Hawaii's Targeted & Emerging Industries

2012 Update Report

Department of Business, Economic Development and Tourism

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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.

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Hawaii Department of Business, Economic Development & Tourism

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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 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 (but not all) were less competitive than their national counterpart.

This update report extends the performance measures through the preliminary data for 2012. Table S-1 provides a comprehensive overview of performance among activities in the Targeted Industry Portfolio over the 2002 to 2012 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:

- 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 counterpart. Among those were Cultural Activities, R&D Services, Medical Testing, Aquaculture, Specialty Health Care, Business Consulting, Technology Manufacturing, and Film/TV Production.
- Adjusting for overlaps, the high-performing activities in the target industry portfolio (Base-growth and Emerging) accounted for about 63,100 jobs or 7.8% of all civilian jobs in 2012. However, between 2002 and 2012 those activities generated 14.4% of the total gain in jobs for the civilian economy, or about 14,100 new jobs.
- Among the best performing activities, Business Consulting, Specialty Health Care, and Cultural Activities grew jobs over 5% per year over the 2002 to 2012 period. While most other activities experienced some ups and downs over the business cycle, these activities were relatively immune to the last recession and showed robust job growth throughout the measurement period.

[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

INDUSTRY GROUPS [1]	JOBS IN HAWAII		AVE. ANN. JOB GROWTH (2002-2012)		CONCENTRATION [2] OF INDUSTRY IN HAWAII COMPARED TO U.S.		AVE ANNUAL EARNINGS (2012)	
	2012	CHANGE 2002-2012	HAWAII	U.S.	2012	% Point CHNG 2002-2012	HAWAII	U.S.
TOTAL CIVILIAN JOBS	806,581	97,482	1.3%	0.9%	100%	0%	$45,101	$49,951
Base-Growth Activities								
Cultural Activities	3,297	1,800	8.2%	1.8%	416%	182%	$37,729	$46,296
Biotechnology	1,967	717	4.6%	2.5%	250%	39%	$52,896	$118,688
Aquaculture Production	201	57	3.4%	-0.5%	773%	225%	$42,260	$30,164
Medical and Diagnostic Testing	1,778	443	2.9%	2.8%	149%	-4%	$61,504	$68,620
Film, TV, Video Production/Distrib	1,853	235	1.4%	0.0%	109%	10%	$46,765	$94,854
Emerging Activities								
Specialty Health Care Services	8,021	4,089	7.4%	5.8%	77%	8%	$41,536	$39,750
Business Consulting	5,146	2,334	6.2%	5.2%	63%	3%	$51,186	$71,361
Call Centers	315	105	4.1%	1.9%	15%	2%	$15,687	$35,531
Other Technology Mfg	607	147	2.8%	-0.2%	10%	2%	$57,415	$101,608
R& D Services (exc Biotechnology)	1,955	460	2.7%	2.2%	78%	1%	$83,356	$108,505
Agric. Support Services	1,320	304	2.7%	2.0%	53%	1%	$41,120	$46,854
Alternative Power Generation	190	32	1.9%	-5.8%	61%	32%	$55,837	$150,076
Hospitals & Nursing Facilities	18,975	2,361	1.3%	1.2%	65%	-2%	$68,333	$57,973
Agric. Inputs	466	56	1.3%	0.0%	42%	3%	$62,589	$64,484
Farm Production	13,387	512	0.4%	-0.3%	95%	3%	$25,256	$25,361
Transitioning Activities								
Specialty Education	4,924	1,468	3.6%	5.3%	89%	-20%	$24,190	$23,122
Art Education	595	119	2.3%	4.9%	60%	-20%	$11,746	$9,993
Design Services	1,701	246	1.6%	2.1%	83%	-8%	$21,034	$35,443
Higher Education	5,488	604	1.2%	2.4%	62%	-11%	$30,191	$46,548
Marketing, Photography & Related	10,111	1,022	1.1%	2.1%	88%	-13%	$33,565	$45,527
Performing and Creative Arts	9,178	812	0.9%	1.9%	130%	-19%	$19,942	$24,755
Computer Sys Design & Related Serv	6,041	513	0.9%	2.7%	63%	-15%	$72,917	$94,735
Health Practitioners	21,361	877	0.4%	2.3%	96%	-24%	$75,384	$75,533
Engineering and Related Services	5,494	115	0.2%	0.8%	80%	-8%	$82,042	$85,695
Music	1,015	14	0.1%	1.1%	129%	-19%	$24,804	$37,182
Declining Activities								
Pharmacies	3,435	-209	-0.6%	0.5%	105%	-17%	$42,634	$43,452
Agric. Processing	6,277	-481	-0.7%	-0.3%	90%	-8%	$41,099	$51,850
Technology Equipment Distribution	764	-91	-1.1%	-0.5%	32%	-3%	$88,124	$108,309
Chemical & Pharmaceutical Mfg	152	-22	-1.3%	-0.6%	8%	-1%	$72,663	$124,784
Radio and Television Broadcasting	1,183	-200	-1.5%	-0.5%	101%	-15%	$52,404	$72,379
Architecture	1,696	-340	-1.8%	-1.1%	128%	-15%	$67,910	$63,079
Information & Telecom Technology	4,750	-1,213	-2.2%	-1.1%	62%	-10%	$77,273	$95,798
Agric. Packaging & Warehsg	237	-78	-2.8%	-0.2%	30%	-11%	$58,122	$50,506
Apparel	1,215	-447	-3.1%	-5.9%	153%	35%	$22,409	$41,005
Publishing & Information	2,106	-858	-3.4%	-1.3%	60%	-17%	$50,013	$73,179
Fishing, Forestry & Hunting	1,407	-825	-4.5%	-2.3%	299%	-93%	$17,986	$29,160

[1] Technical Consulting in Technology Sector, Computer and Digital Media, and Engineering and R&D in Creative Sector, and Medical Labs and Imaging Centers in Health & Wellness Sector are not separately included in this table because they overlap with other industry groups reported in the table.

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

Source: DBEDT based on data from Economic Modeling Specialists, Inc. (EMSI). Estimates for 2012 are based on early 2012 actual data and are also from EMSI.

- Film/TV Production rated again as one of the high performing activities for the 2002 to 2012 period, but only with a modest growth performance.[2] Film/TV Production is a volatile activity that depends on the number of productions filmed during the time period. With many new shows filmed in Hawaii in late 2010, the number of 2010 jobs has more than doubled from its 2009 level. Although Hawaii could not keep up the high level of film activities beyond early 2011, the number of jobs in 2012 was higher than its previous peak in 2005.

- About 40% of the high-performing activities had the average annual earnings that exceeded $60,000 in 2012. R & D Services had the highest earnings average at $83,400. By comparison, the average earnings for the civilian economy in 2012 were $45,100 by the preliminary 2012 estimate.

- Ten activities, about 66,000 jobs in 2012, 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. However, three of those activities - Specialty Education, Art Education, 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 is that they did contribute to job growth in the economy. They were also an important source of high paying jobs. About half of jobs in Transitioning category had average earnings over $70,000 in 2012. 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 2012 period. Notable among these were Fishing & Forest/Hunting, Publishing & Information, and Apparel.

- 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 23,200 in 2012 (2.9% of all civilian jobs), representing a loss of more than 4,700 jobs from 2002. Seven of the eleven industry groups had earnings averages above the average for Hawaii's economy.

- Declining industries are not necessarily dying activities. 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 and defense activity and may be reflecting ups and downs in those industries rather than independent local or export markets.

