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December 30, 2016

The Honorable Ronald D. Kouchi,
President and Members
of the Senate
Twenty-Eighth State Legislature
State Capitol, Room 409
Honolulu, Hawaii 96813

The Honorable Joseph M. Souki,
Speaker and Members of the
House of Representatives
Twenty-Eighth State Legislature
State Capitol, Room 431
Honolulu, Hawaii 96813

Dear President Kouchi, Speaker Souki, and Members of the Legislature:

For your information and consideration, I am transmitting a copy of the report *Hawaii Targeted and Emerging Industries, 2016 Update Report*, as required by Section 201-19(b), Hawaii Revised Statutes. In accordance with Section 93-16, Hawaii Revised Statutes, I am also informing you that the report may be viewed electronically at: http://dbedt.hawaii.gov/overview/annual-reports-reports-to-the-legislature/

Sincerely,

Luis P. Salaveria

Enclosure

c: Legislative Reference Bureau

Report to the Hawaii State Legislature

Pursuant to Section 201-19(b), Hawaii Revised Statutes

Hawaii's Targeted & Emerging Industries

2016 Update Report

Department of Business, Economic Development and Tourism

December 2016

This publication is produced by the Research and Economic Analysis Division (READ) of the Department of Business, Economic Development & Tourism (DBEDT), State of Hawaii which is responsible for its content and presentation.

The DBEDT Research and Economic Analysis Division wishes to thank the many agencies stakeholders who have provided valuable input into the development of the Targeted Industry Portfolio and performance measurements.

Hawaii Department of Business, Economic Development & Tourism

December 2016

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EXECUTIVE SUMMARY

In late 2009 DBEDT Research compiled and published a performance review of Hawaii's targeted industry portfolio.[1] The portfolio consisted of several dozen economic activities that had been suggested, proposed or actively promoted over the past several decades as potential new growth industries. The purpose of the review was to better define those activities for measurement purposes and to find out which had performed best in recent years. Based on a review of regional economic methods, each activity was measured between 2002 and 2008 for both its contribution to job growth in Hawaii's economy and also how well the activity performed relative to its national counterpart.

The activities were grouped into four performance categories. *Base-growth* activities rated the highest on the basis of State and national performance and were more concentrated in Hawaii's economy than the nation overall. Industries in this category had developed a competitive national advantage and were probably exporting some proportion of industry output. *Emerging* activities also rated high on performance but had not reached a level of concentration that would as yet suggest a competitive advantage. *Transitioning* activities in the portfolio were showing growth in jobs over the measurement period (and in some cases impressive growth), but were outperformed by the same activity nationally, suggesting that Hawaii was not as competitive. Finally, *declining* activities lost jobs over the measurement period and, in most cases, were less competitive than their national counterpart. This update report extends the performance measures through the projected data for 2016. Table S-1 provides a comprehensive overview of performance among activities in the Targeted Industry Portfolio over the 2006 to 2016 period. In the body of this report the activities will be examined in detail by their major sector groups such as technology, creative industries, and others. Key observations from the updated examination of the portfolio are:

- Sixteen activities were high performing, with positive job growth combined with a job growth rate that was higher than the nation for the same activity. Among those were Cultural Activities, Fishing, Forestry & Hunting, Apparel, Music, Alternative Power Generation, Farm Production, Agriculture Processing, Specialty Health Care Services, Film, TV, Video Production/Distribution, Art Education, Higher Education, Hospitals & Nursing Facilities, Technical Consulting Services, Business Consulting, Agriculture Support Services, and Agriculture Inputs.
- The high-performing activities in the targeted industry portfolio (Base-growth and Emerging) accounted for about 83,054 jobs or 9.6% of all civilian jobs in 2016. However, between 2006 and 2016 those activities generated 27.1% of the total gain in jobs for the civilian economy or about 18,800 new jobs.
- Among the best performing activities, Alternative Power Generation, Cultural Activities, and Specialty Health Care Services grew jobs over 5% per year during the 2006 to 2016 period.
- Adjusting for overlaps, total targeted jobs reached 160,488 jobs in 2016, an increase of 22,324 jobs from 2006.

[1] *Benchmarking Hawaii's Emerging Industries,* DBEDT, December 2009, http://dbedt.hawaii.gov/economic/reports_studies/emerging-industries/

TABLE S-1. OVERALL PERFORMANCE OF THE TARGETED INDUSTRY PORTFOLIO

INDUSTRY GROUPS	JOBS IN HAWAII		AVG. ANN. JOB GROWTH (2006-2016P)		CONCENTRATION OF INDUSTRY IN HAWAII COMPARED TO U.S.		AVG ANNUAL EARNINGS (2016P)	
	2016P	CHANGE 2006-2016P	HAWAII	U.S.	2016P	% Point CHNG 2006-2016P	HAWAII	U.S.
TOTAL CIVILIAN JOBS	867,947	69,427	0.8%	0.9%	100%	0%	$51,541	$55,531
TOTAL TARGETED JOBS WITHOUT OVERLAP	160,488	22,324	1.5%	1.6%	81%	0%	$55,277	$67,782
Base-Growth Activities								
Cultural Activities	3,573	1,977	8.4%	2.8%	392%	163%	$45,549	$52,548
Fishing, Forestry & Hunting	1,887	190	1.1%	0.5%	344%	21%	$32,249	$35,800
Apparel	1,546	304	2.2%	-1.9%	180%	61%	$21,515	$37,958
Music	1,484	391	3.1%	2.2%	163%	16%	$42,988	$38,546
Alternative Power Generation	312	223	13.4%	-4.2%	102%	84%	$109,040	$158,376
Emerging Activities								
Farm Production	13,906	1,324	1.0%	0.6%	95%	4%	$29,433	$30,440
Agric. Processing	7,285	784	1.1%	0.9%	95%	3%	$48,543	$58,264
Specialty Health Care Services	11,378	4,450	5.1%	5.1%	91%	1%	$48,202	$42,405
Film, TV, Video Production/Distrib	1,494	138	1.0%	0.5%	78%	4%	$67,222	$99,858
Art Education	924	324	4.4%	3.5%	78%	8%	$8,867	$10,673
Higher Education	6,468	1,909	3.6%	2.0%	70%	11%	$30,472	$53,501
Hospitals & Nursing Facilities	21,100	3,213	1.7%	1.1%	69%	4%	$81,047	$65,331
Technical Consulting Services	4,634	1,566	4.2%	4.0%	63%	2%	$53,312	$77,778
Business Consulting	5,050	1,541	3.7%	3.3%	59%	3%	$54,032	$78,628
Agric. Support Services	1,532	385	2.9%	2.0%	59%	6%	$44,592	$51,666
Agric. Inputs	483	100	2.3%	0.4%	43%	8%	$63,998	$68,966
Transitioning Activities								
Design Services	2,146	254	1.3%	1.3%	97%	1%	$25,622	$38,993
Engineering and Related Serv.	6,144	194	0.3%	0.5%	84%	0%	$92,004	$92,459
Specialty Education	5,917	1,770	3.6%	3.8%	93%	0%	$21,165	$24,446
Marketing, Photography & Related	12,076	1,957	1.8%	2.2%	96%	-2%	$23,015	$48,174
Engineering and Research & Development	5,444	182	0.3%	0.8%	73%	-3%	$96,831	$110,833
Health Practitioners	23,507	3,688	1.7%	2.3%	96%	-4%	$79,545	$80,014
Medical Labs, Diagnostic and Imaging Centers*	1,866	227	1.3%	2.3%	142%	-13%	$59,733	$72,560
Computer Sys. Design & Related	6,715	294	0.4%	3.6%	60%	-21%	$80,873	$106,903
Computer Services and Software Publishers	5,168	331	0.7%	4.0%	44%	-17%	$85,184	$115,913
Declining Activities								
Performing and Creative Arts	8,984	-189	-0.2%	1.9%	115%	-25%	$17,728	$27,095
Pharmacies	3,546	-238	-0.6%	0.2%	107%	-8%	$46,608	$48,134
Other Technology Mfg	440	-30	-0.7%	-0.2%	7%	0%	$56,367	$110,529
Information & Telecom Tech.	5,487	-384	-0.7%	0.9%	62%	-10%	$87,681	$117,323
Radio and Television Broadcasting	1,217	-140	-1.1%	-0.3%	99%	-6%	$66,539	$82,467
Architecture	1,923	-260	-1.3%	-0.9%	128%	-4%	$82,261	$70,398
R&D Services (exc. Biotech.)	1,473	-203	-1.3%	1.0%	59%	-15%	$93,043	$130,142
Technology Equipment Distr.	688	-113	-1.5%	-0.6%	29%	-3%	$106,292	$118,610
Biotechnology	483	-135	-2.4%	1.8%	62%	-31%	$81,373	$177,678
Chemical & Pharmaceutical Mfg	96	-31	-2.7%	0.1%	5%	-1%	$81,048	$139,624
Agric. Packaging & Warehsg	273	-114	-3.4%	0.9%	31%	-17%	$55,833	$52,032
Publishing & Information	2,004	-1,152	-4.4%	-1.3%	56%	-20%	$55,406	$105,875
Call Centers	270	-203	-5.4%	3.3%	11%	-15%	$23,759	$38,533

Source: DBEDT based on data from Economic Modeling Specialists, Inc. (EMSI). Estimates for 2016 are based on early 2016 data from EMSI ("P" designates projection). The sum of the individual industries does not add up to the total due to adjusting for overlaps among sectors.
*The 1,866 jobs in this industry were allocated to both the Technology and Health and Wellness Sector.

- About 40% of the high-performing activities had average annual earnings that exceeded $53,300 in 2016. Alternative Power Generation had the highest average earnings at $109,040. By comparison, the average earnings for the civilian economy in 2016 was $51,541 based on the projected 2016 estimate.
- Nine activities, which accounted for about 68,983 jobs in 2016, fell into the Transitioning category. They gained jobs over the period but did not keep up with national growth for the same activities resulting in a loss of competitive national industry share. However, five of these activities - Specialty Education, Marketing, Photography & Related, Health Practitioners, Medical Labs, Diagnostic and Imaging Centers, and Design Services - grew faster in terms of jobs than the civilian economy as a whole.
- The positive side of the Transitioning activities in the portfolio was that they did contribute to job growth in the economy. They were also an important source of high paying jobs. About 68% of jobs in Transitioning category had average earnings over $79,000 in 2016. However, the concern is that these activities are not as competitive compared with the same activities at the national level.
- Thirteen activities in the portfolio fell into the Declining industry category as the result of net job losses for the 2006 to 2016 period. Notable among these were Publishing & Information, Information & Telecom Technology, Architecture, Pharmacies, R&D Services (except Biotech.), Call Centers, and Performing and Creative Arts.
- Except for Call Centers, Performing and Creative Arts, Biotechnology, R&D Services (exc. Biotech.), Information & Telecom Technology, Agriculture Packaging & Warehousing, Pharmacies, and Chemical & Pharmaceutical Manufacturing the Declining activities also lost jobs at the U.S. level, suggesting that there were some national forces influencing the declines. However, the competitive measures show that the losses were generally more severe for Hawaii than the nation.
- Jobs in the Declining industry group totaled an estimated 26,885 in 2016 (3.1% of all civilian jobs), representing a loss of about 3,191 jobs from 2006. About 52.4% of the jobs in the Declining industry group had above average earnings in Hawaii.
- Declining industries are not necessarily dying activities. In some cases, like Publishing & Information activity, the technology for developing and delivering information is improving rapidly, thereby reducing the need for workers. In these cases the declining activities may stabilize at some point and resume some growth as the economy expands. Finally, some Declining activities may be tied to other activities like tourism or defense and may be reflecting the cycle of those industries.

It is important to note that the measures and classifications used in the targeted industry portfolio are descriptive but not diagnostic. That is, the measures alone do not reveal why the industries performed as they did. They also do not reveal the role of these activities in the economy. It is not clear if the high performing industries are growing independently or are feeding off growth of other activities. It is also not clear which industries are devoting their output primarily to export as opposed to local consumption markets, although the measures of concentration help identify probable export candidates. The purpose of this performance assessment is to help economic developers and policy makers understand which targeted industries are achieving the expected potential and which are not.

INTRODUCTION

In 2009, DBEDT Research reviewed the range of economic activities that have been suggested over the years as candidates for diversifying the State's economy. These activities have been labeled variously as *emerging, targeted and growth* industries. The activities ranged from technology specialties, to diversified agriculture and have been pursued by various stakeholders including state and local governments, business groups and community-based organizations.

The report of that review sought to improve the definition of the various activities that had been targeted for promotion in a way that would permit their performance to be measured. The result of the review was the construction of a targeted industry portfolio of around three dozen activities, and performance measures for 2002 to 2008. This is the seventh report that updates the review of targeted industry performance at the state level for 2016 (projected data). In this study, the targeted industry performance at the county level are also examined.

Defining Targeted Industries

Act 148 (2007) directed DBEDT to identify and measure systematically the performance of *emerging* industries in Hawaii's economy. For the first report in 2009, more than a dozen major studies, reports and efforts were reviewed to construct a list of sectors, industries and activities that have been of interest over the last several decades. The activities were then defined for measurement purposes and criteria were established to identify those that could justifiably be called *emerging* industries.

For the purpose of this report, the term "targeted" simply means that at some point in the past an activity was of interest for its potential contribution to growth and diversification by agencies, organizations or stakeholders. These ranged from activities that had simply been suggested as having potential, to industries that had been actively pursued with public resources for their growth potential, like Biotechnology and the Film/TV industry.

Even if it appeared that an activity was no longer of significant development interest it still was included in the portfolio. The portfolio was made broadly inclusive and detailed so that many specific activities could be assessed for their contribution to economic growth and diversification over the years. Some industries in the portfolio will show exceptional performance and others will show relatively poor performance over the periods measured. This range permits us to focus on weaknesses in the portfolio as well as strengths.

The Targeted Industry Portfolio

Table 1 lists the industries of the portfolio. The portfolio industries have also been grouped into major areas of interest such as Technology, Creative and Agribusiness. A detailed description of each portfolio industry was presented in the 2009 report and readers are referred to that report for more detail. For most of these industry groups, definitions for measurement purposes have been adopted from previous studies, particularly for the technology sector, the creative sector, and health and wellness. Activities included in each sector are not necessarily mutually exclusive to each other. For example, a moderate overlap exists between the creative and technology sectors because of their mutually dependent relationship. The Medical Labs, Diagnostic and Imaging Centers group is included in both the Technology sector and the Health & Wellness sector.

