STATE OF HAWAI'I • DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

Hawai'i's Targeted & Emerging Industries

2025 Update Report

RESEARCH & ECONOMIC ANALYSIS DIVISION
DBEDT • STATE OF HAWAI'I

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Department of Business, Economic Development & Tourism
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Following §201-16 and §201-19, Hawai‘i Revised Statutes, this publication was produced by the Research and Economic Analysis Division (READ) of the Department of Business, Economic Development & Tourism (DBEDT), State of Hawai‘i which is responsible for its content and presentation.

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Hawai‘i Department of Business, Economic Development & Tourism

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GLOSSARY

Industry: a group of companies that operate in a similar way and produce similar goods, services, and sources of income. Industries are defined using six-digit North American Industry Classification System (NAICS Coding System).

Industry Group: an aggregation of closely related industries that produce similar goods and services.

Sector: concentrations of industry groups related by knowledge, skills, inputs, demand, and/or other inter-linkages.

Technology Sector: industry groups where technological change and transformation of production methods are generated at a higher pace than the rest of the local economy.

Creative Sector: industry groups where the main inputs of production are Hawai‘i’s unique human capital, cultural diversity, and its host culture, as brand differentiators.

Education (Private) Sector: where higher education institutions influence the way by which the state economy acquires, creates, disseminates, and uses knowledge.

Agribusiness Sector: industry groups where the main inputs of production are or are in close connection with Hawai‘i’s lands and biodiversity.

Health and Wellness Sector: industry groups where the main economic activity is the prevention of illness, and the preservation of health of the Hawaiian population.

Other Industry Groups: the Apparel and Call Center industry groups, which have been the focus of state programs in the past.

Concentration: Proportion of jobs in an economic activity of a region compared to the proportion of the same activity nationally.

Dynamic Deterministic Shift–Share (DDSS): A decomposition method that attributes local employment, productivity, and earnings per job changes to three components:

(a) National Growth Effect (NG): the change expected if each industry in Hawai‘i grew at the same rate as total U.S. employment.

(b) Industry-Mix Effect (IM): the effect of the state’s industry composition relative to the U.S. structure.

(c) Local Competitive Effect (CE): the residual representing Hawai‘i’s industry-specific local advantage or disadvantage.

Gross Regional Product (GRP): Lightcast™ -produced measure of the sum of total industry earnings, taxes on production & imports, and profits, less subsidies, calculated at sub-national levels. It is the regional equivalent of Gross Domestic Product (GDP). Source: Lightcast™ 2024v3.

Productivity: Measured as Gross Regional Product (GRP) per job. Growth in P reflects productivity or value-added gains.

EXECUTIVE SUMMARY

This report assesses the economic performance Hawai‘i’s Targeted and Emerging Industries Portfolio. These sectors represent areas where public investment, workforce development, and strategic planning have been concentrated over the past decade and a half. This report focuses a narrow range of sectors and is not an assessment of Hawai‘i’s overall economy. In 2024, total jobs in the targeted industries portfolio totals 170,302, or 19% of total civilian jobs.

The original report relied heavily on two-point employment comparisons and did not incorporate productivity or earnings per job—critical dimensions of competitiveness and sustainability. These limitations reduced its ability to distinguish cyclical recovery from structural advantage or to identify whether job gains were supported by rising output and wages.

The 2025 update builds on this foundation using an enhanced analytical framework. It adopts a Dynamic Deterministic Shift–Share (DDSS) model that decomposes changes in employment, productivity, and earnings per job into the portions driven by (1) overall national economic growth, (2) the national performance of each industry, and (3) Hawai‘i-specific competitive effects. This approach moves beyond simple growth measurement. It assesses why industries expand or contract, whether gains reflect underlying local strengths, and whether workers benefit from those changes.

To capture both structural and cyclical dynamics, the analysis relies on two complementary time windows. The long-term window, covering 2014 to 2024, reflects the cumulative and structural shifts that have shaped Hawai‘i’s economy over the past decade. The short-term window, spanning 2021 to 2024, highlights the post-pandemic recovery period.

Hawai‘i’s targeted and emerging industries account for a modest share of statewide employment—just over 170,000 jobs—but play an important role in economic diversification, high-skill wage opportunities, and long-term resilience.

Despite the external support, nearly all Hawai‘i’s targeted industries underperformed relative to the rest of the country in 2014-2024. While many of these sectors experienced growth, it was less than their national comparable industries. The biggest exceptions to this trend were Agricultural Support Services; Aquaculture; and Film, TV, Video Production/Distribution, Cable & Media Streaming.

This report reviews the performance of the following sectors: Technology, Creative, Agribusiness, Health and Wellness, Education, and other targeted sectors. It also evaluates the performance of each industry by county.

INTRODUCTION

In 2009, the Department of Business, Economic Development and Tourism's Research and Economic Analysis Division (DBEDT-READ) conducted a comprehensive review of the economic activities that had been proposed over the years as candidates for diversifying Hawai'i's economy. That effort sought to define targeted sectors and measure their performance over time. The result was the creation of a Targeted Industry Portfolio of about three dozen industry groups covering the 2002–2008 period.

Since then, these targeted sectors have continued to evolve and now encompass Hawai'i's Technology, Health and Wellness, Private Education, Agribusiness, and Creative industries. This publication represents the 15th update in the ongoing series, extending the assessment through 2014–2024. It provides an up-to-date picture of how key sectors are contributing to economic diversification, productivity, and resilience.

