.
 - By 2015, printing was left with just over 40 percent of its 2000 employment of 744.
 - Plastics and rubber products manufacturing more than halved its workforce size to employment of 236.
 - Wood product manufacturing shrunk more than 83 percent, from 321 jobs to 54.
 - Primary metal manufacturing, although small (31 workers in 2000), experienced a rate of decline of 10.4 percent annually.
- The **relatively weak labor market** means workers who lose their jobs may have a difficult time finding new ones in the region.
- The Volusia region has **13 laggard sectors**⁷, representing 13.1 percent of employment in the region. Laggard sectors are the lowest performing in terms of their relative importance to the regional economy (as compared with the nation as a whole) and employment growth (as compared with the same sector nationally during the analysis period). A few of these sectors to watch include motor vehicle parts, printing and related support activities, and plastics product manufacturing. Each has more than 200 employees.
- Three manufacturing sectors with high employment, output, and productivity growth in the Volusia region from 2000 to 2015 (textile, paper/pulp, and chemical manufacturing) have significant sources of risk: for the textiles and the paper and pulp manufacturing sectors, growth is a significant concern; for chemical manufacturing, the most significant source of risk is in the industry structure category.⁸

Where should we focus our efforts?

- Given that the majority of the region’s manufacturing employment falls in either “high-performing” or “emerging” sectors, local economic development programs and policies should be designed to capitalize on these sectors’ existing strengths and minimize growth barriers. **Economic development practitioners might begin by identifying the names of individual firms in these sectors to determine why they are high performers**, i.e., the extent to which their recent above-average performance was due to firm-level factors or regional competitive advantages, or both.
- Workforce training organizations and educational institutions can benefit **from identifying the skills required by high-performing and emerging manufacturing sectors and develop programs or talent recruitment strategies to meet the industry’s current and future needs for skilled workers.**
- To increase per capita incomes, the Volusia region should **encourage growth and worker training in manufacturing subsectors that pay above-average wages such as advanced and durable manufacturing.** However, if increasing the *number* of manufacturing jobs in the region, rather than the *quality* of those jobs is the goal, **attracting manufacturing employers whose national competitive advantage is derived from being a low-cost producer may be an effective strategy.**
- Given the size of the majority of the Volusia region’s manufacturers, sector development strategies should **focus on adopting best practices that are relevant for small or very small manufacturing enterprises.**

⁷ See the “Shift-share analysis” section for the definition of a laggard sector, as well as other sector category classifications.

⁸ See definitions of growth and industry structure risk in the “Risk rating by industry sector” section.

Characteristics of the regional economy

Population

IHS estimates the 2015 population in the Volusia region was 617,502 people, or 3.1 percent of the state of Florida. The population density was approximately 308 persons per square mile, 16.6 percent less than the state of Florida's population density of 369.5 persons per square mile.

Unemployment rate

In April 2016, the region's unemployment rate (not seasonally adjusted and based on workers' place of residence rather than on workplace location), was 4.7 percent, equivalent to the US unemployment rate for that month and just above the Florida April 2016 unemployment rate of 4.5 percent. The April 2016 unemployment rate was 0.9 percentage point lower than in April 2015. **Since 2011, the average annual unemployment rate in the Volusia region has been eight-tenths of a percentage point higher than the statewide rate and 1.1 percentage points higher than the national unemployment rate.**

Labor force

In April 2016, the Volusia region's total labor force was 285,444 people, a 1.1 percent increase from April 2015. In the Volusia region, 2,373 fewer people were unemployed in April 2016 than the year before, while the employment level increased by 5,528 workers (2.1 percent). The net effect was the labor force increased as workers, attracted by rising employment levels, reentered the labor force; since employment grew faster than the labor force, the unemployment rate fell. A similar story played out statewide as the number of unemployed persons in April 2016 was down 64,000 on a year-on-year (y/y) basis. The growth of the labor force in the Volusia region and the state of Florida is consistent with that of the United States, where the labor force grew 1.2 percent and the unemployment rate (not seasonally adjusted) dropped 6.9 percent in the same period.

The key finding from the labor-force analysis is that, while unemployment levels have dropped in recent years, the labor market in the Volusia region roughly mirrors that of the United States overall and has more slack than in the state of Florida. The relatively weak labor market means workers who lose their jobs may have a difficult time finding new ones in the region, but it also presents an opportunity for manufacturing companies with workforce shortages to find skilled workers. The soft labor market also suggests little upward pressure on wage levels.

Economic structure

Employment by major economic sector, according to two-digit NAICS codes, is presented in the table below in descending order by number of jobs. **IHS estimates there were 9,921 jobs in 2015 in the Volusia region's manufacturing sector (NAICS codes 31–33). The share of the Volusia region's total 2015 employment in manufacturing is 5.2 percent, significantly below the US figure of 8.5 percent but above the figure for the state of Florida, where 4.1 percent of total 2015 employment was in the manufacturing sector.** The overall below-average share of 2015 manufacturing employment is reflected by the low employment location quotient (LQ) of 0.62⁹.

Of the 22 major sectors in the Volusia region, nine had employment LQs greater than one, and 13 had employment LQs less than one, meaning more than half of the region's sectors are less concentrated, based on employment, than they are in the United States. With a location quotient of 1.62, the arts, entertainment, and recreation sector is more highly concentrated in the Volusia region than it is in the national economy, and the health care and social assistance, retail trade, accommodation and food service, and local government sectors represent more than 50 percent of regional jobs.

⁹ An LQ score greater than 1 indicates a regional economy has a higher share of its total employment in an individual economic sector than the sector's share of total US employment.

Because of its historical role as a center of tourism, transportation, and business and health services, Florida has an above-average concentration of its total employment in the private, services-providing (PSP) sectors¹⁰. The PSP share of employment in Florida in 2015 was 75.9 percent, compared with the US share of 68.9 percent. The PSP share for the Volusia region, at 75.7 percent, is just below the statewide number confirming that **the regional economy has a similar dependence on service industries, which reduces the relative share of economic activity in the manufacturing sector.**

Structure diversity

To evaluate the diversity of the Volusia region’s industrial structure, IHS calculated the Hachman Index, which compares a regional economy’s distribution of economic activity by sector (in this case, employment) to that of the US economy. With the Hachman Index¹¹, the maximum value is 1.00, or in other words, the closer the region’s Hachman Index value is to 1.00, the more similar that region’s economic structure is to the US economy.