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 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 op-

[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.

posed to local consumption markets, although the measures of concentration help identify probable export candidates. The purpose of the performance assessment is 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 will benefit from the priorities economic developers provide after reviewing the performance results in this report series.

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 third report that updates the review of targeted industry performance at the state level to 2012 (preliminary data).

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 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.

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 exclusive to each other. Especially, there exist moderate overlaps between the creative and technology sectors because of their mutually dependent relationship.

TABLE 1. TARGETED INDUSTRY PORTFOLIO

TECHNOLOGY SECTOR	• Radio and Television Broadcasting
• Computer Sys Design and Related Services	• Music
• Engineering and Related Services	• Art Education
• Information & Telecom Technology	**AGRIBUSINESS**
• Technical Consulting Services	• Farm Production
• Biotechnology	• Agric. Processing
• R&D Services (except Biotechnology)	• Fishing, Forestry & Hunting
• Medical and Diagnostic Testing	• Agric. Support Services
• Technology Equipment Distribution	• Agric. Inputs
• Other Technology Mfg	• Agric. Packaging & Warehouse
• Alternative Power Generation	• Aquaculture Production
• Chemical & Pharmaceutical Mfg	**HEALTH & WELLNESS**
CREATIVE SECTOR	• Health Practitioners
• Marketing, Photography & Related	• Hospitals & Nursing Facilities
• Performing and Creative Arts	• Specialty Health Care Services
• Engineering and R&D	• Pharmacies
• Business Consulting	• Medical Labs and Imaging Centers
• Computer Services and Digital Media Products	**EDUCATION (PRIVATE)**
• Cultural Activities	• Higher Education
• Publishing & Information	• Specialty Education
• Film, TV, Video Production/Distribution	**OTHER TARGETS**
• Design Services	• APPAREL
• Architecture	• CALL CENTERS

Source: DBEDT.

Measuring Targeted Industries

In this update 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 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. How jobs among the portfolio activities have grown relative to the state as a whole also carries meaningful information. An activity that grows faster than the rest of the state's economy would help to diversify the economy.

The competitiveness and concentration of the activity in Hawaii compared to elsewhere is of interest. 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.

The average earnings for workers in the various activitieswere reviewed. 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.

Combining these performance measures together we attempt to group the activities in the portfolio 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 industries in the economy into four generalized stages. The first state of the life cycle is usually called the emerging stage of an industry. This characterizes newer, fast growing activities that are usually serving new markets inside or outside the local economy. The second state 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. These are relatively healthy economic activities, but have slowed and becoming 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 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. The ups and downs of the local and national business cycles have a lot to do with such forward and backward movement of industries on the life cycle. However, over a longer period of time, the model should provide a fairly accurate picture of the performance statue 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 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.

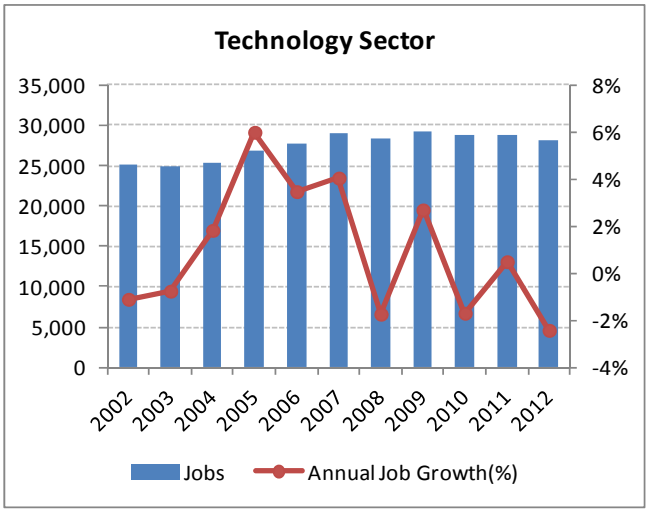
TECHNOLOGY SECTOR

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.[3] The project adopted a definition for technology established by the U.S. Bureau of Labor Statistics (BLS).[4] 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 technology sector because the services could not meet the BLS criteria to be in Technology sector. Wired services, however, are no longer reported separately from other telecom services since the 2007 revision in NAICS. Facing the increased competition with new telecom services, many wired carriers chose to close or reduce the traditional wired services to expand the services with more market potentials. As a result, a variety of services are often served by a single carrier these days and the change in the 2007 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 28,200 jobs in 2012, 3.5% of all civilian jobs in Hawaii including self-employed and sole proprietors. For the 2002 to 2012 period, the technology sector posted an average annual 1.2% gain in jobs, slightly lower than the average growth for the civilian economy.



The 2012 preliminary data shows that the technology sector lost 2.4% of jobs compared to the same period in 2011.. Engineering & Related Services (-5.9%), Computer & Related Services (-4.4%), and R&D Services (-4.0%) were the main sources of the loss.

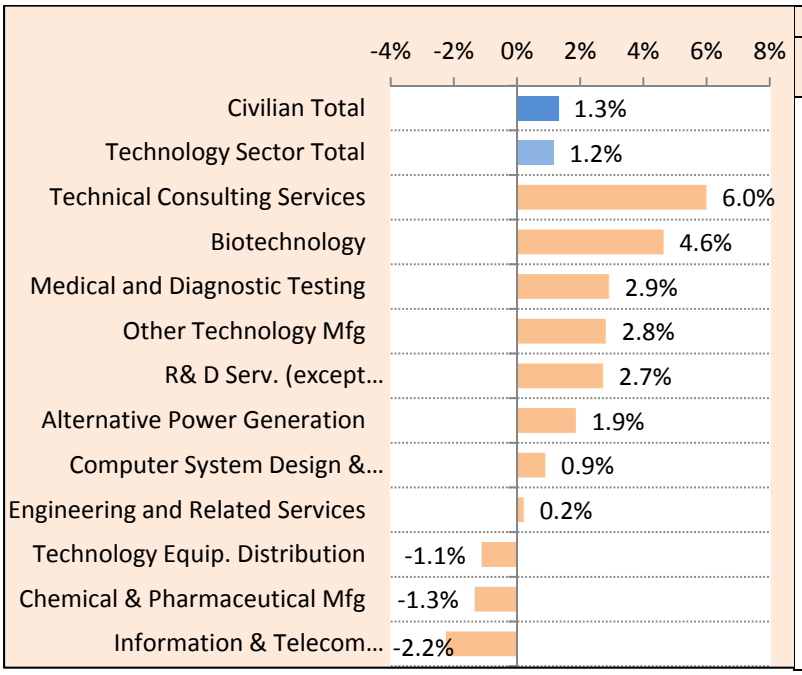
Technology Consulting turned in the best performance among the technology industry groups in terms of job growth. Other high-performing activities in the technology sector were Biotechnology, Medical & Diagnostic Testing, Other Technology Mfg, and R&D Services. The performances of these activities were especially remarkable because they were relatively immune to the economy-wide decline in jobs from 2008 to 2010.

Three technology industry groups failed to see job growth over the 2002 to 2012 period. These were Information & Telecom Tech, Chemical & Pharmaceutical, and Technology Equipment Distribution.

