Hawaii's Targeted & Emerging Industries

2010 Update Report

Department of Business, Economic Development and Tourism

December 2010

This report was produced by the Research and Economic Analysis Division of the Hawaii Department of Business, Economic Development & Tourism, Dr. Pearl Imada Iboshi, Division Head. Data, analysis and narrative report were developed by the Division's Economic Information Staff and Economic Research Branch.

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.

Cover Photo Credit: Hawaii Tourism Authority

Hawaii Department of Business, Economic Development & Tourism

December 2010

Table of Contents

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. This period corresponded closely to the expansion phase of the most recent economic cycle for Hawaii and the U.S. in terms of employment.

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 nationally. 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 out-performed 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 (but not all) were less competitive than their national counterpart.

This update report extends the performance measures through preliminary data for 2010. The first full year of the new expansion cycle in the economy for both the U.S. and Hawaii in terms of employment is expected to be 2011. This means that the 2002 to 2010 period is roughly a complete economic cycle in terms of employment and should reveal how well the targeted industry portfolio performed on average in both good times and bad.

Table S-1 provides a comprehensive overview of performance among activities in the targeted Industry Portfolio. 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:

- Scientific Research and Development has been among the highest performing activities. While still a small industry group, R&D job growth averaged 5.2% over the 2002 to 2010 period, nearly four times faster than the growth in all civilian jobs and an average 3.3 percentage points per year faster than growth of the same industry group nationally. Moreover, R&D has achieved a higher than national concentration in Hawaii's economy, 33% more concentrated than for the industry nationally. Within R&D, Biotechnology was also a very high performing activity, with an even greater concentration in the economy than other R&D activity by 2010.
- More than a dozen activities were high performing, by not only exceeding the state average in terms of job growth, but also performing better than their national counterparts. Among those were Medical Testing, Aquaculture, Performing & Creative Arts, Specialty Health Care, Business Consulting, Design Services, Technology Manufacturing and Computer Services.

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

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

SECTORS & INDUSTRY GROUPS	JOBS 2010	AVE. ANN. JOB GROWTH 2002 - 2010		HAWAII JOBS ADDED 2002-2010	COMPETITIVE MEASURES[1]			COMPARATIVE AVE. ANNUAL EARNINGS	
					GROWTH ABOVE OR BELOW U.S. 2002-2010	CONCENTRATION IN HAWAII ECONOMY COMPARED WITH U.S. 2010	CONCENTRATION IN HAWAII ECONOMY COMPARED WITH U.S. % Point CHNG 2002-2010		
		HAWAII	U.S.					HAWAII	U.S.
TOTAL CIVILIAN EMPLOY.	775,538	1.3%	0.6%	75,170	0.7%			$45,883	$50,778
Base-Growth Activities									
Research & Devel.	**4,131**	5.2%	1.9%	1,382	3.3%	133%	24%	$67,759	$103,463
Biotechnology	2,060	6.4%	2.4%	808	4.0%	274%	62%	$50,326	$113,069
Aquaculture	**193**	3.7%	-1.5%	49	5.3%	789%	239%	$40,711	$30,096
Engrng and R & D Serv.	**7,789**	3.5%	1.4%	1,874	2.1%	102%	11%	$78,797	$96,212
Medical Testing	**1,739**	3.4%	3.0%	404	0.3%	149%	-5%	$57,477	$67,952
Performing & Creative Arts	**10,158**	2.5%	1.9%	1,805	0.6%	149%	-1%	$20,060	$25,138
Emerging Activities									
Specialty Health Care	**7,431**	8.3%	5.5%	3,498	2.8%	81%	12%	$43,014	$39,218
Business Consulting	**4,588**	6.4%	4.8%	1,798	1.6%	63%	4%	$52,716	$75,353
Call Centers	**335**	6.0%	1.5%	125	4.5%	17%	4%	$20,008	$32,747
Tech Manufacturing	**1,026**	4.8%	-0.8%	319	5.5%	12%	4%	$63,220	$105,076
Design Serv.	**1,473**	3.2%	2.5%	329	0.8%	87%	0%	$39,091	$47,203
Agric. Support Serv.	**1,269**	2.7%	2.0%	246	0.8%	53%	0%	$41,451	$52,046
Computer Services	**6,486**	2.5%	2.4%	1,155	0.0%	75%	-4%	$69,621	$90,854
Computer and Digital Media	**6,602**	2.3%	2.1%	1,107	0.2%	66%	-3%	$69,851	$95,656
Higher Education	**5,860**	2.3%	2.1%	973	0.2%	71%	-3%	$41,951	$55,687
Hospitals/Nursing Facilities	**18,940**	1.6%	1.4%	2,315	0.3%	65%	-2%	$66,818	$55,381
Engrng. and Related	**4,486**	0.9%	0.2%	296	0.7%	78%	0%	$83,349	$83,964
Transitioning Activities									
Tech Consulting Serv.	**4,112**	5.5%	5.7%	1,428	-0.2%	65%	-5%	$51,547	$73,758
Arts Education	**638**	3.7%	4.6%	162	-0.9%	71%	-9%	$10,429	$10,447
Specialty Education	**4,589**	3.6%	4.9%	1,132	-1.3%	93%	-16%	$22,259	$23,948
Marketing, & Related	**4,742**	0.7%	1.8%	256	-1.1%	79%	-12%	$38,343	$60,605
Music	**1,053**	0.5%	0.6%	38	-0.1%	142%	-10%	$34,856	$38,881
Cultural Activities	**2,026**	0.3%	1.3%	54	-0.9%	241%	-33%	$48,723	$43,445
Health Practitioners	**20,891**	0.4%	2.4%	646	-2.0%	96%	-23%	$71,219	$75,056
Declining Activities									
Farm Production	**13,148**	-0.2%	-0.9%	-172	0.8%	93%	1%	$24,615	$28,002
Architecture	**1,993**	-0.3%	-1.0%	-42	0.8%	144%	1%	$76,210	$69,678
Pharmacies	**3,574**	-0.3%	0.6%	-79	-0.9%	108%	-15%	$43,992	$42,079
Tech Equip Distribution	**837**	-0.3%	-0.9%	-19	0.6%	35%	0%	$80,405	$102,822
Agric. Inputs	**393**	-0.8%	-0.7%	-27	-0.1%	37%	-3%	$57,604	$61,415
Information & Tele Tech Serv.	**2,087**	-0.9%	-0.2%	-152	-0.7%	48%	-6%	$64,431	$96,443
Agric. Processing	**6,235**	-1.0%	-0.6%	-549	-0.4%	90%	-9%	$42,366	$51,228
Broadcasting	**1,212**	-1.7%	-0.8%	-179	-0.9%	103%	-15%	$57,524	$76,932
Publishing & Information	**2,552**	-1.7%	-1.7%	-378	0.0%	74%	-4%	$55,849	$67,587
Film, TV, Video	**1,310**	-2.2%	-0.1%	-255	-2.1%	78%	-20%	$51,348	$87,160
Fishing, Foresty&Hunting	**1,726**	-3.2%	-2.1%	-514	-1.1%	340%	-55%	$19,841	$32,000
Agric. Packaging/Warehsg	**213**	-4.6%	-0.7%	-97	-3.9%	28%	-13%	$57,462	$49,589
Apparel	**885**	-8.0%	-7.9%	-840	-0.1%	115%	-8%	$23,232	$42,405

[1] See Table 4 and narrative text for explanation of competitive measures.

Source: DBEDT based on data from Economic Modeling Specialists, Inc. (EMSI). Estimates for 2010 are based on early 2010 actual data and are also from EMSI.

- Adjusting for overlaps, the high-performing activities in the target industry portfolio (Base-growth and Emerging) accounted for about 69,600 jobs or 9.0% of all civilian jobs in 2010. However, between 2002 and 2010 those activities generated 20% of the total gain in jobs for the civilian economy, or about 15,000 new jobs.

- For about half of the high performing activities the average annual earnings exceeded $50,000 in 2010. Engineering and Related Activity had the highest average at just over $83,000. The lowest average earnings were in Performing & Creative Arts and Call Centers, at about $20,000. By comparison, the average earnings for the civilian economy in 2010 were $45,900 by preliminary estimate.

- Seven activities in the portfolio, such as Technical Consulting, Arts Education, Special Education, Marketing & Related, Music, Cultural Activities, and Health Practitioners, fell into the Transitioning category. They gained jobs over the period but did not keep up with national growth for same activities resulting in a loss of competitive national industry share. Three of those activities, however, grew much faster in terms of jobs than the civilian economy as a whole.

- Average earnings among the Transitioning activities were generally lower than for the high performing group with health practitioners as an exception. . Health practitioners had a high average earning at $71,200 and also had the most jobs in the Transitioning Group at about 20,900.

- The positive side of the Transitioning activities in the portfolio is that they did contribute to job growth in the economy. The concern is that they generally lost ground competitively to the same activities at the national level.

- About a dozen activities in the portfolio fell into the Declining industry category as the result of net job losses for the 2002 to 2010 period. Notable among these were Farm Production, Architecture, Pharmacies, Information Technology, Broadcasting, Publishing and Film/TV.[2]

- Except for Pharmacies, 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 nationally.

- Jobs in the Declining industry groups totaled an estimated 36,000 in 2010 (4.6% of all civilian jobs), representing a loss of more than 3,400 jobs from 2002. Eight of the thirteen industry groups had earnings averages above $50,000.