Industry	Number of jobs	% share	LQ	CAGR 2000-15
62 Health care and social assistance	30,736	16.2%	1.27	2.0% ▲
44-45 Retail trade	28,539	15.0%	1.40	0.5% ▲
72 Accommodation and food service	23,697	12.5%	1.40	1.5% ▲
900L Local government	19,056	10.0%	1.02	0.2% ▲
56 Administrative and waste services	11,076	5.8%	0.96	2.9% ▲
54 Professional and technical services	10,546	5.6%	0.93	5.8% ▲
23 Construction	10,273	5.4%	1.23	-0.3% ▼
31-33 Manufacturing	9,921	5.2%	0.62	-1.3% ▼
81 Other services, excluding public	8,701	4.6%	1.19	0.5% ▲
61 Educational services	6,499	3.4%	1.45	2.5% ▲
52 Finance and insurance	5,741	3.0%	0.74	2.3% ▲
42 Wholesale trade	4,581	2.4%	0.59	-0.5% ▼
71 Arts, entertainment, and recreation	4,560	2.4%	1.62	1.6% ▲
900S State government	3,221	1.7%	0.48	-0.9% ▼
53 Real estate, rental, and leasing	3,108	1.6%	1.13	-0.3% ▼
51 Information	2,594	1.4%	0.71	-2.4% ▼
11 Agriculture, forestry, fishing	2,320	1.2%	0.52	-3.4% ▼
48-49 Transportation and warehousing	1,976	1.0%	0.32	-0.2% ▼
900F Federal government	1,215	0.6%	0.34	-1.8% ▼
55 Management of companies and Enterprises	882	0.5%	0.31	18.6% ▲
22 Utilities	408	0.2%	0.56	-2.2% ▼
21 Mining	30	0.0%	0.03	0.7% ▲
Total	189,680			0.9% ▲

Notes: CAGR stands for compound annual growth rate; LQ stands for location quotient.
Source: IHS Business Market Insights database. Shutterstock. © 2016 IHS: 1683787

For the Volusia region, the Hachman Index was 0.895, less diverse than the Florida economy, which has a Hachman Index of 0.941. Since regional economies, especially smaller ones, are usually less diverse than larger state economies or the United States, the Volusia region’s Hachman score is to be expected and is actually higher than many other regions within the state.

The Volusia region’s low manufacturing share and moderately high level of structural diversity indicate there is room to grow its manufacturing sector without creating a regional overdependence on it. Ways to enhance the manufacturing sector’s contribution to the Volusia economy include:

- Identifying gaps in manufacturing supply chains such that necessary key inputs can be made in the region rather than imported (also known as import substitution)
- Expanding the value of exports produced by its manufacturing subsectors. (Note there are two types of exports: 1) domestic, i.e., manufactured goods made in the region that are sold to other Florida counties or to other US states; and 2) foreign, i.e., manufactured goods sold to foreign countries.)

¹⁰ The private, services-providing (PSP) sector consists of the following major sectors: trade, transportation, and utilities; information; financial activities; professional and business services; education and health care; leisure and hospitality; and other services. The PSP sector excludes employment in the private, goods-producing sectors—agriculture; natural resources and mining; construction; manufacturing; and government.

¹¹ Calculate two-digit LQs by NAICS sector weighted by employment shares, and then invert the result.

Regional manufacturers seeking to expand their exports should take maximum advantage of their proximity to the Port of Jacksonville and Port Canaveral in Brevard County. As manufacturing companies increase the volume and value of their domestic and foreign exports, they will bring income back into the region, benefitting workers and households. At the same time, as production rises, they will increase their demand for inputs made by local suppliers, some of which will come from other local manufacturing firms. As the round-by-round increases in demand are transmitted through the backward linkages, they will generate further increases in regional economic activity in all sectors through the indirect multiplier effect.

Characteristics of the manufacturing sector

To provide a more accurate picture of the Volusia region’s overall manufacturing industry, the following sections provide data on manufacturing subsectors’ growth, structure, diversity, and risk ratings. We conclude with a shift-share analysis to get a more detailed perspective on regional manufacturing sector performance in 2015.

Industry growth

As shown, the Volusia region had 2015 employment in 19 three-digit manufacturing subsectors, with positive employment growth rates between 2000 and 2015 in only six of them: paper, textile product mills, apparel, food, nonmetallic mineral, and transportation equipment manufacturing. Moreover, for two of these sectors, paper and apparel manufacturing, the high growth rate is mainly because the industry was small in 2000 so the increase of even a few jobs meant that it experienced high growth, relative to the baseline. These industries aside, **the region’s most significant employment growth was in textile product mills, food, nonmetallic mineral, and transportation equipment manufacturing.**

In addition to having a relatively low share of employment in manufacturing, the Volusia region experienced a *negative* 1.3 percent compound annual growth rate (CAGR) in manufacturing employment during the last 15 years. This decline in manufacturing employment, while accounting for the loss of more than 2,000 regional manufacturing jobs, was less rapid than the rate of decline experienced in the state of Florida and the United States as whole, where the CAGR over the same time period was -2.4 percent and -2.3 percent, respectively.