TABLE 1. TARGETED INDUSTRY PORTFOLIO

TECHNOLOGY SECTOR	AGRIBUSINESS
Alternative Power Generation	Agric. Inputs
Biotechnology	Agric. Packaging & Warehsg
Chemical & Pharmaceutical Mfg	Agric. Processing
Computer Sys. Design & Related	Agric. Support Services
Engineering and Related Serv.	Farm Production
Information & Telecom Tech.	Fishing, Forestry & Hunting
Medical Labs, Diagnostic and Imaging Centers	**HEALTH & WELLNESS**
Other Technology Mfg	Health Practitioners
R&D Services (exc. Biotech.)	Hospitals & Nursing Facilities
Technical Consulting Services	Medical Labs, Diagnostic and Imaging Centers
Technology Equipment Distr.	Pharmacies
CREATIVE SECTOR	Specialty Health Care Services
Art Education	**EDUCATION (PRIVATE)**
Architecture	Higher Education
Business Consulting	Specialty Education
Computer Services and Software Publishers	**OTHER TARGETS**
Cultural Activities	Apparel
Design Services	Call Centers
Engineering and Research & Development	
Film, TV, Video Production/Distrib	
Marketing, Photography & Related	
Music	
Performing and Creative Arts	
Publishing & Information	
Radio and Television Broadcasting	

Measuring Targeted Industries

In this updated report, the industry groups of the targeted industry portfolio are presented by the major sectors shown in Table 1. The performance measures are the same as those developed for the 2009 report. However they are presented in a slightly different way that will, hopefully, be more clear and intuitive to readers unfamiliar with economic performance measures.

One of the key performance measures is the change of jobs over time. While most industries show some decline in a recession, we would expect promising industries to show a net increase in jobs over the entire business cycle. The rate of job growth for each portfolio activity, relative to the rest of the state, has important implications for diversifying the state's economy. Activities that grow faster than the overall state economy would help increase economic diversification.

Another performance measure is Hawaii's competitiveness and concentration of activities compared to the nation overall. If the respective activity is growing faster in Hawaii than the nation, this suggests that the state has a competitive advantage in this activity. Also, if the activity has a greater employment concentration in the state than the nation (as measured by the percentage of total jobs), it is likely an activity in which Hawaii has a competitive advantage. A higher concentration (as measured by the percentage of total jobs) also suggests that the activity has matured to the point that it is likely exporting a portion of its output directly or indirectly.

The average earnings for workers in each activity were examined. Higher earnings generally come from high quality jobs. A relatively higher earnings average suggests that the activity is creating high quality jobs that can help keep Hawaii's well educated youth in the state.

By combining these performance measures, we attempt to group the portfolio activities into four performance categories as in Table 2. A popular framework in the economic development research is the industry life cycle model. This model breaks down industries in the economy into four generalized stages. The first stage of the life cycle is usually called the emerging stage of an industry. This characterizes relatively new and fast growing activities that are usually serving new markets inside or outside the local economy. The second stage identifies base-growth industries that have passed through the emerging stage and have become strong, competitive sources of economic growth in the economy. As base-growth industries mature, they reach their full market potential and growth slows. This represents the transition stage. A majority are relatively healthy, but have slowed and have become less competitive over time. Declining industries lose jobs over time and shrink as a proportion of the economy. If the industry is unable to reinvent itself with new products and markets, it will continue to wither and fade away.

Not all industries or their evolution will fit nicely into the model, especially over short periods of time. Some industries may emerge but never rise to the level moving from weakly emerging to the transitioning or declining state, or move back and forth among the different stages over a period of time. Likewise, an industry that has slowed from a base-growth to a transitioning industry may have a revival and move back to base growth status. In the short-term, business cycle fluctuations impact the forward and backward movements of the industry life cycle. However, in the long-term, the model should provide a fairly accurate picture of the performance of industries

TABLE 2. PERFORMANCE MAP CRITERIA (INDUSTRY LIFE CYCLE)

Emerging Activities		***Base-Growth Activities***
Positive job growth Increasing competitive national market share (outperforming the same activity nationally) Lower concentration in Hawaii than nationally	→	Positive job growth Increasing competitive national market share (outperforming the same activity nationally) Higher concentration in Hawaii than nationally
		↓
Declining Activities		***Transitioning Activities***
Losing jobs over period	←	Positive job growth Losing competitive national market share

Data Sources

Jobs and earnings reported in this report include wage and salary positions and estimates for self-employed and proprietors. The data were obtained via a subscription to the data bases of Economic Modeling Specialists, Inc. (EMSI). EMSI uses data from Bureau of Labor Statistics, Bureau of Economic Analysis and others to construct very detailed industry data series regarding jobs, occupations and earnings for the states and counties.

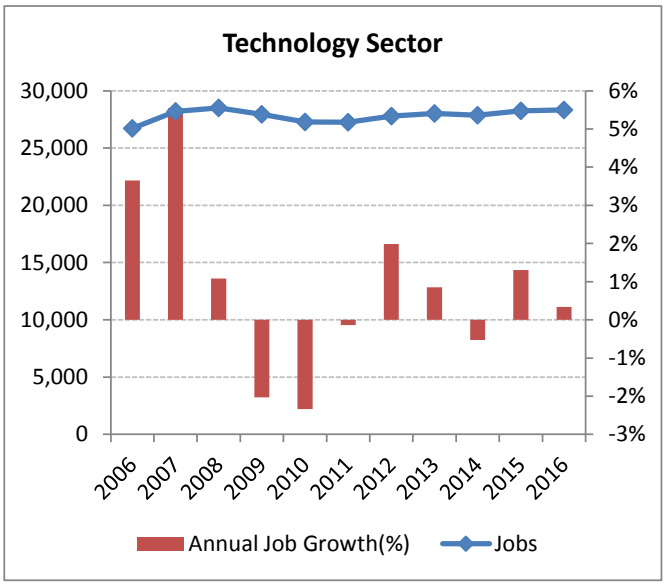
TECHNOLOGY SECTOR

A joint project in 2008 between DBEDT, the Hawaii Science and Technology Association (HiSciTech) and other stakeholders, updated the definition of the technology sector for Hawaii and established baseline measurements.[2] The project adopted a definition for technology established by the U.S. Bureau of Labor Statistics (BLS).[3] The BLS approach classifies industries as being in the technology sector based on the proportion of highly trained technical workers in the industries.

This update report followed the earlier definition with a few adjustments that were necessary due to changes in new NAICS coding system. The earlier definition excluded wireless telecom services from the technology sector, because the services could not meet the BLS criteria to be in the Technology sector. Wired services, however, are no longer reported separately from other telecom services since the 2012 revision in NAICS. Facing the increased competition with new telecom services, many wired carriers chose to close or reduce the traditional wired services in order to expand services with more market potential. As a result, a variety of services are often served by a single carrier and the change in the 2012 NAICS was a reflection of these market trends. This update report adjusted the earlier definition by applying the BLS approach to new NAICS codes.

Size & Growth

With the adjustments described above, the technology sector accounted for 28,838 jobs in 2016, or 3.3% of all civilian jobs in Hawaii including self-employed and sole proprietors. For the 2006 to 2016 period, the technology sector had an annual average 0.6% gain in jobs, 0.2 of a percentage point lower than the average annual growth for the civilian economy.



The 2016 projected estimate shows that the technology sector added 96 jobs or 0.3% in 2016 from 2015. Technical Consulting Services added 127 jobs, followed by Computer System Design and Related (117 jobs). The major categories with job losses in 2016 were R&D Services excluding Biotechnology (lost 70 jobs) and Biotechnology (lost 37 jobs).

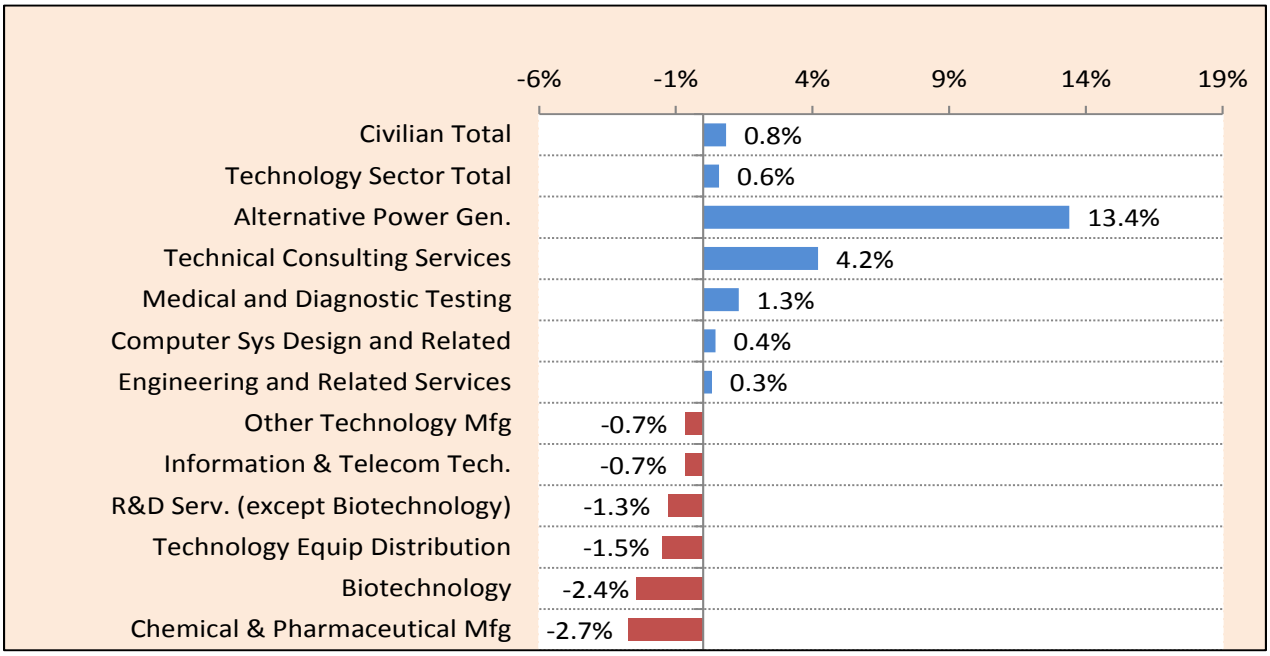
For the 2006 to 2016 period, Alternative Power Generation had the strongest job growth among the technology industry groups. Other high-performing activities in the technology sector were Technical Consulting Services and Medical and Diagnostic Testing.

The six technology industry groups that lost jobs during the 2006 to 2016 period were Chemical & Pharmaceutical Manufacturing, Biotechnology, Technology Equipment Distribution, R&D Services, Information & Telecom Technology, and Other Technology Manufacturing.

[2] Hawaii Science & Technology Institute, *Innovation and Technology in Hawaii: An Economic and Workforce Profile*, October 2008.

[3] As yet there is no official or universally agreed upon definition for the technology sector.

TABLE 3. JOBS[1] IN TECHNOLOGY SECTOR, AVERAGE ANNUAL GROWTH OVER 2006-2016



	Annual Job Growth				Jobs in 2016p
	2006-2016p	2006-2008	2008-2011	2011-2016p	
Civilian Total	0.8%	1.0%	-1.0%	1.9%	867,947
Technology Sector Total	0.6%	3.3%	-1.5%	0.8%	28,338
Alternative Power Gen.	13.4%	35.3%	-5.6%	17.9%	312
Technical Consulting Services	4.2%	13.1%	0.9%	2.8%	4,634
Medical and Diagnostic Testing	1.3%	2.4%	0.5%	1.4%	1,866
Computer Sys Design and Related	0.4%	0.4%	-0.8%	1.3%	6,715
Engineering and Related Services	0.3%	2.3%	-1.4%	0.6%	6,144
Other Technology Mfg	-0.7%	10.3%	4.3%	-7.5%	440
Information & Telecom Tech.	-0.7%	-1.8%	-4.6%	2.2%	5,487
R&D Serv. (except Biotechnology)	-1.3%	12.4%	-3.7%	-4.9%	1,473
Technology Equip Distribution	-1.5%	4.1%	-3.7%	-2.4%	688
Biotechnology	-2.4%	7.0%	-0.8%	-6.9%	483
Chemical & Pharmaceutical Mfg	-2.7%	-13.9%	12.7%	-6.5%	96

[1]Includes wage & salary, sole proprietors & self-employed.

Source: DBEDT based on data from Economic Modeling Specialists, Inc. (EMSI). "P" designates "projection for 2016 based on early 2016 actual data and EMSI estimates.

Competitive Metrics

The sixth column of Table 4 shows the difference in percentage points between job growth in Hawaii and the U.S. for the technology sector industry groups. Overall, Hawaii's technology sector grew jobs slightly less than the same activities for the nation.

Except for Medical and Diagnostic Testing, most fast growing activities in the technology sector outperformed their national counterparts during the 2006-2016 period. Among these, Alternative Power Generation had the most significant gains, at 17.6 percentage points above the nation.

TABLE 4. HAWAII TECHNOLOGY SECTOR PERFORMANCE COMPARED WITH NATION

	Jobs (2016p)	Jobs per Estabs (2016p)	Avg. Annual Earnings (2016p)	Avg. Ann. Job Growth 2006-2016p	Avg. Ann. Job Growth above or below U.S.	When U.S.=100% Concentration[1]	When U.S.=100% Jobs per Estabs	When U.S.=100% Avg. Ann. Earning
Total Civilian	867,947	19.4	51,541	0.8%	-0.1%	100%	98%	93%
TECHNOLOGY SECTOR	**28,338**	**12.5**	**79,894**	**0.6%**	**-0.9%**	**57%**	**83%**	**75%**
Alternative Power Generation	312	9.2	109,040	13.4%	17.6%	102%	20%	69%
Technical Consulting Services	4,634	18.8	53,312	4.2%	0.2%	63%	197%	69%
Medical and Diagnostic Testing	1,866	16.7	59,733	1.3%	-1.0%	142%	115%	82%
Computer Sys. Design & Related	6,715	12.4	80,873	0.4%	-3.1%	60%	125%	76%
Engineering and Related Serv.	6,144	10.9	92,004	0.3%	-0.1%	84%	77%	100%
Other Technology Mfg	440	17.7	56,367	-0.7%	-0.4%	7%	36%	51%
Information & Telecom Tech.	5,487	11.4	87,681	-0.7%	-1.6%	62%	47%	75%
R&D Services (exc. Biotech.)	1,473	10.7	93,043	-1.3%	-2.3%	59%	39%	71%
Technology Equipment Distr.	688	9.4	106,292	-1.5%	-0.9%	29%	66%	90%
Biotechnology	483	12.3	81,373	-2.4%	-4.2%	62%	55%	46%
Chemical & Pharmaceutical Mfg	96	12.3	81,048	-2.7%	-2.8%	5%	18%	58%

1. Proportion of jobs in the activity in Hawaii compared to the proportion nationally

Source: see Table 3 for data source.