Defining Targeted and Emerging Industries

Act 148 (2007) directed DBEDT to identify and measure systematically the performance of emerging industries in Hawai'i's economy. For the initial 2009 report, DBEDT reviewed more than a dozen major studies and planning efforts to compile a list of sectors, industries, and industry groups that had been considered important to the state's diversification strategy. The selected industry groups were defined, and criteria were developed to identify emerging industries.

In this report, the term "targeted" refers to any economic activity that—at some point—was recognized by public agencies, private organizations, or industry stakeholders as having potential to contribute to growth, productivity, or diversification. These sectors include biotechnology and film and television production.

Even if an industry group is no longer an active focus of development efforts, it remains within the portfolio. The portfolio was designed to be comprehensive and inclusive, allowing for historical analysis. This broad coverage identifies strengths and weaknesses across the state's industrial structure.

Sector Definitions

Technology Sector: Industry groups where technological innovation and transformation of production methods occur at a faster pace than in the rest of the regional economy.

Creative Sector: Industry groups whose main production inputs are Hawai'i's distinctive human capital, cultural diversity, and host culture—elements that serve as brand differentiators.

Education (Private) Sector: Industry groups centered on private higher-education institutions that influence how the state acquires, creates, and applies knowledge.

Agribusiness Sector: Industry groups whose main inputs are derived from, or closely connected to, Hawai'i's land resources and biodiversity.

Health and Wellness Sector: Industry groups whose primary activities involve the prevention of illness and preservation of health among Hawai'i's residents.

Other Industry Groups: The Apparel and Call Center industries, which have historically received state attention or program support.

Structure of Industry Classification

Data collection begins at the industry level, defined as a group of establishments that operate in similar ways and produce comparable goods, services, or sources of income. Industries are classified using the six-digit North American Industry Classification System (NAICS). Industry Groups aggregate closely related industries that share production characteristics or markets, while Sectors represent broader concentrations of related industry groups connected by shared knowledge, skills, inputs, or demand linkages.

Table 1 lists the industry groups associated with each sector, and Appendix A presents the full hierarchical classification of industries into industry groups and sectors used throughout this report.[1]

Analytical Framework

Understanding how Hawai‘i’s industry structure is evolving requires an analytical approach capable of distinguishing between growth driven by national trends and growth that reflects genuine local strengths. To meet that need, this report applies the Dynamic Deterministic Shift–Share (DDSS) framework—a modern extension of classic shift–share analysis and widely recognized in regional economic research for its ability to isolate the local competitive dynamics behind industry performance (see Appendix C for technical details). We apply the methodology to the following dimensions:

Jobs (Scale Proxy): Jobs measure the number of filled positions in an industry, regardless of full-time or part-time status. In the classification, jobs serve as a proxy for industry scale, indicating the size, market presence, and labor absorption capacity of each industry group.

Productivity (TFP Proxy): Productivity is defined as output per worker (or per job), capturing how efficiently industries convert labor and other inputs into goods and services. In the classification, it functions as a proxy for total factor productivity (TFP)—reflecting technological productivity, capital intensity, process improvements, and organizational performance.

Earnings per Job (Factor Remuneration Proxy): Earnings per job represent the average annual labor compensation paid in an industry, including wages, salaries, and supplements. They serve as a proxy for factor remuneration, indicating whether productivity gains translate into improved labor income or accrue elsewhere in the value chain.

Shift–share decomposes industry change into three components:

1. Overall U.S. Economic Growth, which affects all regions. This component measures much the region’s industry variable would have grown if it followed overall national growth.

[1] In Appendix A, the industry Group Abbreviations are CS - Creative sector; TS - Technology sector; AG - Agribusiness; HW - Health and Wellness; ED - Higher (Private) Education; OT - Apparel or Call Centers.

2. The National Industry Mix performance of each industry, recognizing that some sectors grow or contract regardless of location. This component measures the additional growth (positive or negative) resulting from the national performance of each industry relative to the overall U.S. economy.
3. A Local Competitive Effect, which captures how much faster or slower local industries' values grew relative to their national counterparts after adjusting for those broader forces. It measures how much the region's industry outperformed (or underperformed) its national counterpart.

Table 1. Targeted Industry Portfolio (Sectors/Industry Groups)

Technology Sector	**Agribusiness Sector**
Alternative Power Generation	Agriculture Inputs
Biotechnology	Agriculture Packaging and Warehousing
Chemical and Pharmaceutical Manufacturing	Agriculture Processing
Computer System Design and Related Services	Agriculture Support Services
Engineering and Related Services	Farm Production
Information and Telecom Technology	Fishing, Forestry and Hunting
Medical Labs and Imaging Centers*	Aquaculture
Other Technology Manufacturing	**Health and Wellness Sector**
R&D Services (except Biotechnology)	Health Practitioners
Technical Consulting Services	Hospitals and Nursing Facilities
Technology Equipment Distribution	Medical Labs and Imaging Centers*
Creative Sector	Pharmacies
Architecture	Specialty Health Care Services
Art Education	**Education (Private) Sector**
Business Consulting	Higher Education
Computer Services and Software Publishers	Specialty Education
Cultural Activities	**Other Targeted Activities Sector**
Design Services	Apparel
Engineering and Research and Development	Call Centers
Film, TV, Video Production/Distribution, Cable and Media Streaming	
Marketing, Photography and Related	
Music	
Performing and Creative Arts	
Publishing and Information	
Radio and Television Broadcasting	

*Medical Labs and Imaging Centers industry group is fully represented in both the Technology and the Health and Wellness sectors
Source: DBEDT.