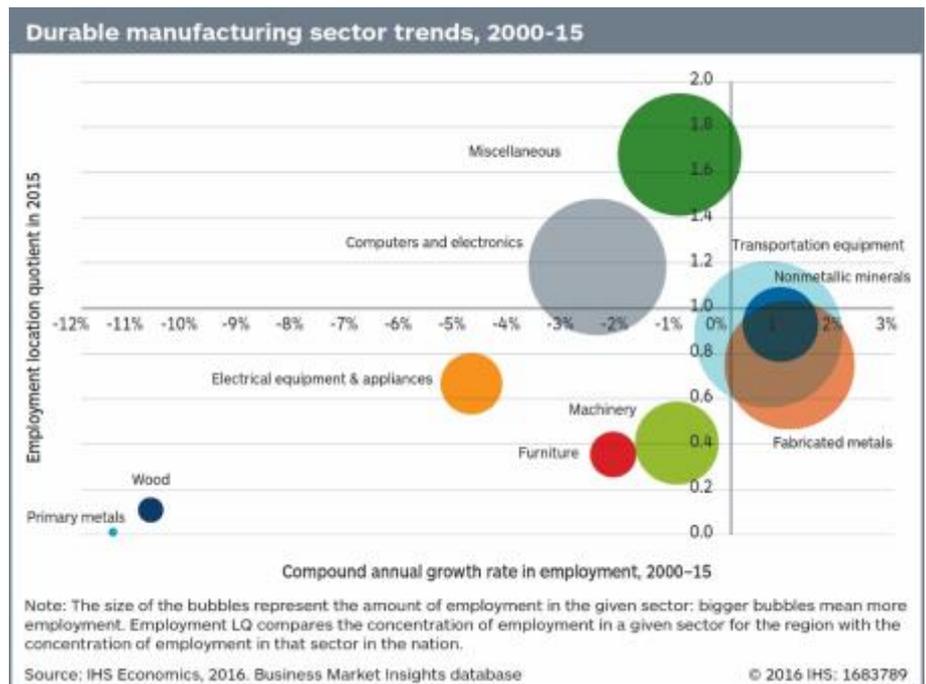


Durables and nondurables

Additional insight into a region's manufacturing sector can be obtained by analyzing the durable and nondurable sectors. Durables, or hard goods, are defined as those that are not totally consumed during their immediate or first use (i.e., used over an extended period of time, usually with a useful life of at least three years, and thus do not have to be purchased often). By contrast, nondurables, or soft or consumable goods, are immediately and totally consumed when initially used, have a useful life of fewer than three years, and need to be purchased frequently. The following charts present the employment trends in the Volusia region for the individual three-digit NAICS code manufacturing subsectors that make up the durable and nondurable sectors. Each chart presents the CAGR in employment between 2000 and 2015 on the x axis, the 2015 employment LQ on the y axis, and the size of each bubble presents that sector's total employment in 2015. Each chart provides a visual representation of the performance of the individual subsectors and the structure of the manufacturing economy. Approximately 79.2 percent and 20.8 percent of the Volusia region's manufacturing employment in 2015 was in the durable and nondurable sectors, respectively, with the Volusia region's durable manufacturing sector constituting a greater share of manufacturing jobs than in Florida overall, where durable manufacturing accounted for 67.9 percent of manufacturing employment.

Because of differences in the goods made and the production processes used, the durable and nondurable manufacturing sectors also differ from each other in terms of the mix of skilled workers required, level of wages paid, and productivity, all of which will determine appropriate economic and workforce development strategies. IHS analyzed detailed occupational employment and wage data for 2015 by four-digit manufacturing subsector for the United States, identifying the following differences between the durable and nondurable sectors:

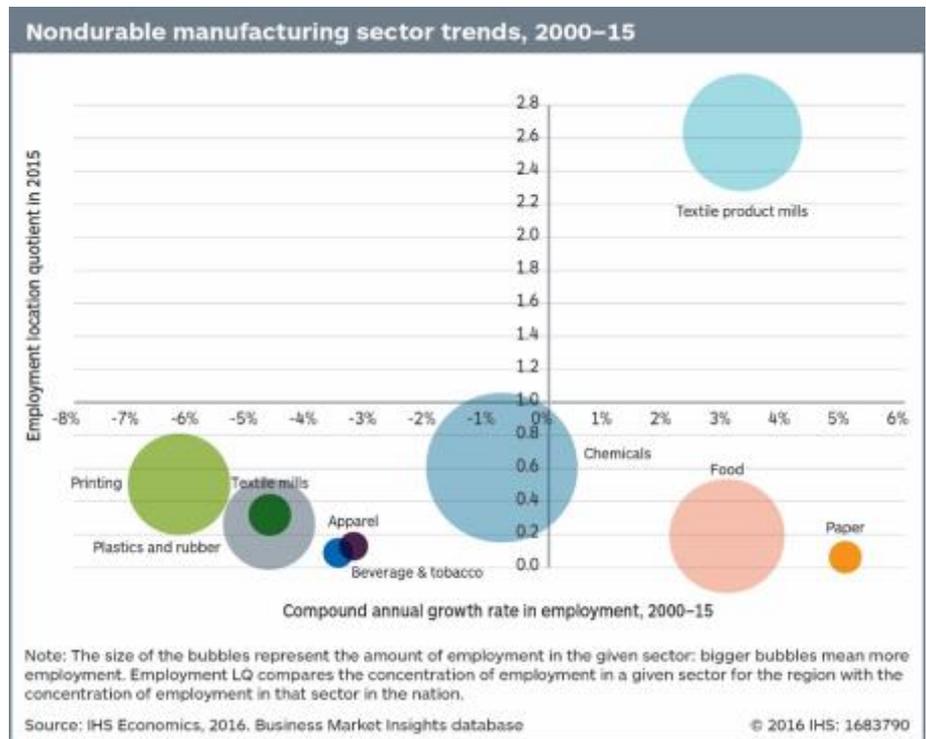
- Durable sectors require higher shares of skilled workers.** About 19.4 percent of the jobs, by detailed occupation, required a Bachelor's degree or higher to obtain an entry-level position, compared with only 12.4 percent in the nondurable sectors. Similarly, 26.0 percent of durable jobs required some type of postsecondary education, compared with only 18.8 percent for the nondurable sector. By contrast, 58.2 percent of durable sector jobs required a high school diploma or equivalent for an entry-level position, compared with 60.9 percent for the nondurables. Interestingly, 1.1 percent of the nondurable jobs require an advanced degree for an entry-level position, compared with only 0.5 percent in the durable sectors, because of the high share of STEM occupations required by the chemicals sector, especially in pharmaceuticals because of its high level of research and development spending.



- Durable jobs pay higher annual wages.** The average annual US wage in the durable sectors in 2015, based on a detailed analysis of occupations required, was \$49,387 compared with \$44,194 in the nondurable sectors.
- Durable sectors are slightly more labor intensive,** creating 2.7 direct jobs per \$1 million in output compared with 1.6 in the nondurable sectors; the latter figure is low because of the high level of output per employee in the

petroleum refining and chemical manufacturing subsectors; if they are excluded, the nondurable figure rises to 2.5 jobs per \$1 million in output.

- Nondurable sectors have higher shares of their employment in traditional “blue-collar” occupations and lower shares in STEM occupations.** The nondurable sectors had 63.3 percent of their total employment in production, transportation, and material handling occupations in 2015 compared with only 57.4 percent for durables. By contrast, durable sectors had 12.2 percent of their total employment in three high-skill, high-education STEM occupations: architecture and engineering; computer and math; and life, physical, and social sciences, well above the 5.2 percent share for the nondurables.



The difference between the durable and nondurable sectors indicates expanding the durable sector will require greater efforts to develop the supply of highly skilled workers in the local labor force. However, the generally lower entry-level education and training requirements for the nondurables, excluding chemicals, indicate these sectors have a greater potential to employ less-skilled workers, thus providing more opportunities for them to begin careers. The first chart, durable manufacturing sector trends, shows the composition and performance of Volusia’s durable sector between 2000 and 2015. Note the relatively large number of jobs and positive employment growth rates of the transportation equipment and fabricated metals manufacturing sectors as well as the above-average employment concentration of the miscellaneous manufacturing sector. The second chart presents the composition and performance of the nondurable sectors. The positive employment growth, high concentration, and large number of jobs in textile product mills are particularly notable.

If one of the objectives of a region’s economic development plan is to increase employment in the traditional, “blue-collar” manufacturing occupations, then expansion of the durable sectors (i.e., more direct jobs per \$1 million of output as noted above), and some nondurables (e.g., textiles, apparel, leather, wood, printing) should be promoted. Similarly, if the economic development objective is to attract higher-paying jobs in the STEM occupations that are often associated with nonproduction facilities such as research and development (R&D) centers, then policies and programs should be directed at the durable sectors, and some nondurables such as petroleum refining and chemicals. In adopting the latter strategy, complementary STEM programs to increase skills of the workforce will also have to be implemented.