- Declining industries are not necessarily dying activities. For instance, Film/TV is a volatile activity that depends on the number of productions filming per year. With more new shows filming in late 2010, the 2002-2010 job losses may be recouped in the next several years if the current production levels continue. In some cases, like Information activity, the technology for developing and delivering information is improving rapidly, and perhaps reducing the need for workers. In those 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

[2] Film/TV jobs mainly reflect just the production crews. It does not include actors, directors, writers and other creative occupations. Those jobs are included in various industries of the Creative Sector. However, the distinction between those engaged in Film/TV as opposed to live performances is not made in the available data. It is noted that independent artists, writers and performers as a group averaged a 2.2% increase in jobs over the 2002 to 2010 period.

and defense activity and may be reflecting ups and downs in those industries rather than independent local or export markets.

Some targeted activities of interest could not be measured using standard statistics that are generated for production industries. Among those are Astronomy, Dual Use Technology, Ocean Science and Technology, and some others. These activities are more market- and product-based and require special surveying efforts. Data from such efforts have been included in this report to the extent available. However, one thing is important to note: The jobs in those market- and product-based activities are included for the most part in one or more of the production-side industries presented in Table S-1.

It is also 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 high performing industries are growing independently or are feeding off growth in 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.

Primarily the performance assessment serves to assist economic developers and policy makers to understand which target industries are achieving the potential hoped for them and which are not. Future diagnostic efforts, which are very time and resource intensive, will benefit from the priorities economic developers provide for that research after reviewing the performance results in this report series.

OVERVIEW

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 new report updates the review of targeted industry performance at the state level to 2010 (preliminary data), including data revisions for 2002-2008 made by data providers.

Defining & Measuring 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 purposes of this report series, 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.

Defining the activities in the portfolio in a way that could be measured was a key step in assessing the portfolio. An economic activity can be defined in several ways. One way is by the *industry that produces a good or service*, for example the computer services industry. This definition focuses on firms and workers engaged in producing a range of products through the same production process. An economic activity can also be defined by a *particular good or service* produced such as computer programming, which would be a major product set of the computer services industry. Finally, an activity can be defined by the *market* it serves, such as digital special effects for films or applications support for mobile devices. These have been new markets for the computer services industry in recent years, although those markets are also served by elements of the Film industry.

Targeted industries proposed for Hawaii have been a mixture of all three of these concepts.[3] It is OK to emphasize different bases for defining the activity we want to develop. The problem comes when we want to measure and track the growth and performance of these activities over time. The ability to measure economic activity depends on the data available and the cost of obtaining the data if it does not exist. Most economic research utilizes existing data for economic activity that is produced regularly by established major statistical programs of government agencies. However, most of these statistical programs gather data based on jobs and earnings of standard industries rather than for products and markets.

To develop data on products and markets usually requires special surveys, which are expensive and time consuming. Researchers have relied on development agencies and industry groups to survey market side activity and provide some data. But while these surveys can shed light on the number of jobs, sales and earnings for products and markets, it is hard to relate the results of surveys with other important data like the occupations, skill sets and educational requirements for those jobs. Data gathered for jobs in standard industry groups, on the other hand, can take advantage of parallel programs that survey occupations and skill sets for those industries and other programs that can translate those occupations and skills into the necessary educational programs.

Thus, as explained in detail in the 2009 study, the targeted industry portfolio is measured and assessed on the basis of industry and firm data on the production side that most closely matches the corresponding products and markets of interest to economic development.

The Targeted Industry Portfolio

Table 1 lists the industries of the portfolio. The list shows two major classes of activities -- those that can be reasonably measured with industry data (first two columns) and activities that represent more of a product or market concept. This report contains ample data for the jobs and earnings of the industry-based targets. Data for jobs in the product and market-based activities in this report were taken from existing surveys and studies.

Despite the limitation on direct data about market-based targeted activity it is important to note that those data are, for the most part, accounted for on the production side of Table 1.[4] That is because these market-based activities consist of bits and pieces of outputs from various production-side activities in the first two columns. For instance, some jobs in the engineering, computer services and R&D industries on the production side are dedicated to market-side activities such as Astronomy, Ocean Science and Defense Dual Use. Thus market activity data are imbedded in the production data and accounted for. However without resource intensive surveys, that data cannot be easily parsed into the corresponding market-side activities.

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

[3] For instance, the effort to develop biotechnology focuses mainly on the firms, workforce and facilities involved in that activity regardless of the products produced, which range from seed corn research to tissue regeneration. On the other hand the state's interest in digital media is focused on specialized products from the computer, music and film industries, mainly to serve entertainment markets. Finally, interest in dual-use technology activity is primarily focused on markets, specifically the military and later commercial markets for the products and services of Hawaii firms over a range of technology industries and products.

[4] Except for Captive Insurance and Specialty Tourism.

groups, definitions for measurement purposes have been adopted from previous studies, particularly for the technology sector, the creative sector, and health and wellness. Jobs and earnings include wage and salary positions and estimates for self employed and proprietors. The data were obtained via 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. These detailed industries can then be combined into groupings that approximate the target activities shown in the first two columns of Table 1.

TABLE 1. TARGETED INDUSTRY PORTFOLIO

PRODUCTION SIDE TARGETED GROUPS		MARKET-SIDE ACTIVITIES
TECHNOLOGY	Architecture	TECHNOLOGY
Computer Services	Design Services	Astronomy
Engineering and Related Services	Radio and TV Broadcasting	Ocean Science & Tech.
Biotechnology	Film, TV and Video Production	Energy Technology
Technical Consulting Services	Music	Defense Dual Use
Research and Development Services	AGRIBUSINESS	OTHER TARGETS
Info and Telecom Tech Services	Farm Production	Captive Insurance
Medical and Diagnostic Testing	Agricultural Processing	Specialty Tourism
Technology Equipment Distrib.	Fishing, Forestry & Hunting	
Technology Manufacturing	Agricultural Support Services	
CREATIVE INDUSTRIES	Agricultural Inputs	
Performing and Creative Arts	Aquaculture Production	
Engineering/R&D	Agricultural Packaging and Warehousing	
Computer and Digital Media	OTHER TARGETS	
Marketing and Related	Health & Wellness	
Business Consulting	Education	
Publishing and Information	Apparel	
Cultural Activities	Call Centers	

Source: DBEDT.

In establishing and refining the definitions and measurements of the targeted industries, DBEDT Research has collaborated with numerous agencies and stakeholders, particularly representatives of the University of Hawaii, Hawaii Science and Technology Council (HiSciTech), the Workforce Development Council, Office of Planning and numerous other stakeholders. Industry criteria and policies developed by the County Economic Development Boards for the Comprehensive Economic Development Strategy plan process also contributed to the development of the targeted industry portfolio.

Portfolio Overview

Table 2 summarizes the change in jobs among the major sectors of the targeted industry portfolio from 2002 to the current estimate for 2010.[5] The table emphasizes three time periods. The 2002 to 2008 period represents the most recent expansion period in the economy for both the U.S. and Hawaii in terms of employment.[6] The 2008 to 2010 period is closely aligned with the recent contraction phase in the U.S. and Hawaii economies in terms of jobs.[7] The 2009 to 2010 period shows how jobs in the sectors are estimated to have performed very recently.

During the growth phase of the economic cycle, Technology, Creative and Private Education sectors outperformed the state's economy in terms of average yearly job growth. During the recent contraction in the economy, some targeted industry sectors experienced job losses. Percentage wise, however, job losses in all major targeted industries were less over the contraction period than the civilian economy.

TABLE 2. CHANGE IN JOBS FOR MAJOR TARGETED INDUSTRY SECTORS

TARGETED INDUSTRY SECTORS	JOBS[1]				CHANGE IN JOBS Annual Average			
	2002	2008	2009	2010est.	2002-2008	2008-2010	2009-2010	2002-2010
TOTAL CIVILIAN EMPLOY.	**700,368**	**803,930**	**780,067**	**775,538**	**2.3%**	**-1.8%**	**-0.6%**	**1.3%**
TECHNOLOGY SECTOR	20,090	24,882	25,142	24,943	3.6%	0.1%	-0.8%	2.7%
CREATIVE SECTOR	39,567	47,079	46,698	46,136	2.9%	-1.0%	-1.2%	1.9%
AGRIBUSINESS	24,241	23,555	23,193	23,177	-0.5%	-0.8%	-0.1%	-0.6%
HEALTH & WELLNESS	45,791	51,988	51,944	52,575	2.1%	0.6%	1.2%	1.7%
EDUCATION (PVT)	8,344	9,746	9,895	10,449	2.6%	3.5%	5.6%	2.9%
OTHER TARGETED								
Apparel	1,725	1,110	880	885	-7.1%	-10.7%	0.6%	-8.0%
Call Centers	210	403	371	335	11.5%	-8.8%	-9.7%	6.0%

[1] Includes wage & salary, sole proprietors & self employed.
Source: DBEDT based on data from Economic Modeling Specialists, Inc. (EMSI). Estimates for 2010 are based on early 2010 actual data and are also from EMSI.

In this update report, the industry groups of the targeted industry portfolio are presented by the major sectors shown in Table 2. The performance measures are the same as those developed for the 2009 report. However they are presented in slightly different way that will hopefully be more clear and intuitive to readers unfamiliar with economic performance measures.

The first key performance measure is the change in 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.

[5] Final 2010 data at the detailed level will not be available until late spring 2011.

[6] Hawaii's employment slowed to a 0.3% gain in 2002 before rebounding in 2003. U.S. employment declined 0.3% in 2002 and also rebounded in 2003.

[7] Employment growth peaked for both Hawaii and the U.S. in 2007 before declining in 2008. Hawaii and U.S. employment are expected to decline slightly in 2010 before beginning gradual recovery in 2011.