Although they had positive job growth over the 2006 to 2016 period, Computer System Design & Related Services and Engineering & Related Services all lost competitive ground to their national counterparts. It is important to note these were all large groups with over 6,000 jobs.

Chemical & Pharmaceutical Manufacturing, Biotechnology, Technology Equipment Distribution, R&D Services, Information & Telecom Technology, and Other Technology Manufacturing jobs declined in Hawaii during the 2006-2016 period. Although Technology Equipment Distribution jobs also declined in the nation, the decline in Hawaii was higher. Three forces may have influenced the negative job growth in the Information Technology group. First, the inclusion of wired telecom service, an activity with declining demand, could be a lag for overall job growth this category. Second, productivity gains in information technology may have reduced the labor required to produce the same output of services. Third, in recent years there has been a consolidation of internet services, especially web hosting, into fewer providers that serve national markets. It is difficult for local internet services to compete with the economies of scale of these large internet service companies.

In terms of concentration, most of Hawaii's technology industry groups are still a relatively small percentage of Hawaii's total economy, compared with the technology industry groups at the national level. In 2016, Hawaii's proportion of the state's workforce in technology was 57% of the proportion nationally. One noteworthy exception was Medical and Diagnostic Testing, which was 42% more concentrated in Hawaii than the nation overall.

The average earnings in Hawaii's technology sector was relatively high, at $79,894 in 2016. As a group, it was 55% higher than the average for Hawaii's economy. Average earnings of the eleven technology industry groups all exceeded the average for Hawaii's economy. However, workers in most of the Hawaii technology sector groups were not paid as much as the U.S. average for the same activities. The average earnings in Hawaii's technology sector, as a whole, was only 75% of the average earnings paid nationally. The largest earnings gaps between Hawaii and the U.S. were found in Biotechnology, Other Technology Manufacturing, Chemical & Pharmaceutical Manufacturing, Alternative Power Generation, and Technical Consulting Services.

Overall Performance

By combining the growth and competitive measures, the technology industry groups can be placed in several performance categories as shown earlier in Table 2.

Two technology industry groups were in the high performing Base-Growth and Emerging categories by showing positive growth and also outperforming their national counterpart. These two industry groups were Alternative Power Generation and Technical Consulting Services. The only difference between the Base-Growth and Emerging categories is their level of concentration in the state's economy. Base-Growth industry groups have reached or exceeded national concentrations, while the Emerging industry groups have yet to reach national concentration levels. Beyond that, both categories showed positive and competitive growth in jobs.

Three groups in the technology sector were in the Transitioning category for the 2006 to 2016 period. Including the two big activities in the technology sector – Computer System Design & Related Services and Engineering & Related Services. While job growth was positive in these industry groups, they still lost some competitive shares to the national industry groups.

Chemical & Pharmaceutical Manufacturing, Biotechnology, Technology Equipment Distribution, R&D Services, Information & Telecom Technology, and Other Technology Manufacturing fell into the Declining category for 2006 to 2016 due to job losses during the period. These groups also lost more jobs proportionately than the same activity nationally, resulting in the loss of competitive share to the U.S. economy.

Emerging Activities	**Base-Growth Activities**
Technical Consulting Services	Alternative Power Generation
Declining Activities	**Transitioning Activities**
Other Technology Mfg	Engineering and Related Serv.
Information & Telecom Tech.	Medical and Diagnostic Testing
R&D Services (exc. Biotech.)	Computer Sys. Design & Related
Technology Equipment Distr.	
Biotechnology	
Chemical & Pharmaceutical Mfg	

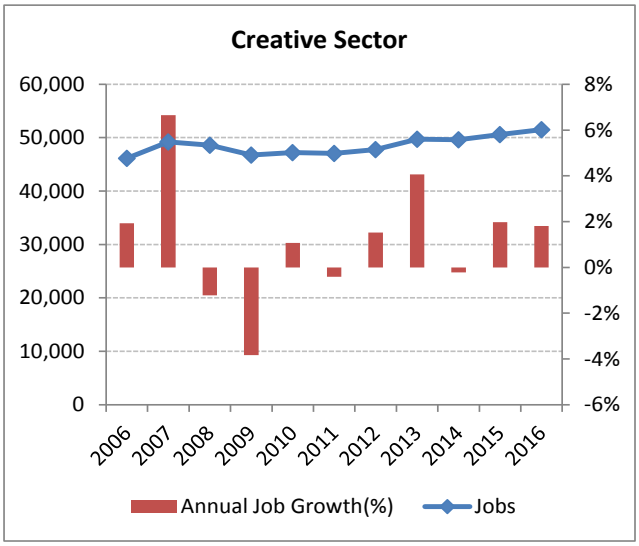
CREATIVE SECTOR

In 2010, the DBEDT Research Division and Creative Industries divisions collaborated on an update of data and industry definitions for the Creative Sector, based on a review of models nationally.[4] The report expanded the scope of creative activity beyond the previous focal areas of arts and culture. The new definition added a number of industries such as Computer and Digital Media, Engineering/R&D, Marketing, and Design, among others. The purpose was to better reflect the integration of art, technology and other creative activities.

Size & Growth

The thirteen creative industry groups accounted for an estimated 51,485 jobs in 2016, about 5.9% of all civilian jobs in Hawaii. Marketing, Photograph & Related and Performing and Creative Arts were the two largest groups in the sector, together the two groups accounted for about 40.9% of jobs in the sector in 2016.

As a group, the creative sector job growth was higher than the state civilian economy over the 2006 to 2016 period at 1.1% per year. It grew jobs faster than Hawaii's civilian economy during the 2006 to 2007 expansion phase. However, the growth rate of the creative sector from 2008 to 2016 was similar to that of the state civilian economy.



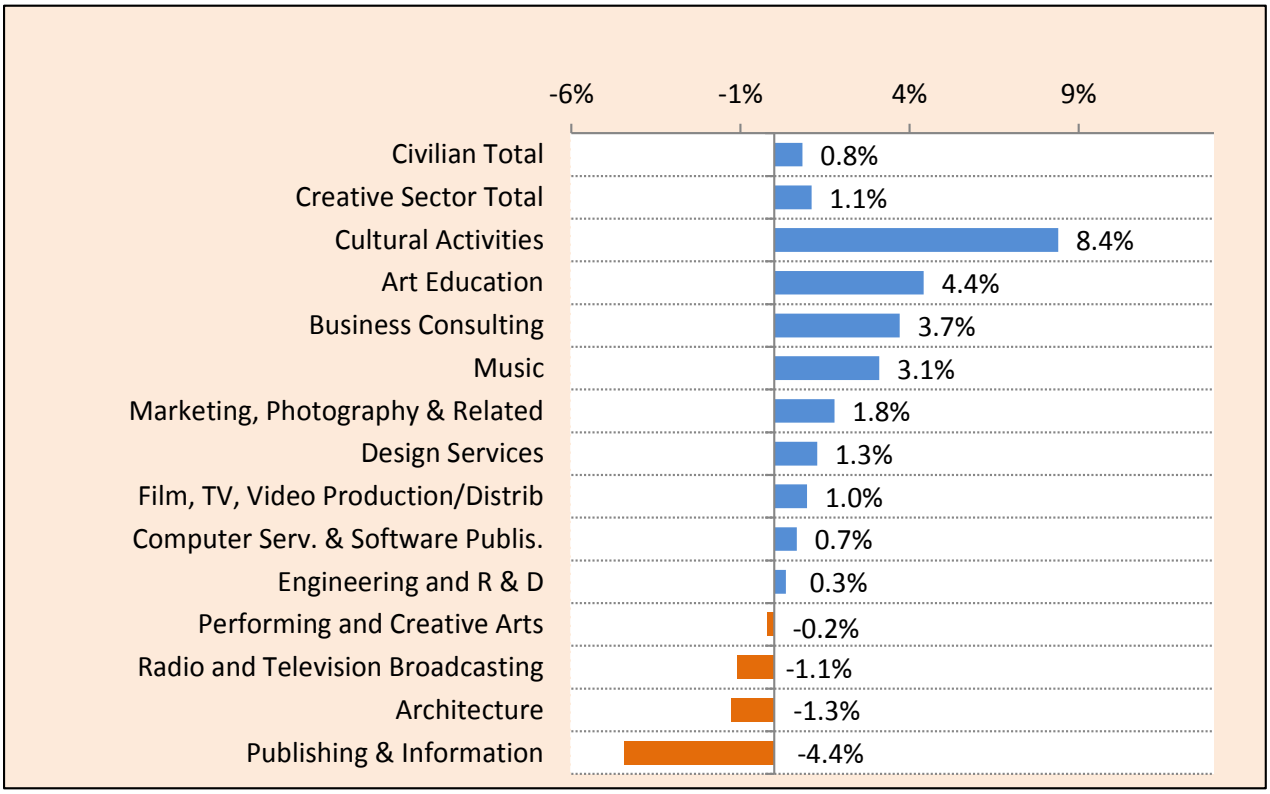
Cultural Activities grew jobs the most over the 2006 to 2016 period, 8.4% per year on average. Most job growth in Cultural Activities was achieved in the Museum category. Jobs in this category increased from 723 in 2006 to 2,176 in 2016. Art Education showed the second highest job growth with a 4.4% average annual increase in jobs for the period.

Film/TV Production varied widely depending on the number of productions filmed during the year. With many new productions filmed in Hawaii in late 2010, the number of 2010 jobs more than doubled from the 2009 level. However, during the overall 2010 to 2016 period, the number of jobs in Film/TV Production decreased from 2,638 jobs to 1,494 jobs.

Four groups in the sector, Performing and Creative Arts, Architecture, Radio/TV Broadcasting, and Publishing & Information failed to gain jobs over the 2006 to 2016 period. These groups experienced a sharp decline in jobs during the contraction period. With the closing of the Honolulu Advertiser in 2010, jobs in Publishing & Information decreased from 3,205 in 2007 to 2,004 in 2016.

[4] DBEDT, *Hawaii's Creative Industries: Update Report 2010*, June 2010. http://dbedt.hawaii.gov/economic/reports_studies/hawaii-creative-report/

TABLE 5. JOBS IN CREATIVE SECTOR: AVERAGE ANNUAL GROWTH OVER 2006-2016



	Annual Job Growth				Jobs in
	2006-2016p	2006-2008	2008-2011	2011-2016p	2016p
Civilian Total	0.8%	1.0%	-1.0%	1.9%	867,947
Creative Sector Total	1.1%	2.6%	-1.1%	1.8%	51,485
Cultural Activities	8.4%	3.3%	18.0%	5.0%	3,573
Art Education	4.4%	3.0%	-1.7%	8.9%	924
Business Consulting	3.7%	12.2%	2.0%	1.5%	5,050
Music	3.1%	2.8%	-3.1%	7.2%	1,484
Marketing, Photography & Related	1.8%	1.7%	-0.4%	3.1%	12,076
Design Services	1.3%	3.6%	-3.1%	3.1%	2,146
Film, TV, Video Production/Distrib	1.0%	2.6%	3.9%	-1.4%	1,494
Computer Serv. & Software Publis.	0.7%	-0.6%	-1.9%	2.8%	5,168
Engineering and R & D	0.3%	5.2%	-0.5%	-1.0%	5,444
Performing and Creative Arts	-0.2%	1.7%	-3.1%	0.8%	8,984
Radio and Television Broadcasting	-1.1%	1.2%	-5.9%	1.0%	1,217
Architecture	-1.3%	3.0%	-6.3%	0.2%	1,923
Publishing & Information	-4.4%	-3.1%	-9.8%	-1.6%	2,004

Source: see Table 3 for data source ("P" designates projection)

Competitive Metrics

Five of the thirteen groups in the creative sector outperformed their national counterparts for the 2006 to 2016 period. In addition to Cultural Activities that had the highest growth, Art Education, Music, Film, TV, Video Production/Distribution, and Business Consulting also outperformed their national counterpart during the period.

A number of creative industry groups have levels of concentration in the state's economy that exceed the nation as a whole. Cultural Activities are almost four times as concentrated in Hawaii. Music, Performing and Creative Arts, and Architecture also exceed national concentrations. In contrast, most business and technology oriented activities in the sector, such as Business Consulting, Computer Services and Software Publishers, and Publishing & Information show a much lower concentration in Hawaii than the same industries nationally.

With an average annual earnings of $46,959 in 2016, the activities in the creative sector were making a little less than the average for the overall Hawaii economy. Compared with the same activities nationally, the average earnings in Hawaii were only 62% of the national average. The lower earnings in Hawaii were found in both business and technology-oriented and artistic-oriented activities in the sector. Among the thirteen activities in the creative sector, only workers in Architecture and Music were paid higher in Hawaii than the nation overall. The activities that showed significant earnings gaps between Hawaii and the U.S. include Marketing/Photography & Related, Publishing & Information, Performing and Creative Arts, Design Services, Film, TV, Video Production/Distribution, Business Consulting, and Computer Services & Software Publishers.

TABLE 6. HAWAII'S CREATIVE SECTOR – PERFORMANCE COMPARED WITH THE NATION

				Avg. Ann. Job Growth		When U.S.=100%		
	Jobs (2016p)	Jobs per Estabs (2016p)	Avg. Annual Earnings (2016p)	2006-2016p	above or below U.S.	Concentration[1]	Jobs per Estabs	Avg. Ann. Earning
Total Civilian	867,947	19.4	51,541	0.8%	-0.1%	100%	98%	93%
CREATIVE SECTOR	**51,485**	**21.3**	**46,959**	**1.1%**	**-0.9%**	**84%**	**143%**	**62%**
Cultural Activities	3,573	22.0	45,549	8.4%	5.5%	392%	149%	87%
Art Education	924	112.8	8,867	4.4%	1.0%	78%	547%	83%
Business Consulting	5,050	18.5	54,032	3.7%	0.4%	59%	200%	69%
Music	1,484	23.3	42,988	3.1%	1.0%	163%	145%	112%
Marketing, Photography & Related	12,076	43.5	23,015	1.8%	-0.4%	96%	228%	48%
Design Services	2,146	39.0	25,622	1.3%	0.0%	97%	302%	66%
Film, TV, Video Production/Distrib	1,494	14.9	67,222	1.0%	0.5%	78%	84%	67%
Computer Services and Software Publishers	5,168	11.7	85,184	0.7%	-3.4%	44%	110%	73%
Engineering and Research & Development	5,444	10.3	96,831	0.3%	-0.5%	73%	58%	87%
Performing and Creative Arts	8,984	56.4	17,728	-0.2%	-2.1%	115%	155%	65%
Radio and Television Broadcasting	1,217	15.0	66,539	-1.1%	-0.7%	99%	47%	81%
Architecture	1,923	12.2	82,261	-1.3%	-0.4%	128%	109%	117%
Publishing & Information	2,004	18.0	55,406	-4.4%	-3.1%	56%	93%	52%

1. Proportion of jobs in the activity in Hawaii compared to the proportion nationally

Source: see Table 3 for data source.