Output and productivity

In addition to employment, it is helpful to consider output by sector and productivity (output per worker), to get a better sense of an individual manufacturing subsector's contribution to a regional economy. For example, a capital-intensive (i.e., high levels and values of structures and equipment per worker) sector such as petroleum refining, chemicals, or primary metals may not employ a lot of workers (i.e., have high levels of output per worker), but could generate substantial increases in regional economic activity through either their backward linkages (i.e., they purchase large amounts of inputs from suppliers located in the region) or through their forward linkages (i.e., the products they make are in turn purchased by other firms in the region who use them as inputs in making other types of goods or services). In other words, **when evaluating the manufacturing sector's regional economic health, it is important to note that, based on changes in productivity, employment growth rates may differ significantly from output growth rates.** For example, in the Volusia region, while only six manufacturing subsectors had a positive CAGR for employment between 2000 and 2015, 14 had a positive CAGR for output. With the addition of chemical manufacturing, the top-five sectors for output growth were also the top performers for employment growth, and the most notable output gains were witnessed in the paper, textile product mills, transportation equipment, and food manufacturing sectors.

Of the 14 manufacturing sectors with positive growth in output during the 2000–15 period, all also demonstrated growth in productivity (output per worker). Of these, chemical manufacturing, textile mills, paper, plastics and rubber, electrical equipment and appliance, transportation equipment, and computer and electronic product manufacturing led the pack with CAGRs for productivity exceeding five percent. **Overall, five sectors (paper, textile product mills, food, nonmetallic mineral, and transportation equipment manufacturing) grew between 2000 and 2015 across all three areas: employment, productivity, and output, although it should be noted that paper manufacturing only employed 30 people in the region in 2015.** Extending this report's durable and nondurable analysis, output per worker in the durable manufacturing sector in the United States in 2015 was \$375,043 compared with \$619,325 in the nondurable sector. The nondurable sector's level is greater because of the high level of productivity in the petroleum refining and chemical sectors.

Growth rates in the manufacturing sector: Output



Sector	Output (millions of \$)		CAGR	Rank
	2000	2015		
322 Paper manufacturing	\$0.3	\$10.5	26.3% ▲	1
314 Textile product mills	\$27.1	\$66.8	6.2% ▲	2
325 Chemical manufacturing	\$207.2	\$469.5	5.6% ▲	3
336 Transportation equipment manufacturing	\$243.6	\$543.4	5.5% ▲	4
311 Food manufacturing	\$80.0	\$171.4	5.2% ▲	5
327 Nonmetallic mineral manufacturing	\$66.0	\$138.4	5.1% ▲	6
333 Machinery manufacturing	\$119.5	\$212.0	3.9% ▲	7
332 Fabricated metal products manufacturing	\$180.4	\$314.6	3.8% ▲	8
339 Miscellaneous manufacturing	\$187.0	\$308.6	3.4% ▲	9
313 Textile mills	\$8.6	\$14.0	3.3% ▲	10
337 Furniture and related products	\$20.0	\$32.3	3.2% ▲	11
334 Computer and electronic product manufacturing	\$294.4	\$449.3	2.9% ▲	12
312 Beverage and tobacco product manufacturing	\$11.4	\$12.6	0.6% ▲	13
326 Plastics and rubber products manufacturing	\$72.2	\$76.8	0.4% ▲	14
315 Apparel manufacturing	\$1.5	\$1.4	-0.4% ▼	15
335 Electrical equipment and appliance manufacturing	\$143.1	\$126.4	-0.8% ▼	16
323 Support activities—Printing	\$77.4	\$53.0	-2.5% ▼	17
321 Wood product manufacturing	\$41.4	\$12.1	-7.9% ▼	18
331 Primary metal manufacturing	\$6.0	\$1.5	-8.9% ▼	19
316 Leather and allied product manufacturing	\$0.2	-	NA	-
324 Petroleum and coal manufacturing	-	-	NA	-
Total manufacturing	\$1,787.5	\$3,014.5	3.5% ▲	
Total industries	\$16,352.5	\$30,838.5	4.3% ▲	

Notes: CAGR is compound annual growth rate.
Source: IHS Business Market Insights. Shutterstock

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The output-per-worker figures presented in the table on productivity growth rates in the manufacturing sector also show the direct increases in manufacturing employment that an increase in output would generate. For example, whereas apparel manufacturing will produce more than 16 direct jobs per \$1 million of new output, a sector such as chemical manufacturing with \$733,606 of output per worker will not produce even 2 new jobs per each additional \$1 million in output. Despite the relatively greater number of direct jobs that would be produced by additional investment in the apparel manufacturing sector, new jobs in the chemical sector are likely to pay substantially more.

If a region’s economic development strategy is to maximize the direct increase in manufacturing employment, organizations should focus on those sectors with the lowest levels of worker productivity.

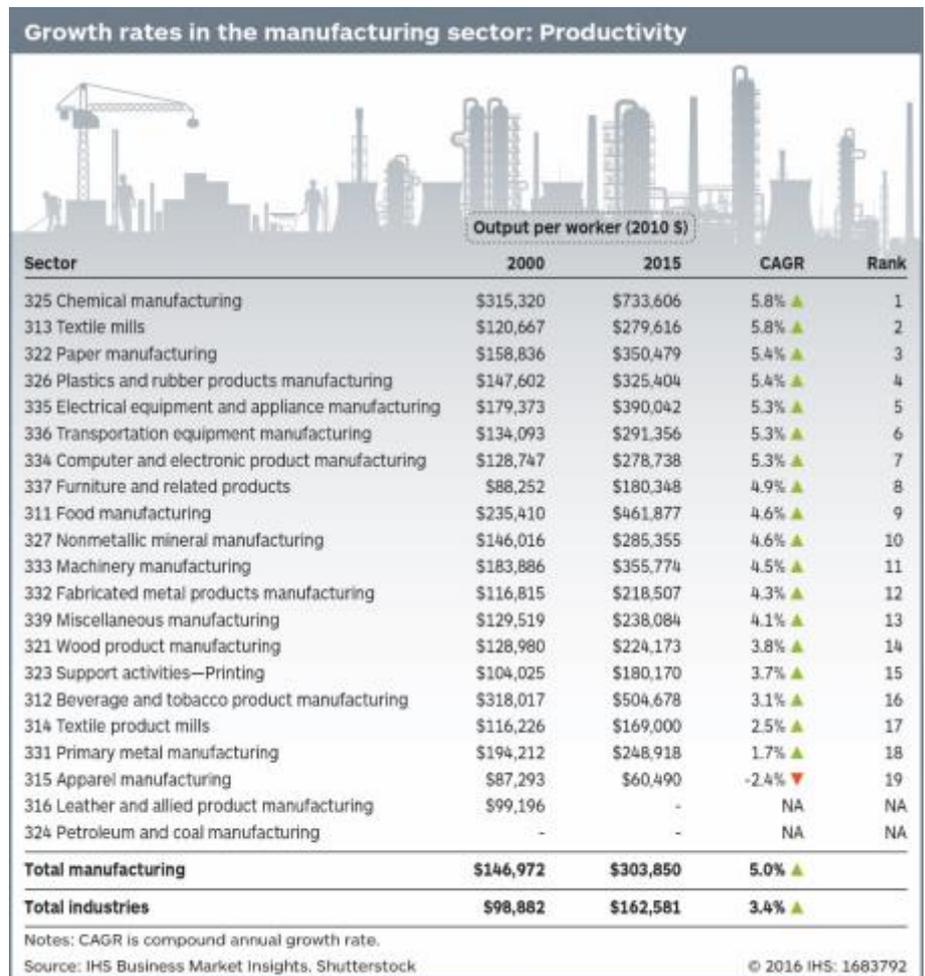
However, there is an important caveat to this strategy: not all manufacturing jobs are equal; they differ widely based on their annual wage levels.