Second, we are interested in measuring how jobs among the portfolio activities have grown relative to the state as a whole. An activity may be showing positive job growth but unless it grows faster than the rest of the state's economy it is not helping to diversify that economy.

Third, the competitiveness and concentration of the activity in Hawaii compared to elsewhere is of interested. If the activity is growing faster in Hawaii than nationally, it suggests that the state has some amount of competitive advantage in the activity. Likewise, if the activity has achieved a greater proportion of jobs in the state than the same activity has in the national economy, it is likely an activity in which Hawaii has a competitive advantage. A higher proportion (or concentration) also suggests that the activity has matured to the point that it is likely exporting a portion of its output directly or indirectly.

Finally, we are interested in the average earnings for workers in the activity. Higher earnings generally come from high quality jobs. A relatively higher earnings average in a competitive activity suggests that the activity is creating high quality jobs that can help keep Hawaii's well educated youth in the state.

Together, these measures will help us group the activities in the portfolio 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 nationally. This suggested that Hawaii was developing a competitive advantage in the activities and 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 out-performed 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 (but not all) were less competitive than their national counterpart.

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.[8] The project adopted a producing-industry-side definition for technology established by U.S. Bureau of Labor Statistics (BLS) staff.[9] As of now, the measurements for that study were based on EMSI data. That definition has been adhered to in the two DBEDT studies of targeted industries with minor adjustments for changes in the industry coding system in 2007.

Size & Growth

The technology sector in 2010 accounted for about 3.2% of all civilian jobs in Hawaii, including self-employed and sole proprietors. For the 2002 to 2010 job cycle the technology sector posted an average 2.7% gain in jobs per year, about twice the average growth for the civilian economy. As Table 3 shows, technology job growth was strong during the expansion phase of the cycle (2002 to 2008).

The technology sector was not immune to the recession that caused the state's job count to contraction from 2008 to 2010. Information & Telecom Technology Service, Engineering and Related, and Technology Equipment Distribution have experienced sharp job losses during the contraction phase. However, Technology sector as a whole was able to keep up the pre-recession job level thanks to large job gains in R&D and Tech Manufacturing sector. Preliminary 2010 data suggest that the technology sector is somewhat behind the rest of the economy in its recovery.

TABLE 3. CHANGE IN TECHNOLOGY SECTOR JOBS

INDUSTRY GROUP	JOBS				CHANGE IN JOBS Annual Average			
	2002	2008	2009	2010est.	2002-2008	2008-2010	2009-2010	2002-2010
TOTAL CIVILIAN EMPLOY.	700,368	803,930	780,067	775,538	2.3%	-1.8%	-0.6%	1.3%
TECHNOLOGY SECTOR	**20,090**	**24,882**	**25,142**	**24,943**	**3.6%**	**0.1%**	**-0.8%**	**2.7%**
Computer Services	5,331	6,497	6,571	6,486	3.4%	-0.1%	-1.3%	2.5%
Engrng. and Related	4,189	4,872	4,753	4,524	2.6%	-3.6%	-4.8%	1.0%
Research & Devel.	2,749	3,679	4,027	4,131	5.0%	6.0%	2.6%	5.2%
Biotech R&D	1,252	1,548	1,840	2,060	3.6%	15.4%	12.0%	6.4%
Tech Consulting Serv.	2,684	4,057	4,138	4,112	7.1%	0.7%	-0.6%	5.5%
Information & Tele Tech Serv.	2,239	2,340	2,160	2,087	0.7%	-5.6%	-3.4%	-0.9%
Medical Testing	1,335	1,719	1,708	1,739	4.3%	0.6%	1.8%	3.4%
Tech Manufacturing	707	839	918	1,026	2.9%	10.6%	11.8%	4.8%
Alternate Power Gen.	161	158	175	290	-0.3%	35.5%	65.7%	7.6%
Chem. & Pharmecu.	118	92	114	115	-4.1%	11.8%	0.9%	-0.3%
Tech Equip. Mfg.	428	589	629	621	5.5%	2.7%	-1.3%	4.8%
Tech Equip Distribution	856	879	867	837	0.4%	-2.4%	-3.5%	-0.3%

*For definition and data source, see Table 2

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

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

Computer Services accounts for the largest share of technology jobs in Hawaii with about 26% of the total in 2010. That industry group is followed in size by Engineering and Related and R&D. The smallest industry groups in technology are Manufacturing and Technology Equipment Distribution.

Technology Consulting turned in the best performance among the technology industry groups in terms of job growth. It had the highest average growth in jobs during the expansion period 2002 to 2008 and the highest growth for the entire cycle of 2002 to 2010. Another high-performing activity in the technology sector was R&D. The performance of this activity was especially impressive because it was one of a few technology industry groups that were relatively immune from the decline in jobs felt by the entire economy from 2008 to 2010.

Only two technology industry groups failed to grow jobs over the 2002 to 2010 economic cycle. Those were Information & Telecom Technology Services and the relatively smaller, Technology Equipment Distribution.

Competitive Metrics

Table 4 shows the difference in percentage points between job growth in Hawaii and the nation for the technology sector industry groups. In all but two groups (Consulting and Information) did Hawaii outperform the nation in job growth. Overall, Hawaii's technology sector grew jobs 1.5% points faster than the U.S.

TABLE 4. HAWAII TECHNOLOGY PERFORMANCE COMPARED WITH NATION

INDUSTRY GROUPS	GAIN OR LOSS IN NATIONAL COMPETITIVENESS[1]			CONCENTRATION OF ACTIVITY IN HAWAII COMPARED TO NATION[2]	
	2002-2008	2008-2010	2002-2010	2010	% POINT CHNG 2002-2010
ALL TECHNOLOGY SECTOR	**1.3%**	**2.1%**	**1.5%**	**62%**	**4%**
Tech Manufacturing	2.9%	13.5%	5.5%	12%	4%
Alternate Power	2.7%	38.9%	10.8%	66%	36%
Chem. & Pharmecu.	-3.6%	14.3%	0.7%	7%	0%
Tech Equip. Mfg.	5.1%	5.6%	5.3%	10%	3%
Research & Devel.	2.2%	6.6%	3.3%	133%	24%
Biotechnology	0.3%	15.7%	4.0%	274%	62%
Engrng. and Related	0.5%	1.5%	0.7%	78%	0%
Tech Equip Distribution	0.4%	1.0%	0.6%	35%	0%
Medical Testing	0.9%	-1.3%	0.3%	149%	-5%
Computer Services	0.1%	0.0%	0.0%	75%	-4%
Tech Consulting Serv.	-0.7%	1.0%	-0.2%	65%	-5%
Information & Tele Tech Serv.	0.1%	-2.9%	-0.7%	48%	-6%

[1] Difference between the average growth of jobs in Hawaii vs. growth for the same activity nationally. For instance, jobs in Hawaii's tech sector as a whole showed 1.5 percentage points more growth for 2002-2010 than the same activity nationally. A negative percentage indicates the national activity grew faster (or in some cases contracted less). This metric corresponds to the Competitive Share Effect of the Shift-Share Measure of regional growth.

[2] Proportion of jobs in the activity in Hawaii compared to the proportion nationally. A proportion of 100% means that the activity accounts for an equal percentage of the total economy for the state and nation. For example, the proportion of all state jobs in the technology sector as a whole in Hawaii was only 62% of the proportion that same industry represents in the national economy. But the last column shows that this represented a gain of 4 percentage points from 2002. (Measure corresponds to Location Quotient or LQ).

*See Table 2 for data source

Manufacturing led the way in technology's competitive performance, growing jobs 5.5% points faster than the same industry nationally. But the R&D industry group probably turned in the most important competitive gain, averaging 3.3% points more job growth for 2002 to 2010 than the same industry group nationally. R&D also showed strength during the 2008 to 2010 contraction, with jobs growing at 6.6% points faster than nationally. Nationally, jobs in R&D actually declined in that period.

Only two technology industry groups (Technical Consulting and Information & Telecom Technology Services) lost competitive ground to their national counterparts over the 2002 to 2010 business cycle.

In terms of concentration, technology remains a smaller proportion of Hawaii's economy than it is nationally. Hawaii's proportion of the State's workforce in technology was about 62% of the proportion nationally. However, thanks to its more competitive performance, this is up 4 % points from 2002.

Most of the technology industry groups are still a relatively smaller proportion of Hawaii's economy than they are nationally. The most notable exception is Research and Development, which is 33% more concentrated in Hawaii than nationally. Within R&D, the biotechnology industry is even more concentrated, registering 174% more than nationally in terms of job proportion in the economy.

Medical Testing also showed a higher proportion of jobs in Hawaii. Hawaii's proportion of this industry group was 49% more than nationally.

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 S-1.

Table 5 shows the technology industry groups by performance rating. Most of the Technology industry groups fell into the high performing, Base-Growth and Emerging categories.

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 Emerging industry groups have yet to reach national concentrations. Beyond that, both categories show positive and competitive growth in jobs.

Technical Consulting Services fell into the Transitioning category for 2002 to 2010. While job growth was strong in this industry group it still lost some competitive share to the national industry group. Also, while the annual earnings average for this group was above the average for Hawaii's economy, it was the lowest among the major technology industry groups at $51,500 in 2010.

Technology Equipment Distribution (a trade industry) and Information & Telecom Technology Services fell into the declining category for 2002 to 2010 by losing jobs over the period. Equipment Distribution lost fewer jobs proportionately than the same activity nationally. So, competitively it held its own with a very weak national industry.