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

[4] 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 2002-2012



	Annual Job Growth				
	2002-2012	2002-2007	2007-2012	2011-2012	Jobs in 2012
Civilian Total	1.3%	2.9%	-0.3%	1.6%	806,581
Technology Sector Total	**1.2%**	**2.9%**	**-0.5%**	**-2.4%**	**28,160**
Technical Consulting Services	6.0%	8.9%	3.2%	3.5%	4,462
Biotechnology	4.6%	3.2%	6.1%	2.0%	1,967
Medical and Diagnostic Testing	2.9%	5.2%	0.7%	1.6%	1,778
Other Technology Mfg	2.8%	0.8%	4.9%	-7.5%	607
R& D Serv. (except...	2.7%	5.3%	0.2%	-4.0%	1,955
Alternative Power Generation	1.9%	-4.1%	8.2%	5.6%	190
Computer System Design &...	0.9%	3.1%	-1.3%	-4.4%	6,041
Engineering and Related Services	0.2%	3.0%	-2.5%	-5.9%	5,494
Technology Equip. Distribution	-1.1%	-1.6%	-0.6%	-0.8%	764
Chemical & Pharmaceutical Mfg	-1.3%	-8.6%	6.5%	26.7%	152
Information & Telecom...	-2.2%	-0.5%	-3.9%	-3.9%	4,750

[1]Includes wage & salary, sole proprietors & self employed.
Source: DBEDT based on data from Economic Modeling Specialists, Inc. (EMSI). Estimates for 2012 are based on early 2012 actual data and are also from EMSI.

Competitive Metrics

The 6th 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 at about the same rate as the same activities in the nation.

Most fast growing activities in the technology sector outperformed their national counterpart. Among those, Biotechnology and Other Technology Mfg turned in the most important competitive gain, averaging 2.2%-3% points more job growth for 2002 to 2012 compared to their national counterpart.

However, three big technology industry groups – Computer & Related Services, Engineering & Related Services, and Technical Consulting -lost competitive ground to their national counterpart although they achieved a positive job growth over the 2002 to 2012 period.

Technology Consulting showed strong growth throughout the measurement period with 6% annual average job growth, but came up a little short compared with the same activity nationally. Computer & Related Services, and Engineering & Related Services, which outgrew their national counterpart during the expansion phase, lost more jobs proportionately than the same activity nationally during the contraction phase. The 2012 preliminary data shows that the two activities lost jobs by another 5.9% and 4.4%, respectively in 2012, while the same activities in the nation were gaining jobs.

Information Technology jobs declined in both Hawaii and the nation from 2002 to 2012, although more so in Hawaii. Three forces may have influenced this decline. First, the inclusion of wired telecom service, an activity with declining demand, should have been responsible for some decline in jobs. Second, productivity gains in information technology may have reduced the labor needed in the

industry 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 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.

In terms of concentration, most of the technology industry groups are still a relatively smaller proportion of Hawaii's economy than they are nationally. Hawaii's proportion of the state's workforce in technology is 61% of the proportion nationally in 2012. One noteworthy exception is Biotechnology, which is 150% more concentrated in Hawaii than nationally. Medical Testing also shows a higher proportion of jobs in Hawaii. Hawaii's proportion of this industry group is 49% more than nationally.

The average earnings in Hawaii's technology sector were relatively high, at $70,500 in 2012. As a group, it was 56% 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 Hawaii technology sector were not paid as much as the U.S. average for the same activities. The average earnings in Hawaii technology sector as a whole were only 75% of the average earnings paid nationally. The biggest earnings gaps between Hawaii and the U.S. were found in Alternative Power Generation and Biotechnology. [5]

TABLE 4. HAWAII TECHNOLOGY SECTOR PERFORMANCE COMPARED WITH NATION

	Jobs (2012)	Jobs per Estabs (2012)	Avg. Annual Earnings (2012)	Avg. Ann. Job Growth 2002-2012	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 Jobs	806,581	21.2	45,101	1.3%	0.4%	100%	109%	90%
TECHNOLOGY SECTOR	**28,160**	**11.5**	**70,515**	**1.2%**	**-0.1%**	**61%**	**73%**	**75%**
Technical Consulting Services	4,462	11.2	50,926	6.0%	-0.3%	63%	107%	72%
Biotechnology	1,967	34.5	52,896	4.6%	2.2%	250%	177%	45%
Medical and Diagnostic Testing	1,778	55.6	61,504	2.9%	0.1%	149%	350%	90%
Other Technology Mfg	607	12.1	57,415	2.8%	3.0%	10%	23%	57%
R& D Serv. (except Biotechnology)	1,955	13.0	83,356	2.7%	0.5%	78%	42%	77%
Alternative Power Generation	190	31.7	55,837	1.9%	7.6%	61%	61%	37%
Computer Serv. & Digital Media Prod	6,041	8.3	72,917	0.9%	-1.8%	63%	80%	77%
Engineering and Related Services	5,494	8.3	82,042	0.2%	-0.6%	80%	60%	96%
Technology Equip. Distribution	764	9.6	88,124	-1.1%	-0.6%	32%	64%	81%
Chemical & Pharmaceutical Mfg	152	25.3	72,663	-1.3%	-0.7%	8%	34%	58%
Information & Telecom Technology	4,750	17.0	77,273	-2.2%	-1.1%	62%	73%	81%

[1] Proportion of jobs in the activity in Hawaii compared to the proportion nationally
Source: see Table 3 for data source.

[5] 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.

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.

Five technology industry groups, Biotechnology, Medical & Diagnostic Testing, Other Technology Mfg, R&D Services, and Alternative Power Generation fell into the high performing, Base-Growth and Emerging categories by not only showing a positive growth but also outperforming their national counterparts. 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.

The three big activities in the technology sector - Technology Consulting, Computer & Related Services, and Engineering & Related Services -all fell into the Transitioning category for the 2002 to 2012 period. While job growth was strong in these industry groups, they still lost some competitive shares to the national industry groups.

Technology Equipment Distribution, Chemical & Pharmaceutical Mfg, and Information & Telecom Technology fell into the Declining category for 2002 to 2012 due to job losses over the period. These activities also lost more jobs proportionately than the same activity nationally, showing a loss of of competiveness comparedto the national economy.

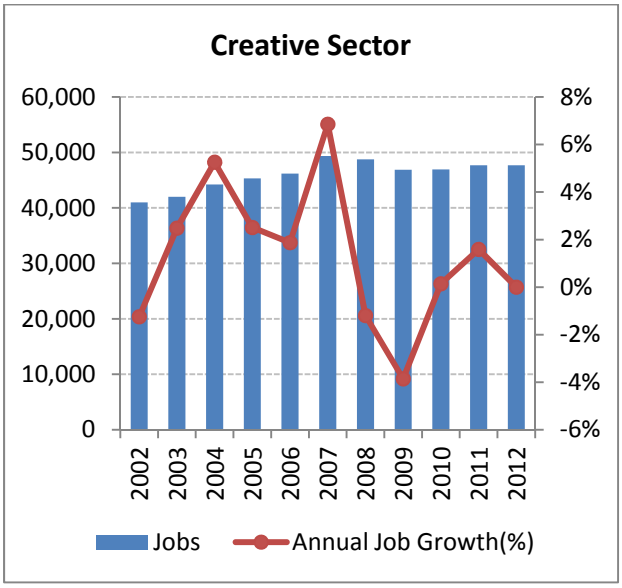
Emerging Activities	*Base-Growth Activities*
-Other Technology Mfg -R& D Services (except Biotechnology) -Alternative Power Generation	-Biotechnology -Medical and Diagnostic Testing
Declining Activities	*Transitioning Activities*
-Technology Equipment Distribution -Chemical & Pharmaceutical Mfg - Information & Telecom Technology	-Technical Consulting Services -Computer System Design and Related Services -Engineering and Related Services

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.[6] 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 thirteen creative industry groups accounted for an estimated 47,700 jobs in 2012, nearly 6% of all civilian jobs in Hawaii. Performing/Creative Arts were the largest group in the sector, accounting for almost 20% of jobs in the sector.