The DDSS formulation used in this report expands on the classic two-point version of the model by performing this decomposition year by year across the entire 2014–2024 period. This approach is better suited to Hawai‘i's recent economic environment, which includes the impacts of the pandemic, subsequent recovery, and ongoing structural transition toward knowledge-intensive activities. By incorporating the full annual trajectory of each industry group, DDSS reduces distortions that can occur when a single start or end year coincides with unusual economic

conditions. It also reveals turning points, momentum shifts, and the cumulative effect of short-run fluctuations that are invisible in a traditional endpoint comparison.

To capture both the scale and quality of industry performance, the analysis extends DDSS to three core indicators:

- Jobs (J) – whether Hawai‘i’s industries added employment faster or slower than their national benchmarks.
- Productivity (P) – whether gains in Gross Regional Product per job outpaced those in comparable industries nationwide.
- Earnings per Job (E) – whether workers shared proportionally in these local competitive gains.

By focusing on the local competitive effect components of these indicators, the DDSS framework isolates the portion of local performance that cannot be explained by national conditions or industry composition alone. This provides a sharper picture of Hawai‘i’s emerging strengths, areas under competitive pressure, and segments undergoing structural adjustment.

To facilitate interpretation, the report summarizes each industry group’s DDSS results in a four-quadrant performance map. The map combines the signs of the local competitive effects for Jobs and Productivity to classify industry trajectories—Jobs and Productivity Growth, Jobs Shrinkage, Productivity Growth, expanding but pressured, and shrinking and restructuring—while the earnings per job component indicates whether workers benefitted from those competitive dynamics (Table 2). This visualization provides an accessible but analytically rigorous way to compare industries and sectors across both long-term (2014–2024) and short-term (2021–2024) windows.

Table 2. Performance Classifications Based on Shift–Share Framework

Jobs and Productivity Growth (J+, P+, E±)	**Jobs Growth, Productivity Shrinkage (J+, P–, E±)**
Industries are gaining scale and efficiency simultaneously. These activities grow faster than their national counterparts and often support stable or rising wages.	Industries are adding jobs more quickly than the nation but with lagging productivity. These sectors may be scaling through labor rather than efficiency.
Jobs Shrinkage, Productivity Growth (J–, P+, E±)	**Jobs and Productivity Shrinkage (J–, P–, E±)**
Industries with rising productivity but shrinking employment. These typically reflect automation, specialization, or capital deepening. Earnings may rise if gains are shared with workers or stagnate if value accrues mainly to firms or upstream suppliers.	Industries are under structural stress, declining in both jobs and productivity. This pattern often signals long-run contraction, digital disruption, or shifts in demand or national policy.

J±, P±, E±: Sign of change for local competitive effect components of Jobs, Productivity and Earnings per Job during the period

Concentration as a Complementary Measure

Alongside DDSS, the report uses employment concentration to measure Hawai‘i’s specialization in each industry group or sector relative to the nation. Concentration is defined as the ratio of:

- the share of state jobs in a given activity, to
- the share of U.S. jobs in that same activity.

High concentration can signal mature local clusters or export-oriented activities but does not by itself imply a competitive advantage. In this framework:

- Concentration is a structural indicator of specialization.
- DDSS local competitive effects (for Jobs, Productivity, and Earnings per Job) indicate whether those specialized industries are currently outperforming or lagging behind their national peers.

Used together, these measures show both where Hawai‘i is most specialized and how those specializations are performing competitively.

A second methodological feature of this report is recognizing the explicit treatment of overlapping NAICS codes in the Technology and Creative sectors.[2]

Data Sources

Jobs and earnings per job reported include wage and salary jobs, self-employed, and proprietors. The data were obtained via a subscription to the databases of Lightcast™. This database uses data from the U.S. Bureau of Labor Statistics, the U.S. Bureau of Economic Analysis, and other data sources to construct very detailed industry data series regarding jobs, occupations, and earnings per job for the states and counties. Lightcast’s sources for final GRP data include the following: Lightcast’s industry earnings data (BLS’s Quarterly Census of Employment and Wages, along with multiple supplementary data sets), BEA Gross State Product (GSP) dataset, Lightcast’s national Input-Output model, BEA National Income and Product Accounts (NIPA).

General Performance Overview

In 2024, Hawai‘i’s total civilian employment reached 894,787 jobs, an increase of 94,220 jobs since 2014 (0.9% average annual growth). The state’s Targeted Industries without overlap accounted for 170,302 jobs, growing 1.2% per year, below national trends. These activities represented 84% of the national employment concentration for comparable industries.

In Table 3 we highlighted industries that substantially outperformed their comparable national industries’ job growth in green, and those that underperformed in red. Across the targeted

[2] Because many innovation-related activities in Hawai‘i—such as software development, engineering, media production, consulting, and R&D—naturally cut across creative and technical domains, several six-digit NAICS codes are common to both sectors. To maintain transparency and avoid double-counting, the report presents two complementary perspectives: a Full Ecosystem View, which retains the overlaps and reflects the true cross-disciplinary nature of Hawai‘i’s innovation economy; and a Core View, which removes duplicated industries to ensure clarity and comparability across sectors. See Appendix D for details.

industries, several groups posted employment gains over 2014–2024. Health Practitioners added the largest number of jobs (+5,044; 2.1% annually), followed by Specialty Health Care Services (+3,892; 3.4% annually), Business Consulting (+2,686; 4.5% annually), Technical Consulting Services (+2,615; 4.8% annually), and Engineering and Related Services (+1,200; 1.8% annually). Other growing activities included Computer Services and Software Publishers (+1,345; 2.5%), Engineering and R&D (+1,097; 1.8%), Marketing, Photography and Related (+1,357; 1.1%), and Film, TV, and Media Production (+828; 4.4%). Hawai‘i also saw rapid expansion in Aquaculture, which grew 4.2% annually and added 136 jobs, outpacing U.S. relative growth.