TABLE 5. TECHNOLOGY INDUSTRY GROUPS, OVERALL PERFORMANCE RANKINGS

SECTORS & INDUSTRY GROUPS	AVE. ANN. JOB GROWTH 2002 - 2010		HAWAII JOBS ADDED 2002-2010	COMPETITIVE MEASURES			COMPARATIVE AVE. ANNUAL EARNINGS	
				GROWTH ABOVE OR BELOW U.S. 2002-2010	CONCENTRATION IN HAWAII ECONOMY COMPARED WITH U.S.			
	HAWAII	U.S.			2010	% Point CHNG 2002-2010	HAWAII	U.S.
TOTAL CIVILIAN EMPLOY.	1.3%	0.6%	75,170	0.7%			$45,883	$50,778
TECHNOLOGY SECTOR	**2.7%**	**1.3%**	**4,853**	**1.5%**	**62%**	**4%**	**$67,710**	**$91,776**
Base-Growth Activities								
Research & Devel.	5.2%	1.9%	1,382	3.3%	133%	24%	$67,759	$103,463
Biotechnology	6.4%	2.4%	808	4.0%	274%	0.6	$50,326	$113,069
Medical Testing	3.4%	3.0%	404	0.3%	149%	-5%	$57,477	$67,952
Emerging Activities								
Tech Manufacturing	4.8%	-0.8%	319	5.5%	12%	4%	$63,220	$105,076
Computer Services	2.5%	2.4%	1,155	0.0%	75%	-4%	$69,621	$90,854
Engrng. and Related	1.0%	0.3%	336	0.7%	78%	0%	$83,922	$84,907
Transitioning Activities								
Tech Consulting Serv.	5.5%	5.7%	1,428	-0.2%	65%	-5%	$51,547	$73,758
Declining Activities								
Tech Equip Distribution	-0.3%	-0.9%	-19	0.6%	35%	0%	$80,405	$102,822
Information & Tele Tech Serv.	-0.9%	-0.2%	-152	-0.7%	48%	-6%	$64,251	$95,629

* For definition and data source, see Table 4

Information Technology jobs declined in both Hawaii and the nation from 2002 to 2010, although more so in Hawaii. Two forces may have influenced this decline. First, productivity gains in information technology may be reducing the labor needed in the industry to produce the same output of services. Second, in recent years there has been a consolidation of internet services, especially web hosting, into fewer providers around the country that serve nationwide markets. The economies of scale for these high volume providers have made the economics of stand-alone, local and regional internet services difficult.

Overall, the industry groups of the technology sector performed very well over the 2002 to 2010 business cycle. As a group they grew jobs at double the rate of the national economy and two groups, R&D and Medical Testing are now more concentrated in Hawaii's economy than for the nation as a whole. Average earnings for all Hawaii technology industry groups are below national averages, but all exceed the average for Hawaii. [10]

Market Side Activities

Table 1 noted several technology activities that could not be measured with industry- based data because they represented market- or product-based concepts, not addressed by standard statistical programs. It was noted that jobs associated with most, if not all of these activities are accounted for in the production-based industry data presented.

However, DBEDT Research has assembled the available information on these market-based technology activities, and that information is summarized below.

[10] The sub industry group activity of Biotech had average earnings relatively lower than other technology groups. This may be due to the number of field workers needed in the corn seed research industry.

Astronomy

Astronomy activity has found Hawaii attractive because of the exceptionally clear viewing conditions atop its highest peak of Mauna Kea on the Big Island of Hawaii and atop Haleakala on Maui. Educational institutions, governments and scientific organizations throughout the world have invested hundreds of millions of dollars in observatories on the summits of Mauna Kea and Haleakala.

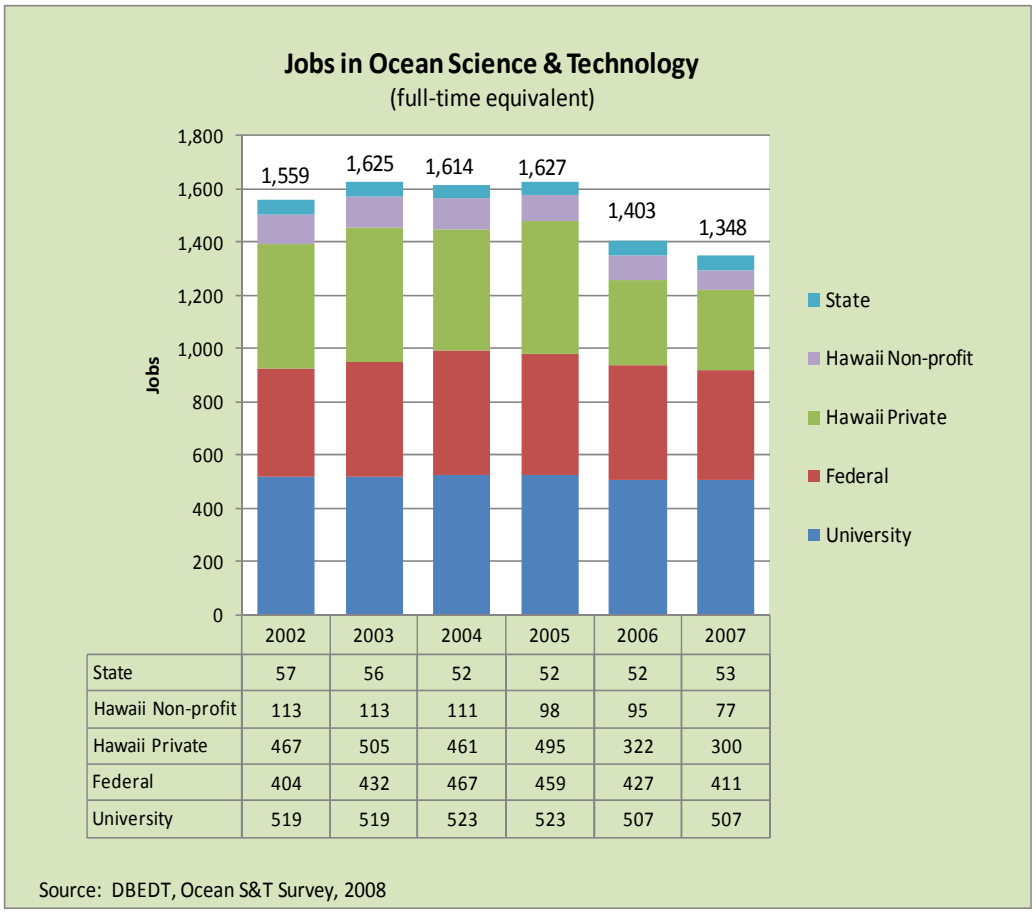
According to information from the UH Institute for Astronomy, there were 11 astronomical facilities on Mauna Kea and six on Maui's Haleakala in 2008. Total expenditures for astronomical facilities and support services on these two islands totaled $108 million in 2008, up from $94 million in 2005. There were 735 jobs associated with these facilities and support services in 2008, up from 678 jobs in 2005.

Mauna Kea has been chosen as the site for one of the three new super telescopes to be built in various locations around the world over the next decade. The new Mauna Kea telescope will be a giant, 30-meter instrument called the TMT (for Thirty Meter Telescope). It will be built by a consortium including an association of Canadian Universities, the California Institute of Technology and the University of California.

Ocean Science and Technology

Ocean science and technology is a mix of different fields including biology, chemistry, geology, physics, engineering and others. In Hawaii, the ocean science and technology sector encompasses both the public and private sectors. The majority of activities in this sector are in research and technical development projects funded by the government, non-profit organizations and some private sources.

FIGURE 1.



	2002	2003	2004	2005	2006	2007
State	57	56	52	52	52	53
Hawaii Non-profit	113	113	111	98	95	77
Hawaii Private	467	505	461	495	322	300
Federal	404	432	467	459	427	411
University	519	519	523	523	507	507

Source: DBEDT, Ocean S&T Survey, 2008

Figure 1 charts the trend in jobs associated with Ocean S&T activity from 2002 to 2007, differentiated by *performing* sector. Performing sectors are the firms and agencies that received funding for projects.

The decline in total Ocean S&T jobs after 2005 corresponds to a decline in funding

for those activities. A more thorough discussion of Ocean Science and Technology funding is presented in the 2009 Emerging Industries report.

The most recent survey on Ocean Science & Technology was conducted in 2008. The report of that survey may be accessed at:
http://hawaii.gov/dbedt/info/economic/data_reports/OceanScTechReport2007.pdf.

Energy Technology

Energy technology targets a number of emerging markets by engaging a multitude of traditional industries. Those industries have allocated some of their activity to focus on the replacement or conservation of fossil fuels. While the system for industry classification does contain a classification for Other Power Generation and is included in the production side data of this report, that captures only a small part of the emerging field of alternate energy activity.

There are two major subsectors in energy technology. *Energy efficiency* is focused on reducing the use of energy in the economy, particularly in buildings. *Energy replacement* (renewable or alternate energy) is focused on replacing fossil fuel with alternative, preferably renewable sources like solar, wind, and other types.

Energy efficiency and energy replacement involve numerous traditional industries ranging from heating and plumping to engineering and architecture. For instance, solar panels may be installed by a number of different contracting specialties. About 20 different industries service some aspect or provide support for renewable energy and conservation. Again, the 2009 Emerging Industries Report discusses in detail the range of industries associated with Energy Technology.