Economic development agencies must consider the prevailing annual wage levels in the manufacturing subsectors they want to promote, which are a function of the types of occupations required, which in turn are determined by the types of manufacturing activities performed.

Establishment size

In addition to evaluating the Volusia manufacturing sectors’ growth in the last 15 years, IHS assessed regional structure in terms of distribution of manufacturing establishments by employment size. **In the two-county Volusia region, the vast majority of manufacturers (91.4 percent, or 370 establishments) employ fewer than 50 workers, 8.4 percent (34 establishments) engage 50–499 employees, and there is only one manufacturing firm with 500 employees or more (0.2 percent of the total). Of the 405 manufacturing establishments in the region, almost three-fifths (59 percent) are “very small” employers (having fewer than 10 employees each).** Manufacturing subsectors with large numbers of very small employers include support activities—printing, fabricated metal products, furniture and related products, and miscellaneous.

The significance of the distribution of manufacturing establishments by employment size is that different types of strategies and accompanying services are required for small firms than for large ones. **Small and medium manufacturing enterprises (SMEs), usually defined as those with fewer than 500 employees, are more vulnerable to changes in the business cycle, fluctuations in interest and currency rates, and regulatory changes; may have more difficulty in accessing capital; and be less able to provide worker training. The RMAs need to be able to offer a broader range of services and supports to SMEs than to larger manufacturing firms.** We note the proportion of total establishments accounted for by SMEs varies widely by subsector based on production processes



used, barriers to entry, need to achieve economies of scale, capital intensity, etc. Some subsectors, such as fabricated metals, machinery, and printing, have traditionally had higher shares of SMEs, whereas others, such as petroleum refining and chemicals, have low shares.

Structure diversity

To evaluate the diversity of the region's manufacturing sector, we again used the Hachman Index¹² based on four-digit NAICS employment, with LQs based on employment in the manufacturing sectors, not total employment. **For the two counties included in the Volusia region, the Hachman Index of 0.251 shows the region's manufacturing sector diversity is significantly lower than the manufacturing diversity of the state of Florida, which has a Hachman Index of 0.701.**

Advanced manufacturing

With 6,293 people employed in the advanced manufacturing sectors, as defined either by researchers from the US Bureau of Labor Statistics (BLS) or the Brookings Institution¹³ think tank, the Volusia region has nearly two-thirds (63 percent) of its manufacturing industry employment in advanced manufacturing. This share is much greater than the US and Florida shares of 46.8 percent and 49.7 percent, respectively. **It is in these sectors that we should expect the greatest innovation to occur (i.e., have higher patent rates), and they have higher growth rates in productivity, require more highly skilled workers, and pay higher wages than other manufacturing sectors.**

The criteria applied in the two studies we used to identify advanced manufacturing:

- High levels of spending for R&D, including high intensity (i.e., above-average shares of R&D spending as a percentage of sales) and high levels per worker
- The share of employment in the STEM occupations

The BLS study also considered industries that use advanced manufacturing processes and that produced high-technology goods. The Brookings and BLS studies identified advanced and high-tech NAICS sectors at the four-digit level across the entire economy; for the purposes of this profile, we considered only the individual sectors that were part of the manufacturing sector.

Similar to the discussion for the durable and nondurable sectors, there are also differences between the advanced manufacturing subsectors and the entire manufacturing sector. Our analysis of detailed occupational employment and wage data for 2015 by four-digit manufacturing subsector for the United States found the following differences:

- **Advanced sectors require higher shares of skilled workers:** About 24.9 percent of the jobs required a Bachelor's degree or higher to obtain an entry-level position, compared with only 16.9 percent for the entire manufacturing sector. Similarly, 32.7 percent of advanced manufacturing jobs required some type of post-secondary education, compared with only 23.5 percent for all of manufacturing. In contrast, 53.9 percent of advanced sector jobs required a high school diploma or equivalent for an entry-level position, compared with 59.2 percent for total manufacturing.
- **Advanced manufacturing jobs pay higher annual wages.** The average annual US wage in advanced manufacturing sectors in 2015, based on a detailed analysis of occupations required, was \$52,635 compared with \$47,505 across the entire manufacturing sector.

¹² See Footnote 11 regarding the Hachman Index calculation.

¹³ The definition of advanced manufacturing subsectors comes from two sources: 1) Daniel E. Hecker, "High-technology employment: A NAICS-based update," Monthly Labor Review, July 2005. (Hecker is an economist in the Office of Occupational Statistics and Employment Projections, US Bureau of Labor Statistics) and 2) Muro, M., Jonathan Rothwell, et al. "America's Advanced Industries: What They Are, Where They Are and Why They Matter," Brookings Advanced Industries Project, February 2015. Both studies identified high-tech and advanced sectors across the entire economy at the four-digit NAICS level; we defined advanced manufacturing to consist of all the manufacturing subsectors that were identified in either study. The result was that 37 of the 86 four-digit NAICS manufacturing subsectors were defined as advanced manufacturing subsectors.

- **Advanced manufacturing requires fewer workers in traditional blue-collar occupations and more in STEM occupations.** Advanced manufacturing had 50.8 percent of its total employment in production, transportation, and material handling occupations in 2015 compared with 59.5 percent for the entire manufacturing sector. Similarly, 16.9 percent of advanced manufacturing employment was in three high-skill, high-education occupations: architecture and engineering; computer and math; and life, physical, and social sciences versus 9.7 percent in all of manufacturing.
- **Productivity in advanced manufacturing is high.** In 2015 output per worker in the US advanced manufacturing sector was \$422,751 compared with \$325,000 for all of manufacturing.