Several industry groups experienced only modest growth or decline over the decade. Losses occurred in Agricultural Processing (–759 jobs; –1.1%), Farm Production (–1,861 jobs; –1.3%), Publishing and Information (–542 jobs; –3.1%), Higher Education (–1,498 jobs; –2.6%), and Biotechnology (–152 jobs; –3.2%)—the latter sharply diverging from strong national growth (+7.0%). Retail-adjacent activities such as Pharmacies and Apparel also experienced employment declines.

Hawai‘i maintains strong regional specialization in several industries. Aquaculture stands out with an exceptionally high location quotient of 1333%, reflecting Hawai‘i’s unique natural and research features. Other highly concentrated activities include Fishing, Forestry and Hunting (326%), Cultural Activities (353%), Apparel (167%), Medical Labs and Imaging Centers (144%), Music (142%), Performing and Creative Arts (114%), Architecture (133%), and Pharmacies (121%). Concentration increased sharply between 2014 and 2024 in Aquaculture (+346 points), Agricultural Support Services (+25), Film and Media Production (+28), Technical Consulting Services (+10), and Specialty Health Care Services (+7). Declines in specialization were most evident in Cultural Activities (–41 points), Biotechnology (–47), Publishing and Information (–8), and Information and Telecom Technology (–8).

Average annual earnings per job in 2024 varied widely across industries. The highest wages were found in advanced technology and specialized professional services. Technology Equipment Distribution offered the highest pay at $152,919, followed by Alternative Power Generation

Table 3. Overall Performance of the Targeted Industry Portfolio

Industry Groups [2/]	Jobs in Hawaii		Av. Annual Job Growth 2014-2014		Concentration [1/]		Avg. Annual Earnings 2024	
	2024	Change 2014-2024	HI	U.S.	2024	Perc. Pt. Chg 2014-2024	HI	U.S.
Total Civilian	894,787	94,220	0.9%	1.8%	100%	0%	$72,356	$76,675
Total Targeted without Overlap	170,302	22,056	1.2%	1.8%	84%	2%	$78,007	$95,216
Agriculture								
Agric. Inputs	458	(10)	-0.2%	0.5%	42%	1%	$63,403	$92,469
Agric. Packaging & W.	202	(8)	-0.4%	1.8%	24%	-3%	$78,434	$75,465
Agric. Processing	6,382	(759)	-1.1%	2.1%	79%	-19%	$62,397	$74,800
Agric. Support Services	2,788	1,305	6.5%	4.0%	84%	25%	$60,519	$70,472
Farm Production	13,398	(1,861)	-1.3%	0.0%	102%	-2%	$37,561	$44,955
Fishing, Forestry and Hunting	1,404	(299)	-1.9%	-0.8%	326%	-3%	$32,460	$39,529
Aquaculture	402	136	4.2%	2.2%	1333%	346%	$62,231	$51,300
Creative								
Art Education	911	73	0.8%	2.5%	71%	-4%	$21,514	$15,944
Music	1,375	13	0.1%	1.6%	142%	-7%	$36,720	$54,113
Performing and Creative Arts	8,779	(259)	-0.3%	1.1%	114%	-4%	$34,507	$38,704
Publishing and Inform.	1,467	(542)	-3.1%	-0.8%	58%	-8%	$75,498	$153,620
Radio and Television Broadcasting	841	(158)	-1.7%	-0.7%	124%	1%	$71,331	$86,042
Architecture	1,925	(45)	-0.2%	1.2%	133%	-5%	$103,344	$97,327
Business Consulting	7,518	2,686	4.5%	4.3%	68%	8%	$81,955	$105,067
Computer Services and Software Publishers	6,224	1,345	2.5%	3.7%	45%	-1%	$132,555	$177,162
Cultural Activities	3,263	(163)	-0.5%	1.7%	353%	-41%	$71,749	$78,551
Design Services	2,319	286	1.3%	2.5%	97%	-1%	$39,708	$58,158
Engineering and Research and Development	6,587	1,097	1.8%	2.5%	82%	3%	$128,701	$143,827
Film, TV, Video Production/Distrib, Cable & Media Streaming	2,367	828	4.4%	1.6%	89%	28%	$98,014	$196,157
Marketing, Photography and Related	12,940	1,357	1.1%	2.5%	94%	-3%	$41,081	$70,549

Table 3. Overall Performance of the Targeted Industry Portfolio, cont.