As a group, the creative sector grew faster than the overall civilian economy over the 2002 to 2012 period. During the 2002 to 2007 expansion phase, the creative sector, mostly owing to outstanding growths in business and technology based activities, grew jobs faster than Hawaii's economy. Even if many activities experienced a severe job decline during the contraction period, as a group the creative sector was able to manage an average 1.5% job growth over the 2002 to 2012 period.

Cultural Activities grew jobs the most over the 2002 to 2012 period, 8.2% per year on average. Most job growth in Cultural Activities was achieved in the Museum category. Jobs in Museum increased from 692 in 2010 to 1,874 in 2011. The 2012 preliminary data shows an additional job growth in Museum by 20% in 2012. Business Consulting showed the second highest job growth with a 6.2% average annual increase in jobs for the period.

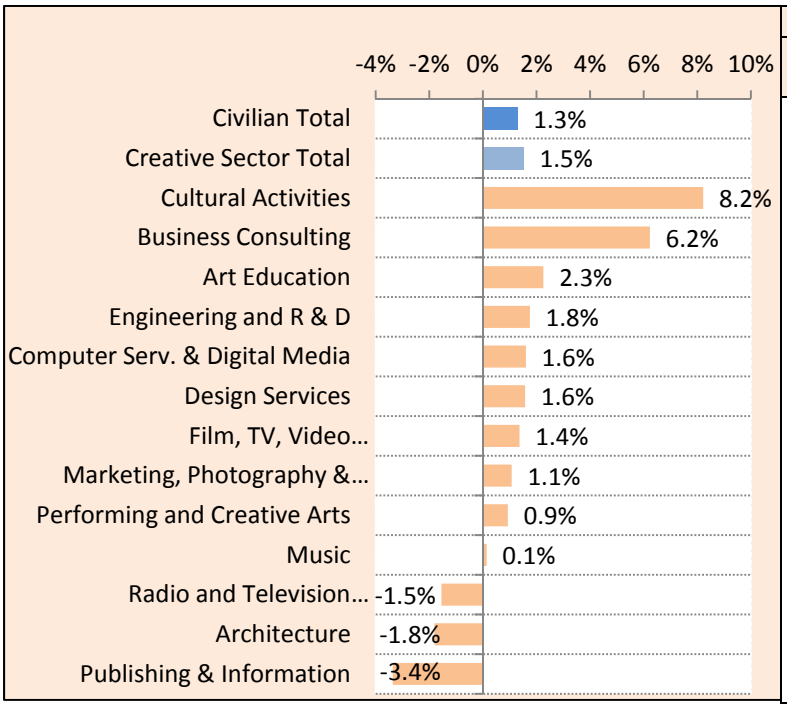
Film/TV Production has shown a great fluctuation in its activities depending on the number of productions filmed during the year. With many new shows filmed in Hawaii in late 2010, the number of 2010 jobs has more than doubled from its 2009 level. Although Hawaii could not keep up the high level of film activities beyond early 2011, the number of jobs in 2012 was higher than its previous peak in 2005.

Three groups in the sector, Publishing & Information, Architecture, and Radio/TV Broadcasting failed to gain jobs over the 2002 to 2012 period. These groups experienced a sharp decline in

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

jobs during the contraction period. With the cease of Honolulu Advertiser in 2010, jobs in Publishing & Information decreased from 3,165 in 2007 to 2,153 in 2011.

TABLE 5. JOBS IN CREATIVE SECTOR: AVERAGE ANNUAL GROWTH OVER 2002-2012



	Annual Job Growth				
	2002-2012	2002-2007	2007-2012	2011-2012	Jobs in 2012
Civilian Total	1.3%	2.9%	-0.3%	1.6%	806,581
Creative Sector Total	**1.5%**	**3.8%**	**-0.7%**	**0.0%**	**47,694**
Cultural Activities	8.2%	2.4%	14.3%	14.7%	3,297
Business Consulting	6.2%	9.1%	3.5%	3.6%	5,146
Art Education	2.3%	6.0%	-1.3%	3.5%	595
Engineering and R & D	1.8%	4.1%	-0.5%	-4.8%	5,544
Computer Serv. & Digital Media	1.6%	5.5%	-2.2%	-4.3%	4,269
Design Services	1.6%	7.5%	-4.0%	-0.7%	1,701
Film, TV, Video...	1.4%	-0.3%	3.0%	6.1%	1,853
Marketing, Photography &...	1.1%	3.2%	-1.0%	-1.9%	10,111
Performing and Creative Arts	0.9%	3.4%	-1.5%	1.4%	9,178
Music	0.1%	3.1%	-2.8%	0.2%	1,015
Radio and Television...	-1.5%	0.1%	-3.1%	0.0%	1,183
Architecture	-1.8%	2.4%	-5.8%	-7.5%	1,696
Publishing & Information	-3.4%	1.3%	-7.8%	-2.2%	2,106

Source: see Table 3 for data source.

Competitive Metrics

Many activities in the creative sector lost competitive share to the U.S. economy over the 2002 to 2012 period. Only three among thirteen groups in the sector notably outperformed their national counterpart during the period. Besides Cultural Activities that achieved an abnormal job growth recently, Business Consulting and Film/TV Production gained jobs at a rate 1-1.4% point faster than their national counterpart.

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 four times as concentrated in Hawaii. Performing/Creative Arts, Music, Architecture, and Film/TV Production also exceed national concentrations. In contrast, most business and technology oriented activities in the sector, such as Business Consulting, Computer & Digital Media, and Publishing & Information, show a much lower concentration in Hawaii than the same industries nationally.

At $45,000 of average annual earnings in 2012, the activities in the creative sector as a whole were making about the same as the average for the Hawaii economy. Compared with the same activities nationally, however, it was only 68% 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 thirteen activities in the creative sector, only workers in Architecture and Art Education were paid slightly higher in Hawaii than nationally. The activities that showed significant earnings gaps between Hawaii and the U.S. include Film/TV Production, Design Services, and Music.

Table 6. Hawaii CREATIVE SECTOR Performance compared with nation

	Jobs (2012)	Jobs per Estabs (2012)	Avg. Annual Earnings (2012)	Avg. Ann. Job Growth 2002-2012	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 Jobs	806,581	21.2	45,101	1.3%	0.4%	100%	109%	90%
CREATIVE SECTOR	**47,694**	**14.4**	**45,480**	**1.5%**	**-0.6%**	**85%**	**93%**	**68%**
Marketing, Photography & Related	10,111	19.6	33,565	1.1%	-1.0%	88%	99%	74%
Performing and Creative Arts	9,178	36.3	19,942	0.9%	-1.0%	130%	98%	81%
Engineering and R & D	5,544	10.0	87,967	1.8%	0.1%	77%	55%	89%
Business Consulting	5,146	11.1	51,186	6.2%	1.0%	63%	109%	72%
Computer Serv/Digital Media	4,269	6.5	78,272	1.6%	-1.5%	44%	59%	75%
Cultural Activities	3,297	48.5	37,729	8.2%	6.4%	416%	335%	81%
Publishing & Information	2,106	16.2	50,013	-3.4%	-2.1%	60%	76%	68%
Film, TV, Video Production/Distrib	1,853	11.4	46,765	1.4%	1.4%	109%	60%	49%
Design Services	1,701	12.4	21,034	1.6%	-0.5%	83%	100%	59%
Architecture	1,696	7.5	67,910	-1.8%	-0.7%	128%	77%	108%
Radio and Television Broadcasting	1,183	26.3	52,404	-1.5%	-1.0%	101%	84%	72%
Music	1,015	14.9	24,804	0.1%	-1.0%	129%	110%	67%
Art Education	595	14.2	11,746	2.3%	-2.6%	60%	72%	118%

[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 are placed into the performance categories as below. Four groups, Cultural Activities, Film/TV Production, Business Consulting, and Engineering and R&D are all rated as high performing for growth and competitiveness with the same activities nationally.