Dual Use (Military Technology Market)

Dual Use Technology has been a market opportunity for Hawaii companies to leverage investment in technology developed for military applications into products to serve commercial markets. For instance, a company developing corneal regeneration technology to treat battlefield eye injuries will likely find a market for that technology in the commercial medical sector.

Like other targets that represent market or product activities, data and information on the workers and revenues of firms serving the military technology market are difficult to develop. This is because they do not fit into the scheme of standard producing industries for which a rich set of data is compiled on a regular basis. Data for market and product based activity like Dual Use Technology must be developed through surveys or other estimating methods.

The most structured effort to gather data on the dual use sector to date was by the State Department of Labor and Industrial Relations (DLIR) in 2005. In support of the Workforce Development Council and Enterprise Honolulu, the Research and Statistics (R&S) Office of DLIR surveyed 132 companies in the dual use sector. The R&S survey estimated employment in the dual-use technology industry to be 1,204 workers in 2005 with an additional 108 positions vacant and needing to be filled.

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.[11] 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 better reflect the integration of art, technology and other creative activity.

Size & Growth

The 13 Creative industry groups accounted for an estimated 46,100 jobs in 2010, nearly 6% of all civilian jobs in Hawaii. Performing and Creative Arts activities are the largest industry group in the sector, accounting for almost 22 percent of jobs in the sector.

The creative sector outgrew the civilian economy in terms of jobs during the expansion period of 2002 to 2008 and experienced relatively milder job losses during the 2008 to 2010 contraction phase (Table 6). Consequently, overall the sector showed stronger growth than the rest of the economy for the 2002 to 2010 period.

TABLE 6. CHANGE IN CREATIVE SECTOR JOBS

INDUSTRY GROUP	JOBS				CHANGE IN JOBS Annual Average			
	2002	2008	2009	2010est.	2002-2008	2008-2010	2009-2010	2002-2010
TOTAL CIVILIAN EMPLOY.	700,368	803,930	780,067	775,538	2.3%	-1.8%	-0.6%	1.3%
CREATIVE SECTOR	**39,567**	**47,079**	**46,698**	**46,136**	**2.9%**	**-1.0%**	**-1.2%**	**1.9%**
Performing & Creative Arts	8,353	9,704	10,099	10,158	2.5%	2.3%	0.6%	2.5%
Computer and Digital Media	5,495	6,621	6,694	6,602	3.2%	-0.1%	-1.4%	2.3%
Engrng and R&D Serv.	5,915	7,424	7,828	7,789	3.9%	2.4%	-0.5%	3.5%
Marketing, & Related	4,486	5,159	4,937	4,742	2.4%	-4.1%	-3.9%	0.7%
Business Consulting	2,790	4,491	4,636	4,588	8.3%	1.1%	-1.0%	6.4%
Publishing & Information	2,930	2,904	2,661	2,552	-0.1%	-6.3%	-4.1%	-1.7%
Cultural Activities	1,972	2,243	2,054	2,026	2.2%	-5.0%	-1.4%	0.3%
Architecture	2,035	2,325	2,149	1,993	2.2%	-7.4%	-7.3%	-0.3%
Design Serv.	1,144	1,613	1,566	1,473	5.9%	-4.4%	-5.9%	3.2%
Film, TV, Video	1,565	1,395	1,118	1,310	-1.9%	-3.1%	17.2%	-2.2%
Broadcasting	1,391	1,377	1,248	1,212	-0.2%	-6.2%	-2.9%	-1.7%
Music	1,015	1,187	1,080	1,053	2.6%	-5.8%	-2.5%	0.5%
Arts Education	476	636	628	638	4.9%	0.2%	1.6%	3.7%

*For definition and data source, see Table 2

Business Consulting grew jobs the most over the 2002 to 2010 cycle. Publishing & Information and Broadcasting that failed to gain jobs over the expansion period experienced a sharp decline in jobs during the 2008 to 2010 contraction period. Film and TV experienced a sharp decline in jobs

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

during the contraction period, especially in 2009, but the 2010 preliminary data showed that at least the job loss it had in 2009 was recouped in 2010.

Competitive Metrics

As a whole, the industry groups of the Creative sector gained a slight bit of competitive share to the U.S. economy from 2002 to 2010. It was mainly due to the competitive gain achieved in Engineering/R&D and Business Consulting. Individual industry group performance varied widely.

The business oriented creative industry groups of Engineering/R&D, Business Consulting, Architecture Design Services and Computer/Digital Media Services all outperformed their national counterparts for the full 2002 to 2010 period. However artistic-oriented industry groups either lost ground competitively to their national counterparts or just managed to hold their own. The artistic groups tend to be more dependent on tourism and that sector was the hardest hit in the 2008 to 2010 downturn.

TABLE 7. HAWAII CREATIVE SECTOR PERFORMANCE COMPARED WITH NATION

INDUSTRY GROUPS	GAIN OR LOSS IN NATIONAL COMPETITIVENESS			CONCENTRATION OF ACTIVITY IN HAWAII COMPARED TO NATION	
	2002-2008	2008-2010	2002-2010	2010	% POINT CHNG 2002-2010
CREATIVE SECTOR	**0.0%**	**1.0%**	**0.2%**	**93%**	**-4%**
Engrng and R & D Serv.	1.1%	5.0%	2.1%	102%	11%
Business Consulting	1.5%	1.9%	1.6%	63%	4%
Architecture	0.5%	1.5%	0.8%	144%	1%
Design Serv.	1.4%	-0.9%	0.8%	87%	0%
Performing & Creative Arts	0.3%	1.5%	0.6%	149%	-1%
Computer & Digital Media	0.2%	0.2%	0.2%	66%	-3%
Publishing & Information	0.0%	0.1%	0.0%	74%	-4%
Music	1.2%	-4.1%	-0.1%	142%	-10%
Arts Education	-0.6%	-1.6%	-0.9%	71%	-9%
Cultural Activities	0.2%	-4.1%	-0.9%	241%	-33%
Broadcasting	-0.5%	-2.2%	-0.9%	103%	-15%
Marketing, & Related	-1.2%	-0.8%	-1.1%	79%	-12%
Film, TV, Video	-2.6%	-0.7%	-2.1%	78%	-20%

* For definition and data source, see Table 4

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 more than twice as concentrated in Hawaii and Engineering/R&D, Architecture, Music, Performing & Creative Arts, and Broadcasting also exceed national concentrations. However, except for Engineering/R&D and Architecture, that level of concentration declined over the 2002 to 2010 period.

Overall Performance

Based on the performance metrics above, the Creative industry groups are placed into the performance categories shown in Table 8. Five groups, Performing & Creative Arts, Engineering/R&D, Business Consulting, Design Services, and Computer/Digital Media are all rated as high performing for growth and competitiveness with the same activities nationally.

Another four groups, Art Education, Marketing & Related, Music and Cultural Activities, grew jobs over the period but came up short competitively compared with the performance of the same industry group nationally over the 2002 to 2010 period. Those groups did not grow jobs fast enough to equal or exceed national growth.

Finally, four Creative Industry Groups were in the lowest performance group. All lost jobs over the 2002-2010 time period, with the moderately large losses in Film/TV, Publishing & Information and Broadcasting. Architecture showed a very slight decline.

These industry groups also lost jobs nationally. However, with the exception of Architecture and Publishing & Information, the losses were higher in Hawaii.

TABLE 8. CREATIVE INDUSTRY GROUPS, OVERALL PERFORMANCE RANKINGS

SECTORS & INDUSTRY GROUPS	AVE. ANN. JOB GROWTH 2002 - 2010		HAWAII JOBS ADDED 2002-2010	COMPETITIVE MEASURES			COMPARATIVE AVE. ANNUAL EARNINGS	
				GROWTH ABOVE OR BELOW U.S. 2002-2010	CONCENTRATION IN HAWAII ECONOMY COMPARED WITH U.S.			
	HAWAII	U.S.			2010	% Point CHNG 2002-2010	HAWAII	U.S.
TOTAL CIVILIAN EMPLOY.	1.3%	0.6%	75,170	0.7%			$45,883	$50,778
CREATIVE SECTOR	**1.9%**	**1.7%**	**6,569**	**0.2%**	**93%**	**-4%**	**$50,577**	**$70,470**
Base-Growth Activities								
Performing & Creative Arts	2.5%	1.9%	1,805	0.6%	149%	-1%	$20,060	$25,138
Engrng and R & D Serv.	3.5%	1.4%	1,874	2.1%	102%	11%	$78,797	$96,212
Emerging Activities								
Business Consulting	6.4%	4.8%	1,798	1.6%	63%	4%	$52,716	$75,353
Design Serv.	3.2%	2.5%	329	0.8%	87%	0%	$39,091	$47,203
Computer and Digital Media	2.3%	2.1%	1,107	0.2%	66%	-3%	$69,851	$95,656
Transitioning Activities								
Art Education	3.7%	4.6%	162	-0.9%	71%	-9%	$10,429	$10,447
Marketing, & Related	0.7%	1.8%	256	-1.1%	79%	-12%	$38,343	$60,605
Music	0.5%	0.6%	38	-0.1%	142%	-10%	$34,856	$38,881
Cultural Activities	0.3%	1.3%	54	-0.9%	241%	-33%	$48,723	$43,445
Declining Activities								
Architecture	-0.3%	-1.0%	-42	0.8%	144%	1%	$76,210	$69,678
Publishing & Information	-1.7%	-1.7%	-378	0.0%	74%	-4%	$55,849	$67,587
Broadcasting	-1.7%	-0.8%	-179	-0.9%	103%	-15%	$57,524	$76,932
Film, TV, Video	-2.2%	-0.1%	-255	-2.1%	78%	-20%	$51,348	$87,160

* For definition and data source, see Table 4

AGRIBUSINESS

The 23,200 jobs in Agribusiness are found in a range of interrelated industry groups that support and service the core farm sector. Most of the agribusiness jobs, including self employed, were in actual farm production (57%). The second largest industry group in the sector is Agricultural Processing at 27% of the sector's jobs.