Industry Groups [2/]	Jobs in Hawaii		Av. Annual Job Growth 2014-2014		Concentration [1/]		Avg. Annual Earnings 2024	
	2024	Change 2014-2024	HI	U.S.	2024	Perc. Pt. Chg 2014-2024	HI	U.S.
Education (Private)								
Higher Education	4,953	(1,498)	-2.6%	-0.1%	62%	-10%	$43,762	$74,564
Specialty Education	6,782	1,290	2.1%	2.5%	98%	7%	$38,101	$35,912
Health and Wellness								
Health Practitioners	27,156	5,044	2.1%	2.4%	104%	7%	$106,503	$96,512
Hospitals and Nursing F.	21,141	1,504	0.7%	0.9%	74%	6%	$102,706	$92,141
Medical Labs and Imaging C.	1,982	273	1.5%	2.0%	144%	8%	$85,126	$95,996
Pharmacies	4,305	(574)	-1.2%	-0.7%	121%	6%	$44,651	$56,642
Specialty Health Care S.	13,793	3,892	3.4%	3.6%	97%	7%	$78,585	$60,872
Technology								
Alternative Power Gen.	255	45	2.0%	3.0%	72%	0%	$149,004	$194,652
Technical Consulting Services	6,967	2,615	4.8%	4.4%	73%	10%	$81,937	$105,806
Technology Equipment Distribution	908	174	2.2%	1.9%	36%	4%	$152,919	$173,404
Biotechnology	400	(152)	-3.2%	7.0%	32%	-47%	$113,031	$246,393
Chemical and Pharmaceutical Mfg	123	(44)	-3.0%	1.6%	6%	-3%	$89,843	$164,373
Computer System Design and Related services	6,830	342	0.5%	2.8%	57%	-7%	$122,804	$161,538
Engineering and Related Services	7,361	1,200	1.8%	1.8%	98%	10%	$125,571	$123,778
Information and Telecom Technology	5,435	229	0.4%	2.7%	61%	-8%	$123,060	$169,240
Medical Labs and Imaging Centers	1,982	273	1.5%	2.0%	144%	8%	$85,126	$95,996
Other Technology Mfg	487	8	0.2%	1.0%	8%	0%	$86,768	$140,502
R&D Services (except Biotechnology)	1,391	(151)	-1.0%	3.0%	50%	-17%	$109,274	$163,378
Others								
Apparel	923	(242)	-2.3%	-2.3%	167%	16%	$28,519	$51,321
Call Centers	329	56	1.9%	-2.7%	20%	9%	$36,676	$58,502

Source: Lightcast™ and DBEDT calculations.

1/ Proportion of jobs in the industry group in the region compared to the proportion nationally.2/ The figures include overlaps.

($149,004), Computer Services and Software Publishers ($132,555), Engineering and R&D ($128,701), and Information and Telecom Technology ($123,060). Health-related industries also provided above-average earnings per job, including Health Practitioners ($106,503) and Hospitals and Nursing Facilities ($102,706). In contrast, several creative and agricultural activities had earnings per job well below the state average, such as Art Education ($21,514), Music ($36,720), and Farm Production ($37,561).

Overall, Hawai‘i’s targeted portfolio performance from 2014 to 2024 reflects job creation in health care, business and technical consulting, creative media, and selective technology-oriented activities; rising specialization in aquaculture and professional services; and local competitive wages in engineering, information technology, alternative energy, and advanced R&D-focused fields.

The statewide results presented above provide the analytic baseline for the more detailed sectoral discussions that follow. They highlight the broad patterns—such as the decade-long expansion of health care, the steady rise of business and technical consulting, the mixed performance across creative industries, and the renewed momentum in renewable energy and technology-enabled services—that shape Hawai‘i’s competitive position. These statewide dynamics, however, unfold differently across industry groups and counties. The next sections examine each major sector in turn, tracing how individual activities contributed to—or diverged from—the overall trends. By linking sector-specific employment, productivity, specialization, and earnings per job patterns back to the statewide benchmarks, the report identifies the drivers of growth, areas of structural strength, and segments facing competitive headwinds within Hawai‘i’s emerging and targeted industries.

TECHNOLOGY SECTOR

In 2008, the Department of Business, Economic Development and Tourism (DBEDT), in collaboration with the Hawai‘i Science and Technology Association (HiSciTech) and other stakeholders, refined the definition of Hawai‘i’s Technology Sector and established baseline measurements.[3] That effort adopted the U.S. Bureau of Labor Statistics (BLS) approach, which classifies industries as part of the technology sector based on the share of highly skilled technical workers they employ.[4] The 2022 Targeted & Emerging Industries Update revised this definition using the 2022 NAICS codes to reflect modern industry classifications. The current 2025 update maintains these adjusted NAICS definitions to ensure consistency and comparability across reporting periods.

Size & Growth

The Technology Sector accounted for 32,540 jobs in 2024, or 3.6% of all civilian employment in Hawai‘i. From 2014 to 2024, the sector’s employment grew at an average annual rate of 1.5%, outpacing the overall civilian economy by 0.8 percentage points.

After the pandemic, technology activities returned to growth. Between 2021 and 2024, technology jobs increased by 2.8%, compared with 3.1% for the statewide civilian economy (Figure 1). By 2024, total technology employment was 17% above its 2019 level, indicating a steady recovery and expansion into new technical and knowledge-intensive activities.

