

DESCRIPTIVE ANALYSIS ON THE STRUCTURE OF THE FRESNO-MADERA ECONOMY

How the Regional Economy Impacts Air-Traffic Demand



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EXECUTIVE SUMMARY

The Fresno Yosemite International Airport (FYI) is an invaluable resource to the San Joaquin Valley and its economic development. Air connectivity has been shown to increase an economy's productivity and specialization partly through the increased business activity that airports drive. Thus, it is important regionally to understand the structure of the Fresno-Madera Metropolitan Statistical Area (MSA) economy, FYI's primary market, and how its evolution over time impacts air traffic demand. This report analyzes the Fresno-Madera economy from 1990 to 2016, while highlighting its specific competitive advantages. Accordingly, using Harvard Business School Professor Dr. Michael E. Porter's Diamond Model, this analysis reveals that the local economy has advanced in critical areas providing the region certain competitive advantages within the following factors: 1) Factor Conditions, 2) Demand Conditions, 3) Firm Strategy, Structure, and Rivalry, and 4) Related and Supporting Industries. Similarly, this report demonstrates how these critical factors of the economy impact air-traffic demand at FYI. In fact, the analysis reveals that growth in population, income, and the share of the Service Sector significantly influenced FYI's growth on total and domestic passenger enplanements from 2011 to 2016, in the aftermath of the Great Recession.

We hope this report can help provide insight on the structure, diversification, and evolution of the Fresno-Madera economy, not only as a tool for the airport as they plan for future growth, but to all stakeholders looking obtain a more clear understanding of the region that includes the fifth largest city in the world's sixth largest economy.

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Introduction

The Fresno-Madera Metropolitan Statistical Area (MSA)'s market position is critical to Fresno-Yosemite International Airport's (FYI) air traffic demand.¹ A diversified and more prosperous regional economy increases the demand of air traffic, which consequently increases cash flows for FYI. The purpose of this report is to provide a comprehensive assessment of the overall structure and evolution of the Fresno-Madera MSA economy through an in-depth descriptive analysis while highlighting specific market competitive advantages.

In general, the recent economic performance of the Fresno-Madera MSA has been vibrant. Its regional economy has expanded and diversified to non-agricultural activities with higher added-value activities. Agricultural production continues, and will continue to, play a significant role in its economy. Nonetheless, the Fresno-Madera MSA has successfully built on agriculture by developing a specialized traded "Agricultural Manufacturing Cluster." This cluster encompasses related and supporting industries with significant productivity levels, over the average of all the economy. Additionally, these supportive industry sectors have progressively increased their market share within the cluster, and developed alternative emerging clusters.

Fresno-Madera's economic progress has been built upon the development of key competitive advantages, which are assessed using a well-regarded economic model called the Diamond model. The Diamond model was developed by Harvard Business School Professor Dr. Michael E. Porter as a way to identify multiple dimensions of economic competitiveness in states and/or other locations and to understand how they interact. By identifying and improving elements within the model that are barriers to productivity, regions, like the Fresno-Madera MSA, can improve competitiveness.² The quality of the business environment and competitiveness of a region can be assessed by four factors captured by the Diamond model: (1) Factor Input Conditions; (2) Demand Conditions; (3) Firm, Strategy, and Rivalry; and (4) Related and Supporting Industries. Each factor is explained in the following paragraphs.

Factor	Economic Indicators	
Factor Input Conditions The region's position in the factors of productions, such as skilled labor or infrastructure, necessary to compete in a given industry.	Total Employment (aggregated and composition) and Unemployment: labor force availability	These indicators are discussed in Section 1
	Average Wages: productivity of labor force	
	Projected Population Cohorts by Age: expected labor participation/ availability	
	Export Industries: specialized industries with quality and efficient products and services	Discussed in Section 2
	Advanced Industries: industries intensive in skilled workforce and research & development (R&D)	Discussed in Section 2

Summary of Factor Input Conditions for the Fresno-Madera MSA

1. The workforce has expanded steadily, while diversifying, mainly within Service sectors.³
2. The workforce has become more productive. The Fresno-Madera MSA real average annual wages have increased in the aftermath of the Great Recession, especially in the sectors with high employment growth and above average annual wage levels: 1) Goods-Producing⁴ and Utilities, Trade, and Transportation.⁵
3. The workforce will continue to expand because the Fresno-Madera MSA has higher projected proportions of young cohorts, age ranges from 0 to 34 years old, in 2030 than California and the United States.
4. The Fresno-Madera MSA has diversified its industries of specialization. Traded service industries—mainly Education, Medical, Tourism; and Information & Technology—have increased their shares of total exports from 2003 to 2016.
5. More than 90 percent of Fresno-Madera's advanced industries are found within the region's industry clusters.

Factor	Economic Indicators	
Demand Conditions The nature of local-market demand for an industry's product or service.	Employment growth performance and Location Quotient ⁶ : The domestic market fosters certain industries to produce quality, efficient, and specialized products. Consequently, these industries develop specialization and higher regional growth rates than the nation.	These indicators are discussed in Section 1
	Total population (local-market demand)	
	Income per capita: purchasing power of the local-market	

Summary of Demand Conditions for the Fresno-Madera MSA

1. The local-market has generated higher employment growth rates in Service; Utilities, Trade, and Transportation; and other Goods-Producing sectors
2. The regional economy has driven the development of non-farming specialized industries, mainly within Service sectors.
3. Fresno-Madera has experienced population growth at much higher rates than the state and the nation.
4. The Fresno-Madera MSA has steadily increased its per capita income since 1990 through the aftermath of the Great Recession.

Factor	Economic Indicators	
Firm Strategy, Structure, and Rivalry	Market share and composition of major employers (1,000 employees or more)	These indicators are discussed in Section 1
The conditions in the region governing how companies are created, organized, and managed, as well as the nature of domestic rivalry.	Market share of large (over 500 employees), mid-size (10 to 499 employees) and micro (1 to 9 employees) establishments.	

Summary of Firm Strategy, Structure, and Rivalry for the Fresno-Madera MSA

1. The Fresno-Madera MSA's economy has competitive markets, illustrated by the concentration of mid-sized business. Over 60 percent of employment in this region is concentrated in mid-size businesses.
2. The Fresno-Madera MSA has a diversified base of principal employers across multiple industries. Public Sectors and Private Service Sectors have expanded most significantly for employers with 1,000 or more workers.

Factor	Economic Indicators	
Related and Supporting Industries	Strategic Traded Industry Clusters: The regional concentration of related industries are a striking feature of economies, making regions uniquely competitive for jobs and private investment. They consist of companies, suppliers, and service providers, as well as government agencies and other institutions that provide specialized training and education, information, research, and technical support.	This indicator is discussed in Section 3
The presence or absence of supplier industries and other related industries.		

Summary of Related and Supporting Industries in the Fresno-Madera MSA

1. Industry clusters hold the most employment and total annual wages in the Fresno-Madera economy.
2. Industry clusters are the principal sources of income as well as the most productive segments of Fresno-Madera MSA's regional economy.
3. The Agricultural Manufacturing Cluster is the principal traded cluster of the Fresno-Madera MSA economy with 32 percent of regional employment, 31 percent of total

annual wages, and 69 percent of total international exports.

4. The Agricultural Manufacturing Cluster has progressively upgraded its value chain as more productive, supporting, and related sub-sectors have increased their share within the cluster.

The analysis also looks at other critical factors of the Fresno-Madera MSA economy that influence air-traffic demand through:

1. Population: Growth of 1 percent in population generates an increase of total enplanements by an estimated 1 percent.
2. Higher incomes: A growth of 1 percent in the total average wage increases domestic enplanements by an estimated 0.32 percent and total enplanements by 0.33 percent.
3. Growth of Service sector: An increase of 10 percent or more as a share of the Fresno-Madera economy generates an estimated increase of 0.20 percent in domestic and total enplanements.
4. Income growth and share of economy of the Service sector collectively serve as a gauge to the positive impact white-collar workforces have on air-traffic demand. As the Fresno-Madera MSA addresses its areas of economic opportunity and advancement, and thus increases the size of its white-collar workforce, the Service sector relationship with air-traffic demand could increase.
5. While income and share of Service Sectors have much lower marginal effects than population in total and domestic enplanements, these significant socioeconomic factors jointly have had a similar aggregate influence as population on Fresno Yosemite International Airport's total enplanements in the aftermath of the Great Recession. This is because, from 2011 to 2016, income and the share of Service sectors have respectively grown 2.8 times and 4.9 times more than population in the Fresno-Madera MSA.

Endnotes and References

1. For purposes of this study, the Fresno-Madera CSA would be referred to as Fresno Madera MSA. It is the major market for the Fresno-Yosemite International Airport's passenger enplanements.

2. The Diamond Model, Institute for Strategy & Competitiveness, Harvard Business School.

3. Service Sectors in these study encompasses 2-digit NAICS codes from 51 to 81: Information; Finance and Insurance; Real Estate; Professional, Scientific, and Technical Services; Management of Companies and Enterprises; Administrative and Support and Waste Management and Remediation Services; Educational Services; Health Care and Social Assistance; Arts, Entertainment, and Recreation; Accommodation and Food Services; and Other Services (except Public Administration).

4. This analysis uses the U.S. Census sectoral classification on Goods Producing Sectors to assess Construction and the Extraction Sectors. Here, the analysis excludes Agriculture and Manufacturing Sectors in order to specifically spotlight their particular performances.

5. Utilizes U.S. Census definition and includes industry sectors in the following North American Industry Classification System: Utilities (22), Retail-Trade (44-45), Wholesale Trade (42), and Transportation and Warehousing (48-49).

6. The Location Quotient (LQ) measures regional industrial specialization from the ratio of industries' regional employment proportions relative to their national employment proportions. An LQ greater than 1 indicates a regional industry specialization as compared to the nation.

Section 1

1. Overview of the Fresno-Madera MSA Economy

Employment, major industries, major employers, population, and income are key economic indicators of regional economies. This section provides an updated performance and projections (if available) on each of these indicators. This section also includes an assessment on three of the Diamond model factors: Factor Input Conditions; Demand Conditions; and Firm Strategy, Structure, and Rivalry. The Factor Input Conditions analysis encompasses employment, average wages (productivity), and unemployment. The Demand Conditions analysis encompasses population, income per capita, and employment dynamics.⁷ Finally, Firm Strategy, Structure, and Rivalry is assessed through the market share and composition of major employers and market shares of large, mid-size, and micro businesses.

1.1 Overall Employment Performance

From 1990 to 2016, the Fresno-Madera MSA has expanded its workforce at a much greater rate than California and the United States overall. In 1990, Fresno-Madera had a total employment of 326,000, which grew to an estimated total employment of 460,000 in 2016. This is a 41 percent increase from 1990 to 2016. In contrast, during this timeframe, California and the United States expanded its workforce by approximately 27 percent ([Graph 1.0](#)).

Fresno-Madera's compounded annual average growth rate (CAAGR) also illustrates the region's exceptional employment growth from 1990 to 2016. During this period, the Fresno-Madera MSA grew its employment by a CAAGR of 1.33 percent, while California grew at a rate of 0.91 percent and the United States at a rate of 0.94 percent ([Table 1.0](#)). Accordingly, the Fresno-Madera MSA grew employment at a rate 40 percent higher than that of California and the United States.

Additionally, the Fresno-Madera MSA's recovery and employment growth following the Great Recession has been significant. From 2011 to 2016, Fresno-Madera's employment grew by a CAAGR of 1.73 percent, a higher rate than its CAAGR from 1990 to 2016. Since the Great Recession, while the Fresno-Madera MSA outperformed the United States, which saw employment grow at a CAAGR of 1.60 percent, it did not exceed California's employment growth, which grew at a CAAGR of 2.13 percent ([Table 1.0](#)). Though not as robust as California as a whole, employment growth post-recession in Fresno-Madera has been significant.

Prior to the Great Recession, the Fresno-Madera MSA generally outperformed state and national employment growth, as seen in [Graph 1.1](#). Post-recession, Fresno-Madera's recovery and employment growth followed a trend where California outperformed Fresno-Madera, though the region generally outperformed the United States in most years. The exception to the post-recession employment growth trend is from 2015 to 2016, where the Fresno-Madera MSA performed better relative to California and the United States. Whether Fresno-Madera's growth from 2015-2016 will be the norm or is an exception will be better known once employment growth data is available from the subsequent years.

1.2 Employment Composition

The steady job growth of the Fresno-Madera MSA has led to a reconfiguration of its economy, where Service Sectors have increased their share of employment by more than 10 percent in the region's economy to levels near that of California and the United States. In 1990, over 48 percent of Fresno-Madera's nonfarm employment was concentrated within the Service sectors. In 2016, that number grew to over 59 percent, which is 1 percent less than the United States and 3 percent less than that of California. For the Fresno-Madera MSA, the significant shift of its employment composition indicates that most of the region's employment growth has been focused within the Service sectors ([Graph 1.2](#)). The significance of the region's employment reconfiguration, associated productivity, and unique regional effects by industry sector are discussed in detail below.

Farming Sector

The Fresno-Madera MSA has seen its farming employment consistently shrink since 1990. Total farming employment has contracted by a CAAGR of -0.48 percent from 1990 to 2016 and a CAAGR of -0.50 percent from 2011 to 2016 ([Table 1.1](#)). In contrast, California and the United States experienced growth of farming employment, with a CAAGR of 0.49 percent and 0.56 percent respectively from 1990 to 2016. From 2011 to 2016 the growth in farming employment was even more pronounced for California and the United States with 1.72 percent and 1.64 percent increases of CAAGR respectively.

One area worth noting within the farming sector is the average wage growth seen in Fresno-Madera. While the sector has consistently seen a decline in employment, the average wage of the farming sector has experienced the highest growth in real average wages versus all other sectors

Graph 1.0. Historical Employment Growth (1990-2016)

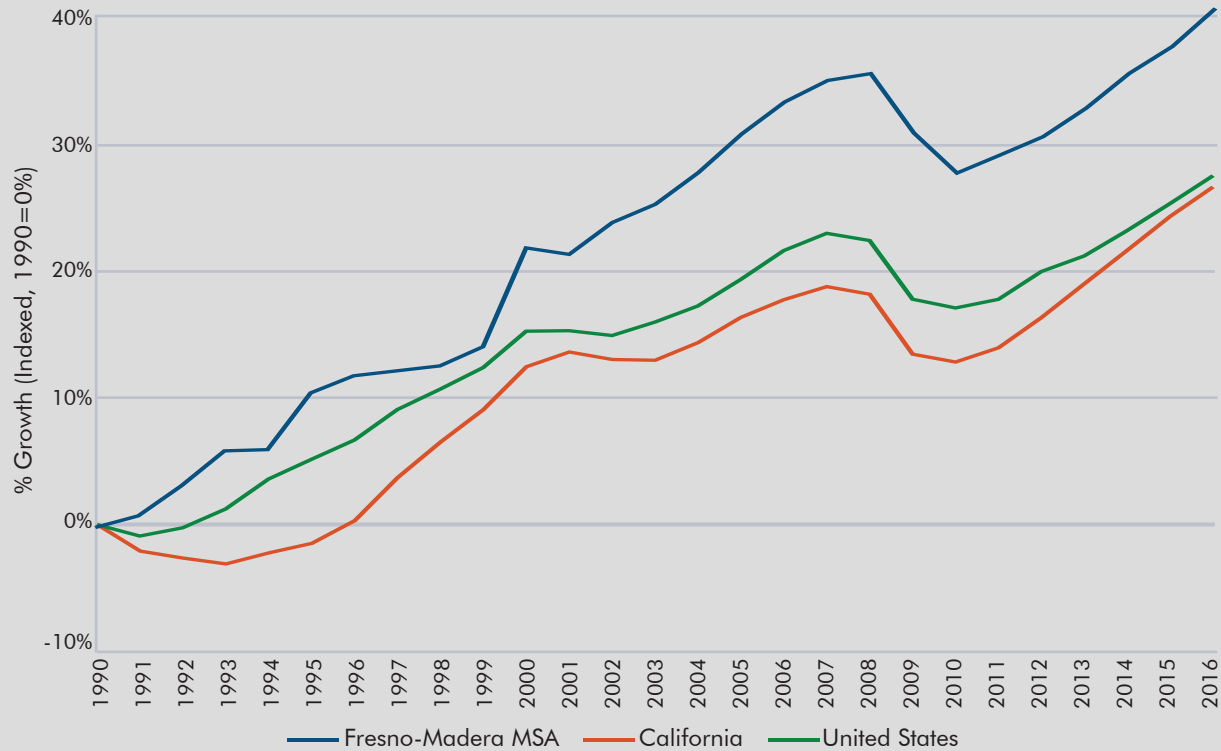
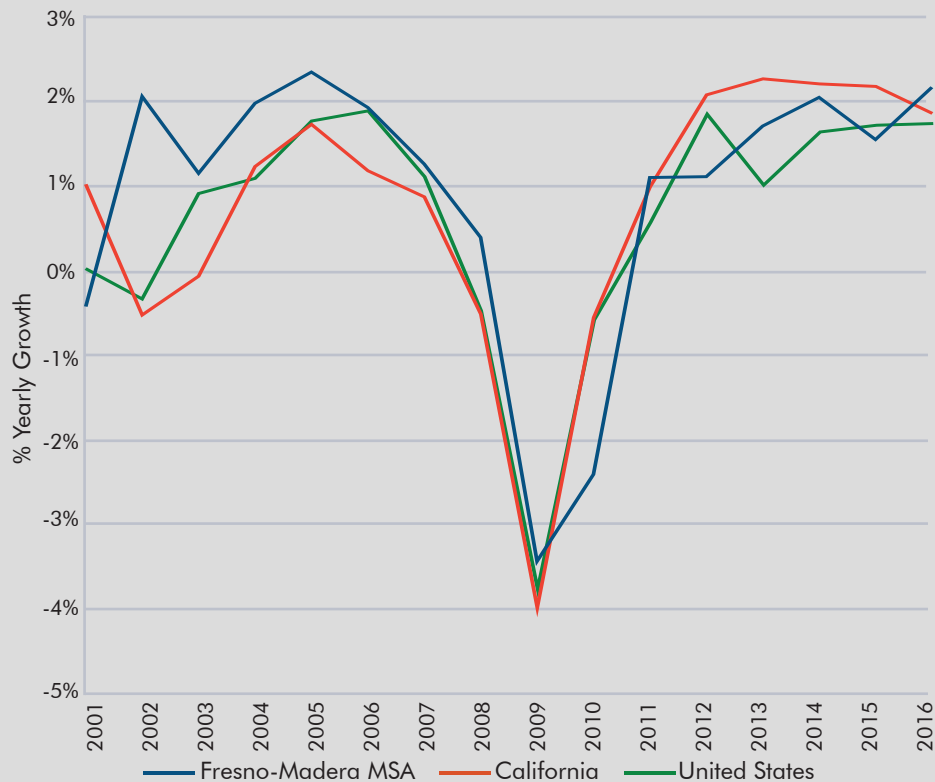


Table 1.0. Historical Employment Levels and Performance

Region	1990 (thousands)	2011	2015	2016	CAAGR 1990-2016	CAAGR 2011-2016	Y-O-Y 2015-2016
Fresno-Madera MSA	326	422	450	460	1.33%	1.73%	2.18%
California	14,258	16,244	17,719	18,050	0.91%	2.13%	1.87%
United States	118,793	139,869	148,834	151,436	0.94%	1.60%	1.75%

Graph 1.1. Yearly Employment Growth (2001-2016)



and industries following the Great Recession. From 2011 to 2016, the real average wage in farming in Fresno-Madera grew by a CAAGR of nearly 5 percent, more than three times the growth rate of the second highest sector, Other Goods Producing, which grew by a CAAGR of nearly 1.5 percent. This dynamic of employment contraction and real average wage growth could be reflection of the automation that has been underway in the harvest and production processes of the farming sector in Fresno-Madera. As industries rely more on technology and automation, they generally see an increase in productivity as a smaller but more efficient and skilled workforce increases overall production. While the average annual wage growth within the sector is notable, the farming sector still has the lowest average wage of all other industries and sectors ([Graph 1.3](#)).