Another six groups - Art Education, Computer & Digital Media, Design Services, Marketing & Photography, Performing/Creative Arts, and Music- grew jobs over the period but came up short competitively compared with the performance of the same industry group nationally over the 2002 to 2012 period. Those groups did not grow jobs fast enough to equal or exceed national growth.

Radio/TV Broadcasting, Architecture, and Publishing & Information were placed in the lowest performance group. All lost jobs over the 2002 to 2012 period.

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

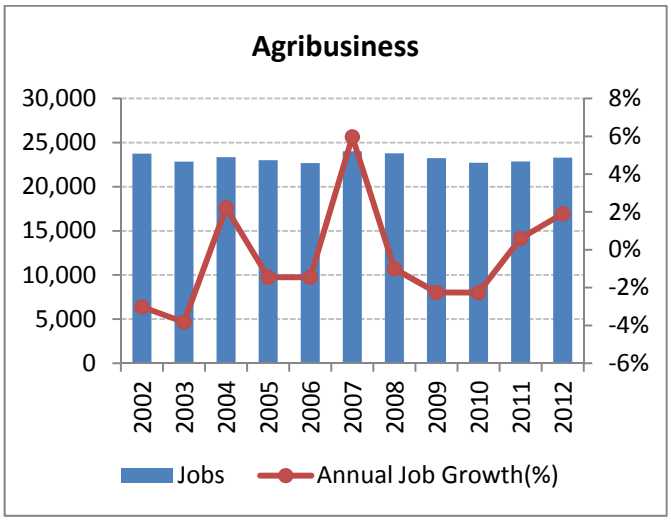
AGRIBUSINESS

The 23,300 jobs in Agribusiness are found in 2012 in a range of interrelated industry groups that support and service the core farm sector. Most of the agribusiness jobs, including self employed, are 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 41.4% in 2010.[7] 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.

Size & Growth

The agribusiness sector lost jobs at a gradual rate over the 2002 to 2012 period. Although four Agribusiness industry groups showed job gains over the period, job losses among declining groups exceeded the gains among groups that showed increases in jobs. However, the 2012 preliminary data shows a promising growth in three groups including two largest groups, resulting in overall 1.9% job growth in 2012.



The best performing agribusiness industry group over the 2002 to 2012 cycle was the relatively small, Aquaculture industry with a 3.4% average annual increase in jobs.

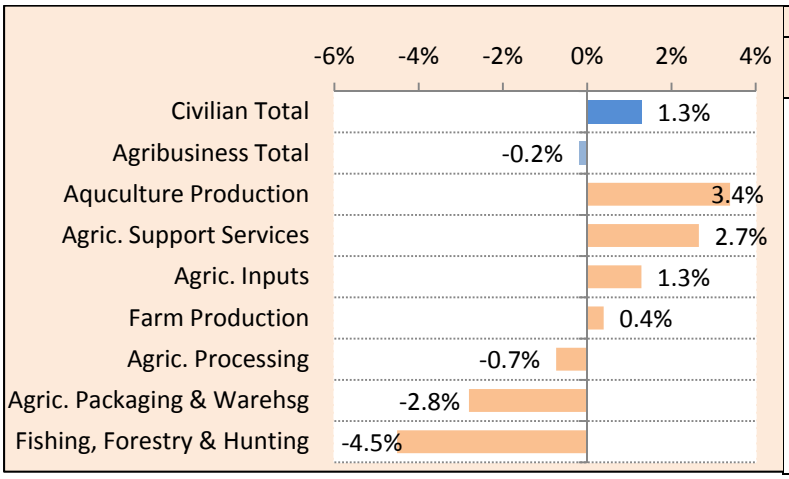
Another high-performing group in agribusiness during the 2002-2012 period was Agricultural Support Services. This group experienced a job growth in most years of the measurement period, turning in an average 2.7% job growth per year over 2002 to 2012.

The largest activity in the agribusiness sector, Farm Production, lost jobs by 3.4% in 2002, but since then it was able to achieve a moderate job growth throughout the 2002-2012 period.

Fishing & Forestry/Hunting, that had showed yearly ups and downs in the early part of the measurement period,lost jobs continuously since 2004. It lost jobs by 4.5% per year over the 2002 to 2012 period.

[7] 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 2002-2012



	Annual Job Growth				
	2002-2012	2002-2007	2007-2012	2011-2012	Jobs in 2012
Civilian Total	1.3%	2.9%	-0.3%	1.6%	806,581
Agribusiness Total	**-0.2%**	**0.2%**	**-0.6%**	**1.9%**	**23,295**
Aquculture Production	3.4%	8.7%	-1.7%	-1.0%	201
Agric. Support Services	2.7%	3.8%	1.6%	-1.9%	1,320
Agric. Inputs	1.3%	1.1%	1.5%	7.1%	466
Farm Production	0.4%	0.9%	-0.1%	1.9%	13,387
Agric. Processing	-0.7%	-0.5%	-0.9%	4.1%	6,277
Agric. Packaging & Warehsg	-2.8%	5.2%	-10.2%	-4.4%	237
Fishing, Forestry & Hunting	-4.5%	-5.1%	-4.0%	-3.6%	1,407

[1] Aquaculture is measured with BLS data for Wage and Salary jobs due to the absence of this specific industry in the EMSI data base.
Source: see Table 3 for data source.

Competitive Metrics

Competitive metrics show that the comparable U.S. agricultural sector also experienced a slight job decline over the period, but not proportionately more than experienced in the sector in Hawaii.

While all four groups that gained jobs between2002 to 2012, outperformed the same activities in the U.S., the three activities that failed to gain jobs over the period lost jobs at a faster rate than the national economy.

TABLE 8. HAWAII AGRIBUSINESS SECTOR PERFORMANCE COMPARED WITH NATION

				Avg. Ann. Job Growth		When U.S.=100%		
	Jobs (2012)	Jobs per Estabs (2012)	Avg. Annual Earnings (2012)	2002-2012	above or below U.S.	Concen-tration [1]	Jobs per Estabs	Avg. Ann. Earning
Total Civilian Jobs	806,581	21.2	45,101	1.3%	0.4%	100%	109%	90%
AGRIBUSINESS	**23,295**	**28.0**	**31,213**	**-0.2%**	**-0.1%**	**90%**	**82%**	**84%**
Farm Production	13,387	39.5	25,256	0.4%	0.7%	95%	96%	100%
Agric. Processing	6,277	24.7	41,099	-0.7%	-0.4%	90%	43%	79%
Fishing, Forestry & Hunting	1,407	21.3	17,986	-4.5%	-2.2%	299%	69%	62%
Agric. Support Services	1,320	12.5	41,120	2.7%	0.7%	53%	90%	88%
Agric. Inputs	466	14.1	62,589	1.3%	1.3%	42%	89%	97%
Agric. Packaging & Warehsg	237	23.7	58,122	-2.8%	-2.7%	30%	68%	115%
Aquaculture Production	201	8.7	42,260	3.4%	3.9%	773%	120%	140%

[1] Proportion of jobs in the activity in Hawaii compared to the proportion nationally
Source: see Table 3 for data source.