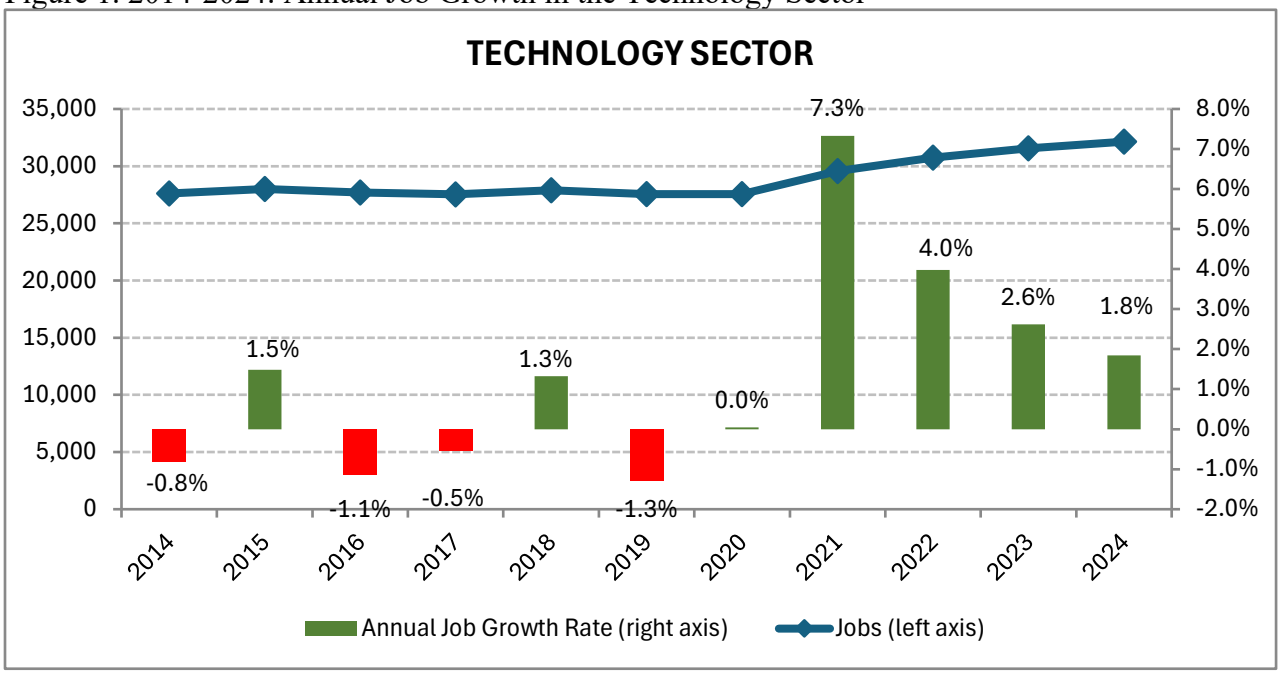
Within the sector, Technical Consulting Services recorded the strongest average annual job growth over 2014–2024 (4.8%), followed by Technology Equipment Distribution (2.2%). Other industry groups with positive long-term growth included Alternative Power Generation (2.0%), Engineering and Related Services (1.8%), Medical Labs and Imaging Centers (1.5%), Computer System Design and Related Services (0.5%), Information and Telecom Technology (0.4%), and Other Technology Manufacturing (0.2%).

Three technology industry groups experienced job declines over the period: R&D Services (except Biotechnology) (–1.0%), Biotechnology (–3.2%), and Chemical and Pharmaceutical Manufacturing (–3.0%) (see Table 4).

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

[4] Currently, there is no official or universally agreed upon definition for the technology sector.

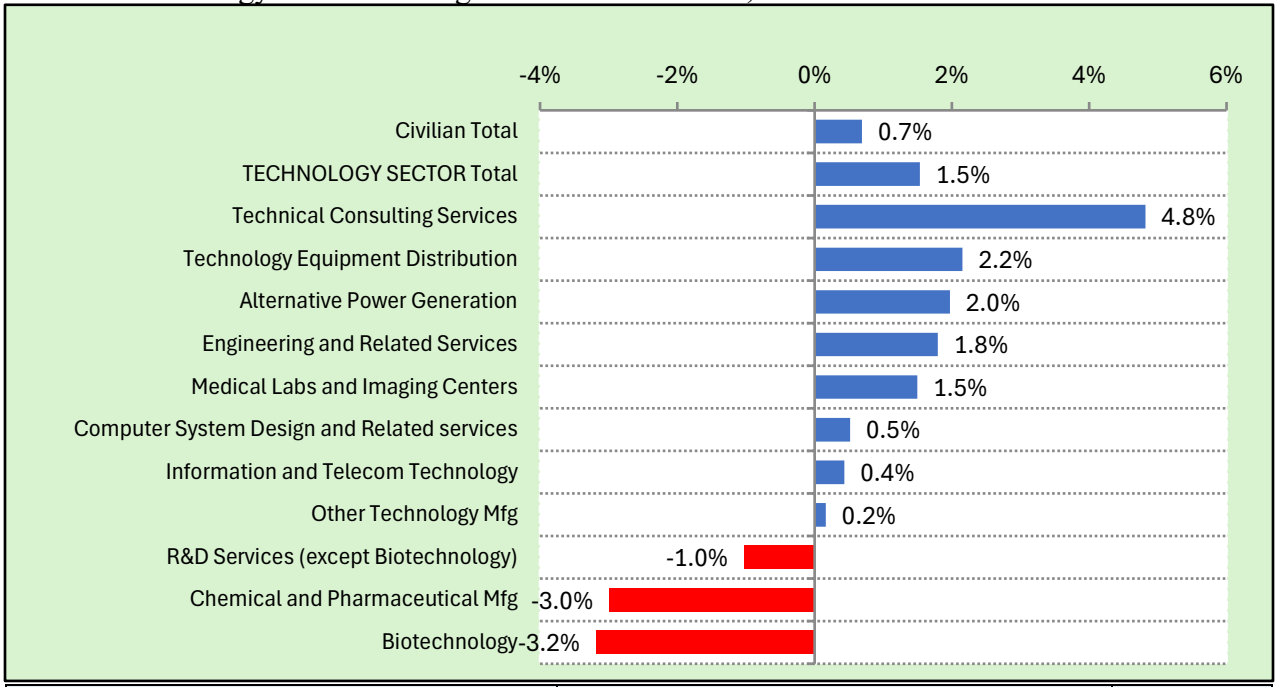
Figure 1. 2014-2024: Annual Job Growth in the Technology Sector



Source: Lightcast™ and DBEDT calculations.