The key finding is that policies and strategies directed at the advanced manufacturing sector will have to concentrate on increasing the skill levels of the region's manufacturing labor force. The training will have to be provided by a range of organizations, including local universities and community colleges, workforce development boards, secondary career and technical education (CTE) schools, the Volusia RMA, labor union apprentice programs, and manufacturing companies themselves. IHS cautions that regions cannot be competitive in all advanced manufacturing sectors, so economic development policies should be designed for and targeted at those advanced manufacturing sectors where clear competitive advantages exist. Competitive sectors are identified in this report's shift-share analysis.

Risk rating by industry sector

IHS World Industry Service Sector risk ratings for each manufacturing sector in the United States use a proprietary methodology that calculates 40 individual risk factors for industrial sectors for most major industrialized countries including the United States. We consider the following major types of risk faced by firms in industrial sectors:

- **Composite sector risk:** A weighted average of 40 different risk components distributed among five major risk categories; 1) growth, 2) price and profitability, 3) supply, 4) industry structure, and 5) economic and commerce risk
- **Growth risk:** Evaluates, for real revenue and nominal sales, the rate and volatility of growth in the sector and detects the presence of turning points and shifts in sales patterns
- **Profitability and pricing risk:** Evaluates the sector's ability to pass on cost increases, its historical and forecast profits, and cash-flow growth and volatility, as well as operating efficiency
- **Supply risk:** Evaluates risk accruing to capital usage, depreciation, and changes in productive capacity
- **Industry-structure risk:** Evaluates the sector's exposure that results from competitive and structural characteristics (These include factors such as barriers to entry and exit.)
- **Economic and commerce risk:** Evaluates the size of the cycle in the sector and sensitivity of output demand to interest rates and incorporates the specific macroeconomic risks related to currency, legal, financial, and tax initiatives

The IHS risk ratings provide a broad perspective on the current and future risks in the industry sectors that state and local economic development organizations may consider assisting in terms of strategy development, technical assistance, workforce development, or the provision of economic development incentives such as loans, grants, and tax credits or deductions. The risk ratings are presented for International Standard Industrial Classification (ISIC) codes, which correspond closely with three-digit NAICS codes, and risk scores range between one (least risk) and ten (highest risk). In our April 2016 release, the minimum (e.g., low risk) and maximum (e.g., high risk) composite risk scores for the US manufacturing sectors were 5.0 and 8.1, respectively, compared with 6.9 for the entire manufacturing sector. The ranges of scores in the five subcategories are wider than for the composite risk, especially for the growth, profitability and pricing, and supply risk categories. The accompanying table presents the IHS industry risk ratings for the US manufacturing sector from April 2016, listed in ascending order of composite risk (i.e., low scores indicate lower levels of risk, and vice versa).

IHS industry risk scores can assist state and local agencies in devising economic development strategies targeted at individual manufacturing subsectors. The appropriate way to use the industry risk rating is to first identify a specific subsector of interest in the table, then read across its row to identify the different types and levels of risks the sector is facing. Informed policies can then be developed based on the potential risks. As some of the risks faced by an individual sector, such as pricing and profitability or industry structure, may not be able to be reduced through state or regional policies, economic development practitioners need to consider the risk factors facing an industry and their ability to lessen those risks when developing strategies for, or allocating scarce resources to, individual manufacturing sectors or companies.

Industry risk ratings for the US manufacturing sector, April 2016



ISIC code	RISK RATING					
	Composite sector	Growth	Profitability and pricing	Supply	Industry structure	Economic and commerce
(D15) Food and beverages	5.0	6.2	6.4	5.6	2.7	2.0
(D19) Leather footwear	5.8	8.0	7.5	7.1	1.7	2.0
(D31) Electrical machinery	5.8	8.2	5.8	6.7	3.3	3.5
(D20) Wood products (exclude furniture)	6.1	7.5	8.3	5.8	3.0	3.7
(D23) Refined petroleum, coke, and nuclear	6.1	8.2	6.8	5.6	4.7	2.0
(D34) Motor vehicles, trailers, and parts	6.1	8.0	6.7	6.6	4.0	3.5
(D35) Transport equipment (excluding motor vehicles)	6.1	6.8	7.0	7.4	4.7	3.5
(D16) Tobacco products	6.2	9.5	7.7	5.1	2.7	2.0
(D18) Wearing apparel	6.2	8.5	7.7	6.6	2.0	4.2
(D33) Medical, precision, and optical	6.2	5.3	7.7	6.4	8.0	2.5
(D29) Machinery, equipment, appliances	6.3	7.6	6.9	6.7	5.0	3.5
(D25) Rubber and plastics products	6.5	8.0	8.8	6.9	3.7	2.5
(D26) Mineral-based products (nonmetallic)	6.6	7.7	8.3	6.4	5.0	3.5
(D27) Basic metals	6.6	8.2	8.1	6.9	5.0	2.0
(D28) Fabricated metal products	6.6	8.6	8.9	5.1	3.7	3.5
Manufacturing	6.9	8.2	7.6	6.7	6.3	3.5
(D21) Paper and pulp	6.9	8.7	8.6	6.7	4.7	2.7
(D24) Chemicals	6.9	7.6	7.1	6.8	8.3	2.8
(D17) Textiles	7.0	9.4	8.6	6.9	3.3	4.2
(D32) Communications equip., semiconductors, and TVs	7.5	7.5	8.9	7.2	8.7	2.7
(D36) Furniture, jewelry, toys, musical, other goods	7.7	8.5	9.1	7.6	7.3	4.0
(D22) Printing and publishing	8.0	10.0	9.4	5.0	8.3	3.2
(D30) Computers and office machinery	8.1	8.8	9.6	7.2	9.3	2.5

Note: The sectors are ranked from lowest risk to highest based on the composite sector risk rating.

Source: IHS, April 2016, World Industry Service, Industry Risk Ratings. Shutterstock. © 2016 IHS: 1683795

From the above table, we note that **three of the sectors noted earlier for their high employment, output, and productivity growth (textile, paper, and chemical manufacturing) have composite sector risk ratings equivalent to that of the manufacturing industry overall (6.9)**. The most significant source of risk for the textiles and paper and pulp manufacturing sectors is growth (in which these sectors’ risk scores exceed the average for the manufacturing industry as a whole); for chemicals manufacturing, the most significant source of risk is in the industry structure category. **Luckily, three of the region’s other fastest-growing sectors (food, nonmetallic mineral, and transportation equipment manufacturing) all have composite risk scores below the US manufacturing industry average, with food and beverage manufacturing ranking the lowest among the IHS composite risk scores for all manufacturing industry subsectors.**

Shift-share analysis

Finally, to examine the performance of the four-digit manufacturing subsectors based on changes in employment between 2000 and 2015, IHS conducted a shift-share analysis of the manufacturing subsectors in the regional study area¹⁴.