Agribusiness shows less concentration in Hawaii than nationally in most activities. The clear exceptions are Aquaculture and Fishing that are significantly more concentrated in Hawaii. Even if there are only about 200 jobs in Aquaculture Production in Hawaii in 2012, its job concentration in

Hawaii is almost 8 times as high as nationally. The concentration of Fishing & Forest/Hunting is also substantially higher than the national average.

As a result of a slower job growth in Hawaii than in the U.S., the concentration of Agribusiness in Hawaii as a group fell from 94% to 90% of the national concentration over the 2002 to 2012 period.

Overall Performance

From an overall performance standpoint, four groups,Aquaculture, Agricultural Support Services, Agricultural Inputs and Farm Production,rated the highest in the Base-Growth or Emerging performance category for the 2002 to 2012 period. Aquaculture in Hawaii grew jobs impressively,while the same activity lost jobs nationally over the same period. The earnings average for 2012 also exceeded its national counterpart.

Farm Production, which was placed in Declining category in the previous review, fell into Emerging category for the 2002 to 2012 period. . Jobs in Farm Production declined 3.6% in 2002.

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. 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.

Losing jobs at 4.5% per year over the 2002 to 2012 period, Fishing & Forestry/Hunting fellinto the Declining category. Other declining activities for 2002 to 2012 in Agribusiness included Agricultural Processing, and Agricultural Packaging & Warehousing. All three activities in Declining category lost jobs faster than nationally, resulting in a decline of competitive share.

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

HEALTH & WELLNESS

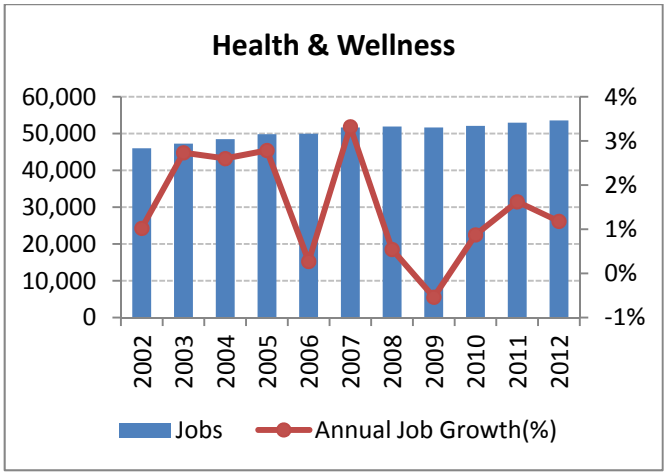
Health and Wellness has been of interest for several decades as a potential export activity. It has been proposed that first class medical and related health facilities in Hawaii could spur Health and Wellness tourism among the more affluent in Asian-Pacific countries that may not have the same level 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.[8] This definition identifies the major industry groups of Hawaii's health care sector.

Size & Growth

The Health and Wellness Sector accounted for an estimated 53,570 jobs in 2012. Most 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 2002 to 2012 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. However, this category added jobs in the contraction phase as the rest of the economylost jobs.

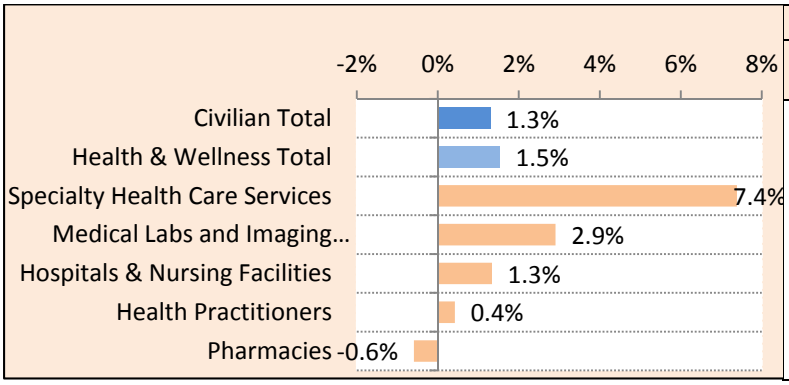
Pharmacies (a retailing industry which includes drug stores) expanded jobs moderately in the 2002 to 2007 expansion phase but experienced a sharp decline during the 2008-2011 time period. It lost 550 jobs in the 3 year period. The reason for the decline is not clear. However, the filling of prescriptions through the internet, rather than in pharmacies has become a more common practice in recent years. Pharmacies also lost jobs nationally during the contraction period, but to a much lesser degree than in Hawaii.

[8] 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 Health Practitioners category,that experienced a slight decrease over the 2002 to 2007 expansion phase,showed modest growth over the contraction period, bringing up the overall job growth to an average 0.4% per year for the 2002 to 2012 period.

The relatively smaller industry groups, Specialty Health Care, grew vigorously over the 2002 to 2007 period. Although this industry group experienced a modest job loss during the recent recession, all of the job loss was recouped by 2011. The 2012 preliminary data shows an additional 6% increase in jobs in Specialty Health Care in 2012.

TABLE 9. JOBS IN HEALTH AND WELLNESS: AVERAGE ANNUAL GROWTH OVER 2002-2012



	Annual Job Growth				Jobs in 2012
	2002-2012	2002-2007	2007-2012	2011-2012	
Civilian Total	1.3%	2.9%	-0.3%	1.6%	806,581
Health & Wellness Total	**1.5%**	**2.3%**	**0.7%**	**1.2%**	**53,570**
Specialty Health Care Services	7.4%	13.5%	1.6%	6.0%	8,021
Medical Labs and Imaging...	2.9%	5.2%	0.7%	1.6%	1,778
Hospitals & Nursing Facilities	1.3%	2.1%	0.6%	-1.2%	18,975
Health Practitioners	0.4%	-0.3%	1.1%	1.3%	21,361
Pharmacies	-0.6%	1.3%	-2.5%	3.1%	3,435

Source: see Table 3 for data source.

Competitive Metrics

Overall, the growth in Hawaii's health and wellness sector was below national growth, resulting in loss of some competitive share in the 2002 to 2012 period. This was due mainly to anemic job growth in the Health Practitioners and Pharmacies.

Only two industry groups, Medical Testing and Pharmacies, show concentrations above national levels. Health Practitioners had been 20% more concentrated than the national group when the measurement period began in 2002. However, that group lost 24% points of concentration in Hawaii, lowering it to 96% of national concentration in 2012.