Overall Performance

Based on the performance metrics above, the creative industry groups were placed into the performance categories as below. Five groups, Cultural Activities, Music, Film, TV, Video Production/Distribution, Art Education, and Business Consulting were rated as high performing for growth and competitiveness, compared with the same activities nationally.

Four other groups – Design Services, Marketing, Photography & Related, Engineering and R&D, and Computer Services & Software Publishers - grew jobs over the period but came up short competitively, compared with the performance of the same industry group nationally over the 2006 to 2016 period.

Performing and Creative Arts, Radio/TV Broadcasting, Architecture, and Publishing & Information were in the lowest performance group. All lost jobs over the 2006 to 2016 period.

Emerging Activities	**Base-Growth Activities**
Film, TV, Video Production/Distrib	Cultural Activities
Art Education	Music
Business Consulting	
Declining Activities	**Transitioning Activities**
Performing and Creative Arts	Design Services
Radio and Television Broadcasting	Marketing, Photography & Related
Architecture	Engineering and Research & Development
Publishing & Information	Computer Services and Software Publishers

AGRIBUSINESS

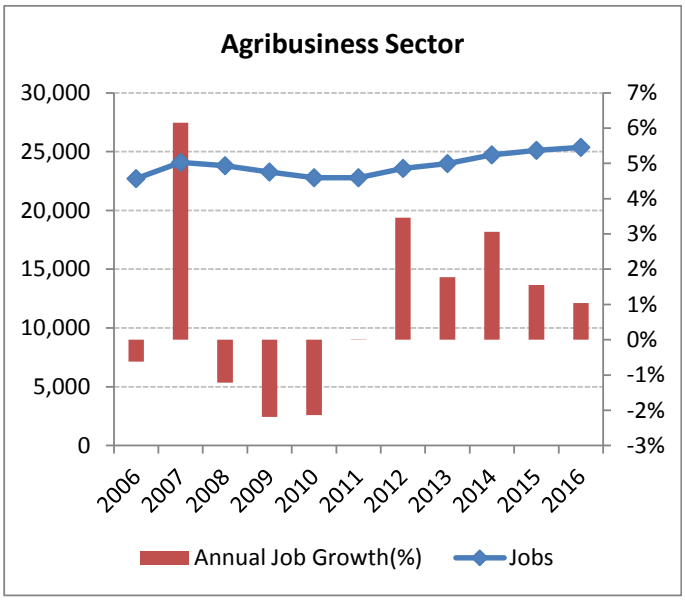
In 2016, the 25,366 jobs in Agribusiness were found in a range of inter-related industry groups that support the core farm sector. Most of the agribusiness jobs, including self-employed, are in actual farm production (55%). The second largest industry group in the sector was Agricultural Processing at 29% of the sector's jobs.

A breakdown of employment for the Farm Production by individual crop and livestock activities, that includes self-employed and proprietors, is not available. However, agricultural values show that seed crops, primarily corn seed research and development, were the largest component in terms of value at 41.4% in 2010 (latest data available).[5] This production value of seed corn was more than double of its value in 2006. Hawaii's two other major agricultural products, sugarcane and coffee, accounted for 11.7% and 5.6% respectively of the total value of agriculture production in 2010. It is important to note that, due to lags in data releases, the sugarcane figures do not include the recent closures.

Size & Growth

The agribusiness sector as a whole achieved positive job growth over the 2006 to 2016 period. Although one of the six Agribusiness industry groups lost jobs over the period, job gains among five other groups exceeded the losses.

The largest activity in the agribusiness sector was Farm Production. Although it lost some jobs during the recession, Farm Production maintained moderate job growth throughout the 2006 to 2016 period. Prior to 2007, Farm Production was a declining sector for an extended period of time; and then in 2007, the sector increased jobs by over 8.7% over the previous year. From 2007 to 2016, jobs in this group were relatively stable.



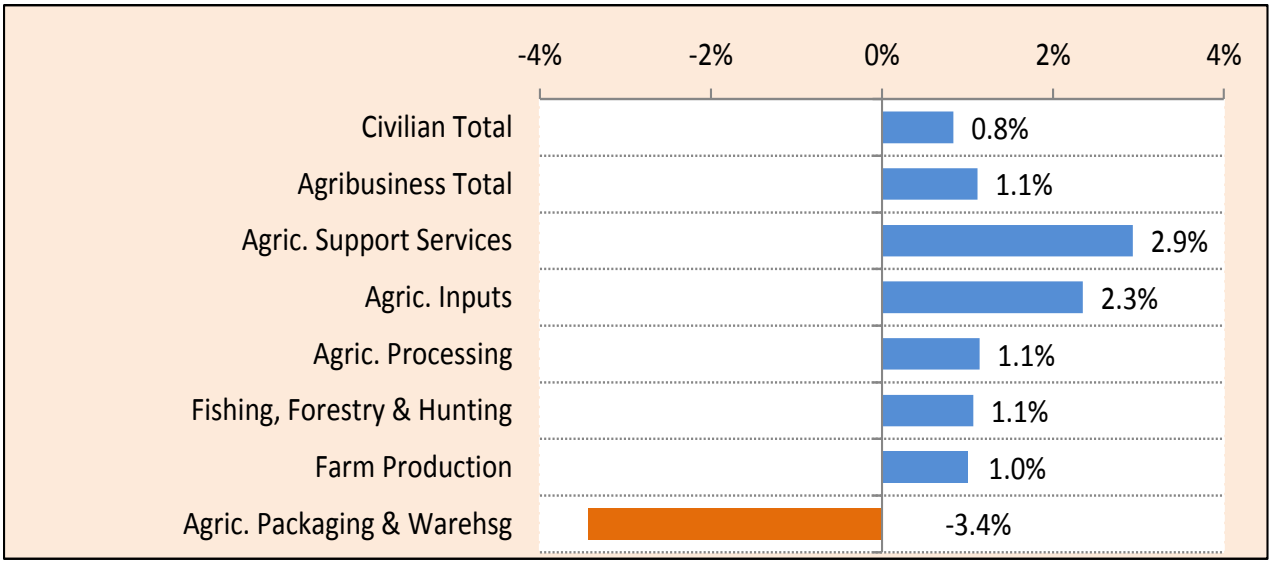
The best performing agribusiness industry group over the 2006 to 2016 cycle was the Agricultural Support Services, with a 2.9% average annual increase in jobs.

Other high-performing groups in agribusiness, during the 2006 to 2016 period, were Agricultural Inputs, Agricultural Processing, Fishing & Forestry/Hunting, and Farm Production. Job growth in these groups averaged 2.3%, 1.1%, 1.1%, and 1.0% per year, respectively, over this period.

Agricultural Packaging & Warehousing lost jobs over the 2006 to 2016 period. During the same period, job growth in this group averaged a negative 3.4% per year.

[5] Source: U.S. Department of Agriculture, National Agricultural Statistical Service. The most recent data may be found at http://www.nass.usda.gov/Statistics_by_State/Hawaii/Publications/Annual_Statistical_Bulletin/index.asp

TABLE 7. JOBS IN AGRIBUSINESS SECTOR: AVERAGE ANNUAL GROWTH OVER 2006-2016



	Annual Job Growth				Jobs in
	2006-2016p	2006-2008	2008-2011	2011-2016p	2016p
Civilian Total	0.8%	1.0%	-1.0%	1.9%	867,947
Agribusiness Total	1.1%	2.4%	-1.4%	2.2%	25,366
Agric. Support Services	2.9%	7.5%	-0.8%	3.4%	1,532
Agric. Inputs	2.3%	5.3%	-1.1%	3.3%	483
Agric. Processing	1.1%	-0.2%	-1.9%	3.6%	7,285
Fishing, Forestry & Hunting	1.1%	0.1%	-2.8%	3.9%	1,887
Farm Production	1.0%	3.8%	-0.9%	1.1%	13,906
Agric. Packaging & Warehsg	-3.4%	-6.9%	-10.8%	2.8%	273

Source: see Table 3 for data source ("P" designates projected estimate)

Competitive Metrics

Competitive metrics show that the comparable U.S. agricultural sector also experienced a slight job gain over the 2006 to 2016 period.

All of the five groups that gained jobs over the 2006 to 2016 period outperformed the same activities in the nation. Among these, Agricultural Inputs gained jobs at 2.3% annually, while its national counterpart gained 0.4% annually. Agricultural Support Services, Fishing, Forestry & Hunting, Farm Production, and Agricultural Processing outperformed the same activities for the nation overall by 1.0%, 0.5%, 0.4%, and 0.2% per year, respectively. Only Agricultural Packaging & Warehousing lost jobs over the period.

TABLE 8. HAWAII AGRIBUSINESS SECTOR PERFORMANCE COMPARED WITH NATION

	Jobs (2016p)	Jobs per Estabs (2016p)	Avg. Annual Earnings (2016p)	Avg. Ann. Job Growth		When U.S.=100%		
				2006-2016p	above or below U.S.	Concen-tration[1]	Jobs per Estabs	Avg. Ann. Earning
Total Civilian	867,947	19.4	51,541	0.8%	-0.1%	100%	98%	93%
AGRIBUSINESS	**25,366**	**27.0**	**36,988**	**1.1%**	**0.3%**	**92%**	**81%**	**87%**
Agric. Support Services	1,532	22.4	44,592	2.9%	1.0%	59%	162%	86%
Agric. Inputs	483	15.6	63,998	2.3%	2.0%	43%	101%	93%
Agric. Processing	7,285	20.6	48,543	1.1%	0.2%	95%	39%	83%
Fishing, Forestry & Hunting	1,887	31.0	32,249	1.1%	0.5%	344%	89%	90%
Farm Production	13,906	34.0	29,433	1.0%	0.4%	95%	87%	97%
Agric. Packaging & Warehsg	273	17.9	55,833	-3.4%	-4.3%	31%	46%	107%

1. Proportion of jobs in the activity in Hawaii compared to the proportion nationally

Source: see Table 3 for data source.

Agribusiness had a lower concentration level in Hawaii than the nation for most activities. The clear exception was Fishing, Forestry & Hunting that was significantly more concentrated in Hawaii than the nation.

Overall Performance

From an overall performance standpoint, five groups – Fishing, Forestry & Hunting, Agricultural Inputs, Farm Production, Agriculture Support Services, and Agricultural Processing – were in the high performance Base-Growth or Emerging categories for the 2006 to 2016 period.

Farm Production, which was categorized as a declining sector before 2007, climbed into the Emerging category for the 2006 to 2016 period by adding about 1,092 jobs in 2007. The 2007 job gain in the sector took place mostly in Crop Production.

Farm Production in Hawaii is made up of a number of very disparate industry groups, with some like seed corn production showing exceptional growth in recent years, while others like pineapple production have been in sharp contraction. For this reason, the interpretations of performance in Farm Production should be made cautiously. It is beyond the scope of this report to delve into the various components of Farm Production. The dynamics of Hawaii farming activity make it difficult to effectively monitor Farming performance, especially with the sketchiness of jobs data for key areas like seed corn and other crop areas.

Agricultural Packaging & Warehousing fell into the Declining category, declining 3.4% per year over the 2006 to 2016 period.

Emerging Activities	**Base-Growth Activities**
Farm Production Agric. Processing Agric. Support Services Agric. Inputs	Fishing, Forestry & Hunting
Declining Activities	**Transitioning Activities**
Agric. Packaging & Warehsg	

HEALTH & WELLNESS

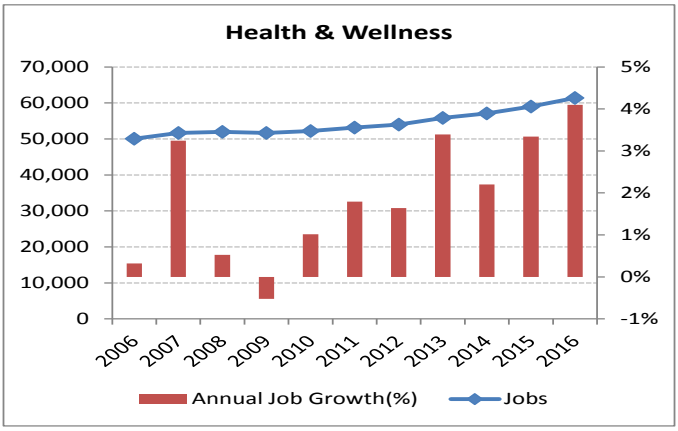
Health and Wellness has been of interest for several decades as a potential export activity. It has been proposed that first class medical and related health facilities in Hawaii could spur Health and Wellness tourism among the more affluent in Asian-Pacific countries that may not have the same level of health care. Unfortunately, there is no readily available data regarding such visitors.

Recuperation and rejuvenation services have also been proposed as potential export activities that could utilize Hawaii's beauty and calming environment. In recent years, spas and similar, non-medical treatment services have been integrated into the hotel industry and serve a specialized tourism market. However, these facilities and their markets are not distinct enough to be reflected separately in standard statistical data.

In order to provide some underlying data to support future discussions on the topic of the Health and Wellness sector, DBEDT adopted with some minor modifications, a definition for Health and Wellness developed by researchers on Kauai for that county's Comprehensive Economic Development Strategy in 2005.[6] This definition identifies the major industry groups of Hawaii's health care sector.

Size & Growth

The Health and Wellness Sector accounted for an estimated 61,397 jobs in 2016. About 72.7% of the jobs were among Health Care Practitioners and in Hospital & Nursing Facilities. All of the industry groups in Health and Wellness, except Pharmacies, grew jobs over the 2006 to 2016 period.



Overall, the Health and Wellness sector grew faster than the rest of the economy during the 2006-2016 period. For all the years from 2006 to 2016, except 2009, this sector showed job growth.