Manufacturing Sector

The manufacturing sector has experienced a long-standing decline in employment that dates back decades across the Fresno-Madera MSA, California, and the United States. This sector, however, did experience a recovery following the Great Recession. Even though manufacturing was contracting from 1990 to 2016, the Fresno-Madera MSA's manufacturing performance exceeded that of California and the United States, which gave the regional economy an advantage in manufacturing. During this time period, the Fresno-Madera MSA contracted by a CAAGR of -0.09 percent, while California and the United States contracted by 20 and 16 times more respectively ([Table 1.1](#)).

Following the Great Recession, the manufacturing sector offered positive signs of having reverted to its decades-long trend of contracting employment in Fresno-Madera, California, and the United States. From 2011 to 2016, Fresno-Madera grew by a CAAGR of 1.13 percent, California by 0.90 percent and the United States by 1 percent. Between 2015-2016 manufacturing employment in the Fresno-Madera MSA contracted by -1.38 percent, while California and the United States continued to grow their manufacturing employment by 0.81 percent and 0.05 percent respectively ([Table 1.1](#)). Yet, preliminary 2017 data from the Bureau of Labor Statistics' (BLS) Quarterly Census of Employment and Wages indicated that the manufacturing employment decline experienced in Fresno-Madera in 2016 may have been an atypical fluctuation, as manufacturing employment was growing at a rate of 1.9 percent through the first six months of 2017.

Finally, the real average annual wages of the Fresno-Madera MSA manufacturing sector have outperformed the overall regional economy. From 2011 to 2016, the real average annual wage across all industries in Fresno-Madera grew by a CAAGR of 0.72 percent, while the manufacturing real average wage grew by a CAAGR of 1.06 percent. Arguably more important, the average

annual wage for manufacturing exceeded the average annual wage across all industries in Fresno-Madera by over \$4,600 in 2016 ([Graph 1.3](#)). For that year manufacturing reported an average annual wage of \$46,323 compared to the average annual wage across all industries in Fresno-Madera of \$41,710.

Other Goods Producing Sectors

(Agriculture and Manufacturing excluded)

The Fresno-Madera MSA has consistently performed well in the Other Goods Producing sectors, and following the Great Recession, the sector has demonstrated unique regional effects. From 1990 to 2016, Fresno-Madera saw small but positive employment growth in the Other Goods Producing Sector with a CAAGR of 0.18 percent. Similarly, California and the United States experienced small but positive growth under 1 percent during this period with a CAAGR of 0.29 percent and 0.82 percent respectively ([Table 1.1](#)).

After the Great Recession, Fresno-Madera experienced a significant increase in employment growth in the Other Goods Producing Sectors which led to unique regional effects in these Sectors. From 2011-2016, the Other Goods Producing Sectors grew by a CAAGR of 6.95 percent, while California and the United States had a CAAGR of 6.16 percent and 3.22 percent respectively. Furthermore, the year-over-year growth from 2015 to 2016 for these sectors was 6.75 percent, while California grew at 5.13 percent and the United States at a much slower rate of 1.68 percent.

In terms of wage growth, Fresno-Madera's Other Goods Producing Sector had the second highest average annual growth rate of all industries post-recession. From 2011 to 2016, the sector grew by a CAAGR of 1.47 percent, which was nearly double the real average annual wage growth seen across all sectors in Fresno-Madera. For 2016, the average annual wage for the Other Goods Producing Sector in Fresno-Madera was \$52,710, which is more than \$10,000 over the average annual wage of all industries in Fresno-Madera. Furthermore, this Sector had the second highest average annual wage in the region, behind only Public Administration, which had an average annual wage of \$56,363 in 2016 ([Graph 1.3](#)).

Service Sectors

The Service Sectors in the Fresno-Madera MSA have experienced solid growth dating back to 1990. From 1990 to 2016, the sectors grew by a CAAGR of 2.28 percent in Fresno-Madera, which is the highest growth rate among all industry sectors. Likewise, California and the United States experienced solid growth as well in the Service Sectors, which grew by a CAAGR of 1.69 percent and 1.82 percent respectively between 1990 and 2016 and were the highest growth rates among all sectors for each. Nevertheless, Fresno-Madera's growth was 35 percent higher than

Graph 1.2. Nonfarm Employment Composition

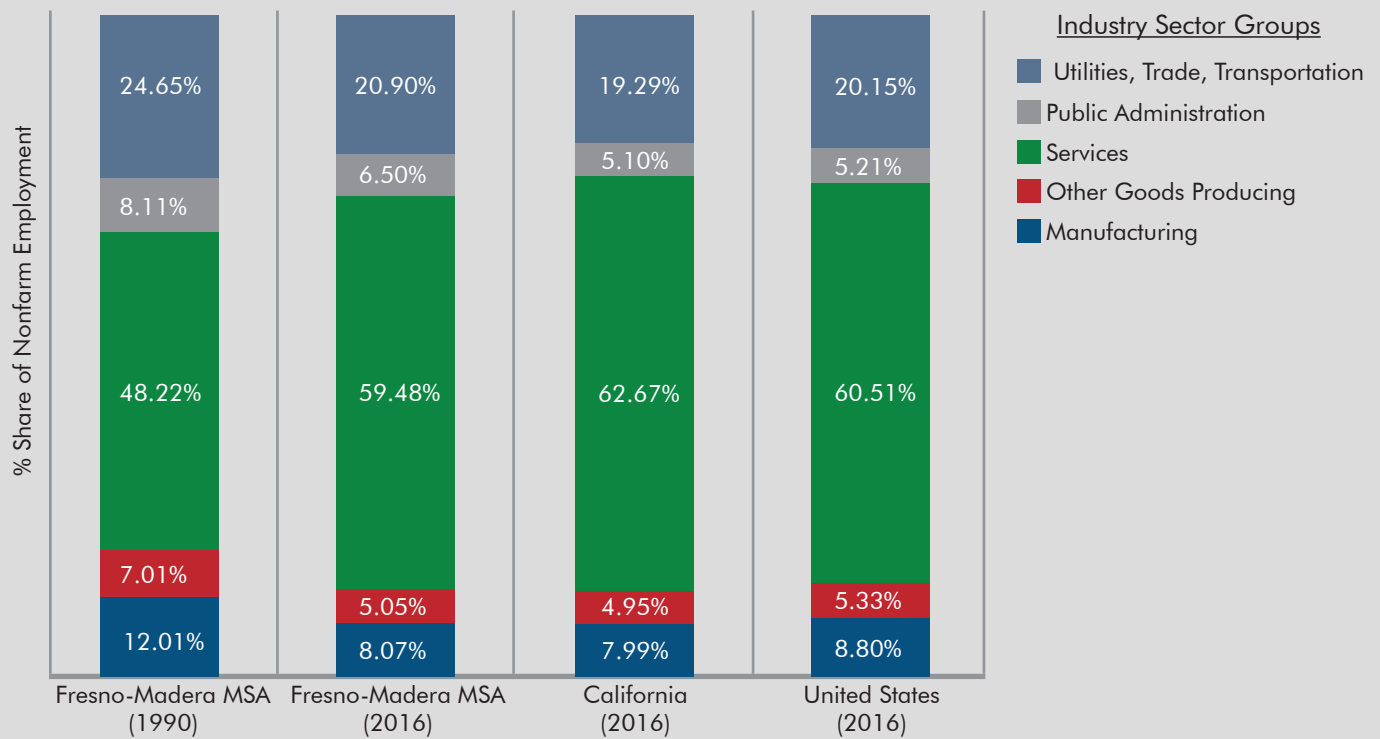
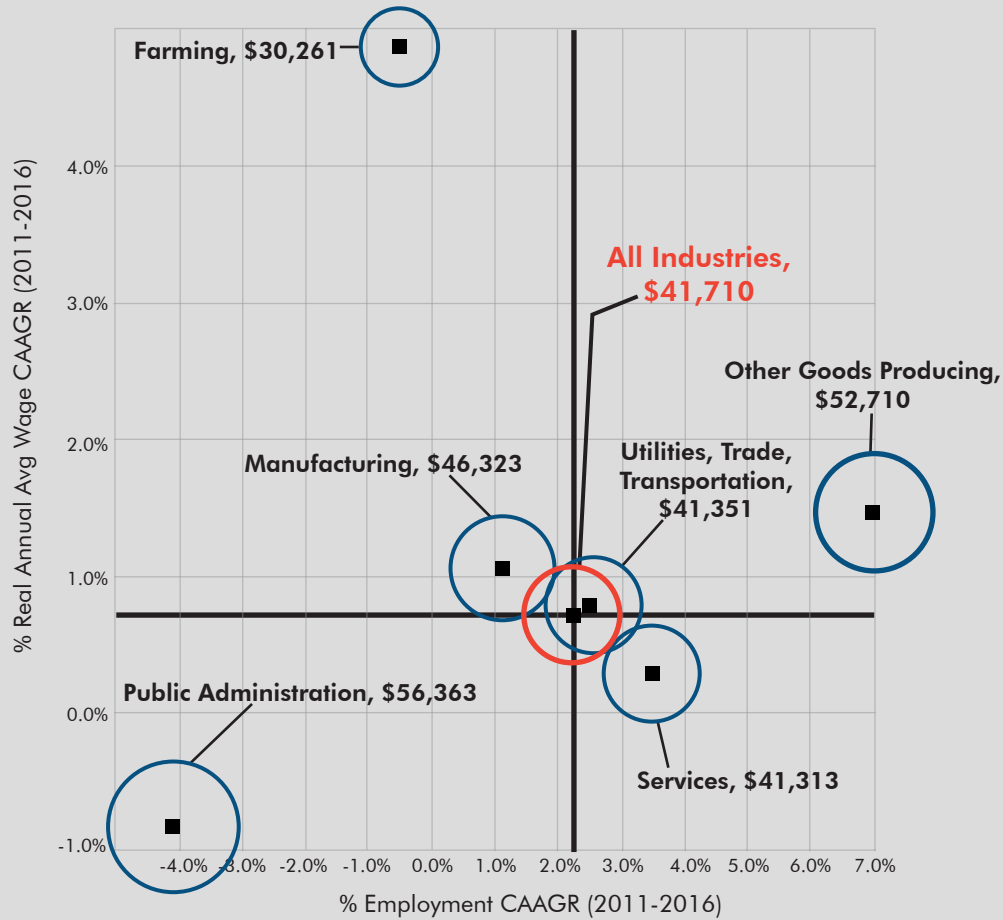


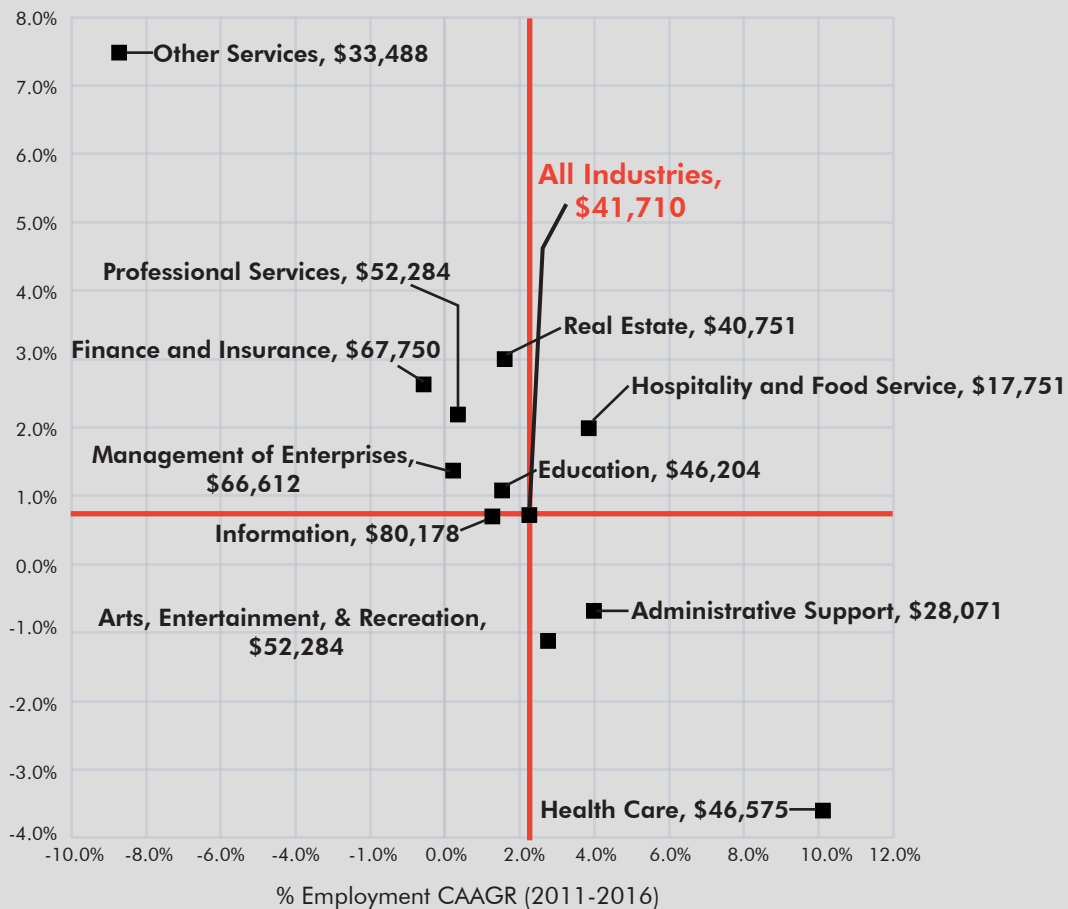
Table 1.1. Composition of Employment Growth

Industry Sector Group	Region	CAAGR 1990-2016	CAAGR 2011-2016	Y-O-Y 2015-2016
Farming	Fresno-Madera MSA	-0.48%	-0.50%	-0.95%
	California	0.49%	1.72%	0.61%
	United States	0.56%	1.64%	0.81%
Manufacturing	Fresno-Madera MSA	-0.09%	1.13%	-1.38%
	California	-1.79%	0.90%	0.81%
	United States	-1.42%	1.00%	0.05%
Other Goods Producing	Fresno-Madera MSA	0.18%	6.95%	6.75%
	California	0.29%	6.16%	5.13%
	United States	0.82%	3.22%	1.68%
Services	Fresno-Madera MSA	2.28%	3.51%	3.22%
	California	1.69%	3.25%	3.01%
	United States	1.82%	2.11%	2.16%
Public Administration	Fresno-Madera MSA	0.59%	-4.09%	1.78%
	California	0.66%	0.40%	1.62%
	United States	0.53	-0.06%	0.90%
Utilities, Trade, Transportation	Fresno-Madera MSA	0.81%	2.51%	3.36%
	California	0.49%	2.14%	1.79%
	United States	0.65%	1.61%	1.25%

Graph 1.3. Employment and Real Average Wage Growth (CAAGR)
By Industry Sector Group: Fresno-Madera MSA



Graph 1.4. Employment and Real Average Wage Growth (CAAGR)
By Service Industry Sector: Fresno-Madera MSA



California's and 25 percent higher than the United States', which demonstrates the regions unique advantage in the Service Sectors ([Table 1.1](#)).

Following the Great Recession, the Fresno-Madera MSA experienced significant employment expansion and unique regional effects in the Service Sectors. From 2011 to 2016, the Fresno-Madera Service sectors saw employment grow by a CAAGR of 3.51 percent, which was the second highest growth rate among all sectors only surpassed by the Goods Producing Sector. California and the United States saw similar employment growth rates in the Service sector from 2011 to 2016 with a CAAGR of 3.25 percent and 2.11 percent respectively, which also represented their second highest employment growth sector following the Goods Producing Sector. Overall, Fresno-Madera employment growth in the Service Sector exceeded California's growth by 8 percent and the United States by 66 percent.

While Fresno-Madera MSA's growth in the Service Sector has been historically positive, it has not yet translated to a significant increase in the sector's average annual wage. From 2011 to 2016, Service Sector grew their real average annual wages by a fractional CAAGR of 0.29 percent, which is about 60 percent lower than the real average annual wage growth across all sectors. In terms of actual wages, for 2016 the sectors' real average annual wage of \$41,313 underperforms slightly by about 1% when compared to the average annual wage of \$41,710 across all sectors in Fresno-Madera ([Graph 1.3](#)).

If we look further into each of the Service Sectors, Accommodation and Food Services have the highest growth performance in both real wages and employment. From 2011 to 2016, this sector grew by a CAAGR of 3.85 percent on employment and 1.99 percent on real wages, 1.7 times the employment growth for all the regional sectors and 2.8 times the real average annual wage growth for the regional economy as a whole. However, Accommodation and Food Services' 2016 average annual wage of \$17,751, is the lowest average wage of all Service Sectors in Fresno-Madera ([Graph 1.4](#)).