A breakdown of employment for the Farm Production industry group 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, have become the largest component in terms of value at 29% in 2008.[12] Seed corn was followed by flowers and nursery products (16%), and sugar growing (7%). Pineapple growing has been consolidated into too few producers for statistics to be reported separately due to nondisclosure rules.

Size & Growth

The Agribusiness sector as a whole lost jobs at a gradual rate over the 2002 to 2010 period. Two Agribusiness industry groups showed job gains over the 2002-2010 time period but overall, job losses among declining groups exceeded the gains among groups that showed increases in jobs.

TABLE 9. CHANGE IN AGRIBUSINESS SECTOR JOBS

INDUSTRY GROUP	JOBS				CHANGE IN JOBS Annual Average			
	2002	2008	2009	2010est.	2002-2008	2008-2010	2009-2010	2002-2010
TOTAL CIVILIAN EMPLOY.	700,368	803,930	780,067	775,538	2.3%	-1.8%	-0.6%	1.3%
AGRIBUSINESS	**24,241**	**23,555**	**23,193**	**23,177**	**-0.5%**	**-0.8%**	**-0.1%**	**-0.6%**
Farm Production	13,320	13,154	13,157	13,148	-0.2%	0.0%	-0.1%	-0.2%
Agric. Processing	6,784	6,459	6,156	6,235	-0.8%	-1.7%	1.3%	-1.0%
Fishing, Forestry & Hunting	2,240	1,702	1,772	1,726	-4.5%	0.7%	-2.6%	-3.2%
Agric. Support Serv.	1,023	1,308	1,306	1,269	4.2%	-1.5%	-2.8%	2.7%
Agric. Inputs	420	417	402	393	-0.1%	-2.9%	-2.2%	-0.8%
Agric. Packaging/Warehsg	310	298	208	213	-0.7%	-15.5%	2.4%	-4.6%
Aquaculture[1]	144	217	192	193	7.1%	-5.7%	0.5%	3.7%

*For definition and data source, see Table 2

[1] Aquacultue is measured with BLS data for Wage and Salary jobs due to the absence of this specific industry in the EMSI data base.

The best performing Agribusiness industry group over the 2002 to 2010 job cycle was the relatively small, Aquaculture industry with a 3.7% average annual increase in jobs. Agricultural Support Services was the only other industry group in Agribusiness to show a gain in jobs at an average 2.7% per year.

The greatest percentage loss of jobs over the period were in Agricultural Packaging /Warehousing (-4.6%), and Fishing/Forestry & Hunting (-3.2%).

[12] Data for 2009 are in the process of being released as this report was being prepared. The most recent data may be found at http://www.nass.usda.gov/Statistics_by_State/Hawaii/Publications/Annual_Statistical_Bulletin/index.asp

Competitive Metrics

Competitive metrics show that while the Hawaii Agribusiness sector lost jobs overall, those losses were not proportionately more than experienced in the sector nationally (Table 10). As a result, the competitive share for the sector overall stayed at same levels for the 2002 to 2010 period. Only Agriculture Input, Agriculture Processing, Fishing/Forestry & Hunting and Agricultural Packaging/Warehousing lost competitive share to the national Agribusiness sector.

In terms of concentration, Aquaculture and Fishing/Forest & Hunting were substantially higher than the national average. Aquaculture made significant gains in concentration over the period, while Fishing's concentration declined. Overall, the level of concentration of Agribusiness in Hawaii's economy fell from about 95% of the national concentration to 90% over the 2002 to 2010 period.

TABLE 10. HAWAII AGRIBUSINESS SECTOR PERFORMANCE COMPARED WITH NATION

INDUSTRY GROUPS	GAIN OR LOSS IN NATIONAL COMPETITIVENESS			CONCENTRATION OF ACTIVITY IN HAWAII COMPARED TO NATION	
	2002-2008	2008-2010	2002-2010	2010	% POINT CHNG 2002-2010
AGRIBUSINESS	**0.1%**	**-0.2%**	**0.0%**	**90%**	**-5%**
Aquaculture	7.0%	0.5%	5.3%	789%	239%
Agric. Support Serv.	1.7%	-2.0%	0.8%	53%	0%
Farm Production	0.9%	0.2%	0.8%	93%	1%
Agric. Inputs	0.0%	-0.6%	-0.1%	37%	-3%
Agric. Processing	-0.4%	-0.5%	-0.4%	90%	-9%
Fishing, Forestry & Hunting	-1.4%	0.1%	-1.0%	437%	-65%
Agric. Packaging/Warehsg	-0.5%	-13.4%	-3.9%	28%	-13%

* For definition and data source, see Table 4

Overall Performance

From an overall performance standpoint, only Aquaculture and Agricultural Support Services managed to rate in the highest, Base-Growth or Emerging performance category for the 2002 to 2010 period (Table 11). Aquaculture grew jobs impressively while the same activity lost jobs nationally over the period. The earnings average for 2010 also exceeded its national counterpart.

Although the job decline over the period resulted in Farm Production falling into the Declining category, it outperformed the national industry for the period. However, 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. But it must be pointed out that Farm Production in Hawaii is made up of a number of very disparate industry groups, with some like seed corn growing showing exceptional growth in recent years, while others like pineapple growing have been in sharp contraction. The dynamics of Hawaii farming activity coupled with the sketchiness of jobs data for key areas like seed corn and other crop areas makes it difficult to effectively monitor Farming for performance purposes.

TABLE 11. AGRIBUSINESS INDUSTRY GROUPS, OVERALL PERFORMANCE RANKINGS

SECTORS & INDUSTRY GROUPS	AVE. ANN. JOB GROWTH 2002 - 2010		HAWAII JOBS ADDED 2002-2010	COMPETITIVE MEASURES			COMPARATIVE AVE. ANNUAL EARNINGS	
				GROWTH ABOVE OR BELOW U.S. 2002-2010	CONCENTRATION IN HAWAII ECONOMY COMPARED WITH U.S.			
	HAWAII	U.S.			2010	% Point CHNG 2002-2010	HAWAII	U.S.
TOTAL CIVILIAN EMPLOY.	1.3%	0.6%	75,170	0.7%			$45,883	$50,778
AGRIBUSINESS	**-0.6%**	**-0.6%**	**-1,064**	**0.0%**	**90%**	**-5%**	**$30,952**	**$38,564**
Base-Growth Activities								
Aquaculture	3.7%	-1.5%	49	5.3%	789%	239%	$40,711	$30,096
Emerging Activities								
Agric. Support Serv.	2.7%	2.0%	246	0.8%	53%	0%	$41,451	$52,046
Declining Activities								
Farm Production	-0.2%	-0.9%	-172	0.8%	93%	1%	$24,615	$28,002
Agric. Inputs	-0.8%	-0.7%	-27	-0.1%	37%	-3%	$57,604	$61,415
Agric. Processing	-1.0%	-0.6%	-549	-0.4%	90%	-9%	$42,366	$51,228
Fishing, Forestry & Hunting	-3.6%	-2.6%	-558	-1.0%	437%	-65%	$19,219	$31,226
Agric. Packaging/Warehsg	-4.6%	-0.7%	-97	-3.9%	28%	-13%	$57,462	$49,589

* For definition and data source, see Table 4

Other declining activities for 2002 to 2010 in Agribusiness included Packaging and Warehousing, Fishing/Forestry & Hunting, Agricultural Processing, and Agricultural Inputs. Most of these lost jobs faster than nationally, resulting in a decline of competitive share.

While they are small industries, the declining performance in Agricultural Inputs and Agricultural Packaging/Warehousing is of particular concern because the earnings average in both exceeds $57,000. The same can be said for Agricultural Processing, which is a much higher proportion of the Agribusiness sector and has one of the higher earnings averages among the sector's industry groups.

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 are no readily available data on 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.[13] This definition identifies the major industry groups of Hawaii's health care sector.

Size & Growth

The Health and Wellness Sector accounted for an estimated 52,600 jobs in 2010 (Table 12). Most of the jobs were among Health Care Practitioners and in Hospitals/Nursing Facilities. All of the industry groups in Health and Wellness except Pharmacies grew jobs over the 2002 to 2010 period. Overall the Health and Wellness Sector grew slightly slower than the rest of the economy in the expansion phase of the recent business cycle, but was able to add jobs in the contraction phase as the rest of the economy was losing jobs.

TABLE 12. CHANGE IN HEALTH & WELLNESS SECTOR JOBS

INDUSTRY GROUP	JOBS				CHANGE IN JOBS Annual Average			
	2002	2008	2009	2010est.	2002-2008	2008-2010	2009-2010	2002-2010
TOTAL CIVILIAN EMPLOY.	700,368	803,930	780,067	775,538	2.3%	-1.8%	-0.6%	1.3%
HEALTH & WELLNESS	**45,791**	**51,988**	**51,944**	**52,575**	**2.1%**	**0.6%**	**1.2%**	**1.7%**
Health Practitioners	20,245	20,518	20,683	20,891	0.2%	0.9%	1.0%	0.4%
Hospitals/Nursing Facilities	16,625	18,368	18,687	18,940	1.7%	1.5%	1.4%	1.6%
Specialty Health Care	3,933	7,357	7,359	7,431	11.0%	0.5%	1.0%	8.3%
Pharmacies	3,653	4,026	3,507	3,574	1.6%	-5.8%	1.9%	-0.3%
Medical Testing	1,335	1,719	1,708	1,739	4.3%	0.6%	1.8%	3.4%

*For definition and data source, see Table 2

[13] 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

Pharmacies (a retailing industry which includes drug stores) expanded jobs moderately in the 2002 to 2008 expansion period but experienced a sharp decline between 2008 and 2009. A similar but less severe decline occurred in Pharmacy jobs nationally. 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 achieved only a modest growth over the 2002 to 2008 expansion phase showed a faster growth over the contraction period, bringing up the overall growth of jobs to an average 0.4% per year for 2002 to 2010.