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

	Jobs (2012)	Jobs per Estabs (2012)	Avg. Annual Earnings (2012)	Avg. Ann. Job Growth 2002-2012	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 Jobs	806,581	21.2	45,101	1.3%	0.4%	100%	109%	90%
HEALTH & WELLNESS	**53,570**	**18.2**	**65,257**	**1.5%**	**-0.6%**	**81%**	**77%**	**108%**
Health Practitioners	21,361	8.6	75,384	0.4%	-1.8%	96%	83%	100%
Hospitals & Nursing Facilities	18,975	291.9	68,333	1.3%	0.1%	65%	114%	118%
Specialty Health Care Services	8,021	45.8	41,536	7.4%	1.6%	77%	108%	104%
Pharmacies	3,435	17.5	42,634	-0.6%	-1.1%	105%	133%	98%
Medical Labs and Imaging Centers	1,778	55.6	61,504	2.9%	0.1%	149%	350%	90%

[1] Proportion of jobs in the activity in Hawaii compared to the proportion nationally
Source: see Table 3 for data source.

At $65,300, the average earnings for the health & wellness sector as a whole exceeded the national average in 2012 by nearly 8%. This is the only major sector in the targeted industry portfolio that has earnings above the U.S. average for the same sector. Except for Medical Testing, all groups in the sector have earnings either similar to or higher than the U.S. average.

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. Only Medical Testing exceeded the national level in terms of industry concentration.

Health Practitioners fells into Transitioning category. This group grew jobs but lost some competitive national shares due to better growth at the U.S. level.

The only declining activity in health and wellness sector for 2002 to 2012 was Pharmacies. As suggested earlier, competition from internet-based prescription processing could be playing a part in this.

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

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 higher education system could draw affluent students from the Asia-Pacific region.

However, it is not possible to isolate statistics on this market. The most readily available data for education activity reflects private sector colleges and specialty schools. Unfortunately, there is no information on the portion of these activities that represent educational exports. 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 10,400 jobs in 2012. These sectors together performed better than the rest of the Hawaii economy. Jobs grew 2.2% annually, adding more than 2,000 new jobs to the economy over the past ten years.

Through the expansion period of the employment cycle (until 2007), private education grew slower than the overall economy. However, during the contraction period, education accelerated job growth while jobs in the rest of the economy declined. There is a tendency for educational enrollments to rise during economic declines.

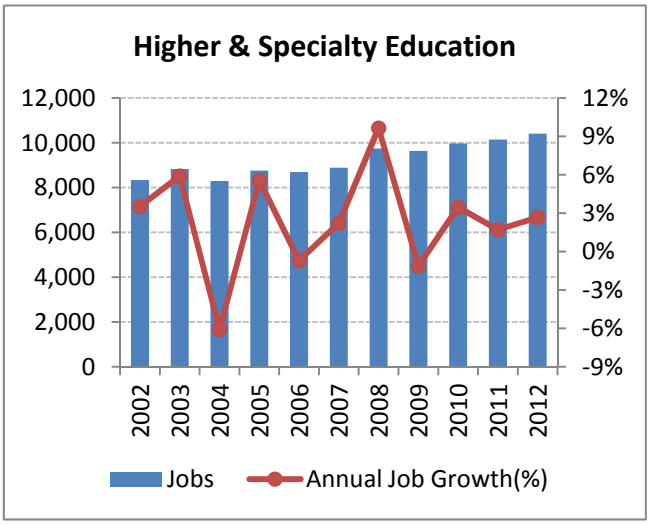
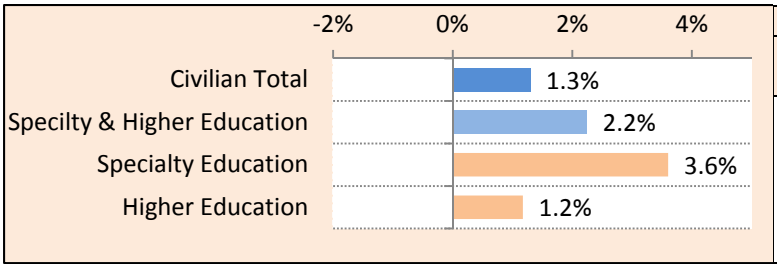


TABLE 11. JOBS IN HIGHER AND SPECIALTY EDUCATION: AVERAGE ANNUAL GROWTH OVER 2002-2012



Annual Job Growth				
2002-2012	2002-2007	2007-2012	2011-2012	Jobs in 2012
1.3%	2.9%	-0.3%	1.6%	806,581
2.2%	**1.3%**	**3.2%**	**2.7%**	**10,412**
3.6%	3.1%	4.1%	6.0%	4,924
1.2%	-0.1%	2.5%	-0.1%	5,488

Source: see Table 3 for data source.

Competitive Metrics

Despite the high growth in private education jobs over the 2002 to 2012 period, it came up short compared with the performance of the same activities nationally. 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 2012 that concentration had fallen to 72% of the national level.

Specialty education showed a sharp decline in concentration, falling nearly 20% pointsto 89% of the national level in 2012. This is a sharp contrast to the 2002 level, which was 9% higher than the national level.

The annual earnings of Specialty Education in Hawaii averaged at $24,200 in 2012, but this level of earnings were not relatively low compared with $23,100 nationally. However, the average earnings in Hawaii Higher Education in 2012 were 35% lower than nationally paid for the same activities.

TABLE 12. HAWAII PRIVATE EDUCATION SECTOR PERFORMANCE COMPARED WITH NATION

	Jobs (2012)	Jobs per Estabs (2012)	Avg. Annual Earnings (2012)	Avg. Ann. Job Growth 2002-2012	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 Jobs	806,581	21.2	45,101	1.3%	0.4%	100%	109%	90%
EDUCATION (PRIVATE)	**10,412**	**22.6**	**27,353**	**2.2%**	**-1.2%**	**72%**	**50%**	**73%**
Higher Education	5,488	79.5	30,191	1.2%	-1.3%	62%	29%	65%
Specialty Education	4,924	12.6	24,190	3.6%	-1.7%	89%	65%	105%

[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 growth of jobs, both the Higher Education and Specialty Education categories fell into the Transitioning category over the 2002-2012 period. They achieved a positive job growth over the period, but not as fast as the same activities nationally.

Transitioning Activities
-Specialty Education -Higher Education

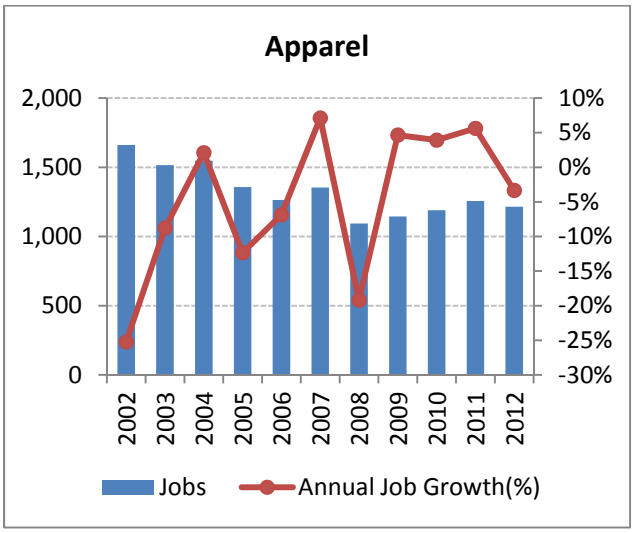
OTHER TARGETED ACTIVITIES

Apparel and Call Centers have been pursued as sources of economic diversification over the last decade or more. 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 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

Within the period under study of 2002 to 2012, Apparel manufacturing has declined in terms of jobs at an average of 3.1% per year. Jobs in Apparel decreased from 1,662 in 2002 to 1,094 in 2008. However, the industry regained some jobs during 2009-2011 period possibly stirred by high tourism demand in Hawaii in recent years. The 2012 preliminary data shows 1,215 jobs in Apparel in 2012.