Other Service Sectors of note that have experienced overall positive employment and real wage growth included: Real Estate, Professional Services, Management of Enterprises, and Information. These sectors have experienced employment growth that was below the Fresno-Madera average across all sectors, but have performed at or better than the overall regional economy in wage growth (see [Graph 5](#)). More importantly, four of these growing Service Sectors had annual wages over the average of the regional economy in 2016. These sectors included, Information (\$80,178), Management of Enterprises (\$66,612), Professional Services (\$58,284), and Education (\$46,205).

Public Administration

Public Administration employment in the Fresno-Madera MSA has experienced marginal growth from 1990 to 2016. During this time, employment in the sector grew by a CAAGR of 0.59 percent. The sector experienced a sharp decline in employment following the Great Recession. From 2011 to 2016 the sector declined by a CAAGR of -4.09 percent, significantly worse than California and the United States. California experienced employment growth with a 0.40 percent CAAGR while the United States saw a negligible decline of -.06 CAAGR. Additionally, Public Administration's share of the total employment in Fresno-Madera has declined from 8.11% in 1990 to 6.5% in 2016 ([Table 1.1](#)).

While Public Administration real average wage growth has experienced a small decline in Fresno-Madera since 2011, with a CAAGR of -0.83 percent, the sector has the highest average wage across all sectors in the region. At \$56,363, Public Administration's average wages in 2016 were not only the highest, but were also 35% higher than the average wage in the regional economy ([Graph 1.3](#)).

Utilities, Trade, and Transportation (UTT)⁸

Like many of the other sectors and industries discussed, UTT has experienced consistent employment growth from 1990-2016. During this period UTT grew by a CAAGR of 0.81 percent in Fresno-Madera. Its growth rate during this period exceeded California's and the United States', which had a CAAGR of 0.49 percent and 0.65 percent respectively. Following the Great Recession, UTT in Fresno-Madera grew by a CAAGR of 2.51 percent, the third best employment growth sector in the region. UTT's growth post-recession also exceeded the state and national average, with California experiencing a growth rate of 2.14 percent while the United States experienced a growth of 1.61 percent. Year-over-year, UTT grew at an even higher rate, posting a growth of 3.36 percent between 2015 and 2016 in the Fresno-Madera MSA. This growth rate was 1.9 times higher than California's and 2.7 times higher than that of the United States ([Table 1.1](#)). On the whole, the Fresno-Madera MSA demonstrates consistent unique regional advantages within the UTT sectors.

UTT has also demonstrated real average annual wage growth post-recession. From 2011 to 2016, UTT average annual wages grew by a CAAGR of 0.79 percent, which is nearly 10 percent higher than the wage growth across all sectors in Fresno-Madera during this time. Furthermore, UTT is one of only two only industry sector groups with both higher employment and real wage growths that exceed the rates across all industries in Fresno-Madera from 2011 to 2016. In 2016, UTT's real annual average wage in the region in 2016 was \$41,351, near the average annual wage across all sectors in Fresno-Madera ([see Graph 1.3](#)).

1.3 Regional Employment Specialization

The Fresno-Madera MSA employment composition has steadily diversified its industries of specialization since 1990. During this time, the regional economy has gradually reduced its proportion of employment from specialized farming while it has increased its proportion of employment in specialized service and public administration sectors. Concentration of employment in specialized manufacturing industries has remained consistent, while specialized industries from the Other Goods Producing sector and Utilities, Trade, and Transportation have seen a decrease in concentration of employment (Table 1.2).

1.4 Structural Unemployment and Re-composition of the Economy

Historically, the Fresno-Madera MSA unemployment rate is higher than that of California and the United States, usually hovering between 8 percent and 10 percent. For instance, from 2004 to 2016, Fresno-Madera's unemployment rate was generally between 52 percent and 80 percent higher than California and the United States. This figure does not take into account the highest unemployment rates experienced during the Great Recession. From its highest point in 2010 at 16.7 percent, the Fresno-Madera MSA has seen a significant reduction in its unemployment rate to 9.4 percent by 2016 (Graph 1.5), however the gap in unemployment rate compared to California and the United States has increased. In 2009, the Fresno-Madera MSA had an unemployment rate that was 37 percent higher than California and by 2016 that number increased to 73 percent. Compared to the United States, in 2009 Fresno-Madera's unemployment rate was 74 percent higher and increased to 92 percent higher by 2016. The increase in the regional gap began to appear with the Great Recession after years of slowly bridging that gap between 2004 and 2008 (Graph 1.6). The next paragraph offers insight on Fresno-Madera's structural unemployment dynamic.

Based on academic literature, Fresno-Madera's chronically high unemployment is primarily driven by industry and labor mismatches.⁹ This means that the local workforce supply does not possess the quality or skills demanded by private industry in Fresno-Madera MSA. This situation likely worsened after an economic recovery driven by industries demanding different skill sets than those available within local workforce. In fact, as Fresno-Madera MSA's economy has reconfigured its employment composition (mainly to service industries), the local workforce confronts the need to upgrade their skills to compete in the labor market. Thus, the growing regional workforce could maximize their economic opportunities with policies focused on matching or upgrading local workforce skills with those demanded by the local economy. Fresno-Madera's private and public stakeholders have recognized this and have taken proactive steps in addressing the issue. An example of this

is Fresno Unified School District's Linked Learning Pathway which provides "career-based" and "real world experience" courses focused on preparing their students to graduate and follow career pathways with market demand. Similarly, the State Center Community College District offers career technical education programs focused on employers' needs. Both of these programs have been developed with the input of Private Sector employers within the region's promising industries.

1.5 Major Employers and Market Structure

A balanced market structure brings about economic stability and economic growth potential. A varied industry-mix reduces volatility in regional economies when specific industries face significant shocks or downturns.¹⁰ Similarly, having more evenly distributed market-shares across multiple size businesses reduces the regional economy's vulnerability from the financial downturns of major employers.¹¹ Correspondingly, evenly distributed market shares across multiple size businesses would imply a greater number of market participants and competition, which brings about higher innovation, productivity and economic growth.¹² In other words, market competition incentivizes processes to lower costs of production, as well as to increase the quality of goods and services in the market economy. Thus, a market structure is a fundamental factor for a stable and growing economy. This analysis approaches market structure by analyzing the share of the market and industry composition of major employers (1,000 of more employees), as well as the evolution of the market share of large, mid-size, and micro establishments in Fresno-Madera from 1990 to 2013.¹³

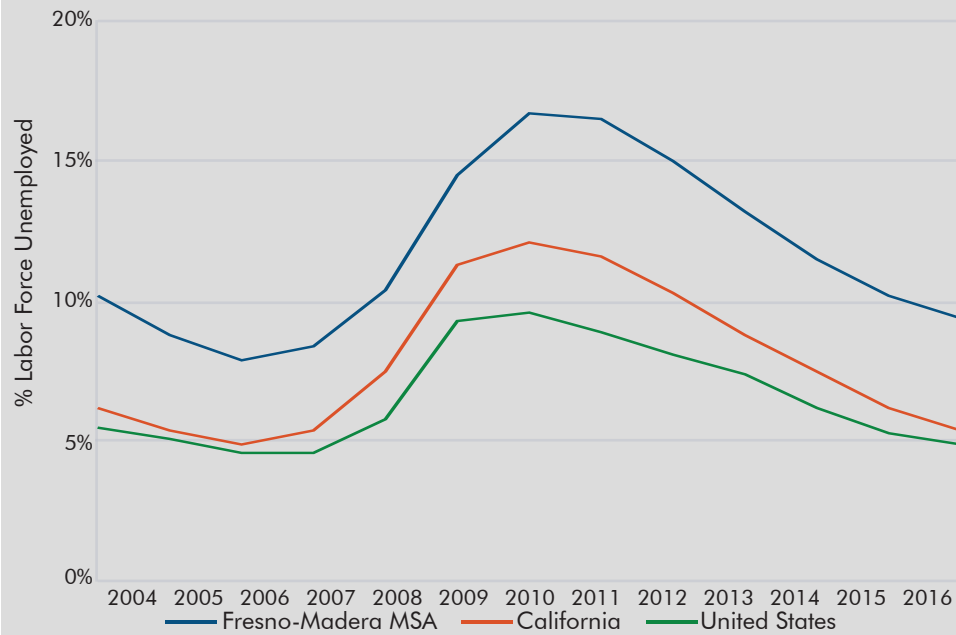
From 1990 to 2013, the percent of the workforce employed by major employers in the region increased from 19.21 percent to 23.79. This is largely attributed to the Public Sector, where major employers increased their share of total employment from 10.2 percent in 1990 to 33.1 percent in 2013. Among the Private Sectors, the workforce participation shares, with the exception of farming, have decreased their share of employment among major employers. Though the Farming Sector increased its market share from 1990 to 2013, its participation among major employers has been under 3 percent. Meanwhile, Services and UTT have remained as the top sectors with the largest share of employment among major employers during this time period (Table 1.3).

Accordingly, the Fresno-Madera MSA would benefit from, increasing the market share of employers with less than 1,000 employees, and by further diversifying the industry-mix of major employers. Increasing the market share of major employers would allow for more market stability because the Fresno-Madera economy would be less vulnerable to financial downturns of its major employers.

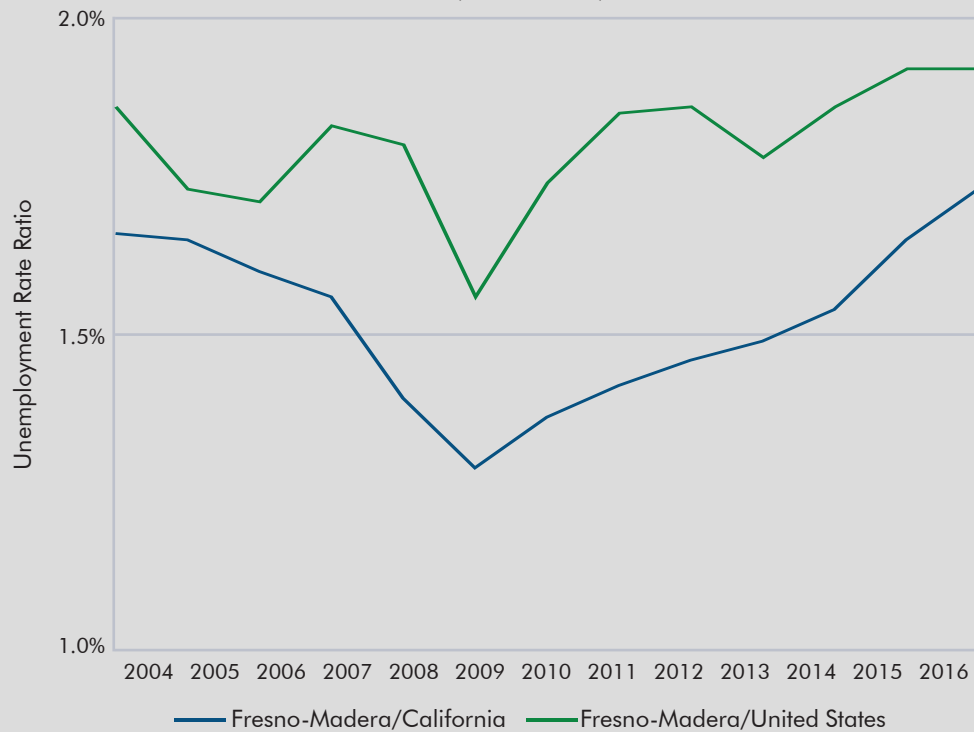
Table 1.2. Percent of All Employment in Industries (NAICS4) with a Location Quotient greater than 1, By Industry Sector Group (1990-2016), Fresno-Madera MSA

Industry Sector	1990	2011	2016
Farming	35.73%	33.66%	26.78%
Manufacturing	8.23%	9.78%	8.45%
Other Goods Producing	6.63%	2.49%	4.48%
Public Administration	4.86%	8.60%	14.78%
Services	25.62%	28.30%	37.59%
Utilities, Trade, Transportation	18.93%	17.18%	7.92%

Graph 1.5. Historical Unemployment Rate (2004-2016)



Graph 1.6. Fresno-Madera MSA Unemployment Ratio with California and the United States (2004-2016)



It would also allow for more participants and market competition, which fosters productivity and economic growth. Diversifying the industry mix would also contribute to greater stability because the regional economy would be less vulnerable to major industrial downturns if the region's major employers are diversified across industries. Similarly, a greater diversification of major employers across traded industries would increase opportunities of economic growth.

Mid-size establishments make up the largest share of the Fresno-Madera MSA economy. Mid-size establishments employed 62.5 percent of the workforce in 2013, up by 2.7 percent from 1990. Micro-size establishments employed 29.2 percent of the workforce in 2013, which represents a decrease of 3 percent from 1990 (Graph 1.7). While mid-size establishments have increased their share of employment over time, their 2000 to 2013 growth rate has slowed compared to their 1990 to 2013 (Graph 1.8). Micro-size establishments represented 29 percent of total employment in 2013, compared to 32 percent in 1990. However, micro-size establishments have significantly increased their growth rates from 2000 to 2013 compared to their growth from 1990 to 2013. Meanwhile, large establishments have been relatively consistent, with 8.03 percent share of total employment in 1990 and 8.31 percent in 2013. Based on the above, the Fresno-Madera MSA would see greater economic impact from increased employment growth rates from mid-size establishments versus micro establishments. Mid-size establishments generally produce more stable, competitive, and established jobs than micro establishments, as well as correlate to higher growth rates in employment for the overall Fresno-Madera economy.¹⁴

1.6 Population Dynamics

The Fresno-Madera MSA has steadily expanded its population at generally higher rates than the United States and California, an observable by-product of its growing consumer market (Graph 1.9).¹⁵ From 1990 to 2016, the Fresno-Madera MSA grew by a CAAGR of 1.59 percent, 49 percent greater than California and 59 percent greater than the United States (Table 1.4). Additionally, Fresno-Madera's population growth rates have remained higher than California and the United States following the Great Recession, but at growth rates lower than pre-recession levels (Graph 1.10). From 2011 to 2016, the Fresno-Madera MSA grew by a CAAGR of .92 percent, 5 percent higher than California and 26 percent higher than the United States. From 2015 to 2016, Fresno-Madera saw year-over-year growth of 0.93 percent, which exceeded California's growth by 24 percent and the United States' by 33 percent (Table 1.4).

Population projections for Fresno-Madera follow a similar trend. From 2016 to 2020, the Fresno-Madera MSA has a projected CAAGR of 1.1 percent, which is 38 percent

greater than California and 26 percent greater than the United States. From 2016 to 2030, projections have Fresno-Madera growing at a CAAGR of 1.1 percent, which is 36 percent greater than California and 43 percent greater than the United States (Table 1.5). Thus, Fresno-Madera is projected to increase its population at faster rates than California and the United States in both the near and long term.

Finally, for 2030 population projections, the Fresno-Madera MSA has a projected population that will be younger than that of California and the United States, which consequently implies a higher workforce availability. In fact, 30 percent of the population for Fresno-Madera will be between the ages of 15 and 34 in 2030 versus 26.9 percent for California and 25.1 percent for the United States (Graph 1.11). Thus, the projected young and growing population in Fresno-Madera provides the region a competitive advantage and a greater economic growth potential.

1.7 Income per capita

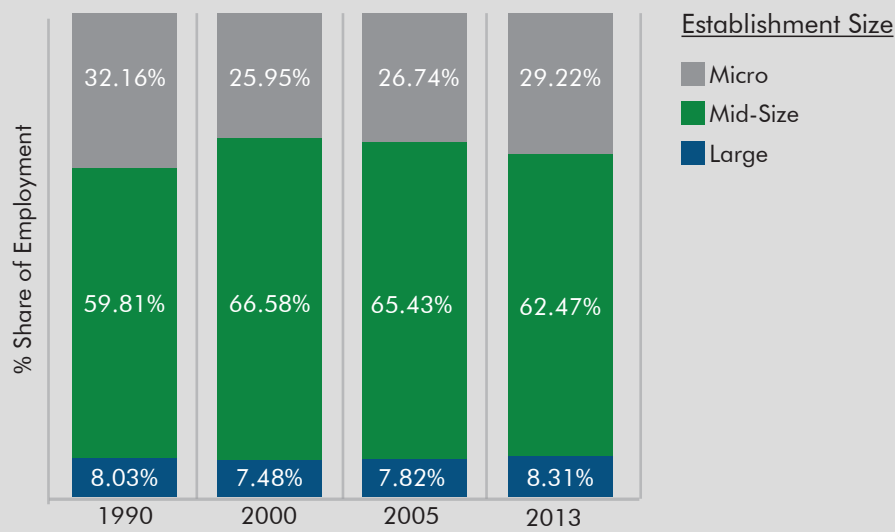
Per capita income is a crucial indication of how strong demand conditions are in the economy because it reflects the average disposable income of consumers.¹⁶ The Fresno-Madera MSA has steadily increased its real per capita income from 1990 to 2016 by more 30 percent, while California and the United States expanded their per capita incomes over 40 percent during the same period of time (Graph 1.12). Actually, according to the latest number of the Bureau of Economic Analysis in 2015, the Fresno-Madera MSA had a per capita income of \$35,817, compared to \$44,173 in California and \$44,255 in the United States. These numbers measure income per capita levels at Regional Price Parities (2009 U.S. dollars), which means that the difference between costs of goods and services across regions are already accounted for.

Nonetheless, though the Fresno-Madera MSA is behind state and national income levels, its real income per capita growth rate has improved over time, meaning that its population has greatly increased their purchasing power. From 1990 to 2016, Fresno-Madera's real income per capita grew at a CAAGR of 1.15 percent, which was 77 percent and 86 percent of California's and the United States' growth (Table 1.6). Following the Great Recession, Fresno-Madera saw a real income per capita CAAGR of 2.55 percent, 89 percent of the growth experienced in California, but 1.52 times greater than the United States. Finally, from 2015-2016, Fresno-Madera real income per capita grew at 1.31 percent, which was 75 percent the growth experienced in California but 3.5 times greater than the United States. Hence, in the aftermath of the Great Recession, the Fresno-Madera MSA has improved its income per capita growth performance relative to California and the United States, and more specifically, outperformed the United States.