Overall, the Technology Sector's average annual job growth exceeded that of the civilian economy by 0.8 percentage points during the 2014–2024 period—by 1.7 points over the 2014–2021 period—but trailed the statewide pace by 0.3 points in the post-pandemic 2021–2024 window.

Table 4. Technology Sector: Average Annual Job Growth, 2014-2024



Industry Sector/Group	Annual Job Growth			Jobs in 2024
	2014-2024	2014-2021	2021-2024	
Civilian Total	0.7%	-0.3%	3.1%	894,787
TECHNOLOGY SECTOR Total	1.5%	1.0%	2.8%	32,140
Technical Consulting Services	4.8%	4.6%	5.3%	6,967
Technology Equipment Distribution	2.2%	3.3%	-0.5%	908
Chemical and Pharmaceutical Mfg	-3.0%	-8.6%	11.6%	123
Engineering and Related Services	1.8%	1.8%	1.7%	7,361
Medical Labs and Imaging Centers	1.5%	1.7%	1.1%	1,982
Information and Telecom Technology	0.4%	-1.0%	3.7%	5,435
Computer System Design and Related services	0.5%	0.0%	1.8%	6,830
Other Technology Mfg	0.2%	-0.2%	0.9%	487
R&D Services (except Biotechnology)	-1.0%	-2.6%	2.7%	1,391
Alternative Power Generation	2.0%	0.3%	6.0%	255
Biotechnology	-3.2%	-5.2%	1.7%	400

Source: Lightcast™ and DBEDT calculations.

National Comparisons

The sixth column of Table 5 reports the difference between Hawai‘i’s and the nation’s average annual job growth rates for the technology sector and its industry groups. Over the 2014–2024 period, Hawai‘i’s overall technology sector grew 1.1 percentage points more slowly than the national technology sector.

At the industry-group level, Technology Equipment Distribution and Technical Consulting Services outperformed their national counterparts by 0.4 and 0.3 percentage points, respectively. All

other technology industry groups in Hawai‘i lost job share relative to the nation, with Biotechnology lagging the national growth rate by 10.2 percentage points.

Table 5. Hawai‘i Technology Sector Performance Compared with Nation

Industry Groups	Jobs 2024	Jobs per Establishment 2024	Avg Annual Earnings 2024	Avg Ann Job Growth		When U.S. = 100%		
				2014-2024	Above USA	Concentration 1/	Jobs per Establishment	Avg Annual Earnings
Total Civilian	894,787	14.9	$72,356.2	0.7%	-1.1%	100%	82%	94%
TECHNOLOGY SECTOR	32,140	6.7	$111,978.1	1.5%	-1.1%	59%	61%	76%
Alternative Power Generation	255	7.4	$149,004.4	2.0%	-1.1%	72%	43%	77%
Engineering and Related Services	7,361	8.5	$125,571.0	1.8%	0.0%	98%	70%	101%
Technical Consulting Services	6,967	9.5	$81,937.3	4.8%	0.4%	73%	109%	77%
Computer System Design and Related services	6,830	4.7	$122,804.1	0.5%	-2.3%	57%	67%	76%
Information and Telecom Technology	5,435	5.0	$123,060.2	0.4%	-2.3%	61%	42%	73%
Medical Labs and Imaging Centers	1,982	30.0	$85,126.1	1.5%	-0.5%	144%	260%	89%
R&D Services (except Biotechnology)	1,391	6.9	$109,274.2	-1.0%	-4.0%	50%	34%	67%
Technology Equipment Distribution	908	4.4	$152,919.2	2.2%	0.3%	36%	41%	88%
Other Technology Mfg	487	11.8	$86,767.8	0.2%	-0.8%	8%	27%	62%
Biotechnology	400	5.4	$113,030.7	-3.2%	-10.2%	32%	40%	46%
Chemical and Pharmaceutical Mfg	123	10.7	$89,843.3	-3.0%	-4.6%	6%	24%	55%

1/ Proportion of jobs in the industry groups in the region compared to the proportion nationally.
Source: Lightcast™ and DBEDT calculations.

In terms of concentration, most of Hawai‘i’s technology industry groups account for a smaller share of the state’s total employment than their counterparts do nationally. In 2024, Hawai‘i’s overall concentration of technology jobs was 59% of the national concentration. A notable exception is Medical Labs and Imaging Centers, which was 44% more concentrated in Hawai‘i than in the nation overall.

In 2024, average annual earnings per job in Hawai‘i’s technology sector were $111,278—about 55% higher than the state’s civilian-economy average of $72,356. All eleven technology industry groups recorded average annual earnings per job above the statewide civilian average. Engineering and Related Services’ average annual earnings per job slightly exceeded the national average for that industry (by 1 percentage point). However, workers in most Hawai‘i technology industry groups were paid less than their U.S. counterparts. Overall, average annual earnings per job

in Hawai‘i’s technology sector were just 78% of the national average, with the largest gaps in Biotechnology and Chemical and Pharmaceutical Manufacturing.