On the other hand, the relatively smaller industry groups, Specialty Health Care and Medical Testing, grew vigorously over the 2002 to 2010 period, slowing only in the 2008 to 2010 contraction.

Competitive Metrics

Overall, the modest growth in Hawaii's Health and Wellness Sector was below national growth and the sector lost some competitive share in the 2002 to 2010 period (Table 13). However this was due mainly to anemic job growth in the Health Practitioners industry group. All other groups, with the exception of Pharmacies were more competitive than nationally.

Only two industry groups, Medical Testing and Pharmacies, showed concentrations above national levels. Health Practitioners had been more concentrated than the national group when the measurement period began in 2002. However, that group lost 23% points of concentration in Hawaii, bringing it to only 96% of national concentration in 2010.

TABLE 13. HAWAII HEALTH & WELLNESS SECTOR PERFORMANCE COMPARED WITH NATION

INDUSTRY GROUPS	GAIN OR LOSS IN NATIONAL COMPETITIVENESS			CONCENTRATION OF ACTIVITY IN HAWAII COMPARED TO NATION	
	2002-2008	2008-2010	2002-2010	2010	% POINT CHNG 2002-2010
HEALTH & WELLNESS	**-0.3%**	**-0.9%**	**-0.5%**	**82%**	**-8%**
Specialty Health Care	5.1%	-3.6%	2.8%	81%	12%
Medical Testing	0.9%	-1.3%	0.3%	149%	-5%
Hospitals/Nursing Facilities	0.2%	0.5%	0.3%	65%	-2%
Pharmacies	0.2%	-3.9%	-0.9%	108%	-15%
Health Practitioners	-2.5%	-0.6%	-2.0%	96%	-23%

* For definition and data source, see Table 4

Overall Performance

Among the Health & Wellness industry groups, Medical Testing, Specialty Health Care and Hospitals/Nursing Facilities performed the best in terms of growth and competitiveness (Table 14). Only Medical Testing exceeded the national level in terms of industry concentration.

Health Practitioners was the only Transitioning industry group in this sector. That group grew jobs but lost some competitive national share due to better growth at the U.S. level.

The only declining activity in Health and Wellness for 2002 to 2010 was among Pharmacies. As suggested earlier, competition from internet-based prescription processing could be playing a part in this.

TABLE 14. HAWAII HEALTH & WELLNESS GROUPS, OVERALL PERFORMANCE RANKINGS

SECTORS & INDUSTRY GROUPS	AVE. ANN. JOB GROWTH 2002 - 2010		HAWAII JOBS ADDED 2002-2010	COMPETITIVE MEASURES			COMPARATIVE AVE. ANNUAL EARNINGS	
				GROWTH ABOVE OR BELOW U.S. 2002-2010	CONCENTRATION IN HAWAII ECONOMY COMPARED WITH U.S.			
	HAWAII	U.S.			2010	% Point CHNG 2002-2010	HAWAII	U.S.
TOTAL CIVILIAN EMPLOY.	1.3%	0.6%	75,170	0.7%			$45,883	$50,778
HEALTH & WELLNESS	**1.7%**	**2.2%**	**6,784**	**-0.5%**	**82%**	**-8%**	**$63,342**	**$59,242**
Base-Growth Activities								
Medical Testing	3.4%	3.0%	404	0.3%	149%	-5%	$57,477	$67,952
Emerging Activities								
Specialty Health Care	8.3%	5.5%	3,498	2.8%	81%	12%	$43,014	$39,218
Hospitals/Nursing Facilities	1.6%	1.4%	2,315	0.3%	65%	-2%	$66,818	$55,381
Transitioning Activities								
Health Practitioners	0.4%	2.4%	646	-2.0%	96%	-23%	$71,219	$75,056
Declining Activities								
Pharmacies	-0.3%	0.6%	-79	-0.9%	108%	-15%	$43,992	$42,079

* For definition and data source, see Table 4

At $63,300, the average earnings for the Health & Wellness sector as a whole exceeded the national average in 2010 by nearly 7%. This is the only major sector in the targeted industry portfolio that has earnings above the U.S. average for the same sector. This was due to a number of industry groups in the sector including Hospital/Nursing Facilities, Specialty Health Care, and Pharmacies, which all exceeded the U.S. average.

EDUCATION

Education is another sector that has been proposed as a way to export Hawaii's expertise to the Asia-Pacific region. It has been thought that building an export market for Hawaii's private higher education system could draw affluent students from the Asia-Pacific region. Colleges such as University of the Pacific and others do appear to have tapped that market.

However, it is not possible to isolate statistics on this market. The best that can be done with standard statistics is to track jobs in the private system of post-secondary and specialty education. Hopefully, these data can be used with data on foreign students as they are developed to better evaluate the basis for educational export potential.

Size & Growth

Private post secondary and specialty education in Hawaii accounted for about 10,400 jobs in 2010 (Table 15). Post secondary education was the largest of the two components in this sector with 56% of the jobs.

This sector has grown faster than the overall civilian workforce over the 2002 to 2010 period – an average 2.9% per year compared with 1.3% per year for the total civilian workforce. The fastest growing group in private education was specialty education.

TABLE 15. CHANGE IN PRIVATE EDUCATION SECTOR JOBS

INDUSTRY GROUP	JOBS				CHANGE IN JOBS Annual Average			
	2002	2008	2009	2010est.	2002-2008	2008-2010	2009-2010	2002-2010
TOTAL CIVILIAN EMPLOY.	700,368	803,930	780,067	775,538	2.3%	-1.8%	-0.6%	1.3%
EDUCATION (Private)	**8,344**	**9,746**	**9,895**	**10,449**	**2.6%**	**3.5%**	**5.6%**	**2.9%**
Higher Education	4,887	5,545	5,565	5,860	2.1%	2.8%	5.3%	2.3%
Specialty Education	3,457	4,201	4,330	4,589	3.3%	4.5%	6.0%	3.6%

*For definition and data source, see Table 2

Through the expansion period of the employment cycle (2002 to 2008), private education tracked the overall growth in jobs fairly closely. However, during the contraction period of 2008 to 2010, education continued to experience job gains while the rest of the economy declined. There is a tendency for educational enrollments to rise during economic declines.

Competitive Metrics

Despite the growth in private education jobs over the 2002 to 2008 period, the same activities grew faster at the national level (Table 16). As a result the Hawaii sector lost some national competitive share.

In addition, the sector declined in terms of concentration. In 2002 the private Higher and Specialty Education activities together were about 85% as concentrated as the same activities nationally. By 2010 that concentration had fallen to 79% of the national level.

Specialty education showed the sharpest decline in concentration, falling nearly 16% points, from 10% higher concentration than nationally in 2002, to just 93% of the national level in 2010.

TABLE 16. HAWAII PRIVATE EDUCATION SECTOR PERFORMANCE COMPARED WITH NATION

INDUSTRY GROUPS	GAIN OR LOSS IN NATIONAL COMPETITIVENESS			CONCENTRATION OF ACTIVITY IN HAWAII COMPARED TO NATION	
	2002-2008	2008-2010	2002-2010	2010	% POINT CHNG 2002-2010
EDUCATION	**-0.8%**	**1.6%**	**-0.2%**	**79%**	**-6%**
Higher Education	0.0%	1.0%	0.2%	71%	-3%
Specialty Education	-2.6%	2.4%	-1.3%	93%	-16%

* For definition and data source, see Table 4

Overall Performance

Based on growth of jobs, but loss of competitive share to the national sector, Specialty Education fell into the transitioning category over the 2002 to 2010 period (Table 17). However, Higher Education experienced gains in both jobs and competitive national market share in the period.

The sector also compared poorly with the U.S. in terms of average earnings. Hawaii's private Higher and Specialty Education averaged $33,300 in 2010 compared with $43,900 nationally. Both components of the sector had average earnings below the nation.

TABLE 17. EDUCATION SECTOR GROUPS, OVERALL PERFORMANCE RANKINGS

SECTORS & INDUSTRY GROUPS	AVE. ANN. JOB GROWTH 2002 - 2010		HAWAII JOBS ADDED 2002-2010	COMPETITIVE MEASURES			COMPARATIVE AVE. ANNUAL EARNINGS	
				GROWTH ABOVE OR BELOW U.S. 2002-2010	CONCENTRATION IN HAWAII ECONOMY COMPARED WITH U.S.			
	HAWAII	U.S.			2010	% Point CHNG 2002-2010	HAWAII	U.S.
TOTAL CIVILIAN EMPLOY.	1.3%	0.6%	75,170	0.7%			$45,883	$50,778
EDUCATION (Private)	**2.9%**	**3.1%**	**2,105**	**-0.2%**	**79%**	**-6%**	**$33,303**	**$43,859**
Emerging Activities								
Higher Education	2.3%	2.1%	973	0.2%	71%	-3%	$41,951	$55,687
Transitioning Activities								
Specility Education	3.6%	4.9%	1,132	-1.3%	93%	-16%	$22,259	$23,948

* For definition and data source, see Table 4

OTHER TARGETED ACTIVITIES

Four other targeted activities have been pursued as sources of economic diversification over the last decade or more, Apparel, Call Centers, Captive Insurance Companies and Specialty Tourism. The first two activities are able to be measured with standard industry statistics. The last two are market-based activities and will be discussed shortly.