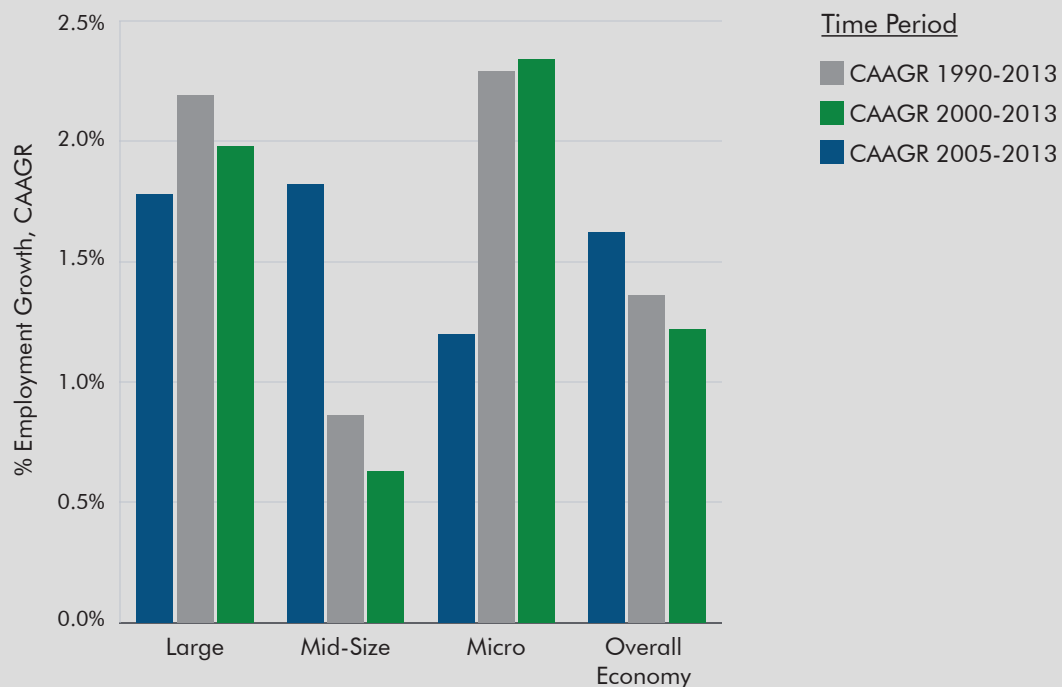
Table 1.3. Historic Composition of Major Employers by Industry Sector Group, Fresno-Madera MSA

Major Employers	1990	2000	2005	2013
Public Sector	10.23%	20.51%	31.18%	33.12%
Private Sector				
Manufacturing	8.95%	8.57%	1.52%	1.90%
Other Goods Producing	1.20%	0.11%	0.22%	0.27%
Farming	1.79%	0.88%	2.10%	2.78%
Services	60.39%	59.02%	55.36%	54.36%
Utilities, Trade, and Transportation	17.43%	10.91%	9.62%	7.57%
Share of Total Employment from Employers 1000 and greater	19.21%	21.87%	21.12%	23.79%

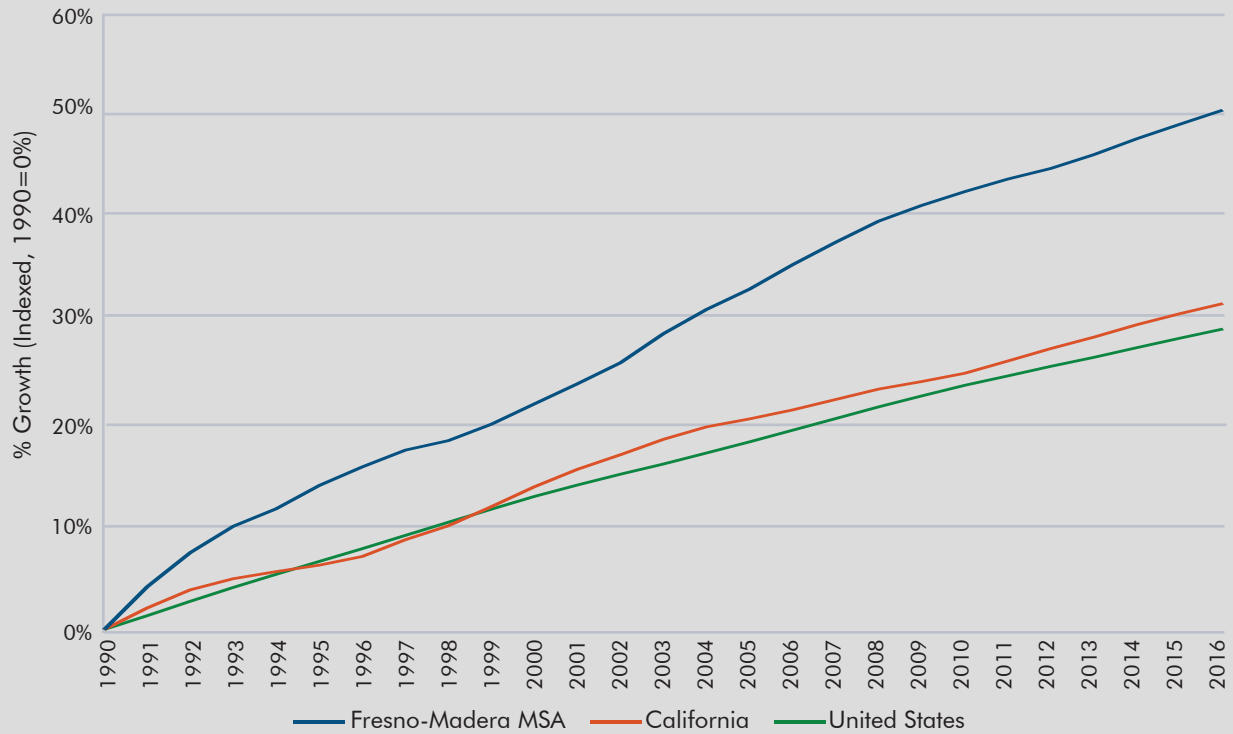
Graph 1.7. Share of Employment by Establishment Size Category, Fresno-Madera MSA



Graph 1.8. Share of Employment by Establishment Size Category, Fresno-Madera MSA



Graph 1.9. Historical Evolution of Population



Graph 1.10. Yearly Population Growth (2001-2016)

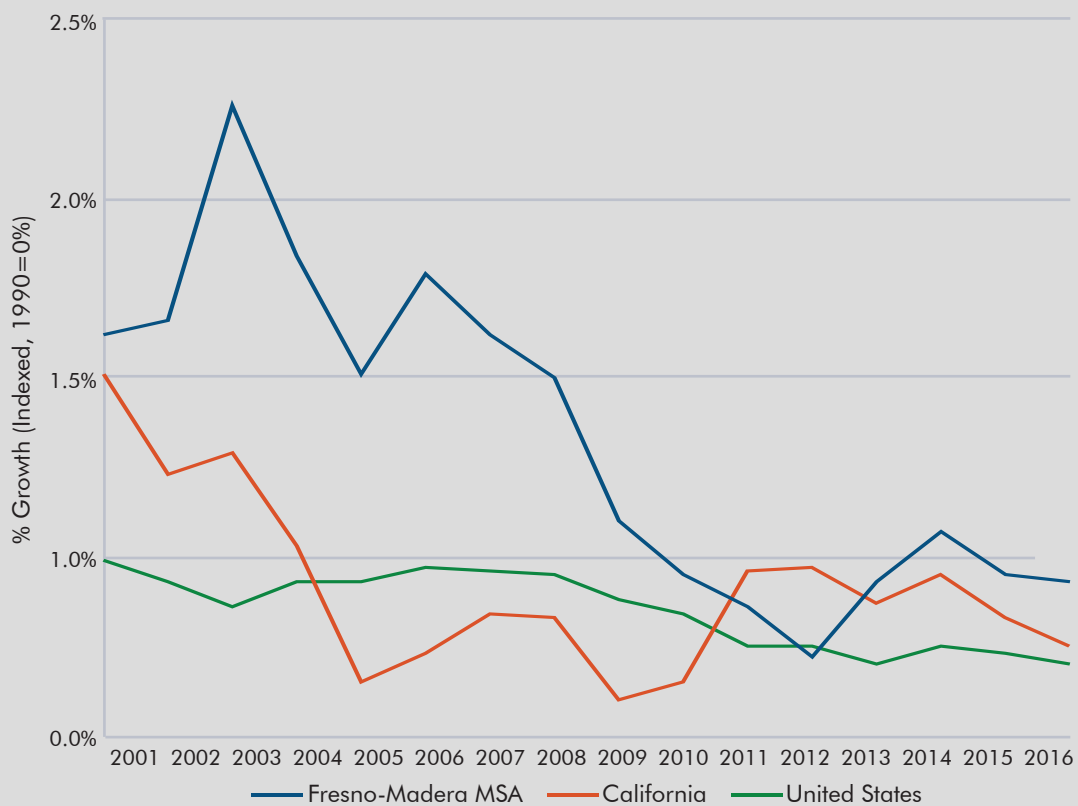


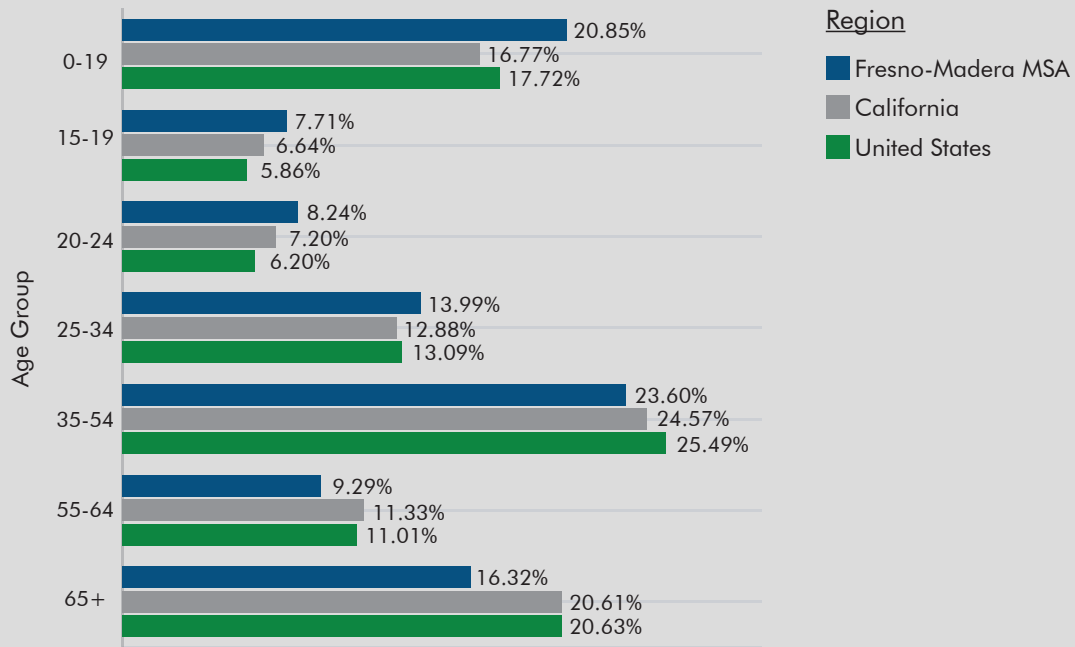
Table 1.4. Historical Population Levels (in thousands) and Growth (1990-2016)

Region	1990	2011	2015	2016	CAAGR 1990-2016	CAAGR 2011-2016	Y-o-Y 2015-2016
Fresno-Madera MSA	759	1,094	1,134	1,145	1.59%	0.92%	0.93%
California	29,828	37,675	39,060	39,354	1.07%	0.88%	0.75%
United States	249,623	311,663	320,897	323,128	1.00%	0.73%	0.70%

Table 1.5. Projected Population (in thousands) and Growth (2016-2030)

Region	2016	2020	2030	CAAGR 2016-2020	CAAGR 2016-2030	CAAGR 2020-2030
Fresno-Madera MSA	1,145	1,196	1,332	1.10%	1.09%	1.09%
California	39,354	40,720	44,020	0.86%	0.80%	0.78%
United States	323,128	334,503	359,402	0.87%	0.76%	0.72%

Graph 1.11. Projected 2030 Population, Share by Age Group



Graph 1.12. Historical Evolution of Real Income per Capita (1990-2016), chained USD 2009

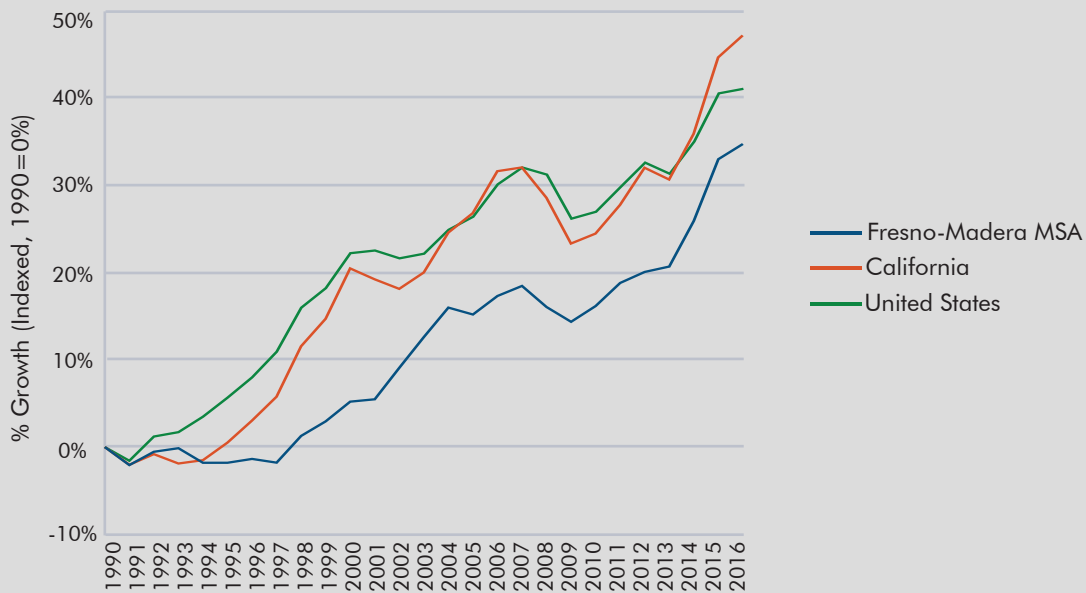


Table 1.6. Historical Real Income per Capita Levels and Performance (chained USD 2009)

Region	1990	2011	2015	2016	CAAGR 1990-2016	CAAGR 2011-2016	Y-o-Y 2015-2016
Fresno-Madera MSA	\$26,369	\$31,332	\$35,074	\$35,534	1.15%	2.55%	1.31%
California	\$34,234	\$43,740	\$49,532	\$50,394	1.50%	2.87%	1.74%
United States	\$31,203	\$40,508	\$43,859	\$44,023	1.33%	1.68%	0.37%

Endnotes and References

7. Demand conditions include processes in which specific domestic market demands and needs push for local industrial specialization in advance of national or international market demands. If fact, such solutions could subsequently serve to shape other national and foreign markets. This is referred to as “early warning indicators” by Robert E. Porter (1990), “The Competitive Advantage of Nations”, New York: Free Press. Thus, as an observable implication, employment would allow to “approximate” this dynamic through industry-employment specialization and “regional “competitive effect” (meaning changes on sectors derived from their unique regional markets).

8. Using the US Census definitions, these industry sector category encompasses Utilities (22), Retail-Trade (44-45), Wholesale Trade (42), and Transportation and Warehousing (48-49).

9. Adrian Otoi and Emilia Titan (2012), “Main Drivers of Structural Unemployment in Times of Relative Prosperity,” *Procedia - Social and Behavioral Sciences* 62 (2012) 109 – 113

10. Refer to Felix, Alison (2012), Industrial Diversity, “Growth, and Volatility in the Seven States of the Tenth District,” *Economic Review* 4Q, Federal Reserve Bank of Kansas City

11. Refer to Hall, Robert E., et. al.(1986), “Market Structure and Macroeconomic Fluctuations,” *Brookings Papers on Economic Activity*, Vol. 1986, No. 2, pp. 285-338; Gray, Mia et. al.(1996), “Big Firms, Long Arms, Wide Shoulders: The ‘Hub-and-Spoke’ Industrial District in Seattle Region,” 30:7, 651-666, DOI:10.1080/00343409612331349948

12. Paolo Buccirossi, Lorenzo Ciari, Tomaso Duso, Giancarlo Spagnolo, and Cristiana Vitale, *Competition Policy and Productivity Growth: An Empirical Assessment*, *The Review of Economics and Statistics*, October 2013, 95(4): 1324–1336; Philippe Aghion and Rachel Griffith, *Competition and Growth: Reconciling Theory and Evidence*, MIT Press, 2008; Vossen, R.W. (1998), “Combining Small and Large Firm Advantages in Innovation: Theory and Examples,” SOM Research Report 98B21, Research School Systems Organisation and Management, Universiteitsbibliotheek Groningen.

13. Employers with 1000 or more employees in all its establishments/divisions within the Fresno-Madera MSA

14. Micro businesses have higher chances of closing than mid-size and large businesses. Additionally, micro businesses generally offer jobs with lower stability, wages, and benefits. Refer to Edmiston, Kelly (2007), “The Role of Small and Large Business in Economic Development,” *Economic Review* 2Q, Federal Reserve Bank of Kansas City.

15. Refer to “Urban World: The Global Consumers to Watch,” McKinsey Global Institute, April 2016. The report points out that population growth and purchasing power growth drive consumption growth. In fact, it claims that population growth used to be the main driver of growth of consumption. However, as population growth slowed down, consumer expansion would depend more from higher purchasing power and the inclination of consumers to spend.