Call Center activity increasedin the early 2000s increasing jobs from 210 in 2002 to 437 in 2003. The activity sustained the high level of jobs for several years until 2006, and then continued to shrink until recently. The current level of jobs is about two-thirds of what the industry used to offer in its peak year.



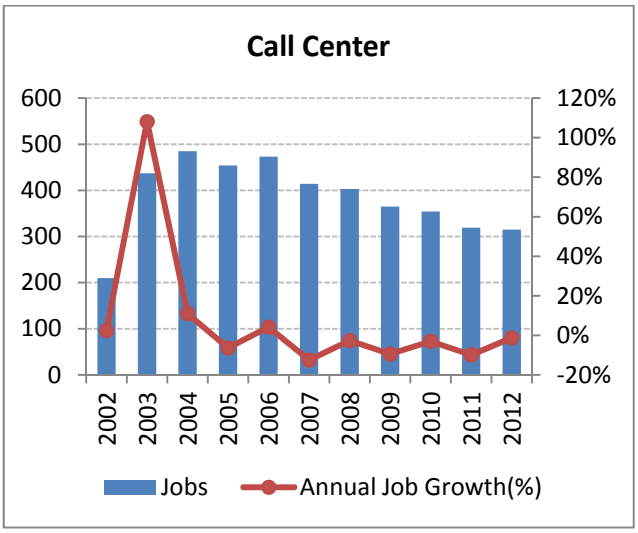
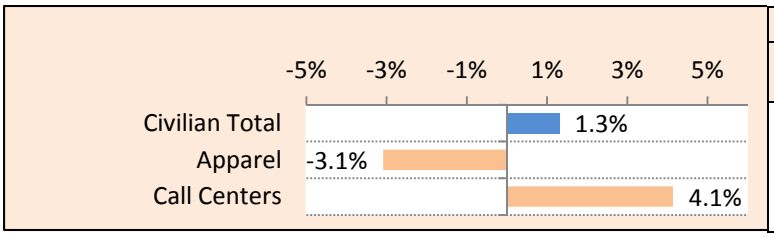


TABLE 13 . JOBS IN APPAREL AND CALL CENTERS: AVERAGE ANNUAL GROWTH OVER 2002-2012



	Annual Job Growth				Jobs in 2012
	2002-2012	2002-2007	2007-2012	2011-2012	
Civilian Total	1.3%	2.9%	-0.3%	1.6%	806,581
Apparel	-3.1%	-4.0%	-2.1%	-3.3%	1,215
Call Centers	4.1%	14.5%	-5.3%	-1.3%	315

Source: see Table 3 for data source.

Competitive Metrics

In terms of job growth, both Apparel and Call Centers performed better than their national counterpart. Although theApparel category in Hawaii lost 3.1% of its jobs annually during 2002-2012 period, the U.S. garment industry lost almost 6% of its jobs annually for the same period due to manufacturing outsourcing.. Call Centers in Hawaii also outperformed their national counterpart by 2.2% in annual job growth.

Apparel shows a 53% margin over the nation in terms of concentration in 2012. Unlike Apparel, Call Centers has a very low job concentration in Hawaii's economy compared to the activity nationally. The concentration of Call Centers in Hawaii is only 15% of the national level in 2012.

The annual earnings average for Apparel and Call Center are $22,400 and $15,700 respectively in 2012. These levels of earnings are only about half the average earnings nationally, suggesting that these sectors in Hawaii are predominantly part time activities for workers.

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

	Jobs (2012)	Jobs per Estabs (2012)	Avg. Annual Earnings (2012)	Avg. Ann. Job Growth 2002-2012	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 Jobs	806,581	21.2	45,101	1.3%	0.4%	100%	109%	90%
APPAREL	1,215	20.6	22,409	-3.1%	2.8%	153%	84%	55%
CALL CENTERS	315	13.1	15,687	4.1%	2.2%	15%	23%	44%

[1] Proportion of jobs in the activity in Hawaii compared to the proportion nationally
Source: see Table 3 for data source.

Overall Performance

Despite the poor growth over recent years, the Call Centers industry group technically rated Emerging category for the 2002 to 2012 period due to its strong growth until mid 2000s. However, unless the decline in this activity during the contraction phase is reversed, it will likely drift towards the declining category over the coming years.

Losing jobs at 3.1% per year over the 2002 to 2012 economic cycle, Apparel fell into the declining category. The job growth during 2009-2011 wasn't substantial enough to reverse the declining trend. Garment manufacturing in Hawaii 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.

Emerging Activities	*Declining Activities*
Call Centers	Apparel

CONCLUSIONS

This report is the third 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 and 2011 update reports extended those measurements through the contraction phase providing an overall picture of how targets performed in good times and bad over the business cycle. This updated report added the 2012 preliminary data to illustrate how target industries have been recovering from the recession.

Table 15 summarizes the best performing target industry groups for the 2002 to 2012 period in terms of average growth and national competitiveness. They all showed positive growth and at the same time outperformed the same activity nationally over the measurement period. Among the fifteen best performing industry groups, nine groups had earnings averages above the average for Hawaii's economy.

TABLE 15. HIGHEST PERFORMING TARGETED ACTIVITIES, 2002 TO 2012

INDUSTRY GROUPS	JOBS IN HAWAII		AVE. ANN. JOB GROWTH (2002-2012)		CONCENTRATION OF INDUSTRY IN HAWAII COMPARED TO U.S.		AVE ANNUAL EARNINGS (2012)	
	2012	CHANGE 2002-2012	HAWAII	U.S.	2012	% Point CHNG 2002-2012	HAWAII	U.S.
TOTAL CIVILIAN JOBS	806,581	97,482	1.3%	0.9%	100%	0%	$45,101	$49,951
Base-Growth & Emerging Activities								
Above Average State Earnings								
R&D Serv. (exc Biotechnology)	1,955	460	2.7%	2.2%	78%	1%	$83,356	$108,505
Hospitals & Nursing Facilities	18,975	2,361	1.3%	1.2%	65%	-2%	$68,333	$57,973
Agric. Inputs	466	56	1.3%	0.0%	42%	3%	$62,589	$64,484
Medical and Diagnostic Testing	1,778	443	2.9%	2.8%	149%	-4%	$61,504	$68,620
Other Technology Mfg	607	147	2.8%	-0.2%	10%	2%	$57,415	$101,608
Alternative Power Generation	190	32	1.9%	-5.8%	61%	32%	$55,837	$150,076
Biotechnology	1,967	717	4.6%	2.5%	250%	39%	$52,896	$118,688
Business Consulting	5,146	2,334	6.2%	5.2%	63%	3%	$51,186	$71,361
Film, TV, Video Prod/Distrib	1,853	235	1.4%	0.0%	109%	10%	$46,765	$94,854
Below Average State Earnings								
Aquaculture Production	201	57	3.4%	-0.5%	773%	225%	$42,260	$30,164
Specialty Health Care Services	8,021	4,089	7.4%	5.8%	77%	8%	$41,536	$39,750
Agric. Support Services	1,320	304	2.7%	2.0%	53%	1%	$41,120	$46,854
Cultural Activities	3,297	1,800	8.2%	1.8%	416%	182%	$37,729	$46,296
Farm Production	13,387	512	0.4%	-0.3%	95%	3%	$25,256	$25,361
Call Centers	315	105	4.1%	1.9%	15%	2%	$15,687	$35,531

* For definition and data source, see Table 3