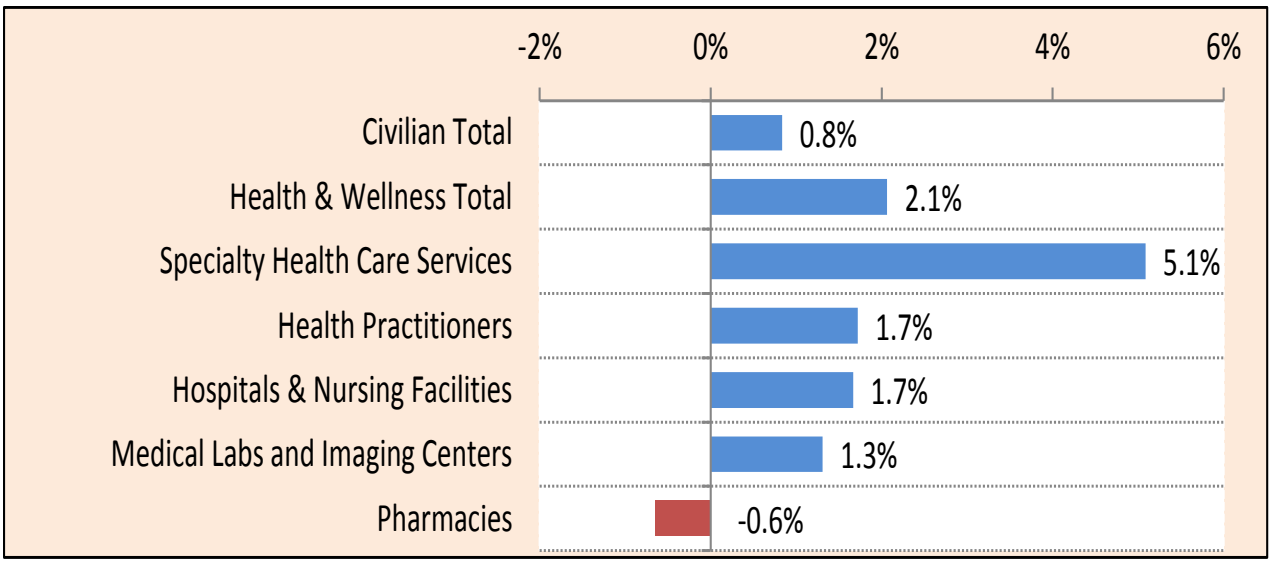
Pharmacies (a retailing industry which includes drug stores) expanded jobs moderately in the 2006 to 2007 expansion phase but experienced a sharp decline during the 2007-2010 contraction period. Pharmacies lost 563 jobs in the 3 year period. The reason for the decline is not clear. However, the filling of prescriptions through the internet, rather than in pharmacies, has become a more common practice in recent years.

Health Practitioners, that had lost jobs until 2006, showed a modest growth since then including the contraction period, bringing up the overall job growth to an average 1.7% per year for the 2006 to 2016 period.

[6] Hawaii Office of Planning, *Hawaii Statewide Comprehensive Economic Development Strategy (CEDS)*, 2005. Modifications included translating from the 1997 to the 2002 NAICS industry codes. Report is at http://hawaii.gov/dbedt/op/projects.htm

The highest job growth was observed in Specialty Health Care, a relatively small industry group. Except for a modest job loss in 2008, this industry group achieved high growth during the 2006-2016 period. This subsector gained jobs at an annual average rate of 5.1% during the period.

TABLE 9. JOBS IN HEALTH AND WELLNESS: AVERAGE ANNUAL GROWTH OVER 2006-2016



	Annual Job Growth				Jobs in
	2006-2016p	2006-2008	2008-2011	2011-2016p	2016p
Civilian Total	0.8%	1.0%	-1.0%	1.9%	867,947
Health & Wellness Total	2.1%	1.9%	0.8%	2.9%	61,397
Specialty Health Care Services	5.1%	3.2%	1.9%	7.8%	11,378
Health Practitioners	1.7%	2.0%	0.8%	2.2%	23,507
Hospitals & Nursing Facilities	1.7%	1.3%	1.4%	2.0%	21,100
Medical Labs and Imaging Centers	1.3%	2.4%	0.5%	1.4%	1,866
Pharmacies	-0.6%	1.4%	-5.0%	1.2%	3,546

Source: see Table 3 for data source ("P" designates projection)

Competitive Metrics

Overall, the growth in Hawaii's Health and Wellness Sector was about the same as the national growth for the same sector over the 2006 to 2016 period. The higher job growth in Hawaii's Hospitals & Nursing Facilities offset the lower job growth in other groups of the sector.

Only one industry group, Hospitals & Nursing Facilities, show concentrations above national levels.

TABLE 10. HAWAII HEALTH AND WELLNESS SECTOR PERFORMANCE COMPARED WITH NATION

	Jobs (2016p)	Jobs per Estabs (2016p)	Avg. Annual Earnings (2016p)	Avg. Ann. Job Growth 2006-2016p	Avg. Ann. Job Growth above or below U.S.	When U.S.=100% Concentration[1]	When U.S.=100% Jobs per Estabs	When U.S.=100% Avg. Ann. Earning
Total Civilian	867,947	19.4	51,541	0.8%	-0.1%	100%	98%	93%
HEALTH & WELLNESS	**61,397**	**13.9**	**71,749**	**2.1%**	**0.0%**	**85%**	**58%**	**109%**
Specialty Health Care Services	11,378	20.7	48,202	5.1%	0.0%	91%	49%	114%
Health Practitioners	23,507	12.6	79,545	1.7%	-0.5%	96%	113%	99%
Hospitals & Nursing Facilities	21,100	12.3	81,047	1.7%	0.5%	69%	5%	124%
Medical Labs and Imaging Centers	1,866	16.7	59,733	1.3%	-1.0%	142%	115%	82%
Pharmacies	3,546	21.5	46,608	-0.6%	-0.8%	107%	187%	97%

1. Proportion of jobs in the activity in Hawaii compared to the proportion nationally

Source: see Table 3 for data source.

At $71,749, the average earnings for the Health & Wellness Sector, as a whole, exceeded the national average in 2016 by about 9%. This is the only major sector in the targeted industry portfolio that had earnings above the U.S. average for the same sector. Except for Medical Labs & Imaging Centers, all groups in the sector had earnings either similar to or higher than the U.S. average.

Overall Performance

Among the Health & Wellness industry groups, Specialty Health Care Services and Hospitals & Nursing Facilities performed the best in terms of growth and competitiveness. However, these groups didn't exceed the national level in terms of industry concentration.

Health Practitioners and Medical Labs & Imaging Centers were in the Transitioning category. These groups grew jobs but lost competitive national share due to better growth at the U.S. level.

Only Pharmacies fell into the Declining category, declining 0.6% per year over the 2006 to 2016 period.

Emerging Activities	Base-Growth Activities
Specialty Health Care Services Hospitals & Nursing Facilities	
Declining Activities	**Transitioning Activities**
Pharmacies	Health Practitioners Medical Labs and Imaging Centers

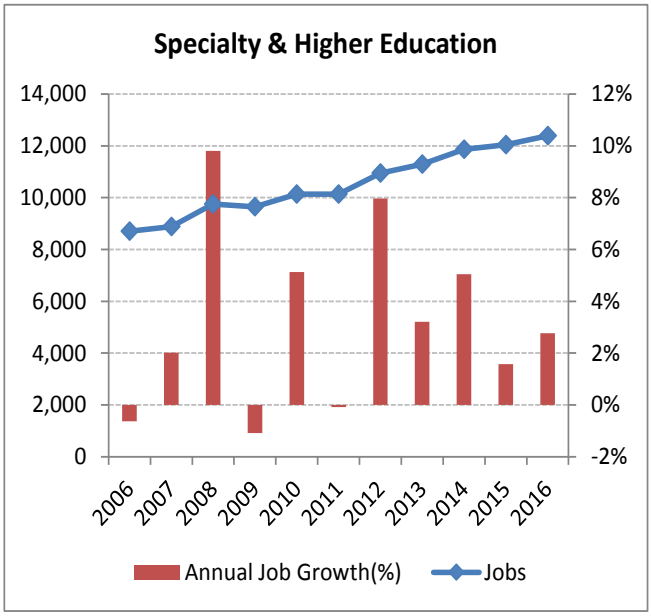
EDUCATION

The private education sector, which includes private colleges and specialty schools, is an important segment of Hawaii's economy. One area of particular interest for economic development is the number of foreign students in Hawaii. There is strong potential for Hawaii's higher education system to attract more students from around the world. However, while the number of foreign students in the U.S. overall has been increasing, the number of Hawaii foreign students has been decreasing. In 2015, Hawaii had an estimated 4,035 foreign students, including both public and private institutions, and this was a 19.3% decrease from the 2010 estimated number of 5,000 foreign students.[7] In contrast to Hawaii's decline, the number of foreign students in the U.S. overall increased 41.1%, from 690,923 students in 2010 to an estimated 974,926 students in 2015. While the topic of foreign students is outside of the main focus of this section, it is an area that should be examined in the future. The following section examines the growth and performance of the education activity of the private sector colleges and specialty schools.

Size & Growth

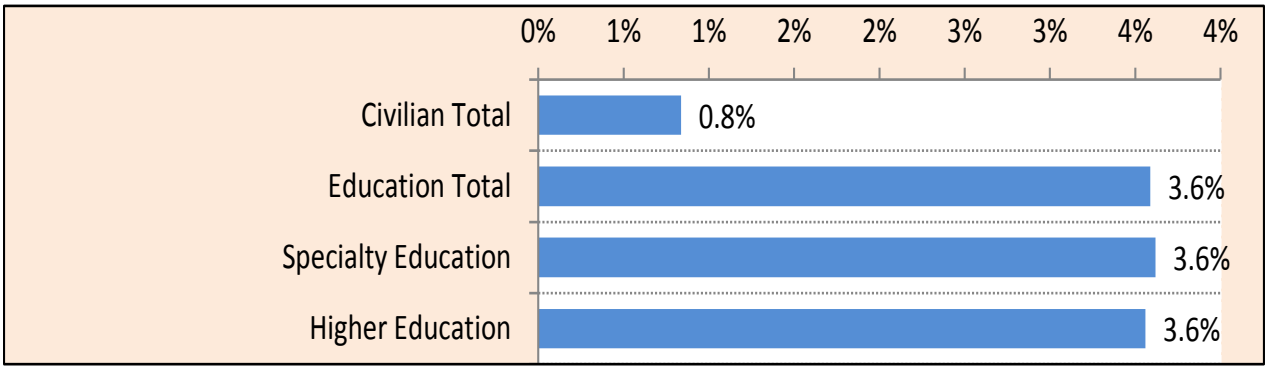
Private post-secondary and specialty education in Hawaii accounted for 12,385 jobs in 2016. These sectors together performed better than the rest of the Hawaii economy. Jobs grew 3.6% annually, adding 3,680 new jobs to the economy over the past ten years.

Both Specialty Education and Higher Education added jobs significantly over the 2006 to 2016 period. From 2006 to 2016, Specialty Education only lost jobs in 2007; while Higher Education lost jobs in 2006, 2009, 2011 and 2015. During the contraction period, in contrast to a majority of the other sectors, both Specialty Education and Higher Education grew jobs more than the overall economy. This reflects the tendency for educational enrollments to increase during economic declines.



[7] Institute of International Education, Open Doors Fact Sheet 2015 and 2010.

TABLE 11. JOBS IN HIGHER AND SPECIALTY EDUCATION: AVERAGE ANNUAL GROWTH OVER 2006-2016



	Annual Job Growth				Jobs in 2016p
	2006-2016p	2006-2008	2008-2011	2011-2016p	
Civilian Total	0.8%	1.0%	-1.0%	1.9%	867,947
Education Total	3.6%	5.8%	1.3%	4.1%	12,385
Specialty Education	3.6%	0.7%	4.6%	4.2%	5,917
Higher Education	3.6%	10.3%	-1.4%	4.0%	6,468

Source: see Table 3 for data source ("P" designates projection)

Competitive Metrics

For Specialty Education, despite the high growth in jobs over the 2006 to 2016 period, it came up short compared with the performance of the same activities nationally. As a result, the Hawaii Specialty Education group lost some national competitive share. For Higher Education, however, job growth in Hawaii was above the national level and Hawaii gained some national competitive share. Overall, the Hawaii Education Sector gained some national competitive share.

The Education Sector also increased in terms of concentration. In 2006, the private Higher and Specialty Education activities together were about 72% as concentrated as the same activities nationally. By 2016, that concentration had increased to 79% of the national level.

The annual earnings of Specialty Education in Hawaii averaged $21,165 in 2016, which was about 41% of the earning average of civilian jobs in Hawaii. This level of earnings was about 87% of the national level for the same group. The average earnings in Hawaii Higher Education was higher than Specialty Education, but was only about 57% of the national earnings for the same activities in 2016.

TABLE 12. HAWAII PRIVATE EDUCATION SECTOR PERFORMANCE COMPARED WITH NATION

	Jobs (2016p)	Jobs per Estabs (2016p)	Avg. Annual Earnings (2016p)	Avg. Ann. Job Growth 2006-2016p	Avg. Ann. Job Growth above or below U.S.	When U.S.=100% Concentration[1]	When U.S.=100% Jobs per Estabs	When U.S.=100% Avg. Ann. Earning
Total Civilian	867,947	19.4	51,541	0.8%	-0.1%	100%	98%	93%
EDUCATION (PRIVATE)	**12,385**	**38.4**	**26,025**	**3.6%**	**0.9%**	**79%**	**92%**	**62%**
Specialty Education	5,917	47.2	21,165	3.6%	-0.1%	93%	245%	87%
Higher Education	6,468	32.8	30,472	3.6%	1.6%	70%	15%	57%

1. Proportion of jobs in the activity in Hawaii compared to the proportion nationally

Source: see Table 3 for data source.

Overall Performance

During the 2006 to 2016 period, the Higher Education group increased both jobs and competitiveness and fell into the Emerging category. Due to the overall job growth combined with a loss of national competitive share, the Specialty Education group was in the Transitioning category over the period.