16. Ibid.

Graph Sources

Graph 1.0. Source: Fresno County EDC creation with LAUS Database of the Bureau of Labor Statistics, accessed on December 2017

Graph 1.1. Ibid

Graph 1.2. Source: Fresno County EDC creation with the QCEW Databases (1990, 2016) of the Bureau of Labor Statistics

Graph 1.3. Source: Fresno County EDC creation with the QCEW Databases (2011, 2016) of the Bureau of Labor Statistics & the Bureau of Labor Statistics' CPI-U-RS, U.S. City average, all items, seasonally adjusted

Graph 1.4. Ibid

Graph 1.5. Source: Fresno County EDC creation with LAUS Database of the Bureau of Labor Statistics, accessed on December 2017

Graph 1.6. Ibid

Graph 1.7. Source: Fresno County EDC creation from the 2013 National Establishments Time-Series Database

Graph 1.8. Ibid

Graph 1.9. Source: Fresno County EDC creation with data from the California Finance Department, Demographic Research Unit, and the U.S. Census Bureau's Demographic Data

Graph 1.10. Ibid

Graph 1.11. Ibid

Graph 1.12. Source: Fresno County EDC creation with data from the Bureau of Economic Analysis and the Bureau of Labor Statistics' CPI-U-RS, U.S. City average, all items, seasonally adjusted

Table Sources

Table 1.0 Source: Fresno County EDC creation with LAUS Database of the Bureau of Labor Statistics, accessed on December 2017

Table 1.1. Source: Fresno County EDC creation with the QCEW Databases (1990, 2011, 2015, and 2016) of the Bureau of Labor Statistics

Table 1.2. Ibid

Table 1.3. Source: Fresno EDC creation with 2013 National Establishments Time-Series Database

Table 1.4. Source: Fresno County EDC creation with data from the California Finance Department, Demographic Research Unit, and the U.S. Census Bureau Demographic Data

Table 1.5. Ibid

Table 1.6. Source: Fresno County EDC creation with data from the Bureau of Economic Analysis and the Bureau of Labor Statistics' CPI-U-RS, U.S. City average, all items, seasonally adjusted

Section 2

2. Traded Industries Performance

Traded industries significantly drive economic growth because they bring income by serving markets beyond the regions where they are located. Furthermore, these industries provide a glimpse into the state of an economy's factors of production such as skills and technology because "traded industries" concentrate on the segments of the economy with the greatest strengths: goods and services with high specialization, quality, and efficiency.¹⁷ Thus, this section will spotlight the composition of traded industries through their international exports from 2003 to 2016. The composition and evolution of Fresno-Madera's exports are compared to California and the United States in order to identify areas of emerging opportunities.

The Fresno-Madera MSA has generally increased its exports at levels similar to California and the United States. From 2003 to 2016, Fresno-Madera increased its total real exports by over 64 percent, whereas California increased exports by 74 percent and the United States by 62 percent, with minor trend fluctuations throughout the period. From 2005 to 2011, Fresno-Madera outperformed California and the United States in export growth. From 2012 to 2015, which included the recovery from the Great Recession, Fresno-Madera's export growth slowed behind that of the California and the United States. By 2016 the region's export growth exceeded that of the United States, but was still outperformed by California ([Graph 2.0](#)).

Fresno-Madera's export growth has also experienced a slight reconfiguration of its base from Agriculture to other promising traded service industries. In 2003, Agricultural and Manufacturing exports each represented about 40 percent of total exports in the region, with the remaining export industries distributed across various service sectors. Those sectors included 1) Information & Technology, 2) Education, Medical, Tourism services, and 3) Engineering and Heavy Industry ([Graph 2.1](#)). By 2016, Agricultural exports represented 35 percent of all exports in Fresno-Madera, 5 percent less than in 2003, and Manufacturing exports were around 1 percent less by 2016, signifying relative stability. Meanwhile, the Services sector expanded its export share in 2016 by approximately 5 percent, concentrated mostly among the above-listed Service sectors.

Fresno-Madera MSA has also unveiled its promisingly alternative traded service industries during its most recent export growth performance. As previously mentioned, from 2012 to 2015, export growth decelerated. This was due

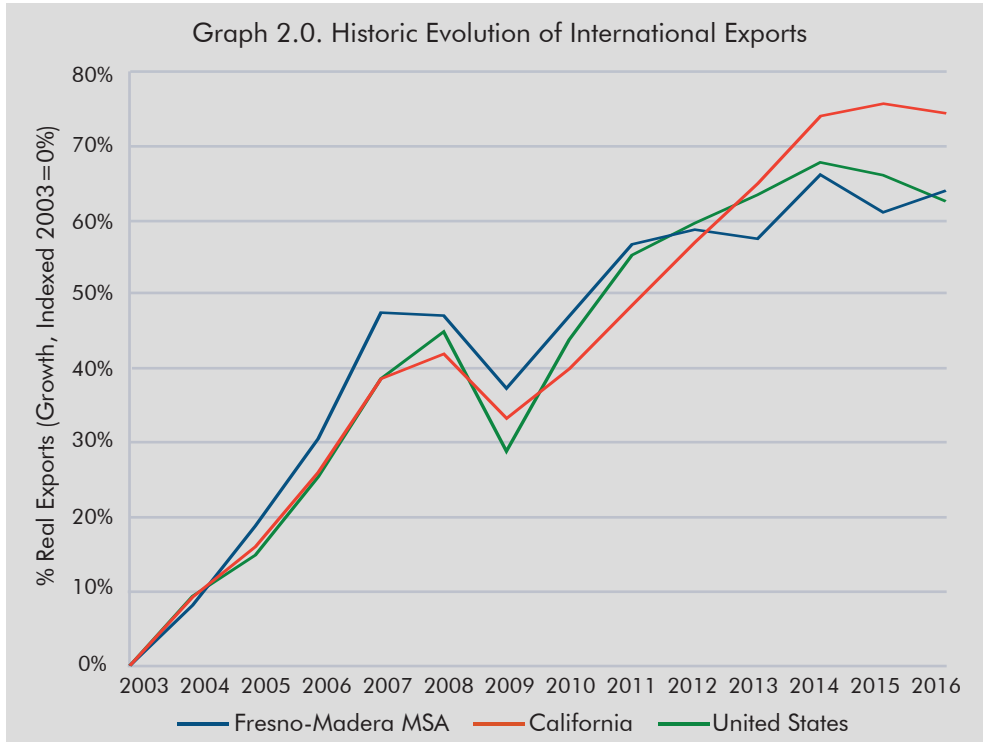
to the lack of growth within the agricultural exports of the region, which grew ever so slightly by a CAAGR of 0.12 percent ([Graph 2.2](#)). However, the region's alternative traded exports grew at a much faster rate because of the diversification of its export base in other sectors, which experienced steady growth during this period. In fact, Education, Medical, and Tourism, and Information & Technology services were the main drivers of export growth during this time. They both are among the sectors with the highest CAAGR (6.39 percent and 1.72 percent respectively), as well as among the industry sectors with the largest export shares following manufacturing and agriculture.

Finally, the Fresno-Madera MSA has made progress on the compositions of its export base relative to California and the United States. Service related exports are becoming more significant contributors of total exports in the region, which was already the case for California and the United States. In fact, from 2011 to 2016, the top two exporting sectors in size and growth for Fresno-Madera, California, and the United States were Education, Medical, and Tourism, and Information & Technology. Furthermore, by 2016, manufacturing held the largest share of exports in Fresno-Madera, similar to that of California and the United States ([Graph 2.2](#)).

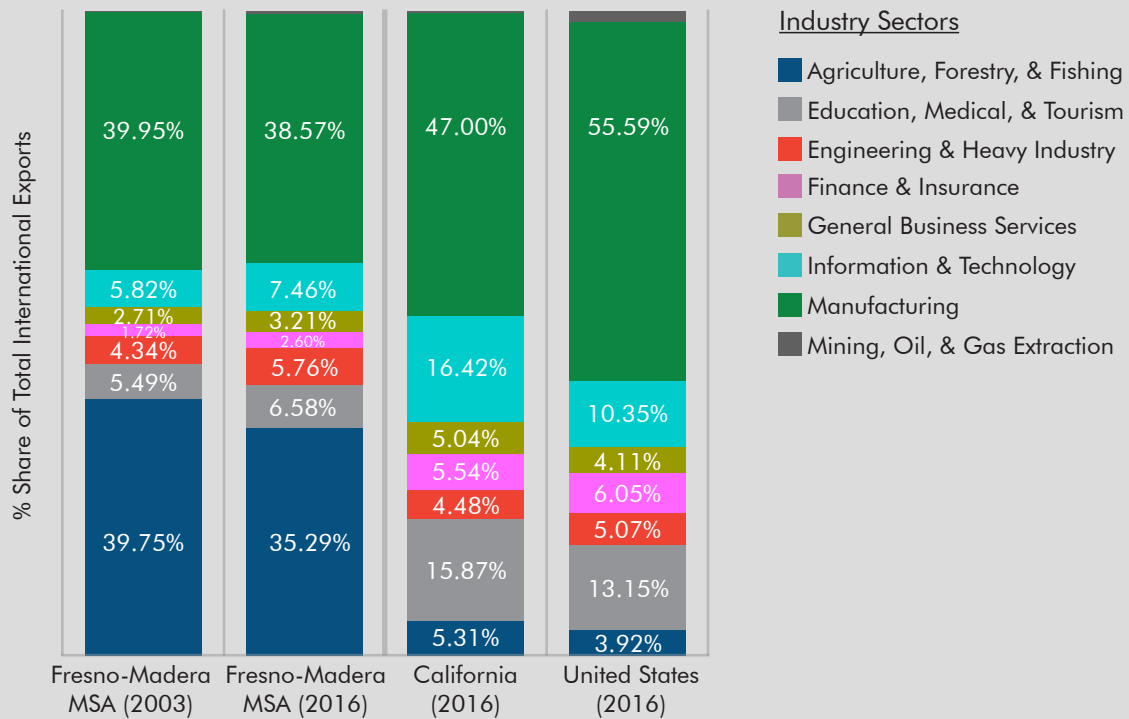
All things considered, Fresno-Madera's diversification of its export base is a positive sign for the economy. The region has demonstrated the ability to count on alternative competitive advantages in goods and services for international exports sufficient to support the stability of its export base even during down years of a critical sector like agriculture. The competitive advantage of many of these other export industry sectors is built on the value chain of agricultural and food processing industries, which is discussed in the following section on strategic clusters and economic upgrade.

Table 2.0. Historical levels (in million USD 2016) and performance of International Exports

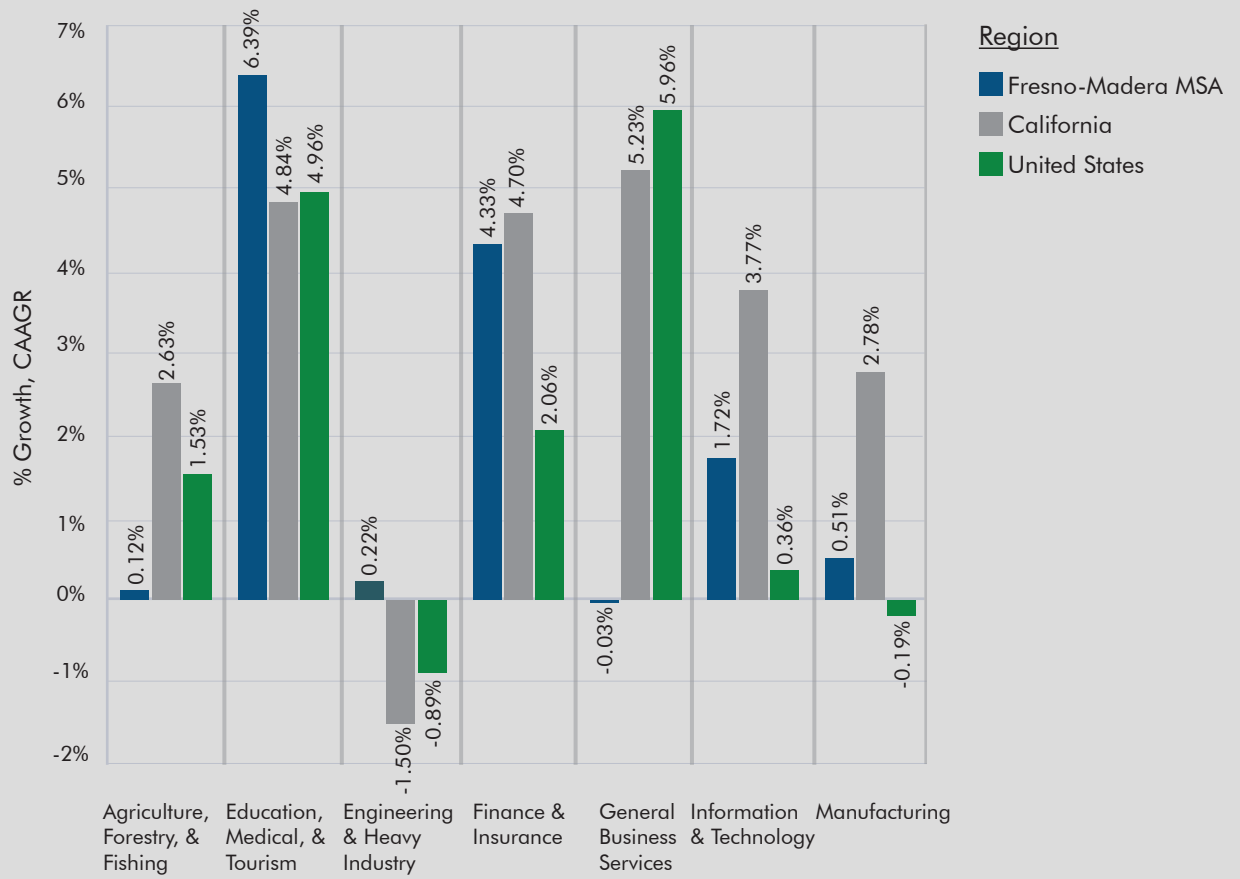
Region	2006	2011	2016	CAAGR 2006-2016	CAAGR 2011-2016
Fresno-Madera MSA	\$3,782	\$4,540	\$4,749	2.30%	0.91%
California	\$182,385	\$214,940	\$252,305	3.30%	3.26%
United States	\$1,459,410	\$1,806,796	\$1,890,986	2.62%	0.92%



Graph 2.1. Distribution of International Exports by Industry Sector, 2003 and 2016



Graph 2.2. Compounded Real Average Annual Growth Rates of International Exports by Industry Sectors (2011-2016)



Endnotes and References

17. Refer to “Competitive Cities for Jobs and Growth: What, Who, and How, December, 2015, World Bank MC 13-121, Washington DC; Liu, Amy (2016), “Remaking Economic Development,” The Brookings Institution, Metropolitan Policy Program.

Graph Sources

Graph 2.0. Source: Fresno County EDC creation with Brookings Institute's Export Monitor Database (2003-2016)

Graph 2.1. Ibid

Graph 2.2. Ibid

Table Sources

Table 2.0. Source: Fresno County EDC creation with Brookings Institute's Export Monitor Database (2003-2016)

Section 3

3. Strategic Industry Clusters

Agricultural production has been the historical engine of economic growth in the Fresno-Madera MSA. However, its value chain has been gradually upgraded to include a variety of supportive and related industries with higher value, linked, and co-located around a traded Agricultural Manufacturing Cluster. In fact, this dynamic has allowed for the emergence of new clusters of specialization. Emerging industry clusters were defined from “segments” of supportive and interrelated industries within the regional economy by utilizing the U.S. Cluster Mapping tool and by developing an inter-sectional or inter-sector analysis on their employment and wage performance.¹⁸ From this analysis, the following emerging clusters were identified: Financial, Insurance, and Business Services; Information; Logistics and Distribution; Construction; Water Technology; Energy; Health Care and; Education & Knowledge Creation. This section will describe the Fresno-Madera’s Agricultural Manufacturing Cluster, its principal traded cluster, as well its emerging industry clusters. Additionally, this section will also assess the evolution of advanced industries in order to approximate the position and advancement of critical factors of production – skilled labor and R&D – in Fresno-Madera’s economy.

3.1. Industry Clusters in the Fresno-Madera MSA

Industry clusters make up a significant portion of the Fresno-Madera MSA economy. Yet, the region’s industry clusters vary with employment and income. When considering employment, industry clusters comprise 57 percent of the total economy in 2016 (Graph 3.0). Of this employment, Agricultural Manufacturing alone is responsible for nearly 60 percent. In contrast, when considering income (approximated via total annual wages), industry clusters comprised a much higher share, 64 percent, of the total economy, with emerging industry clusters having a higher average income than the Agricultural Manufacturing Cluster (Graph 3.1). Thus, emerging clusters, at first glance, are more productive. Nonetheless, while industry clusters make up a significant portions of Fresno-Madera’s economy, non-clustered industries have outperformed the region’s clusters following the Great Recession. The following paragraphs provide greater insight on this trend.

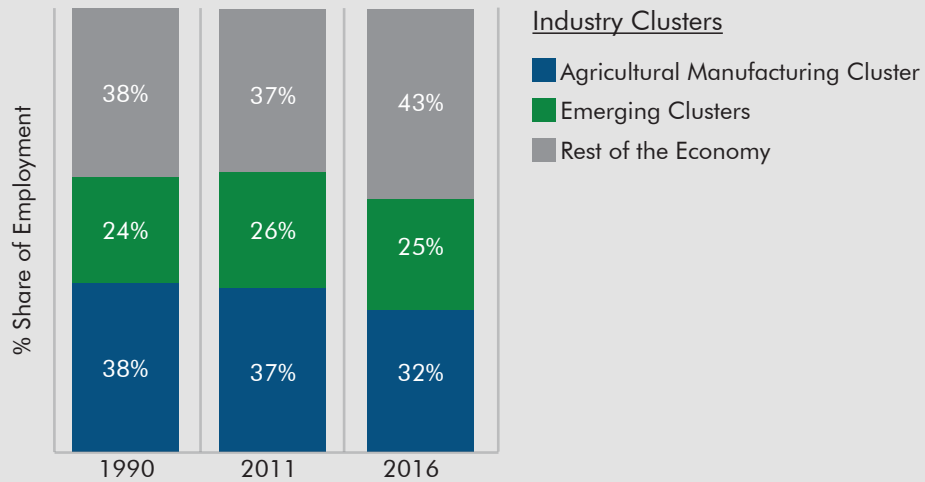
To begin, while industry clusters were experiencing growth, the rest of the economy grew at faster rates from 2011 to 2016. In terms of employment growth performance, the Agricultural Manufacturing Cluster grew by a CAAGR of 1.80 percent, emerging clusters grew at a higher CAAGR

of 4.20 percent, and the rest of the economy grew by a much faster CAAGR of 7.68 percent (Table 3.0). In terms of real average annual wages, the non-farming segments of the Agricultural Manufacturing Cluster grew by a CAAGR of 1.23 percent, while the farming segments of Agricultural Manufacturing grew by a much higher rate of 4.60 percent. Emerging clusters grew average annual wages by a fractional rate of 0.69 percent and the rest of the economy, or non-clustered industries grew by 2.20 percent rate (Table 3.1). Thus, the rest of the economy grew employment and real wages at faster rates than industry cluster sectors, with the exception of the farming sector within the Agricultural Manufacturing Cluster, which grew 2 times faster. Given these facts, there is a need to distinguish quality of growth among the industry cluster segments and the rest of the economy.