Shift-share analysis is an analytical technique used to decompose changes in a variable, such as employment or income, which occurred in a regional economy during a historical period. It compares the performance of an individual economic sector over time within the regional economy of interest with that same sector's performance in a larger reference economy, usually the United States, in the same time period. Shift-share analysis is based on the theory that an individual sector's performance in a regional economy over time is due to four effects:

- **National:** The share of growth in the larger reference economy that was captured by the region
- **Industry mix:** The shares of high-growth and low-growth sectors in the region and how they changed over time
- **Competitive:** The extent to which an individual economic sector in the region outperformed or underperformed the same sector at the level of the reference economy over the analysis period (The United States is the reference economy for the shift-share analysis presented in this profile.)
- **Allocation:** The extent to which a region has above-average shares of economic activity in those sectors where it has a competitive advantage

Stated another way, shift-share analysis enables an analyst to determine how much of the change in a variable, such as employment, in an individual economic sector over time was due to growth in the US economy and how much was attributable to characteristics of the regional economy, such as competitive advantages or disadvantages, and the distribution of economic activity into competitive and noncompetitive sectors.

Employment is the variable most often used in a shift-share analysis because it is the most widely available, the most current, and is published at the detailed NAICS level. For this study, using employment data at the four-digit NAICS code level (86 manufacturing subsectors) from the IHS Business Market Insights database, we classify each sector that has more than 50 employees into one of four types based on its performance.

- **Type A (“High Performing”):** The sector's 2015 employment LQ is greater than 1.0, and its employment CAGR during the analysis period was greater than the sector's employment CAGR for the United States in the same period.
- **Type B (“Emerging”):** The sector's 2015 LQ is less than 1.0, but its employment CAGR was greater than the sector's employment CAGR for the United States during the same period.
- **Type C (“Legacy”):** The sector's 2015 LQ is greater than 1.0, but its employment CAGR was less than the sector's employment CAGR for the United States in the same period.



¹⁴ See Appendix A for full results of shift-share analysis.

- **Type D (“Laggard”)**: The sector’s 2015 LQ is less than 1.0 and its employment CAGR during the analysis period was less than the sector’s employment CAGR for the United States during the same period.

In the Volusia region, there were **nine high-performing manufacturing sectors** classified as A that outperformed the United States and represented an above-average share of the region’s economy (i.e., had employment LQs above 1.0), which cumulatively **accounted for more than half (50.8 percent) of total 2015 manufacturing employment in the Volusia region**. These included:

- Ship and boat building
- Medical equipment and supplies
- Navigational, measuring, electromedical, and control instruments
- Cement and concrete product
- Soap, cleaning compound, and toilet preparation
- Other textile product mills
- Industrial machinery
- Textile and fabric finishing and fabric coating mills
- Audio and video equipment

In addition to the large share of regional employment created by A sectors were **2,024 jobs in 16 B sectors (20.6 percent of regional employment)**. While these emerging or growth sectors are doing well compared with their nationwide peers in terms of employment growth, they do not yet account for a larger-than-average share of regional economic activity. A few of the notable B sectors providing more than 100 jobs in the region include:

- Machine shops; turned product; and screw, nut, and bolt
- Architectural and structural metals
- Other fabricated metal product
- Fruit and vegetable preserving and specialty food
- Household and institutional furniture and kitchen cabinet
- Pharmaceutical and medicine

Of these, only machine shops; turned product; and screw, nut, and bolt manufacturing, fruit and vegetable preserving, and specialty food manufacturing witnessed positive employment growth in the past 15 years, with fruit and vegetable preserving and specialty food manufacturing growing at a compound annual growth rate of 6.5 percent.

Combined, the A and B sectors represent just more than two-thirds (a whopping 71.4 percent) of regional manufacturing employment, meaning state and local economic development organizations such as FloridaMakes have a significant opportunity to support sectors with existing strengths in the Volusia region.

For the **traditionally important legacy industries in which the region still has above-average shares of economic activity, but for a variety of reasons, the industries are underperforming their peers at the US level (the C sectors), we note four**, which represent 15.5 percent of the region’s manufacturing employment:

- Semiconductor and other electronic component
- Other general purpose machinery
- Other electrical equipment and component
- Forging and stamping

Finally, we find **13 D sectors that are the lowest performing in terms of relative importance to the regional economy** (as compared with the nation as a whole) and with slower growth than the sector had at the US level during the analysis period. These sectors represent 13.1 percent of employment in the region and 1,287 jobs.

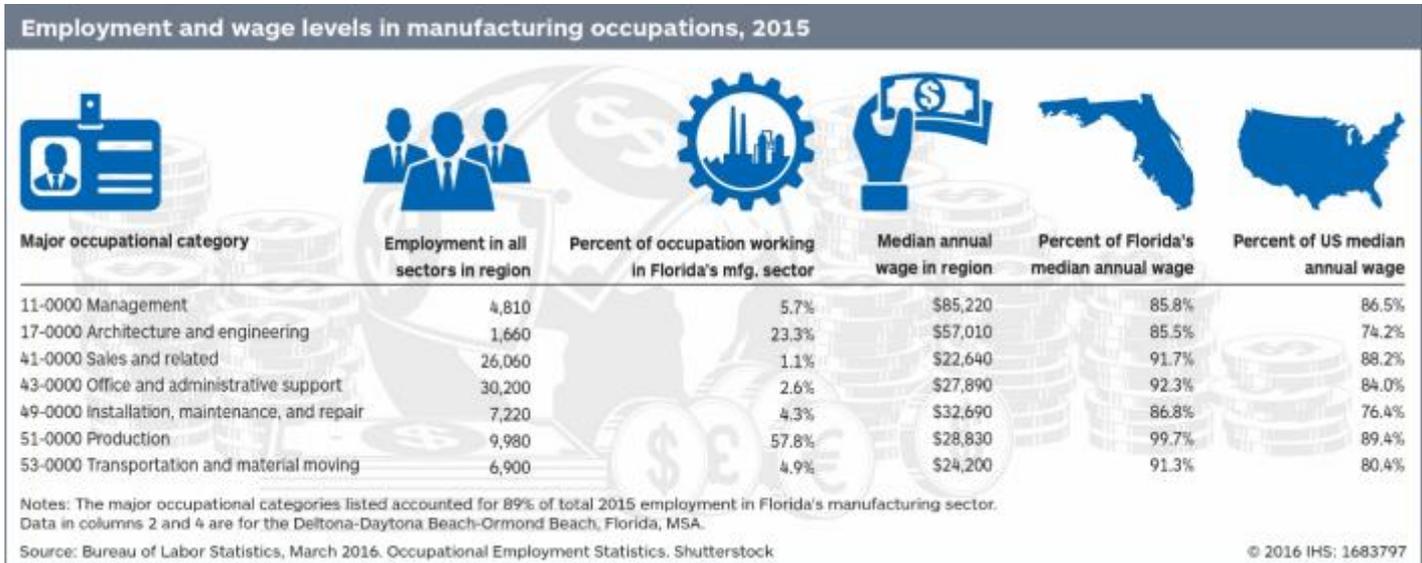
The results of the shift-share analysis can be used for developing strategies in the following manner:

- Analyze the economic sectors classified as either A or B, as they are the highest performers, to identify the competitive advantages in the region that drive their performance. The **B sectors should receive special attention because, while they currently account for below-average shares of economic activity, this is where growth opportunities are likely to be found.** The economic development objective is to turn B sectors into A sectors.
- **Identify the names of individual firms in each A and B sector and analyze them to determine why they are high performers.** It is essential to determine the extent to which their high performances are due to:
 - 1) Firm-level factors such as excellent management, efficient operations, competitive prices, superior product quality, etc.
 - 2) Regional competitive advantages such as lower cost of doing business; high quality of labor; proximity to markets, suppliers, or both; lower tax rates; excellent transportation networks; favorable regulatory environment; etc.
- **Analyze the C sectors and identify the factors that affect their competitiveness;** they constitute traditional centers of manufacturing activity so helping them remain profitable also maintains manufacturing employment.
- **Identify clusters of subsectors with similar needs** that also interact with each other through **buying and selling relationships.**
- **Identify those regional competitive advantages** that apply across all the manufacturing subsectors and those that are uniquely important to a few specialized subsectors.
- **Identify those regional competitive advantages where local actions can make a difference** (i.e., increasing the supply of skilled workers needed by the advanced manufacturing sectors).
- Begin to **develop strategies and programs** that maintain and enhance regional competitive advantage in the targeted sectors.

Based on our experience in other studies, it is always valuable to have economic development professionals with detailed knowledge of the regional economy review the list of the subsectors assigned to each of the four shift-share types. Ideally, the distribution of subsectors by type should generally confirm their understanding of the region's economic composition (i.e., the subsectors they expect to be classified as A or B sectors actually appear there).

Wages in manufacturing occupations

A review of the major occupational categories involved in Florida’s manufacturing sector statewide shows 57.8 percent of all production workers in Florida are employed in the manufacturing sector, followed by 23.3 percent of all architects and engineers. As such, these are two of the most significant categories for evaluating manufacturing occupation wages in the Volusia region. From the table on manufacturing employment and wage levels in 2015, we can infer **someone in a production occupation in the Volusia region makes less than both a production worker statewide and nationally. The same is true for an architect or engineer, where the wage difference is even greater.** Because of these occupational wage differences, **the Volusia region has a competitive advantage nationally in terms of labor costs for the manufacturing industry. One implication of these findings is that if increasing the number of manufacturing jobs in the region rather than increasing per capita incomes is the desired goal, an effective strategy may be attracting manufacturing employers whose national competitive advantage is derived from being a low-cost producer. However, if the Volusia region seeks to encourage growth in manufacturing subsectors that pay above-average wages, it should focus on where job gains can be enhanced among its advanced and durable manufacturing (i.e., basic chemicals or metalworking machinery).**



Appendix A: Results of the shift-share analysis

Appendix A: Shift-share analysis of the Volusia manufacturing sector, 2015						
NAICS sector	Description	Allocation code	Employment	LQ	% of Private Sector Employment	Employment CAGR 2000-15
3366	Ship and boat building	A	1,462	8.25	0.95%	1.66%
3391	Medical equipment and supplies	A	1,120	2.88	0.73%	1.51%
3345	Navigational, measuring, electromedical, and control instruments	A	898	1.89	0.59%	7.83%
3273	Cement and concrete product	A	441	2.00	0.29%	3.00%
3256	Soap, cleaning compound, and toilet preparation	A	432	3.33	0.28%	0.45%
3149	Other textile product mills	A	379	4.90	0.25%	4.42%
3332	Industrial machinery	A	172	1.27	0.11%	16.24%
3133	Textile and fabric finishing and fabric coating mills	A	47	1.09	0.03%	-2.71%
3343	Audio and video equipment	A	36	1.40	0.02%	26.99%
3327	Machine shops; turned product; and screw, nut, and bolt	B	490	0.99	0.32%	1.08%
3323	Architectural and structural metals	B	387	0.88	0.25%	-0.78%
3329	Other fabricated metal product	B	282	0.88	0.18%	-0.41%
3114	Fruit and vegetable preserving and specialty food	B	180	0.84	0.12%	6.50%
3371	Household and institutional furniture and kitchen cabinets	B	177	0.62	0.12%	-0.88%
3254	Pharmaceutical and medicine	B	101	0.29	0.07%	29.88%
3118	Bakeries and tortilla	B	78	0.21	0.05%	2.36%
3115	Dairy product	B	72	0.44	0.05%	0.38%
3335	Metalworking machinery	B	59	0.26	0.04%	-1.59%
3251	Basic chemical	B	45	0.24	0.03%	28.89%
3328	Coating, engraving, heat treating, and allied activities	B	45	0.26	0.03%	2.09%
3272	Glass and glass product	B	31	0.26	0.02%	6.53%
3222	Converted paper product	B	30	0.09	0.02%	19.79%
3152	Cut and sew apparel	B	17	0.12	0.01%	0.84%
3141	Textile furnishings mills	B	16	0.24	0.01%	-5.08%
3325	Hardware	B	14	0.42	0.01%	4.73%
3344	Semiconductor and other electronic component	C	668	1.46	0.44%	-7.03%
3339	Other general-purpose machinery	C	353	1.04	0.23%	-2.67%
3359	Other electrical equipment and component	C	287	1.88	0.19%	-4.31%
3321	Forging and stamping	C	216	1.42	0.14%	-2.96%
3363	Motor vehicle parts	D	296	0.44	0.19%	-3.52%
3231	Printing and related support activities	D	294	0.53	0.19%	-6.00%
3261	Plastics product	D	214	0.31	0.14%	-4.58%
3399	Other miscellaneous	D	176	0.51	0.11%	-7.31%
3364	Aerospace product and parts	D	93	0.14	0.06%	-3.01%
3212	Veneer, plywood, and engineered wood product	D	43	0.51	0.03%	-8.50%
3255	Paint, coating, and adhesive	D	43	0.57	0.03%	-10.63%
3353	Electrical equipment	D	37	0.21	0.02%	-11.57%
3121	Beverage	D	25	0.10	0.02%	-2.40%
3262	Rubber product	D	22	0.14	0.01%	-6.15%
3113	Sugar and confectionery product	D	18	0.19	0.01%	-6.06%
3119	Other food	D	15	0.06	0.01%	-4.30%
3219	Other wood product	D	11	0.04	0.01%	-16.28%

Note: Only sectors with employment of 10 or more were considered; LQ = location quotient and CAGR = compound annual growth rate.

Source: IHS Business Market Insights © 2016 IHS

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