Emerging Activities	Base-Growth Activities
Higher Education	
Declining Activities	**Transitioning Activities**
	Specialty Education

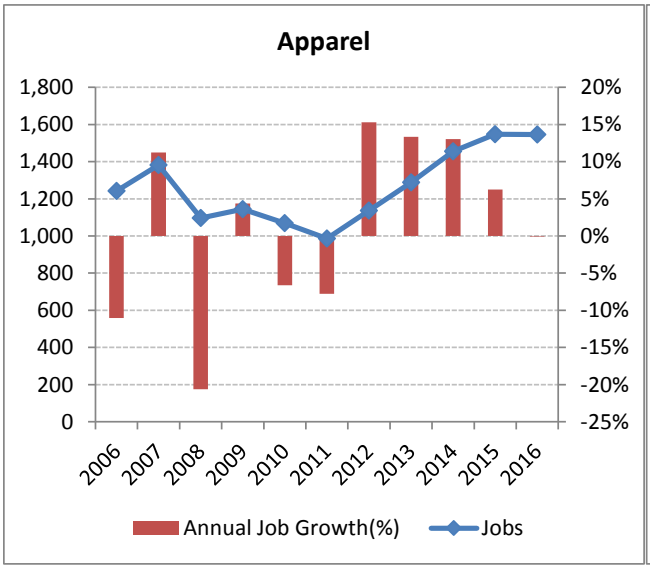
OTHER TARGETED ACTIVITIES

Apparel and Call Centers have been pursued as sources of economic diversification. Apparel was promoted based on Hawaii's unique style and cultural heritage that brought Hawaiian/Aloha wear to worldwide prominence. However, over the years, a large portion of the garment manufacturing jobs have been outsourced overseas. While there is still some manufacturing of Hawaiian wear in the state, it is more common to find garments with labels that say designed in Hawaii but manufactured elsewhere. Call Centers were promoted based on Hawaii's developing communications technology capacity, its mid Pacific location and multi-lingual resources.

Size & Growth

Apparel Manufacturing in Hawaii lost jobs from 2007 to 2011, but increased jobs from 2011 to 2016. Jobs in Apparel decreased from 1,382 in 2007 to 986 in 2011, and then increased to 1,546 in 2016. From 2006 to 2016, jobs in the Apparel group increased 2.2% per year on average.

Call Center activity expanded in the early 2000s, increasing jobs from 210 in 2002 to 485 in 2004. The activity sustained this level of jobs for several years until 2006 and then continued to contract until recently. The current level of jobs for Call Center activity is only about 56% of the peak year.



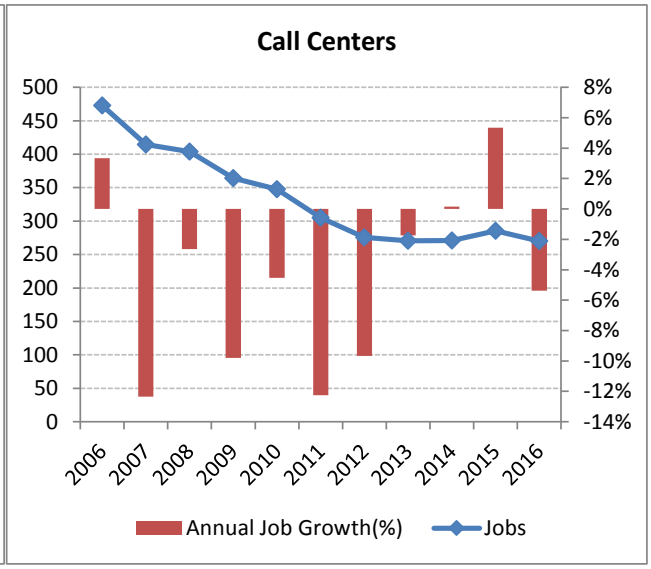
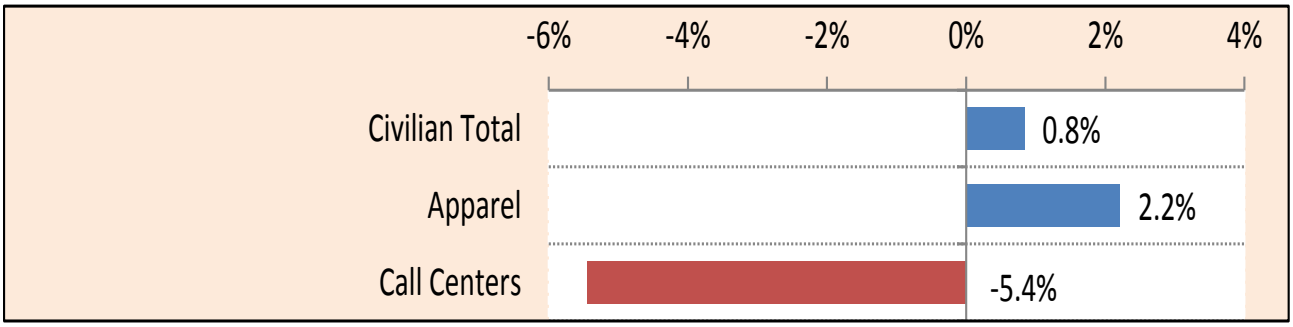


TABLE 13. JOBS IN APPAREL AND CALL CENTERS: AVERAGE ANNUAL GROWTH OVER 2006-2016



	Annual Job Growth				Jobs in
	2006-2016p	2006-2008	2008-2011	2011-2016p	2016p
Civilian Total	0.8%	1.0%	-1.0%	1.9%	867,947
Apparel	2.2%	-6.0%	-3.5%	9.4%	1,546
Call Centers	-5.4%	-7.6%	-8.9%	-2.4%	270

Source: see Table 3 for data source ("P" designates projection)

Competitive Metrics

In terms of job growth, Apparel increased in Hawaii but decreased in the nation. During the 2006-2016 period, Apparel in Hawaii added 2.2% of its jobs annually, while the U.S. apparel industry lost 1.9% of its jobs annually. This partially reflects the trend of outsourcing manufacturing to abroad.

During the 2006 to 2016 period, nationally, the Call Center industry had a steady job increase of 3.3% per year. In contrast, the Call Center industry in Hawaii experienced an average job decrease of 5.4% per year, during the same period.

The concentration level of Apparel in 2016 was 80% above the national level. In contrast, Call Centers had a very low job concentration in Hawaii's economy compared to the activity nationally. The concentration of Call Centers in Hawaii was only 11% of the national level in 2016, down from 25% in 2006.

The annual average earnings for Apparel and Call Center were $21,515 and $23,759 respectively in 2016. These earning levels were about 57% for Apparel and 62% for Call Centers of the average earnings nationally, suggesting that these sectors are predominantly part time activities in Hawaii.

TABLE 14. HAWAII APPAREL AND CALL CENTERS PERFORMANCE COMPARED WITH NATION

	Jobs (2016p)	Jobs per Estabs (2016p)	Avg. Annual Earnings (2016p)	Avg. Ann. Job Growth		When U.S.=100%		
				2006-2016p	above or below U.S.	Concen-tration[1]	Jobs per Estabs	Avg. Ann. Earning
Total Civilian	867,947	19.4	51,541	0.8%	-0.1%	100%	98%	93%
Apparel	1,546	46.5	21,515	2.2%	4.1%	180%	165%	57%
Call Centers	270	42.1	23,759	-5.4%	-8.7%	11%	70%	62%

1. Proportion of jobs in the activity in Hawaii compared to the proportion nationally

Source: see Table 3 for data source.

Overall Performance

Based on the performance metrics, the Apparel group is rated as high performing for growth and competitiveness, compared with the same activities nationally, during the 2006 to 2016 period. The Call Center category fell into the declining category, with an average job loss of 5.4% per year.

Emerging Activities	Base-Growth Activities
	Apparel
Declining Activities	**Transitioning Activities**
Call Centers	

PERFORMANCE BY COUNTY

The following tables summarize the 2006 to 2016 county performance of the statewide targeted & emerging industries. Performance has been organized by Best Performing Targets (registering as base-growth & emerging industry groups) and Other Targeted Industry Performance (those that fell into the transitioning and declining categories).

The total number of jobs in Hawaii's targeted & emerging industries without overlaps was 160,488 in 2016. Honolulu accounted for about 71%, followed by Hawaii County at 14%, Maui at 10%, and Kauai at 5%. From 2006 to 2016, adjusting for overlaps, total jobs in the targeted & emerging industries increased by 22,324 jobs. Honolulu added 15,691 jobs, followed by Hawaii at 4,321 jobs, Kauai at 1,204 jobs, and Maui at 923 jobs.

TABLE 15. JOBS AND JOB CHANGES FROM 2006 TO 2016 BY COUNTY

	2016 Jobs				
	State	Honolulu	Hawaii	Maui	Kauai
Total Civilian	867,947	613,385	102,875	106,304	45,383
Total Targeted w/o Overlap	160,488	114,550	21,674	16,606	7,349
TECHNOLOGY SECTOR	28,338	22,873	2,441	2,022	927
CREATIVE SECTOR	51,485	37,346	5,085	6,457	2,450
AGRIBUSINESS	25,366	10,693	8,778	4,001	1,885
HEALTH & WELLNESS	61,397	47,750	6,306	4,973	2,351
EDUCATION (PRIVATE)	12,385	10,677	852	528	209
OTHERS	1,816	1,456	113	155	89
	% in State 2016 Jobs				
	State	Honolulu	Hawaii	Maui	Kauai
Total Civilian	100%	71%	12%	12%	5%
Total Targeted w/o Overlap	100%	71%	14%	10%	5%
TECHNOLOGY SECTOR	100%	81%	9%	7%	3%
CREATIVE SECTOR	100%	73%	10%	13%	5%
AGRIBUSINESS	100%	42%	35%	16%	7%
HEALTH & WELLNESS	100%	78%	10%	8%	4%
EDUCATION (PRIVATE)	100%	86%	7%	4%	2%
OTHERS	100%	80%	6%	9%	5%
	Job Changes 2006-2016				
	State	Honolulu	Hawaii	Maui	Kauai
Total Civilian	69,427	48,508	8,551	9,126	3,242
Total Targeted w/o Overlap	22,324	15,691	4,321	923	1,204
TECHNOLOGY SECTOR	1,609	730	439	158	223
CREATIVE SECTOR	5,355	3,960	726	180	375
AGRIBUSINESS	2,669	1,151	1,508	-161	161
HEALTH & WELLNESS	11,340	8,701	1,603	741	372
EDUCATION (PRIVATE)	3,680	3,066	387	62	46
OTHERS	101	-120	68	95	55

Source: see Table 3 for data source.

City & County of Honolulu

Adjusting for overlaps, Honolulu accounted for 114,550 of the state's targeted & emerging industry jobs in 2016, a 1.5% annual increase from 2006. As shown in Table 16, among the six major sectors, two sectors were high performing Emerging activities in Honolulu County in the 2006 to 2016 period. Three sectors were in the Transitioning category, and one sector was in the Declining category.

Table 16. Performance of the Major Groups of Honolulu Targeted Industry Portfolio

INDUSTRY GROUPS	JOBS IN HONOLULU		AVG. ANN. JOB GROWTH (2006-2016P)		CONCENTRATION OF INDUSTRY IN HONOLULU COMPARED TO U.S.		AVG ANNUAL EARNINGS (2016P)	
	2016P	CHANGE 2006-2016P	HONOLULU	U.S.	2016P	% Point CHNG 2006-2016P	HONOLULU	U.S.
TOTAL CIVILIAN JOBS	613,385	48,508	0.8%	0.9%	100%	0%	$54,880	$55,531
TOTAL TARGETED JOBS W/O OVERLAP	114,550	15,691	1.5%	1.6%	82%	0%	$60,605	$67,782
Emerging Activities								
EDUCATION (PRIVATE)	10,677	3,066	3.4%	2.7%	97%	8%	$26,891	$41,653
AGRIBUSINESS	10,693	1,151	1.1%	0.8%	55%	2%	$44,080	$42,598
Transitioning Activities								
HEALTH & WELLNESS	47,750	8,701	2.0%	2.1%	94%	1%	$74,427	$65,713
CREATIVE SECTOR	37,346	3,960	1.1%	2.0%	86%	-7%	$52,618	$75,255
TECHNOLOGY SECTOR	22,873	730	0.3%	1.5%	65%	-7%	$83,210	$106,371
Declining Activities								
OTHERS	1,456	-120	-0.8%	1.7%	60%	-16%	$23,691	$38,388

Source: see Table 3 for data source ("P" designates projection). The sum of the individual industries does not add up to the total due to adjusting for overlaps among sectors.

Table 17 shows the performance of detailed targeted & emerging industry groups in Honolulu. Among the 38 detailed industry groups, 15 groups were high performing, with positive job growth combined with a job growth rate that was higher than the nation for the same activity. The high-performing activities in the targeted industry portfolio accounted for about 59,824 jobs or 9.8% of all civilian jobs in 2016. Between 2006 and 2016, those groups generated 29.9% of the total gain in jobs for the civilian economy, or about 14,493 new jobs.

About 43% of the high-performing activities had average annual earnings that exceeded $71,000 in 2015. By comparison, the average earnings for the civilian economy in 2016 was $54,880 by the projected 2016 estimate.

In 2016, ten activities, which included 46,059 jobs, fell into the Transitioning category. They gained jobs over the period but did not keep up with national growth for the same activities resulting in a loss of competitive national industry share. However, six of those activities grew faster in terms of jobs than the civilian economy as a whole.

Thirteen activities in the portfolio fell into the Declining industry category as the result of net job losses for the 2006 to 2016 period. Jobs in the Declining industry groups totaled an estimated 23,400 in 2016, representing a loss of 2,955 jobs from 2006.