In terms of quality growth, industry cluster segments generate higher incomes per employee than the rest of the economy. In 2016, emerging clusters and the non-farming segments of the Agricultural Manufacturing Cluster produced much higher average annual wages than non-clustered industries and the overall regional economy. In fact, these cluster segments generated over \$5,000 and over \$10,000 more than the overall economy and non-clustered industries respectively (Graph 3.2). Thus, industry clusters provide higher quality growth because their expansion generates higher incomes than the non-clustered industries.

Additionally, industry clusters and export growth are closely linked. As a principal source of added capital accumulation in any regional economy, exports also offer insight into what the main industry sources of income are. For Fresno-Madera, those main sources of income are significantly concentrated in its industry clusters. From 2003 to 2016, industry clusters have generally accounted for almost 90 percent of all international exports of the region. Meanwhile, the remaining industries of the economy have generally accounted for a little over 10 percent of all international exports. In fact, over time and among industry clusters, the Agricultural Manufacturing Cluster alone has generally accounted for nearly 70 percent of total exports (Graph 3.3). Given this, the next section focuses on the composition of this traded cluster.

Graph 3.0. Total Employment Distribution within Industry Clusters, Fresno-Madera MSA



Graph 3.1. Total Annual Real Wage Distribution within Industry Clusters, Fresno-Madera MSA

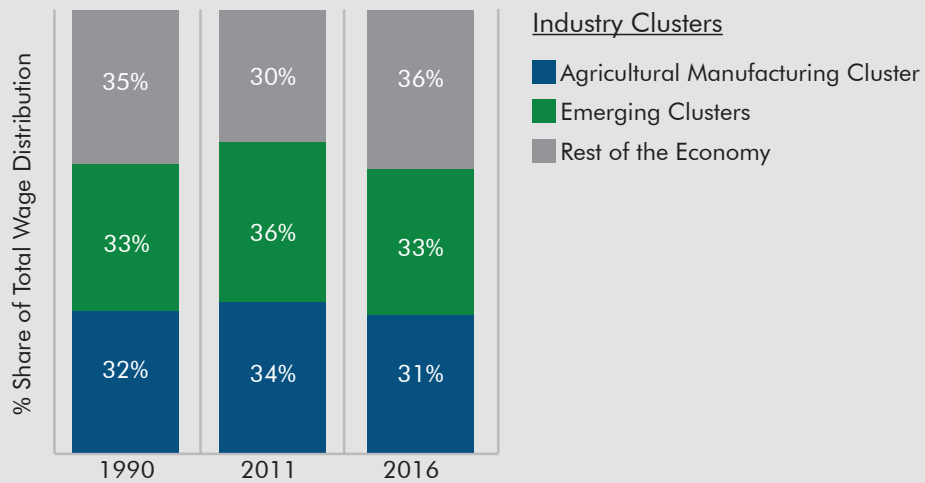


Table 3.0. Employment Performance for Industry Clusters, Fresno-Madera MSA

Industry Clusters	2011	2016	CAAGR 2011-2016
Agricultural Manufacturing Cluster	110,093	120,379	1.80%
Emerging Clusters	78,119	95,972	4.20%
Rest of the Economy	111,375	161,250	7.68%

Table 3.1. Average Annual Real Wage Performance, Fresno-Madera MSA

Industry Clusters	CAAGR 2011-2016
Agricultural Manufacturing Cluster (farming segment only)	4.60%
Agricultural Manufacturing Cluster (excluding farming segment)	1.23%
Emerging Clusters	0.69%
Rest of the Economy	2.20%

3.2 Composition of Agricultural Manufacturing Cluster

As previously mentioned, the Agricultural Manufacturing Cluster makes up a meaningful size of the Fresno-Madera economy. It is responsible for over 30 percent of the workforce and income, as well as close to 70 percent of all the exports. However, this does not mean that agricultural production drives the economy of Fresno-Madera by these amounts. The Agricultural Manufacturing Cluster encompasses a wide range of related industries that support its core farm production and food processing activities. These supporting and related industries have upgraded the cluster by increasing their market share. Farming employment has consequently seen a decline in share of employment within the Agricultural Manufacturing Cluster, while non-advanced supporting industries have significantly increased their participation.¹⁹ In 1990, farming accounted for 60 percent of total employment within the cluster, while non-advanced supporting industries accounted for 25 percent. By 2011, farming accounted for 50 percent of total employment, while non-advanced supporting industries increased their participation to 32 percent. Finally, by 2016, farming further decreased its employment share to 49 percent, while non-advanced supporting industries increased its participation to 34 percent (Graph 3.4).

Similarly, farming exports have gradually diminished their share within the Agricultural Manufacturing Cluster, while food processing exports have experienced the largest growth. In 2003, farming exports made up 55 percent of total exports within the cluster, while food processing exports consisted of 14 percent. In 2011, farming exports accounted for 51 percent of exports, while food processing increased its share to 15 percent. In 2016, farming further lowered its export share to 50 percent, while food processing already accounted for 17 percent. Finally, in all these time periods, advanced and non-advanced industry suppliers generally accounted for almost a third of total exports within the cluster (Graph 3.5).

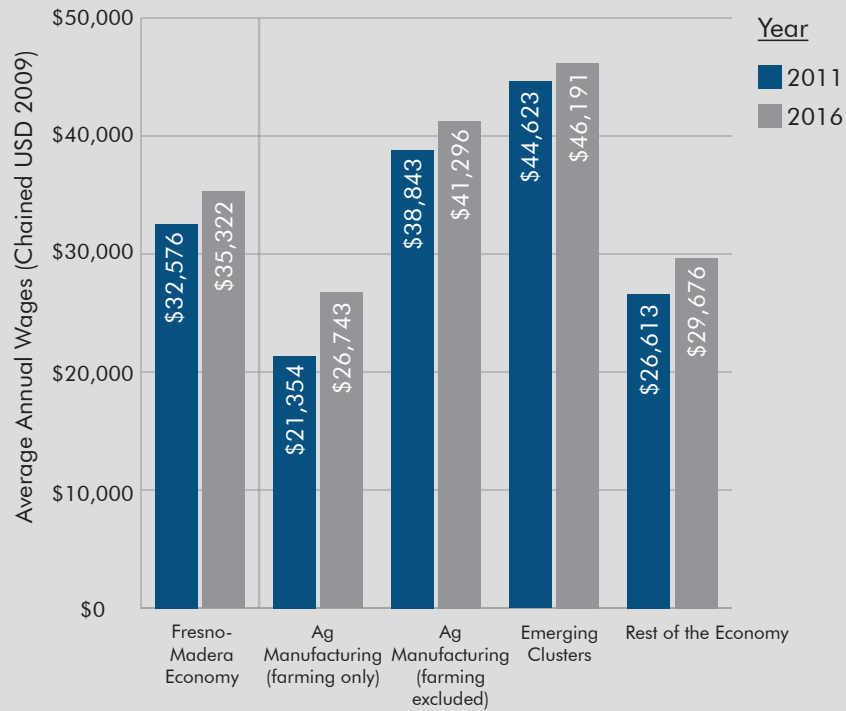
The Agricultural Manufacturing Cluster also covers segments of the economy with significant and growing incomes. In 2016, among the cluster's segments, advanced suppliers paid the most, with an average annual wage in excess of \$50,000.²⁰ Non-advanced suppliers had the second highest average annual wage at nearly \$40,000, followed by food processing's average annual wage of \$33,000. The average annual wage for farming was the lowest of the cluster, at over \$25,000. Nevertheless, farming's average annual wage grew by a CAAGR of 4.60 percent from 2011 to 2016, which is the largest of all cluster segments. This substantial real wage growth could be a reflection of the upgrade in the production processes via automation (Graph 3.6). Therefore, the following section will elaborate on the significance of advanced industries in the economy.

3.3 Advanced Industries in the Fresno-Madera MSA

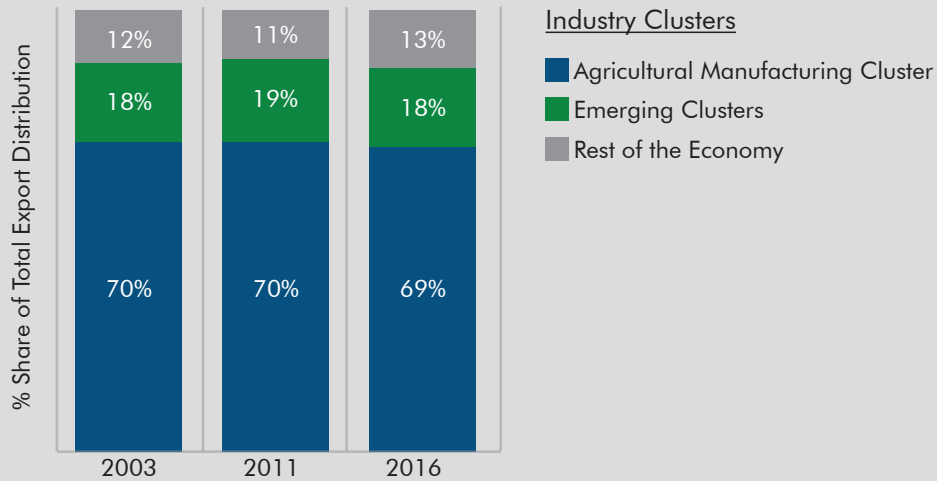
The advanced industries of the Fresno-Madera MSA signal the positioning of critical factors of production; skilled workforce and research and development.²¹ Industry clusters concentrate more than 90 percent of all advanced industry employment over time. For Fresno-Madera, the Agricultural Manufacturing Cluster has historically concentrated around 70 percent of all advanced industries' employment alone, while emerging clusters have shown a progressive increase of their employment shares within advanced industries (Graph 3.7).

Further development of advanced industries is an unmistakable area of economic opportunity for the Fresno-Madera. From 1990 to 2016, its advanced industry employment has had an overall share of total employment between 2.6 to over 3.1 percent. In contrast, advanced industry employment in California and the United States have represented a share of the economy of over 9 percent over time, with California outperforming the United States (Graph 3.8). Growing advanced industry employment in Fresno-Madera will increase the overall productivity of the region through technical advancement and a larger skilled workforce. This consequently will lead to sustained economic growth and greater incomes for the Fresno-Madera MSA.²²

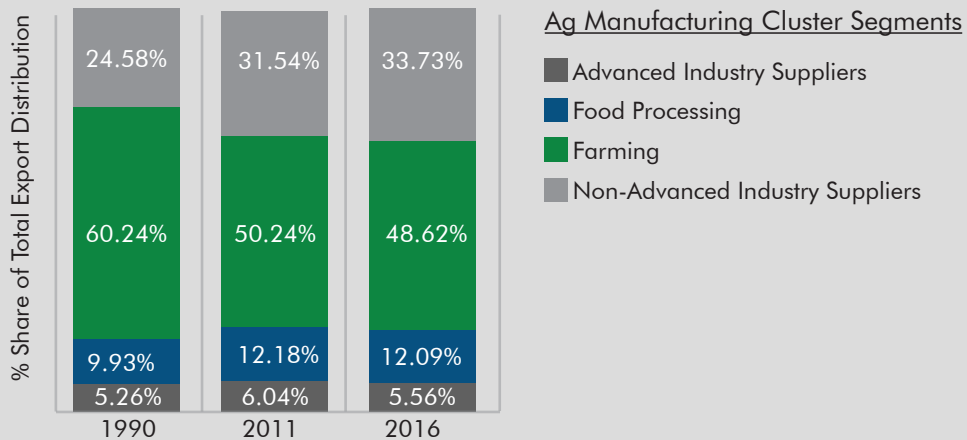
Graph 3.2. Real Annual Average Wage within Industry Clusters, Fresno-Madera MSA



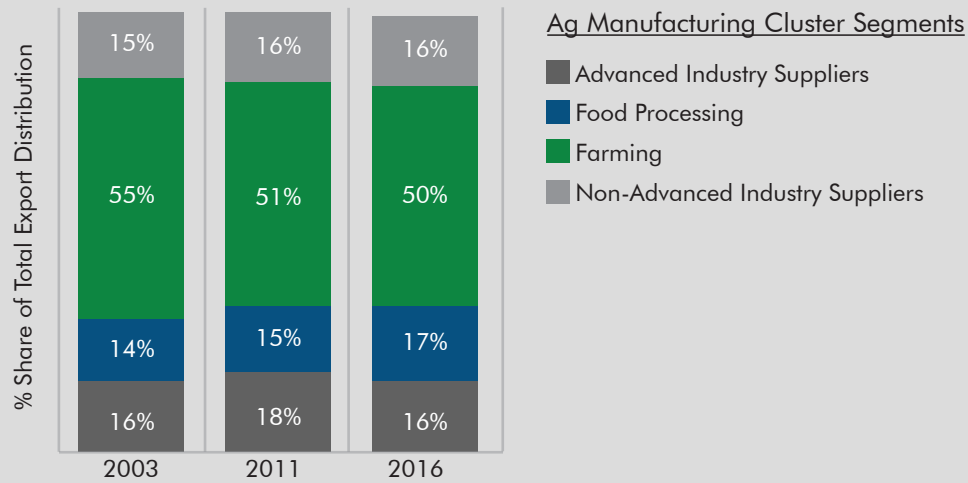
Graph 3.3. Total Export Distribution within Industry Clusters, Fresno-Madera MSA



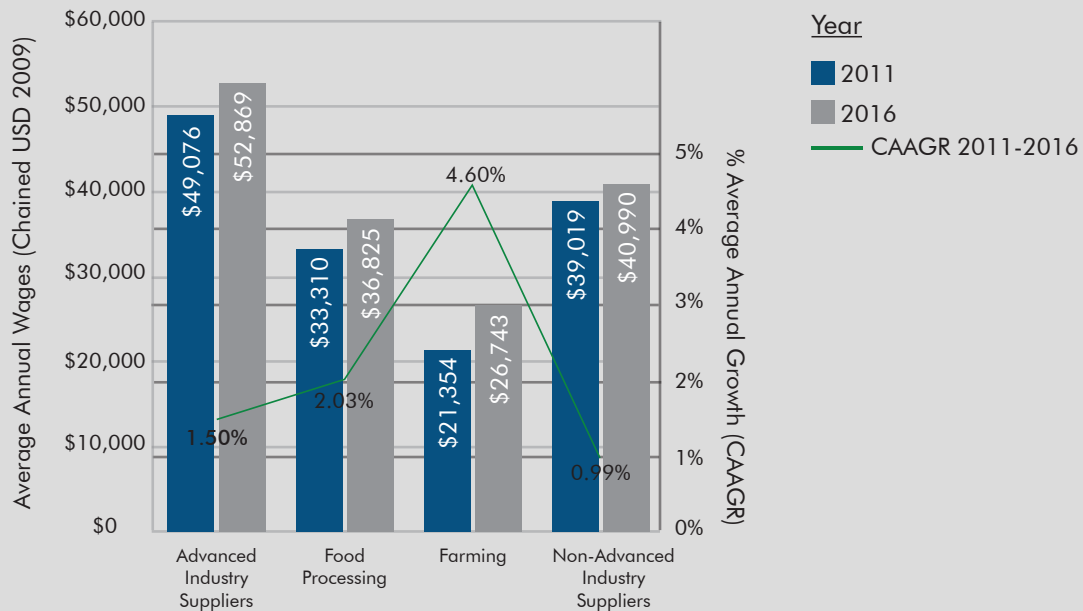
Graph 3.4. Agricultural Manufacturing Cluster Composition, (Employment Distribution Within the Traded Cluster), Fresno-Madera MSA



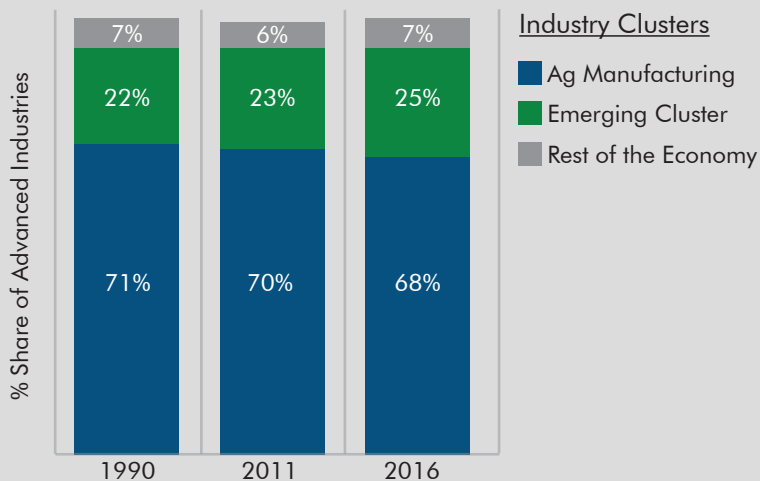
Graph 3.5. International Exports by Agricultural Manufacturing Segments, Fresno-Madera MSA



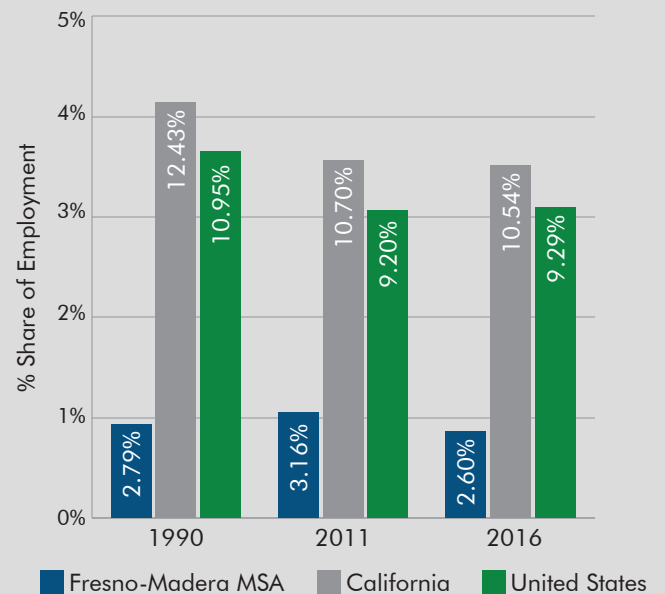
Graph 3.6. Real Average Wage Performance by Agricultural Manufacturing Segments, Fresno-Madera MSA



Graph 3.7. Advanced Industries Distribution, Fresno-Madera MSA



Graph 3.8. Advanced Industries Employment Share of Total Employment, Fresno-Madera MSA



Endnotes and References

18. Funded by the U.S. Department of Commerce, Economic Development Administration, The U.S. Cluster Mapping Project is led by Professor Michael E. Porter at the Institute for Strategy and Competitiveness, Harvard Business School.