The 2009 Report on Emerging Industries discusses Apparel and Call Centers in detail. Apparel was promoted based on Hawaii's unique style and cultural heritage that brought Hawaiian/Aloha wear to worldwide prominence. However, over the years the labor intensive job of manufacturing garments was substantially out-sourced 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

Within the period under study of 2002 to 2010, Apparel manufacturing has declined in terms of jobs at an average of 8% per year (Table 18). The decline ran throughout most of the period with the exception of 2010 which may show an upturn for the year.

Call Center activity exploded in the early 2000s from 210 jobs in 2002 to a peak of 485 jobs in 2004. Jobs in Call Centers then declined to the estimate of 335 in 2010. Still, the aggressive growth in the first two years of the period was sufficient to show an overall gain for the period.

TABLE 18. CHANGE IN HAWAII OTHER TARGETED ACTIVITIES JOBS

INDUSTRY GROUP	JOBS				CHANGE IN JOBS Annual Average			
	2002	2008	2009	2010est.	2002-2008	2008-2010	2009-2010	2002-2010
TOTAL CIVILIAN EMPLOY.	700,368	803,930	780,067	775,538	2.3%	-1.8%	-0.6%	1.3%
OTHER TARGETED ACTIVITIES								
Apparel	1,725	1,110	880	885	-7.1%	-10.7%	0.6%	-8.0%
Call Centers	210	403	371	335	11.5%	-8.8%	-9.7%	6.0%

*For definition and data source, see Table 2

Competitive Metrics

Despite the poor growth over recent years, Call Centers have posted positive competitive metrics for the 2002 to 2010 period. Apparel showed a 15% margin over the nation in terms of concentration in 2010. However these results are primarily due to poorer performance nationally than underlying strength in the industries locally.

TABLE 19. HAWAII OTHER TARGETED ACTIVITIES PERFORMANCE COMPARED WITH NATION

INDUSTRY GROUPS	GAIN OR LOSS IN NATIONAL COMPETITIVENESS			CONCENTRATION OF ACTIVITY IN HAWAII COMPARED TO NATION	
	2002-2008	2008-2010	2002-2010	2010	% POINT CHNG 2002-2010
OTHER TARGETED ACTIVITIES					
Call Centers	9.2%	-8.0%	4.5%	17%	4%
Apparel	0.3%	-1.3%	-0.1%	115%	-8%

* For definition and data source, see Table 4

Overall Performance

For the period 2002 to 2010, the Call Centers industry group technically rated an emerging industry classification due to its strong growth in the first two years of measurement. However, unless the decline in this activity since 2004 is reversed, it will likely drift towards the declining category over the next few years. The low earnings average of $20,000 per year suggests that this is either a very low paying industry, a predominantly part time activity for workers, or some combination of both.

Losing jobs at 8% per year over the 2002 to 2010 economic cycle, Apparel fell into the declining category. In terms of job growth, Apparel sector in Hawaii performed similarly to the U.S. garment industry that has been contracting rapidly in recent years as much manufacturing has been outsourced aboard. Like Call Centers, the average earnings are relatively low, suggesting that much of the labor force in Hawaii is part-time and businesses very small.

However, unlike Call Centers, garment manufacturing has an important implication for tourism revenues. Visitor who buy Hawaiian wear, often as gifts, prefer those actually made in Hawaii. If the local manufacturing of garments was to disappear, the impact on sales of Hawaiian wear would be of concern.

TABLE 20. HAWAII OTHER TARGETED ACTIVITIES, OVERALL PERFORMANCE RANKINGS

SECTORS & INDUSTRY GROUPS	AVE. ANN. JOB GROWTH 2002 - 2010		HAWAII JOBS ADDED 2002-2010	COMPETITIVE MEASURES			COMPARATIVE AVE. ANNUAL EARNINGS	
				GROWTH ABOVE OR BELOW U.S. 2002-2010	CONCENTRATION IN HAWAII ECONOMY COMPARED WITH U.S.			
	HAWAII	U.S.			2010	% Point CHNG 2002-2010	HAWAII	U.S.
TOTAL CIVILIAN EMPLOY.	1.3%	0.6%	75,170	0.7%			$45,883	$50,778
Other Targeted Activities								
Emerging Activities								
Call Centers	6.0%	1.5%	125	4.5%	17%	4%	$20,008	$32,747
Declining Activities								
Apparel	-8.0%	-7.9%	-840	-0.1%	115%	-8%	$23,232	$42,405

* For definition and data source, see Table 4

Market Side Activities (Captive Insurance & Specialty Tourism)

An additional two activities, Captive Insurance and Specialty Tourism, are not readily measurable with standard industry data. The 2009 report found that Captive Insurance apparently generated only a limited number of direct jobs in Hawaii.

Specialty Tourism actually focuses on specialized markets within the scope of an existing major industry, Tourism. These markets include specialized *tourists* such as Conventioneers and Honeymooners, as well as specialized *purposes* for tourism such as Eco-Tourism, Cultural, Historical and even Technology and Medical Tourism (discussed earlier). Specialty Tourism activities certainly help diversify and reenergize the visitor industry by adding new reasons to visit Hawaii. However, it must be noted that they do not significantly diversify the industry and occupational base in a way that can help counter or soften periodic declines in major industries like tourism.

The available performance measures for Specialty Tourism may be found in the latest reports of the Hawaii Tourism Authority, Research Office.[14]

[14] http://www.hawaiitourismauthority.org/

CONCLUSIONS

This report has updated the performance measures of Hawaii's Targeted Industry Portfolio developed in 2009. The data reflect the entire employment cycle (expansion and contraction) in the Hawaii and U.S. economy from 2002 to 2010 (as measured by change in jobs).

The previous 2009 report, which initially established and measured the targeted industry portfolio, showed that a number of industry groups performed well during the expansion phase of the recent business cycle. This updated report has extended those measurements through the contraction phase, providing an overall picture of how targets performed in good times and bad over the business cycle.

The results (Table 21) show that the strongest performing targets in terms of above average growth, national competitiveness, and above-average earnings were Business Consulting, Research and Development (particularly biotechnology), Tech Manufacturing, Medical Testing, Computer Services, Computer and Digital Media, Aquaculture, and Engineering and Related Services.

TABLE 21. HIGHEST PERFORMING TARGETED ACTIVITIES, 2002 TO 2010

SECTORS & INDUSTRY GROUPS	JOBS 2010	AVE. ANN. JOBS GROWTH 2002 - 2010		HAWAII JOBS ADDED 2002-2010	COMPETITIVE MEASURES			COMPARATIVE AVE. ANNUAL EARNINGS	
					GROWTH ABOVE OR BELOW U.S. 2002-2010	CONCENTRATION IN HAWAII ECONOMY COMPARED WITH U.S.			
		HAWAII	U.S.			2010	% Point CHNG 2002-2010	HAWAII	U.S.
TOTAL CIVILIAN EMPLOY.	775,538	1.3%	0.6%	75,170	0.7%			$45,883	$50,778
Base-Growth & Emerging Activities									
Abover Average State Earnings									
Business Consulting	4,588	6.4%	4.8%	1,798	1.6%	63%	4%	$52,716	$75,353
Research & Devel.	4,131	5.2%	1.9%	1,382	3.3%	133%	24%	$67,759	$103,463
Biotechnology	2060	6.4%	2.4%	808	4.0%	274%	62%	$50,326	$113,069
Tech Manufacturing	1,026	4.8%	-0.8%	319	5.5%	12%	4%	$63,220	$105,076
Engrng and R & D Serv.	7,789	3.5%	1.4%	1,874	2.1%	102%	11%	$78,797	$96,212
Medical Testing	1,739	3.4%	3.0%	404	0.3%	149%	-5%	$57,477	$67,952
Computer Services	6,486	2.5%	2.4%	1,155	0.0%	75%	-4%	$69,621	$90,854
Computer and Digital Media	6,602	2.3%	2.1%	1,107	0.2%	66%	-3%	$69,851	$95,656
Hospitals/Nursing Facilities	18,940	1.6%	1.4%	2,315	0.3%	65%	-2%	$66,818	$55,381
Engrng. and Related	4,486	0.9%	0.2%	296	0.7%	78%	0%	$83,349	$83,964
Below Average State Earnings									
Specialty Health Care	7,431	8.3%	5.5%	3,498	2.8%	81%	12%	$43,014	$39,218
Call Centers	335	6.0%	1.5%	125	4.5%	17%	4%	$20,008	$32,747
Aquaculture	193	3.7%	-1.5%	49	5.3%	789%	239%	$40,711	$30,096
Design Serv.	1,473	3.2%	2.5%	329	0.8%	87%	0%	$39,091	$47,203
Agric. Support Serv.	1,269	2.7%	2.0%	246	0.8%	53%	0%	$41,451	$52,046
Performing & Creative Arts	10,158	2.5%	1.9%	1,805	0.6%	149%	-1%	$20,060	$25,138
Higher Education	5,860	2.3%	2.1%	973	0.2%	71%	-3%	$41,951	$55,687

* For definition and data source, see Table 4