Table 17. Performance of the Detailed Honolulu Targeted Industry Portfolio

INDUSTRY GROUPS	JOBS IN HONOLULU		AVG. ANN. JOB GROWTH (2006-2016P)		CONCENTRATION OF INDUSTRY IN HONOLULU COMPARED TO U.S.		AVG ANNUAL EARNINGS (2016P)	
	2016P	CHANGE 2006-2016P	HONOLULU	U.S.	2016P	% Point CHNG 2006-2016P	HONOLULU	U.S.
Base-Growth Activities								
Cultural Activities	3,343	1,934	9.0%	2.8%	520%	233%	$46,032	$52,548
Apparel	1,228	73	0.6%	-1.9%	202%	46%	$23,798	$37,958
Engineering and Related Serv.	5,263	258	0.5%	0.5%	102%	2%	$96,119	$92,459
Specialty Health Care Services	8,923	3,554	5.2%	5.1%	101%	3%	$49,074	$42,405
Emerging Activities								
Film, TV, Video Production/Distrib	1,319	122	1.0%	0.5%	98%	6%	$71,871	$99,858
Agric. Processing	5,228	656	1.3%	0.9%	96%	5%	$49,161	$58,264
Higher Education	6,256	1,766	3.4%	2.0%	96%	13%	$30,677	$53,501
Hospitals & Nursing Facilities	18,554	2,938	1.7%	1.1%	86%	6%	$83,471	$65,331
Art Education	719	262	4.6%	3.5%	86%	10%	$8,657	$10,673
Technical Consulting Services	3,586	1,238	4.3%	4.0%	69%	3%	$58,462	$77,778
Alternative Power Generation	141	96	12.0%	-4.2%	65%	52%	$92,960	$158,376
Business Consulting	3,945	1,206	3.7%	3.3%	65%	3%	$58,946	$78,628
Agric. Support Services	987	276	3.3%	2.0%	54%	7%	$44,474	$51,666
Agric. Inputs	263	100	4.9%	0.4%	33%	12%	$75,394	$68,966
Chemical & Pharmaceutical Mfg	68	14	2.4%	0.1%	5%	1%	$75,707	$139,624
Transitioning Activities								
Farm Production	3,168	194	0.6%	0.6%	31%	0%	$30,071	$30,440
Design Services	1,436	162	1.2%	1.3%	92%	0%	$24,531	$38,993
Engineering and Research & Development	4,416	274	0.6%	0.8%	84%	-1%	$99,406	$110,833
Specialty Education	4,422	1,300	3.5%	3.8%	98%	-1%	$21,535	$24,446
Music	625	104	1.8%	2.2%	97%	-2%	$71,762	$38,546
Fishing, Forestry & Hunting	801	3	0.0%	0.5%	206%	-8%	$51,468	$35,800
Medical Labs, Diagnostic and Imaging Centers*	1,512	232	1.7%	2.3%	162%	-8%	$60,710	$72,560
Marketing, Photography & Related	8,431	1,176	1.5%	2.2%	95%	-5%	$25,044	$48,174
Health Practitioners	16,286	2,131	1.4%	2.3%	94%	-7%	$83,458	$80,014
Performing and Creative Arts	4,963	142	0.3%	1.9%	90%	-14%	$16,836	$27,095
Declining Activities								
Computer Services and Software Publishers	4,207	-56	-0.1%	4.0%	51%	-25%	$88,186	$115,913
Computer Sys. Design & Related	5,683	-111	-0.2%	3.6%	72%	-31%	$82,842	$106,903
Pharmacies	2,474	-154	-0.6%	0.2%	106%	-7%	$46,968	$48,134
Information & Telecom Tech.	4,403	-390	-0.8%	0.9%	70%	-13%	$91,760	$117,323
R&D Services (exc. Biotech.)	935	-118	-1.2%	1.0%	53%	-12%	$93,943	$130,142
Architecture	1,547	-201	-1.2%	-0.9%	145%	-3%	$89,528	$70,398
Radio and Television Broadcasting	1,003	-138	-1.3%	-0.3%	115%	-10%	$71,685	$82,467
Technology Equipment Distr.	651	-128	-1.8%	-0.6%	39%	-5%	$109,880	$118,610
Other Technology Mfg	336	-86	-2.3%	-0.2%	8%	-2%	$59,904	$110,529
Agric. Packaging & Warehsg	245	-77	-2.7%	0.9%	40%	-17%	$57,360	$52,032
Publishing & Information	1,393	-1,026	-5.4%	-1.3%	55%	-28%	$59,270	$105,875
Call Centers	228	-193	-6.0%	3.3%	13%	-19%	$23,114	$38,533
Biotechnology	294	-275	-6.4%	1.8%	53%	-68%	$79,269	$177,678

Source: see Table 3 for data source ("P" designates projection)

Hawaii County

Adjusting for overlaps, Hawaii County accounted for 21,671 of the state's targeted & emerging industry jobs in 2016, a 2.2% annual increase from 2006. As shown in Table 18, among the six major sectors, five sectors were high performing in Hawaii County in the 2006 to 2016 period. One sector was in the Transitioning category and no sector lost jobs.

Table 18. Performance of the Major Groups of Hawaii County Targeted Industry Portfolio

INDUSTRY GROUPS	JOBS IN HAWAII COUNTY		AVG. ANN. JOB GROWTH (2006-2016[P])		CONCENTRATION OF INDUSTRY IN HAWAII COMPARED TO U.S.		AVG ANNUAL EARNINGS (2016[P])	
	2016[P]	CHANGE 2006-2016[P]	HAWAII COUNTY	U.S.	2016[P]	% Point CHNG 2006-2016[P]	HAWAII COUNTY	U.S.
TOTAL CIVILIAN JOBS	102,875	8,551	0.9%	0.9%	100%	0%	$41,908	$55,531
TOTAL TARGETED JOBS W/O OVERLAP	21,671	4,320	2.2%	1.6%	92%	6%	$38,762	$67,782
Base-Growth Activities								
AGRIBUSINESS	8,778	1,508	1.9%	0.8%	269%	29%	$26,969	$42,598
Emerging Activities								
HEALTH & WELLNESS	6,303	1,602	3.0%	2.1%	74%	7%	$57,523	$65,713
EDUCATION (PRIVATE)	852	387	6.2%	2.7%	46%	14%	$23,618	$41,653
TECHNOLOGY SECTOR	2,441	439	2.0%	1.5%	41%	2%	$64,120	$106,371
OTHERS	113	68	9.8%	1.7%	28%	15%	$18,695	$38,388
Transitioning Activities								
CREATIVE SECTOR	5,085	726	1.6%	2.0%	70%	-3%	$34,015	$75,255

Source: see Table 3 for data source ("P" designates projection). The sum of the individual industries does not add up to the total due to adjusting for overlaps among sectors.

Table 19 shows the performance of detailed targeted & emerging industry groups in Hawaii County. Among the 38 detailed industry groups, 23 groups were high performing. The high-performing activities in the targeted industry portfolio accounted for about 18,696 jobs or 18.2% of all civilian jobs in 2016. Between 2006 and 2016, those groups generated 49.1% of the total gain in jobs for the civilian economy or about 4,201 new jobs.

About 8.6% of the high-performing activities had average annual earnings that exceeded $71,000 in 2016. By comparison, the earnings average for the civilian economy in 2016 was $41,908 by the projected 2016 estimate.

In 2016, six activities with 4,046 jobs fell into the Transitioning category. They gained jobs over the period but did not keep up with national growth for the same activities resulting in a loss of competitive national industry share. However, five of those activities grew faster in terms of jobs than the civilian economy as a whole.

Nine activities in the portfolio fell into the Declining industry category, as the result of net job losses for the 2006 to 2016 period. Jobs in the Declining industry groups totaled an estimated 590 in 2016, representing a loss of 158 jobs from 2006.

Table 19. Performance of the Detailed Hawaii County Targeted Industry Portfolio

INDUSTRY GROUPS	JOBS IN HAWAII COUNTY		AVG. ANN. JOB GROWTH (2006-2016[P])		CONCENTRATION OF INDUSTRY IN HAWAII COMPARED TO U.S.		AVG ANNUAL EARNINGS (2016[P])	
	2016[P]	CHANGE 2006-2016[P]	HAWAII COUNTY	U.S.	2016[P]	% Point CHNG 2006-2016[P]	HAWAII COUNTY	U.S.
Base-Growth Activities								
Fishing, Forestry & Hunting	589	116	2.2%	0.5%	905%	143%	$19,519	$35,800
Farm Production	6,866	1,257	2.0%	0.6%	395%	53%	$24,240	$30,440
Music	178	102	8.9%	2.2%	165%	78%	$23,745	$38,546
R&D Services (exc. Biotech.)	409	73	2.0%	1.0%	137%	13%	$93,109	$130,142
Alternative Power Generation	45	9	2.2%	-4.2%	124%	60%	$135,580	$158,376
Pharmacies	434	68	1.7%	0.2%	111%	16%	$42,341	$48,134
Design Services	288	55	2.1%	1.3%	110%	9%	$25,365	$38,993
Health Practitioners	3,042	684	2.6%	2.3%	105%	4%	$65,315	$80,014
Agric. Processing	954	108	1.2%	0.9%	105%	4%	$46,746	$58,264
Specialty Education	787	368	6.5%	3.8%	104%	25%	$23,502	$24,446
Emerging Activities								
Apparel	98	69	13.0%	-1.9%	96%	73%	$14,817	$37,958
Specialty Health Care Services	1,397	627	6.1%	5.1%	95%	10%	$45,123	$42,405
Agric. Support Services	266	52	2.2%	2.0%	86%	2%	$38,184	$51,666
Architecture	154	8	0.5%	-0.9%	86%	12%	$66,306	$70,398
Engineering and Research & Development	611	95	1.7%	0.8%	69%	6%	$86,757	$110,833
Art Education	81	36	5.9%	3.5%	58%	12%	$6,389	$10,673
Information & Telecom Tech.	517	118	2.6%	0.9%	49%	8%	$71,262	$117,323
Engineering and Related Serv.	360	31	0.9%	0.5%	42%	2%	$70,366	$92,459
Biotechnology	32	12	5.0%	1.8%	35%	9%	$81,149	$177,678
Hospitals & Nursing Facilities	1,190	186	1.7%	1.1%	33%	2%	$61,485	$65,331
Computer Services and Software Publishers	311	106	4.3%	4.0%	22%	1%	$63,717	$115,913
Higher Education	65	19	3.4%	2.0%	6%	1%	$25,021	$53,501
Other Technology Mfg	21	4	2.2%	-0.2%	3%	1%	$22,036	$110,529
Transitioning Activities								
Marketing, Photography & Related	1,270	232	2.0%	2.2%	85%	0%	$16,944	$48,174
Computer Sys. Design & Related	322	93	3.5%	3.6%	24%	0%	$61,022	$106,903
Business Consulting	503	128	3.0%	3.3%	50%	-1%	$35,350	$78,628
Medical Labs, Diagnostic and Imaging Centers*	243	39	1.8%	2.3%	156%	-8%	$39,016	$72,560
Technical Consulting Services	477	128	3.2%	4.0%	55%	-4%	$35,229	$77,778
Performing and Creative Arts	1,231	29	0.2%	1.9%	133%	-22%	$16,590	$27,095
Declining Activities								
Film, TV, Video Production/Distrib	60	-1	-0.1%	0.5%	27%	-2%	$35,116	$99,858
Call Centers	15	-1	-0.4%	3.3%	5%	-2%	$43,930	$38,533
Publishing & Information	251	-14	-0.6%	-1.3%	59%	5%	$39,859	$105,875
Radio and Television Broadcasting	73	-14	-1.8%	-0.3%	50%	-7%	$40,445	$82,467
Agric. Inputs	90	-19	-1.9%	0.4%	68%	-17%	$37,868	$68,966
Technology Equipment Distr.	9	-2	-2.0%	-0.6%	3%	0%	$91,111	$118,610
Agric. Packaging & Warehsg	12	-5	-3.5%	0.9%	12%	-6%	$50,250	$52,032
Cultural Activities	75	-34	-3.7%	2.8%	70%	-64%	$42,176	$52,548
Chemical & Pharmaceutical Mfg	5	-67	-23.5%	0.1%	2%	-27%	$63,000	$139,624

Source: see Table 3 for data source ("P" designates projection)

Maui County

Adjusting for overlaps, Maui accounted for 16,605 of the state's targeted & emerging industry jobs in 2016, a 0.6% annual increase from 2006. As shown in Table 20, among the six major sectors, only one sector was high performing in Maui County in the 2006 to 2016 period. Four sectors were in the Transitioning category and one sector lost jobs.

Table 20. Performance of the Major Groups of Maui County Targeted Industry Portfolio

INDUSTRY GROUPS	JOBS IN MAUI		AVG. ANN. JOB GROWTH (2006-2016^{p})		CONCENTRATION OF INDUSTRY IN MAUI COMPARED TO U.S.		AVG ANNUAL EARNINGS (2016^{p})	
	2016^{p}	CHANGE 2006-2016^{p}	MAUI	U.S.	2016^{p}	% Point CHNG 2006-2016^{p}	MAUI	U.S.
TOTAL CIVILIAN JOBS	106,304	9,126	0.9%	0.9%	100%	0%	$44,603	$55,531
TOTAL TARGETED JOBS W/O OVERLAP	16,605	920	0.6%	1.6%	68%	-7%	$44,147	$67,782
Emerging Activities								
OTHERS	155	95	10.0%	1.7%	37%	20%	$14,372	$38,388
Transitioning Activities								
HEALTH & WELLNESS	4,972	738	1.6%	2.1%	56%	-2%	$64,893	$65,713
TECHNOLOGY SECTOR	2,022	158	0.8%	1.5%	33%	-2%	$66,870	$106,371
EDUCATION (PRIVATE)	528	62	1.2%	2.7%	28%	-4%	$15,584	$41,653
CREATIVE SECTOR	6,457	180	0.3%	2.0%	86%	-15%	$30,786	$75,255
Declining Activities								
AGRIBUSINESS	4,001	-161	-0.4%	0.8%	119%	-15%	$39,484	$42,598

Source: see Table 3 for data source ("P" designates projection). The sum of the individual industries does not add up to the total due to adjusting for overlaps among sectors.

Table 21 shows the performance of detailed targeted & emerging industry groups in Maui. Among the 38 detailed industry groups, 17 groups were high performing. The high-performing activities in the targeted industry portfolio accounted for about 6,713 jobs or 6.3% of all civilian jobs in 2016. Between 2006 and 2016, those groups generated 22.0% of the total gain in jobs for the civilian economy or about 2,008 new jobs.

About 63% of the high-performing activities had average annual earnings that exceeded $71,000 in 2016. By comparison, the earnings average for the civilian economy in 2016 was $44,603 by the projected 2016 estimate.

In 2016, six activities with 3,156 jobs fell into the Transitioning category. They gained jobs over the period but did not keep up with national growth for the same activities, resulting in a loss of competitive national industry share. However, five of those activities grew faster in terms of jobs than the civilian economy as a whole.

Fifteen activities in the portfolio fell into the Declining industry category as the result of net job losses for the 2006 to 2016 period. Jobs in the Declining industry groups totaled an estimated 8,186 in 2016, representing a loss of 1,477 jobs from 2006.