19. Non-Advanced suppliers refers to the industries that are not intensive in high-skills and high-technologies.

20. Advanced suppliers refers to the industries that are intensive in high-skills and high-technologies.

21. Refer to, Muro, Mark et. al. (2016), "America's advanced industries: New trends," Advanced Industries Series, The Metropolitan Policy Program at the Brookings Institute. The article refers that advanced industries are strategic engines of economic growth and prosperity for local and national economies mainly because they concentrate the innovation and "technical skills" necessary to increase productivity, fundamental for higher firms' profit and competitiveness. This consequently leads to greater standards of living for local and national economies. Note: this analysis used the Advanced Industries definition of the Brookings Institute Initiative.

22. Ibid.

Graph Sources

Graph 3.0. Source: Fresno County EDC creation with the QCEW Databases (1990, 2011, and 2016) of the Bureau of Labor Statistics, level 4-NAICS, the Bureau of Labor Statistics' CPI-U-RS, U.S. City average, all items, seasonally adjusted, the "Snapshot Agricultural of the Manufacturing Ecosystem in the San Joaquin Valley", March 2014, The San Joaquin Valley Investing in Manufacturing Communities Partnership (IMCP), and the Delgado, M., M.E. Porter, and S. Stern (2014), "Defining Clusters of Related Industries," US Clusters Mapping of the U.S. EDA and the Harvard Business School

Graph 3.1. Ibid

Graph 3.2. Ibid

Graph 3.3. Ibid

Graph 3.4. Source: Fresno County EDC creation with the QCEW Databases (1990, 2011, and 2016) of the Bureau of Labor Statistics, level 4-NAICS, the "Snapshot Agricultural

of the Manufacturing Ecosystem in the San Joaquin Valley", March 2014, The San Joaquin Valley Investing in Manufacturing Communities Partnership (IMCP)

Graph 3.5. Ibid

Graph 3.6. Ibid

Graph 3.7. Source: Fresno County EDC creation with the QCEW Databases (1990, 2011, and 2016) of the Bureau of Labor Statistics, level 4-NAICS; Rothwell, Jonathan et.al., "America's Advanced Industries: What They Are, Where They Are, Why They Matter", January 2015, The Metropolitan Policy Program at the Brookings Institute

Graph 3.8. Ibid

Table Sources

Table 3.0. Source: Fresno County EDC creation with the QCEW Databases (2011 and 2016) of the Bureau of Labor Statistics, level 4-NAICS, the "Snapshot Agricultural of the Manufacturing Ecosystem in the San Joaquin Valley", March 2014, The San Joaquin Valley Investing in Manufacturing Communities Partnership (IMCP), and the Delgado, M., M.E. Porter, and S. Stern (2014), "Defining Clusters of Related Industries," US Clusters Mapping of the U.S. EDA and the Harvard Business School

Table 3.1. Source: Fresno County EDC creation with the QCEW Databases (2011 and 2016) of the Bureau of Labor Statistics, level 4-NAICS, the Bureau of Labor Statistics' CPI-U-RS, U.S. City average, all items, seasonally adjusted, the "Snapshot Agricultural of the Manufacturing Ecosystem in the San Joaquin Valley", March 2014, The San Joaquin Valley Investing in Manufacturing Communities Partnership (IMCP), and the Delgado, M., M.E. Porter, and S. Stern (2014), "Defining Clusters of Related Industries," US Clusters Mapping of the U.S. EDA and the Harvard Business School

Section 4

4. Enplanements and Critical Socioeconomic Indicators

Total Fresno-Yosemite International Airport (FYI) passenger enplanements have expanded at faster rates than the overall growth of Fresno-Madera's population. This can be observed by the ratio between total enplanements and the total population of Fresno-Madera from 2002 to 2016. While the region has generally grown at a faster rate than California, FYI's total enplanements have grown even faster and thus have increased its ratio relative to Fresno-Madera's population, the time period of the Great Recession notwithstanding ([Graph 4.0](#)). Are there any other socioeconomic factors influencing the growth of FYI's enplanements? This section details the general relationship between socioeconomic factors and the air passenger enplanement demand of the Fresno-Madera MSA. Specifically, it will illustrate how Fresno-Madera's growth in income and the share of Service Sectors impacts FYI's passenger enplanements at similar cumulative proportions than the growth in population.

To begin with, FYI's significant increase in its domestic enplanements - almost 1.4 times from 2002 to 2016--correlates with multiple socioeconomic indicators of the region: population, employment, and per capita income. These socioeconomic indicators generally show a relation in the direction of domestic enplanements over time. From 2002 to 2016, FYI domestic enplanements grew at a similar pace as employment and per capita income. Similarly, domestic enplanements experienced a decline when employment and per capita income declined, specifically during the Great Recession. Furthermore, though population has always experienced at least some growth from 2002 to 2016 in Fresno-Madera, its growth rates decelerated from pre-recession rates following the Great Recession. Likewise domestic enplanements also experienced decelerated growth rates compared to pre-recession levels. ([Graph 4.1](#)).

Similarly, FYI's average airfares show an overall inverse relation with domestic enplanements from 2002 to 2016. As airfare price growth has declined over time, domestic enplanements have increased. When airfares have increased, domestic enplanements have decreased. This trend is especially notable from 2007 to 2008 and from 2014 to 2015. The exception to this trend is during the Great Recession and in the immediate aftermath. During the Great Recession, both airfares and enplanements experienced declines and in the immediate aftermath of the recession from 2009 to 2010, both airfare and enplanements grew

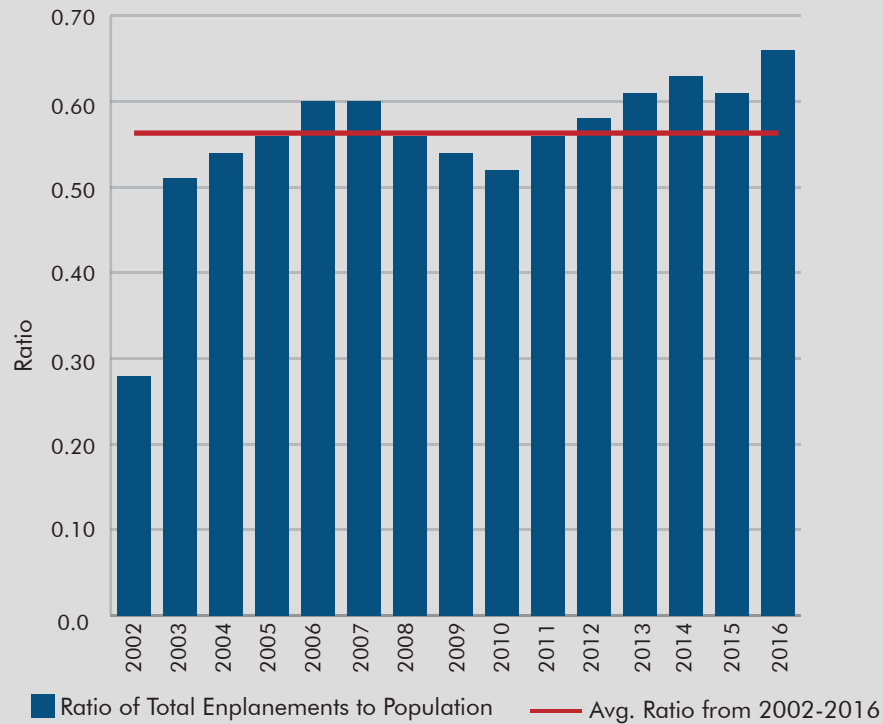
together ([Graph 4.1](#)). The next paragraph offers a more precise description on the strength of the relation of each of these socioeconomic factors with domestic enplanements at FYI.

Of the aforementioned socioeconomic factors, changes of population in Fresno-Madera demonstrate the strongest Pearson correlation coefficient with changes of total enplanements at FYI, while airfare shows the weakest correlation with total enplanements at FYI.²³ From 2002 to 2016, change in population had demonstrated a strong relationship with yearly growth rates, and the second strongest with absolute numbers ([Table 4.0](#)). Meanwhile, changes in employment have demonstrated strongest relationship with absolute numbers and weakest of all three factors in yearly growth rates. Income per capita demonstrates the third strongest relationship in absolute numbers, while it demonstrates the second highest (yet weak) relationship on yearly growth rates. Finally, airfares have demonstrated the weakest relationship with enplanements in both absolute numbers and yearly growth rates.

Previous studies do in fact support that population generally is the strongest socioeconomic predictor of air traffic, followed by income and Service sector employment. Based on an empirical study developed by Paulos Lawek , holding other factors constant, population is shown to have a proportional impact on total and domestic enplanements of 1:1.²⁴ A 1 percent growth in population relates with a 1 percent growth in total enplanements. A 1 percent growth in income correlates with 0.32 percent higher total enplanements. A 10 percent increase in the share of Service sector employment generally correlates with a 0.20 percent increase in enplanements. Then, Lawek's study implies that an economy's re-composition toward Service sectors positively impacts air-traffic demand. Additionally, Lawek points out that the significant impacts of wages and Service employment provide insight on how higher "white collar" employment in a local economy increases air traffic demand ([Table 4.1](#)). Following the Great Recession, total enplanements grew at FYI by a CAAGR of 4.4 percent from 2011 to 2016, while domestic enplanements grew by a CAAGR of 3.4 percent ([Table 4.2](#)). How is this growth explained through the effects of each of the socioeconomic factors outlined by Lawek?

Although population has the largest marginal impacts on total enplanements, income growth and Service economy also demonstrated a strongly similar impact on FYI's traffic

Graph 4.0. Ratio of Total Enplaned Passengers and Population, Fresno-Yosemite International Airport and Fresno-Madera MSA



Graph 4.1. Enplanements and Average Airfares for Fresno-Yosemite International Airport, Fresno-Madera MSA

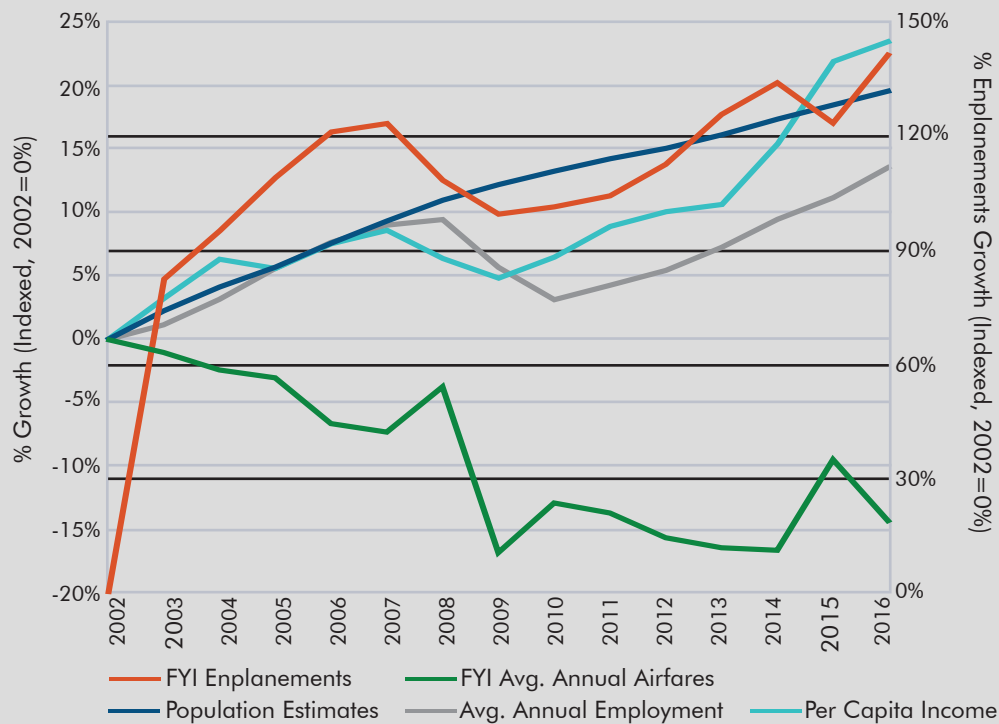


Table 4.0 Pearson Correlation Coefficient on the Historical Evolution of Domestic Enplanements and Critical Socioeconomic Indicators (2002-2016)

Indicators	Absolute Number	Yearly Growth Rate
Population	0.74	0.61
Airfares	-0.57	-0.05
Employment	0.78	0.16
Per capita income	0.69	0.26

demand from 2011 to 2016. Population grew by a CAAGR of 0.92 percent during this time, which is 21 percent and 27 percent of FYI's growth rate in total and domestic enplanements respectively. Then, given the proportional effects of population on air traffic, other factors must have accounted for the additional growth in FYI's air traffic demand. Here, income and Service Sectors add a similar impact as population. Assuming per capita income as wages, the 2.55 percent increase of income per capita in Fresno-Madera would relate to 0.82 percent of FYI's CAAGR on total passenger enplanements and 0.84 percent of the growth on domestic passenger enplanements. Additionally, the region's share of the Service economy grew by a CAAGR of 4.52 percent, which would related to 0.09 percent of FYI's domestic and total passenger enplanement growth. Thus, adding both income and Service Sector impacts, they had an overall annual effect of 0.91 percent and 0.93 percent on total and domestics passenger enplanements respectively from 2011 to 2016. This is virtually the same effect that Fresno-Madera's population growth had during this time period on Fresno-Yosemite International Airport's total and domestic passenger enplanements.

Considering all the data, Fresno-Madera's advancement in its competitive advantages does have a significant economic impact on air-traffic demand. These competitive advantages have upgraded Fresno-Madera MSA's regional economy which has allowed for higher incomes, larger Service Sectors, and a larger population. This consequently has fostered greater market demand for passenger enplanements at the Fresno-Yosemite International Airport. The next section closes this economic outlook by summarizing the progress and further areas of development on the competitive advantages of Fresno-Madera MSA's regional economy.

Graph 4.2. Visualization of the strength of the linear Pearson Correlation coefficient between variables

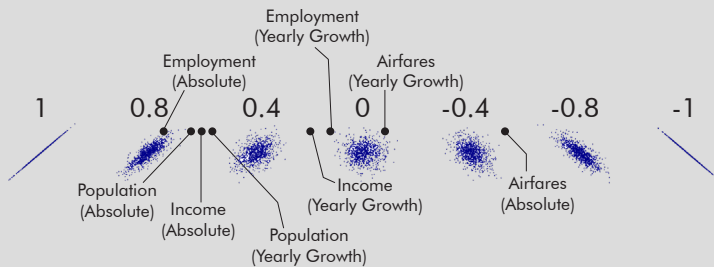


Table 4.1 Related Impacts of Socioeconomic Factors on Demand of Air Passenger Traffic

Paulos Ashebir Lakew (2015)'s Fixed Effects Models on Domestic and Total Enplanements		
Passengers	Total	Domestic
Constant	-6.2887	-6.5538
	(1.56)	(1.617)
Population	1.166***	1.1694***
	(3.988)	(3.979)
Service Economy	2.0218***	2.0315***
	(3.392)	(3.416)
Manufacture	0.5228	0.4588
	(0.6)	(0.527)
Wage	0.321**	0.3366**
	(2.297)	(2.426)
Unemployment Rate	-0.0039	-0.0054
	(0.662)	(0.922)
Young	-1.3526	-1.2195
	(0.445)	(0.401)
Old	1.2975	1.6754
	(0.545)	(0.705)
Fuel Price	-0.3519	-0.3108
	(1.104)	(1.242)
Adj. Rsq	0.994	0.9937
f-stat	4245.73	4050.41
(Prob)	0	0
Obs.	3955	3955

Absolute t-statistics in parentheses *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$. All other coefficients are not statistically significant. Linear regression tests show that Population coefficient of 1.17 is not statistically significant from 1.
Passengers, Population, Wage, and Fuel are in natural logs.

Table 4.2. Performance of Passenger Enplanements and Its Related Critical Socioeconomic Indicators (2011-2016)

Indicators	CAAGR 2011-2016
Domestic Enplanements	3.41%
Total Enplanements	4.40%
Ave. Annual Employment	1.73%
Real Per Capita Income (chained USD 2009)	2.55%
Population Estimates (All Ages)	0.92%
Service Employment Share of total Economy	4.52%

Endnotes and References

24. The Pearson correlation coefficient measures the strength of the linear relation between two variables.

25. Lakew, Paulos A (2015), "Airport Traffic and Metropolitan Economies: Determinants of Passenger and Cargo Traffic," Transportation Research Record: Journal of the Transportation Research Board, Volume 2471. Here, Lawek endogenously determines airfares in his model. Actually, using panel data, he uses the statistical instrument of fixed effects to hold constant uncaptured unique regional characteristics "...such as airport policies, facilities, transportation infrastructure, fuel supply and proximity to national boundaries ...proximity... to important business or leisure destinations." Such differences may affect airfares levels and air transport considerably (Pp. 14-15).