Table 21. Performance of the Detailed Maui County Targeted Industry Portfolio

INDUSTRY GROUPS	JOBS IN MAUI		AVG. ANN. JOB GROWTH (2006-2016[P])		CONCENTRATION OF INDUSTRY IN MAUI COMPARED TO U.S.		AVG ANNUAL EARNINGS (2016[P])	
	2016[P]	CHANGE 2006-2016[P]	MAUI	U.S.	2016[P]	% Point CHNG 2006-2016[P]	MAUI	U.S.
Base-Growth Activities								
Music	611	167	3.2%	2.2%	549%	58%	$21,692	$38,546
Alternative Power Generation	76	69	26.9%	-4.2%	202%	190%	$124,759	$158,376
Apparel	134	97	13.8%	-1.9%	127%	98%	$13,413	$37,958
Design Services	328	48	1.6%	1.3%	121%	4%	$30,872	$38,993
Health Practitioners	3,167	638	2.3%	2.3%	105%	1%	$72,888	$80,014
Emerging Activities								
Agric. Inputs	103	18	2.0%	0.4%	75%	11%	$61,909	$68,966
Radio and Television Broadcasting	99	27	3.3%	-0.3%	66%	20%	$41,175	$82,467
Cultural Activities	73	38	7.5%	2.8%	66%	23%	$40,420	$52,548
Agric. Support Services	200	53	3.1%	2.0%	63%	7%	$42,550	$51,666
Technical Consulting Services	414	155	4.8%	4.0%	46%	3%	$38,121	$77,778
Business Consulting	441	166	4.8%	3.3%	42%	6%	$40,096	$78,628
Computer Sys. Design & Related	493	238	6.8%	3.6%	36%	10%	$78,162	$106,903
Computer Services and Software Publishers	448	210	6.5%	4.0%	31%	7%	$79,910	$115,913
Biotechnology	18	6	4.6%	1.8%	18%	4%	$55,429	$177,678
Chemical & Pharmaceutical Mfg	24	22	28.0%	0.1%	9%	8%	$100,013	$139,624
Other Technology Mfg	65	47	13.6%	-0.2%	9%	7%	$59,837	$110,529
Technology Equipment Distr.	21	9	5.8%	-0.6%	7%	3%	$67,403	$118,610
Transitioning Activities								
Fishing, Forestry & Hunting	272	8	0.3%	0.5%	404%	-8%	$16,471	$35,800
Higher Education	19	3	1.6%	2.0%	2%	0%	$25,997	$53,501
Marketing, Photography & Related	1,507	225	1.6%	2.2%	98%	-5%	$18,789	$48,174
Specialty Health Care Services	758	254	4.2%	5.1%	50%	-4%	$44,206	$42,405
Art Education	91	10	1.2%	3.5%	62%	-15%	$13,392	$10,673
Specialty Education	509	59	1.2%	3.8%	65%	-18%	$15,189	$24,446
Declining Activities								
Farm Production	2,652	-90	-0.3%	0.6%	148%	-14%	$37,948	$30,440
Film, TV, Video Production/Distrib	53	-2	-0.4%	0.5%	23%	-2%	$31,384	$99,858
Call Centers	21	-2	-0.8%	3.3%	7%	-3%	$20,497	$38,533
Pharmacies	448	-43	-0.9%	0.2%	111%	-12%	$45,279	$48,134
Hospitals & Nursing Facilities	518	-93	-1.6%	1.1%	14%	-4%	$60,168	$65,331
Agric. Processing	767	-137	-1.6%	0.9%	81%	-23%	$49,170	$58,264
Medical Labs, Diagnostic and Imaging Centers*	82	-15	-1.7%	2.3%	51%	-24%	$84,301	$72,560
Engineering and Related Serv.	366	-71	-1.7%	0.5%	41%	-10%	$62,367	$92,459
Performing and Creative Arts	2,078	-421	-1.8%	1.9%	217%	-96%	$20,282	$27,095
Publishing & Information	277	-68	-2.2%	-1.3%	64%	-5%	$49,936	$105,875
Architecture	151	-60	-3.3%	-0.9%	82%	-23%	$43,432	$70,398
Information & Telecom Tech.	375	-155	-3.4%	0.9%	35%	-19%	$74,724	$117,323
Engineering and Research & Development	300	-160	-4.2%	0.8%	33%	-22%	$70,443	$110,833
R&D Services (exc. Biotech.)	90	-148	-9.2%	1.0%	29%	-56%	$56,793	$130,142
Agric. Packaging & Warehsg	7	-13	-10.0%	0.9%	7%	-14%	$37,429	$52,032

Source: see Table 3 for data source ("P" designates projection)

Kauai County

Adjusting for overlaps, Kauai County accounted for 7,349 of the state's targeted & emerging industry jobs in 2016, a 1.8% annual increase from 2006. As shown in Table 22, among the six major sectors, three sectors were high performing in Kauai County in the 2006 to 2016 period. Three sectors were in the Transitioning category and no sector lost jobs.

Table 22. Performance of the Major Groups of Kauai County Targeted Industry Portfolio

INDUSTRY GROUPS	JOBS IN KAUAI		AVG. ANN. JOB GROWTH (2006-2016P)		CONCENTRATION OF INDUSTRY IN KAUAI COMPARED TO U.S.		AVG ANNUAL EARNINGS (2016P)	
	2016P	CHANGE 2006-2016P	KAUAI	U.S.	2016P	% Point CHNG 2006-2016P	KAUAI	U.S.
TOTAL CIVILIAN JOBS	45,383	3,242	0.7%	0.9%	100%	0%	$42,654	$55,531
TOTAL TARGETED JOBS W/O OVERLAP	7,349	1,206	1.8%	1.6%	71%	3%	$45,834	$67,782
Base-Growth Activities								
AGRIBUSINESS	1,885	161	0.9%	0.8%	131%	3%	$37,606	$42,598
Emerging Activities								
OTHERS	89	55	10.0%	1.7%	50%	28%	$9,082	$38,388
TECHNOLOGY SECTOR	927	225	2.8%	1.5%	35%	5%	$65,474	$106,371
Transitioning Activities								
EDUCATION (PRIVATE)	209	46	2.5%	2.7%	25%	0%	$20,657	$41,653
CREATIVE SECTOR	2,450	375	1.7%	2.0%	76%	-1%	$26,825	$75,255
HEALTH & WELLNESS	2,351	372	1.7%	2.1%	62%	-1%	$69,989	$65,713

Source: see Table 3 for data source ("P" designates projection). The sum of the individual industries does not add up to the total due to adjusting for overlaps among sectors.

Table 23 shows the performance of detailed targeted & emerging industry groups in Kauai. Among the 38 detailed industry groups with jobs in 2015, 15 groups were in the high performing category with positive job growth combined with a job growth rate that was higher than the nation for the same activity. The high performing activities in the targeted industry portfolio accounted for about 3,910 jobs or 8.6% of all civilian jobs in 2016. Between 2006 and 2016, those groups generated 38.4% of the total gain in jobs for the civilian economy or about 1,246 new jobs.

In 2016, about 31% of the high-performing activities had average annual earnings that exceeded $71,000, based on projected estimates; by comparison, the earnings average for the overall civilian economy was lower at $42,654. Eleven activities with 1,973 jobs fell into the Transitioning category for 2016. They gained jobs over the period but did not keep up with national growth for the same activities resulting in a loss of competitive national industry share. All the eleven activities grew faster in terms of jobs than the civilian economy as a whole.

Twelve activities in the portfolio fell into the Declining industry category as the result of net job losses for the 2006 to 2016 period. Jobs in the Declining industry groups totaled an estimated 2,000 in 2016, representing a loss of 275 jobs from 2006.

Table 23. Performance of the Detailed Kauai County Targeted Industry Portfolio

INDUSTRY GROUPS	JOBS IN KAUAI		AVG. ANN. JOB GROWTH (2006-2016P)		CONCENTRATION OF INDUSTRY IN KAUAI COMPARED TO U.S.		AVG ANNUAL EARNINGS (2016P)	
	2016P	CHANGE 2006-2016P	KAUAI	U.S.	2016P	% Point CHNG 2006-2016P	KAUAI	U.S.
Base-Growth Activities								
Fishing, Forestry & Hunting	226	64	3.4%	0.5%	785%	202%	$15,718	$35,800
Biotechnology	138	121	23.1%	1.8%	338%	288%	$89,219	$177,678
Alternative Power Generation	51	49	38.2%	-4.2%	318%	310%	$114,614	$158,376
Apparel	83	62	14.6%	-1.9%	185%	146%	$8,306	$37,958
Cultural Activities	81	41	7.2%	2.8%	170%	60%	$32,793	$52,548
Music	69	19	3.4%	2.2%	144%	19%	$22,567	$38,546
Marketing, Photography & Related	795	254	3.9%	2.2%	121%	21%	$16,874	$48,174
Emerging Activities								
Agric. Processing	324	145	6.1%	0.9%	81%	33%	$40,335	$58,264
Health Practitioners	1,007	234	2.7%	2.3%	79%	5%	$80,590	$80,014
Film, TV, Video Production/Distrib	61	21	4.3%	0.5%	61%	20%	$29,060	$99,858
Hospitals & Nursing Facilities	836	181	2.5%	1.1%	53%	7%	$68,007	$65,331
Art Education	32	16	7.3%	3.5%	52%	17%	$7,103	$10,673
Information & Telecom Tech.	180	32	2.0%	0.9%	39%	5%	$60,505	$117,323
Other Technology Mfg	18	5	3.3%	-0.2%	6%	2%	$46,839	$110,529
Higher Education	9	3	4.1%	2.0%	2%	0%	$29,000	$53,501
Transitioning Activities								
Business Consulting	162	43	3.2%	3.3%	36%	0%	$30,773	$78,628
Agric. Inputs	27	1	0.2%	0.4%	46%	0%	$50,251	$68,966
Technical Consulting Services	157	45	3.5%	4.0%	41%	-1%	$29,721	$77,778
Performing and Creative Arts	711	64	1.0%	1.9%	174%	-13%	$15,959	$27,095
Specialty Education	200	43	2.5%	3.8%	60%	-7%	$20,281	$24,446
Agric. Support Services	80	5	0.6%	2.0%	58%	-7%	$70,796	$51,666
Computer Sys. Design & Related	171	33	2.2%	3.6%	29%	-4%	$53,493	$106,903
Computer Services and Software Publishers	158	33	2.3%	4.0%	26%	-4%	$51,526	$115,913
Specialty Health Care Services	300	15	0.5%	5.1%	46%	-24%	$47,882	$42,405
Chemical & Pharmaceutical Mfg	0	0	0.0%	0.1%	0%	0%	$0	$139,624
Technology Equipment Distr.	7	7	0.0%	-0.6%	6%	6%	$80,714	$118,610
Declining Activities								
Farm Production	1,220	-36	-0.3%	0.6%	159%	-12%	$38,491	$30,440
Design Services	94	-11	-1.2%	1.3%	81%	-21%	$25,293	$38,993
Architecture	68	-9	-1.3%	-0.9%	87%	-2%	$39,004	$70,398
Pharmacies	179	-29	-1.5%	0.2%	104%	-16%	$50,455	$48,134
Engineering and Related Serv.	142	-28	-1.8%	0.5%	37%	-8%	$59,850	$92,459
Engineering and Research & Development	103	-31	-2.6%	0.8%	27%	-10%	$100,887	$110,833
Radio and Television Broadcasting	41	-15	-3.1%	-0.3%	64%	-19%	$44,633	$82,467
R&D Services (exc. Biotech.)	34	-13	-3.2%	1.0%	26%	-13%	$140,441	$130,142
Publishing & Information	75	-50	-4.9%	-1.3%	40%	-17%	$58,361	$105,875
Medical Labs, Diagnostic and Imaging Centers*	28	-28	-6.7%	2.3%	41%	-60%	$108,955	$72,560
Call Centers	6	-7	-7.5%	3.3%	4%	-9%	$19,833	$38,533
Agric. Packaging & Warehsg	9	-17	-10.2%	0.9%	20%	-43%	$36,667	$52,032

Source: see Table 3 for data source ("P" designates projection)

CONCLUSIONS

This report is the seventh update of the performance measures of Hawaii's Targeted Industry Portfolio that was developed in 2009. The 2009 report, which initially established and measured the targeted industry portfolio, showed that a number of industry groups performed well during the expansion phase (as measured by change in jobs). The 2010 - 2015 update reports extended those measurements through the contraction phase, providing an analysis of how targets performed over the ups and downs of the business cycle. This updated report added the 2016 projected data to illustrate how targeted industries have been performing after the recovery period of the recession.

Table 24 summarizes the best performing targeted industry groups for the 2006 to 2016 period in terms of average growth and national competitiveness. They all showed positive growth and at the same time outperformed the same activities nationally over the measurement period. Among the sixteen best performing industry groups, six groups had average earnings above the average for Hawaii's economy.

TABLE 24. HIGHEST PERFORMING TARGETED ACTIVITIES, 2006 TO 2016

INDUSTRY GROUPS	JOBS IN HAWAII		AVG. ANN. JOB GROWTH (2006-2016^{p})		CONCENTRATION OF INDUSTRY IN HAWAII COMPARED TO U.S.		AVG ANNUAL EARNINGS (2016^{p})	
	2016^{p}	CHANGE 2006-2016^{p}	HAWAII	U.S.	2016^{p}	% Point CHNG 2006-2016^{p}	HAWAII	U.S.
TOTAL CIVILIAN JOBS	867,947	69,427	0.8%	0.9%	100%	0%	$51,541	$55,531
TOTAL TARGETED JOBS WITHOUT OVERLAP	160,488	22,324	1.5%	1.6%	81%	0%	$55,277	$67,782
Base-Growth and Emerging Activities								
Above Average State Earnings								
Alternative Power Generation	312	223	13.4%	-4.2%	102%	84%	$109,040	$158,376
Hospitals & Nursing Facilities	21,100	3,213	1.7%	1.1%	69%	4%	$81,047	$65,331
Film, TV, Video Production/Distrib	1,494	138	1.0%	0.5%	78%	4%	$67,222	$99,858
Agric. Inputs	483	100	2.3%	0.4%	43%	8%	$63,998	$68,966
Business Consulting	5,050	1,541	3.7%	3.3%	59%	3%	$54,032	$78,628
Technical Consulting Services	4,634	1,566	4.2%	4.0%	63%	2%	$53,312	$77,778
Below Average State Earnings								
Agric. Processing	7,285	784	1.1%	0.9%	95%	3%	$48,543	$58,264
Specialty Health Care Services	11,378	4,450	5.1%	5.1%	91%	1%	$48,202	$42,405
Cultural Activities	3,573	1,977	8.4%	2.8%	392%	163%	$45,549	$52,548
Agric. Support Services	1,532	385	2.9%	2.0%	59%	6%	$44,592	$51,666
Music	1,484	391	3.1%	2.2%	163%	16%	$42,988	$38,546
Fishing, Forestry & Hunting	1,887	190	1.1%	0.5%	344%	21%	$32,249	$35,800
Higher Education	6,468	1,909	3.6%	2.0%	70%	11%	$30,472	$53,501
Farm Production	13,906	1,324	1.0%	0.6%	95%	4%	$29,433	$30,440
Apparel	1,546	304	2.2%	-1.9%	180%	61%	$21,515	$37,958
Art Education	924	324	4.4%	3.5%	78%	8%	$8,867	$10,673

* For definition and data source, see Table 3