Table 4.2. Source: Fresno County EDC creation with data from the United States Department of Agriculture, Economic Research Service; the California Production Statistics Directories, and the Bureau of Labor Statistics' CPI-U-RS, U.S. City average, all items, seasonally adjusted

Graph Sources

Graph 4.0. Source: Fresno County EDC creation with data from California Department of Finance, Demographic Research Unit; the Bureau of Economic Analysis; the LAUS Database of the Bureau of Labor Statistics; the Bureau of Labor Statistics' CPI-U-RS, U.S. City average, all items, seasonally adjusted; and Bureau of Transportation Statistics T-100 Market data

Graph 4.1. Source: Fresno County EDC creation with data from California Department of Finance, Demographic Research Unit, and Bureau of Transportation Statistics T-100 Market data

Graph Sources

Table 4.0. Source: Fresno County EDC creation with data from California Department of Finance, Demographic Research Unit; the Bureau of Economic Analysis; the LAUS Database of the Bureau of Labor Statistics; the Bureau of Labor Statistics' CPI-U-RS, U.S. City average, all items, seasonally adjusted; and Bureau of Transportation Statistics T-100 Market data

Table 4.1. Source: Fresno County EDC creation with data from California Department of Finance, Demographic Research Unit; the Bureau of Economic Analysis; the LAUS Database of the Bureau of Labor Statistics; the QCEW Databases (2011 and 2016) of the Bureau of Labor Statistics, level 2-NAICS; the Bureau of Labor Statistics' CPI-U-RS, U.S. City average, all items, seasonally adjusted; and Bureau of Transportation Statistics T-100 Market data

Section 5

5. Conclusion

The development of the Fresno-Madera MSA's competitive advantages has strengthened the economic performance of its economy. In doing so, air traffic demand has been impacted through the retention and attraction of more residents who have found greater economic opportunities within the regional economy. Indeed, Fresno-Madera has become a larger, richer, and more diversified economy over the last two decades. Thus, as the Fresno-Madera keeps building on its competitive advantages, its economic performance should increase at even higher rates. Outlined below are the key findings of this analysis utilizing the Diamond model which details how the Fresno-Madera economy has progressively built on its competitive advantages.

Factor Input conditions

1. Fresno-Madera has expanded its employment base following the Great Recession.
2. The Fresno-Madera economy has progressively transitioned from a farming driven economy to a more diversified economy, mainly through the growth in the Service Sectors.
3. While farming employment in the regional economy has contracted, the nonfarm employment share of the Service Sectors has expanded the most by over 10 percent from 1990 to 2016. Additionally, during this time period, the Service Sector has consistently been among the fastest growing sectors of the regional economy.
4. Key Fresno-Madera sectors have increased their real average annual wage relative to the overall regional economy:
 - Other Goods Producing and Utilities, Trade, and Transportation grew both real wages and employment at faster rates than the overall Fresno-Madera economy. These Sectors also had real average wages higher than the overall regional economy in 2016.
 - Manufacturing grew its real average annual wage at faster rates than the overall regional economy, however, employment grew at a slower rate. This sector also had a higher annual average wage than the overall regional economy in 2016.
 - The Farming Sector had the highest wage growth among all sectors, which may be a signal of increased atomization within the sector. The farming workforce saw a decline in share of total employment and its average annual real wage

in 2016 was over \$10,000 below the region's average.

5. In 2030, Fresno-Madera's population is projected to have a larger share of young cohorts, ages 0-34, than California and the United States. This points toward a larger available workforce.
6. Fresno-Madera unemployment rate has steadily decreased from its peak levels following the Great Recession. Nevertheless, California and the United States have been decreasing unemployment at a faster rate than Fresno-Madera during this time period.
7. Fresno-Madera's international exports have had steady growth relative to the United States and California from 2003 to 2016.
8. Fresno-Madera has diversified its export base towards more promising traded services.
9. The Fresno-Madera economy has an opportunity to continue growing its advanced industries. Advanced industries would provide for a more skilled and productive workforce in the regional economy. Currently, over 90 percent of the region's advanced industries are part of the region's core or emerging industry clusters.

Demand Conditions

1. Fresno-Madera's population has steadily grown at faster rates than California and the United States, as well as has higher projected growth rates in 2020 and 2030.
2. Fresno-Madera has progressively increased its real income per capita. While its income per capita is still below that of California and the United States, Fresno-Madera has had a higher real per capital income growth than the United States in the aftermath of the Great Recession.
3. The regional economy has shifted toward specialized alternative industries from farming. Specialized industries were mostly concentrated within Service Sectors in 2016, whereas they were mostly concentrated within the Farming Sector in 1990.
4. Fresno-Madera has historically experienced higher growth rates in Services; Utilities, Trade, and Transportation; and in Other Goods Producing Sectors.

Firm Strategy, Structure, and Rivalry

1. Major employers (1,000+ employees) have increased their share of overall employment since 1990.
2. Public Administration has gradually concentrated most of the employment within major employers. Major employers within service sectors have steadily expanded

- over time, but at lower rates than Public Administration.
3. Over 60 percent of employment is concentrated within mid-size establishments in Fresno-Madera, while micro size and large establishments have experienced higher employment expansion rates than mid-size establishments since 2000.

Related and Supportive Industries

1. Industry clusters are the principal sources of income as well as the most productive segments of Fresno-Madera's economy:
 - Industry clusters have higher average wages than the overall regional economy and non-clustered industries.
 - 87 percent of all exports in 2016 were concentrated within industry clusters.
2. The Agricultural Manufacturing Cluster is the principal traded cluster of Fresno-Madera MSA's economy.
 - It accounted for 32 percent of total regional employment and 31 percent of total annual wages in 2016.
 - It accounted for 69 percent of total exports in 2016.
 - Its employment composition is moving from farming (48.6 percent in 2016) to advanced suppliers (5.6 percent in 2016), non-advanced suppliers (33.7 percent in 2016), and food processing industries (12.1 percent in 2016). All of these cluster "segments" have grown in their real annual average wages.
 - Its exports are progressively diversifying from farming to food processing (17 percent in 2016), advanced suppliers (16 percent in 2016), and non-advanced suppliers (16 percent in 2016).

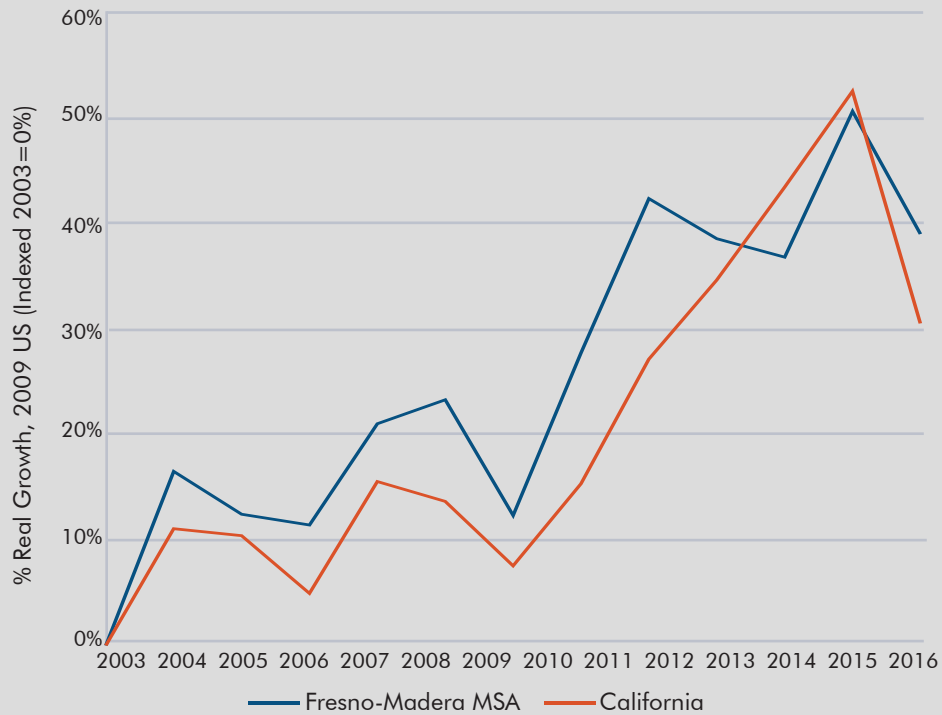
Appendix

Appendix Table 1.0. Notable Fresno County Opening & Expansion Announcements (2014-2018), Fresno County

	Company	Location	Type	Project Size (SF)	New Jobs	Investment \$	Industry
1.	Amazon (fulfillment center)	Fresno	New	855,000	2,000	\$200 million	Retail
2.	ULTA, Inc. (fulfillment center)	Fresno	New	670,000	542	\$110 million	Retail
3.	Horizon Nut	Firebaugh	New	400,000	300	\$20 million	Food Mfg
4.	OK Produce	Fresno	Expansion	314,915	100	-	Wholesale
5.	Bitwise Industries	Fresno	Expansion	300,000	-	\$30 million	Professional Services
6.	Harris Ranch Beef Company	Selma	New	281,000	35	\$10 million	Food Mfg
7.	IFCO Systems	Fresno	New	204,000	80	-	Manufacturing
8.	D&H Systems	Fresno	Expansion	200,000	40	\$9 million	Wholesale
9.	Pana-Pacific	Fresno	Expansion	150,000	100	\$8.3 million	Manufacturing
10.	Cargill	Fresno	Expansion	124,800	300	\$50 million	Food Mfg
11.	Scelzi Enterprises	Fresno	Expansion	80,000	100	\$4 million	Manufacturing
12.	JD Foods	Fresno	Expansion	65,000	144	\$10.5 million	Wholesale
13.	Brenntag Pacific	Fresno	Expansion	53,787	22	\$9 million	Manufacturing
14.	Quail-T-Ruck Services	Fresno	Expansion	50,000	5	\$2.8 million	Transportation
15.	Lightning Source	Fresno	New	50,000	25	-	Manufacturing
16.	Sacramento Container Corp	Kingsburg	Expansion	45,000	40	\$3.75 million	Manufacturing
17.	Caylym Technologies	Fresno	Expansion	41,000	53	\$3.5 million	Manufacturing
18.	Valley Industrial Products	Fresno	New	37,500	15	-	Manufacturing
19.	Maxco Packaging	Parlier	Expansion	36,000	-	\$1.3 million	Manufacturing
20.	Fiore Di Pasta	Fresno	Expansion	36,000	-	-	Food Mfg
21.	Baker Distributing	Fresno	New	24,450	10	-	Wholesale
22.	Alfa Laval, Inc	Fresno	New	22,965	28	-	Manufacturing
23.	Blueline Rental	Fresno	New	17,500	17	-	Rental/Leasing
24.	Alorica, Inc.	Fresno	Expansion	-	400	-	Supporting Business Svs
25.	Aetna Health of California	Fresno	Expansion	-	225	\$29.1 million	Finance and Insurance
26.	The Gap, Inc. (fulfillment center)	Fresno	Expansion	-	515	-	Retail
27.	Betts Company	Fresno	Expansion	-	53	\$7 million	Manufacturing
28.	Producers Dairy	Fresno	Expansion	-	50	-	Food Mfg
29.	Outback Materials	Fresno	Expansion	-	49	\$3.5 million	Manufacturing
30.	BCT Consulting	Fresno	Expansion	-	17	\$2.4 million	Professional Services

Source: Fresno County EDC

Appendix Graph 1.0. Evolution of Real Gross Value of Agricultural Production



Source: Fresno County EDC creation with data from the United States Department of Agriculture, Economic Research Service; the California Production Statistics Directories, and the Bureau of Labor Statistics, accessed on January, 2018.

Appendix Table 1.1. Historical Levels (in billion, USD 2009) and Real Growth of Gross Value of Agricultural Production

Region	1990	2010	2014	2015	CAAGR 1990-2015	CAAGR 2010-2015	Y-o-Y 2015-2015
Fresno-Madera MSA	\$5.73	\$7.17	\$8.46	\$7.81	1.24%	1.70%	-7.72%
California	\$30.71	\$40.19	\$53.16	\$45.49	1.58%	2.51%	-14.43%

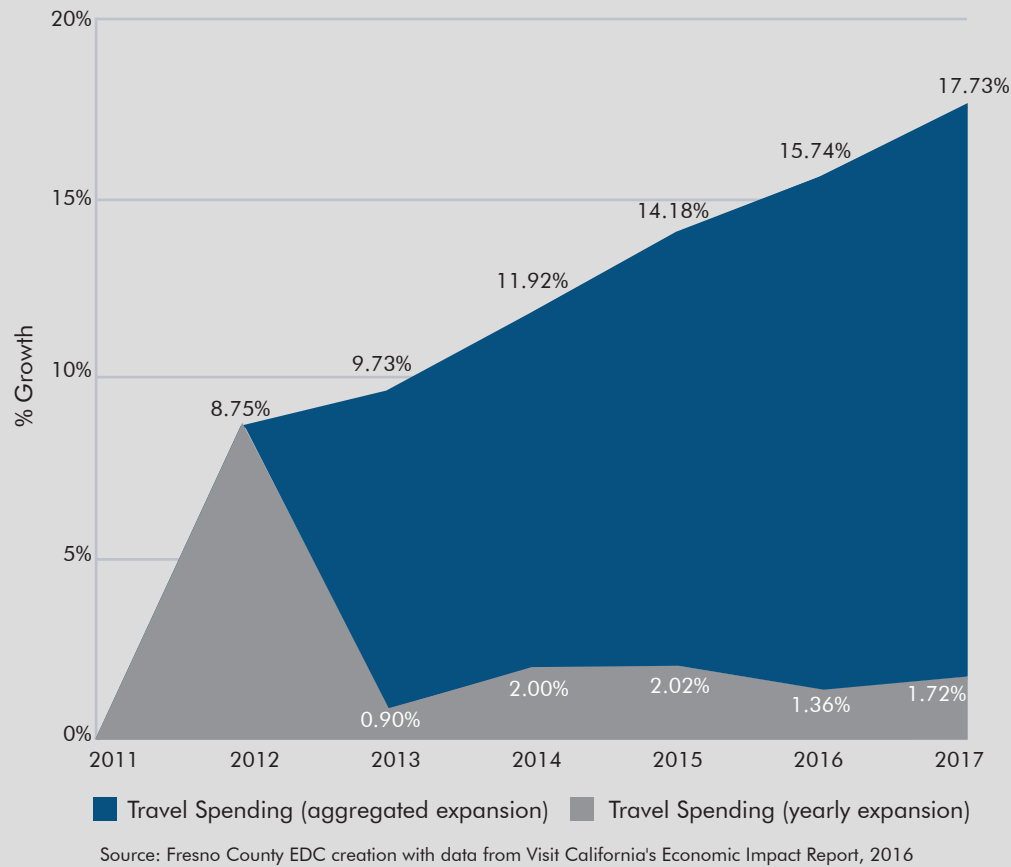
Source: Fresno County EDC creation with data from the United States Department of Agriculture, Economic Research Service; the California Production Statistics Directories, and the Bureau of Labor Statistics, accessed on January, 2018.

Appendix Table 1.2. Evolution of Annual Travel Spending (in million, USD 2017) and Performance (2012-2017)

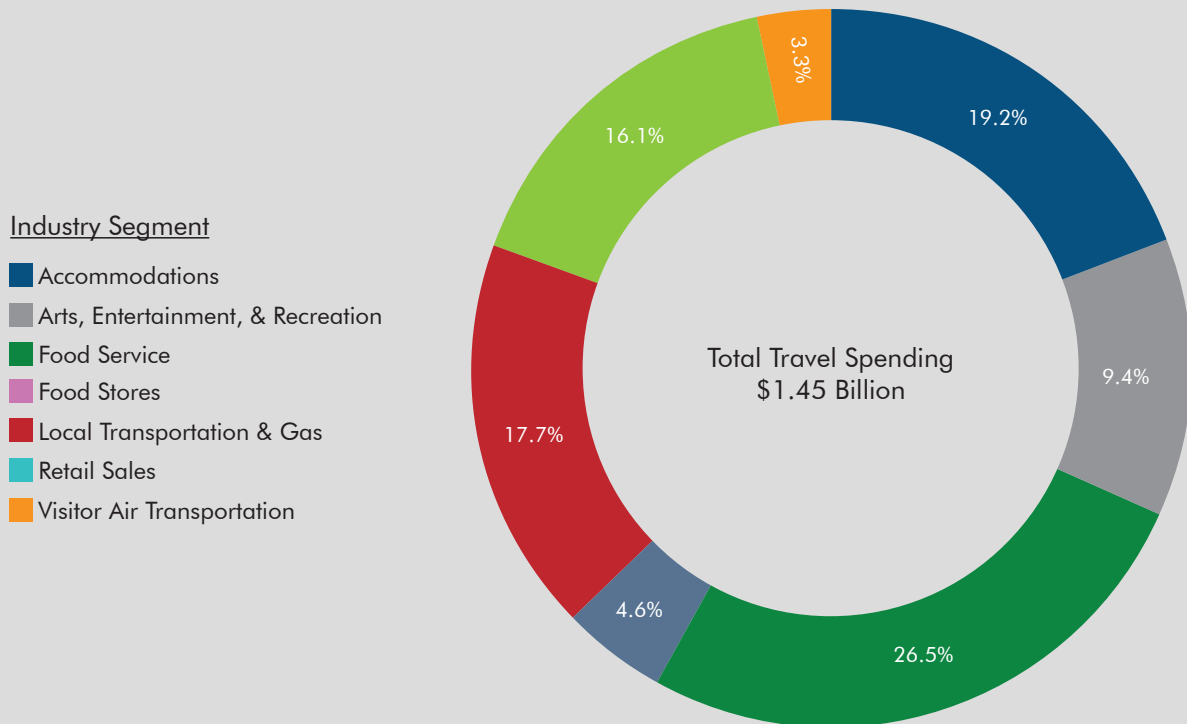
Region	2012	2017	CAAGR 2012-2017
Fresno-Madera MSA	\$1,572	\$1,702	1.24%

Source: Fresno County EDC creation with data from Visit California's Economic Impact Report, 2016

Appendix Graph 1.1. Travel Spending (2011-2017),
Fresno-Madera MSA



Appendix Graph 1.2. Percent Share of Spending from Travel, by Industry Segment (2016),
Fresno-Madera MSA



Source: Fresno County EDC creation with data from Visit California's Economic Impact Report, 2016



Downtown Fresno

About the Fresno County Economic Development Corporation

The Fresno County Economic Development Corporation is a private non-profit organization established to market Fresno County as the premier location for business prosperity. We strive to not only facilitate site selection for new businesses, but also assist in the retention and expansion of local businesses within Fresno County.

To learn more, visit www.fresnoedc.com

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