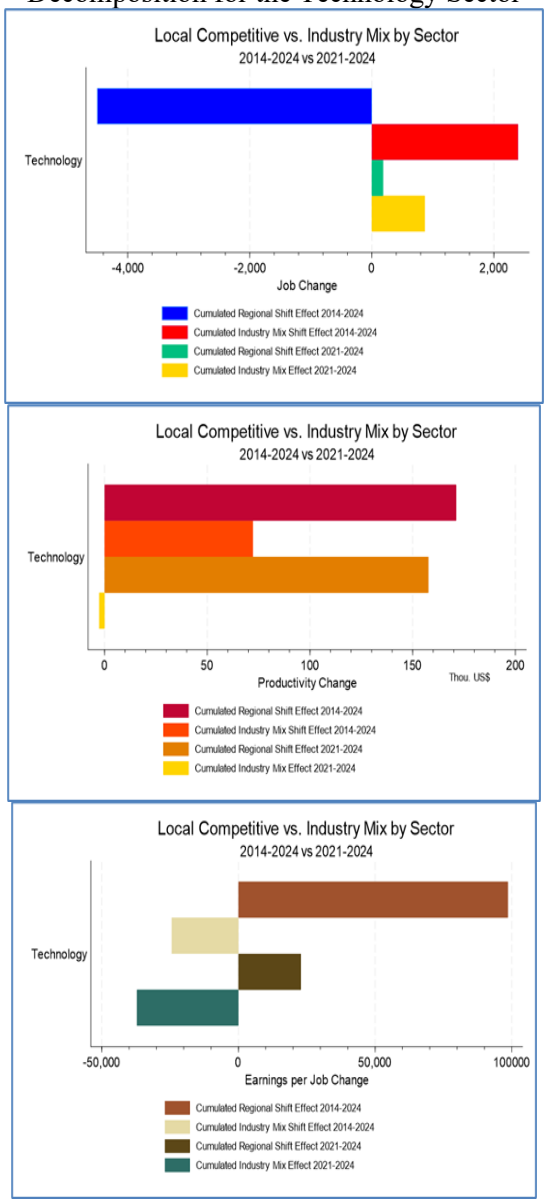
Competitive Map Analysis of the Technology Sector

The competitive map for the Technology Sector is based on the Dynamic Deterministic Shift–Share (DDSS) competitive components for Jobs (CE_J), Productivity (CE_P), and Earnings per Job (CE_EPJ). It compares each technology industry group’s local performance with that of its national counterpart. This national industry mix component is calculated net of national general employment growth. Figure 2 reports the DDSS decomposition for jobs, productivity, and earnings per job for the Technology sector aggregates.

While Hawai‘i’s Technology Sector has experienced growth, it has been less than the national average. Over the 2014–2024 period, the Technology Sector experienced negative local competitive effects on employment: Hawai‘i lost several thousand technology jobs due to local conditions. This contrasts with the positive national industry mix effect, which indicates that Hawai‘i’s mix of technology activities should have produced a more robust job growth if local competitive performance had matched national trends. In short, the long-run employment picture is one of positive national tailwinds but weak locally induced job creation.

In sharp contrast to employment outcomes, the productivity decomposition shows that Hawai‘i’s Technology Sector outperformed national benchmarks over the decade. The local competitive effect is positive, suggesting that the firms and activities that remained in Hawai‘i became significantly more productive, likely through consolidation, technological upgrading, and capital deepening. The national industry mix effect reinforces this pattern, reflecting widespread productivity gains across U.S. technology industries and confirming that Hawai‘i benefited from these structural advancements.

Figure 2. Local and National Component Decomposition for the Technology Sector



Source: Lightcast™ and DBEDT calculations.

The earnings-per-job decomposition follows a similar trajectory. Over 2014–2024, Hawai‘i’s Technology Sector exhibits a positive local competitive effect on wages, indicating that compensation grew faster locally than nationally. This suggests tightening labor markets for high-skilled workers, increased competition for technical talent, and higher costs of retaining specialized staff in Hawai‘i’s high-cost environment. The national industry mix effect—rising wages across U.S. tech industries—added further upward pressure, resulting in strong long-run wage growth across the sector.

The 2021–2024 period marks a shift, but not a reversal, of these trends. In the post-pandemic recovery, the local competitive effect for employment turns slightly positive, indicating modest job gains attributable to Hawai‘i-specific conditions. However, the magnitude of the rebound remains small compared to the long-run losses, suggesting that Hawai‘i’s Technology Sector is stabilizing rather than expanding. Productivity and earnings per job continue to show positive local effects after 2021, meaning that the sector maintained its productivity gains and wage competitiveness during the recovery.

Taken together, these results show that Hawai‘i’s Technology Sector is characterized by high value-added performance but limited employment expansion. The sector has become more productive and better compensated over time, but it has not grown larger in terms of jobs. This “better, not bigger” trajectory reflects both the strengths and constraints of Hawai‘i’s technology ecosystem: strong alignment with national technological trends and workforce upgrading on one hand, but persistent local barriers to scale—such as small markets, high costs, and limited agglomeration—on the other. While the post-2021 period shows signs of stabilization and localized recovery, especially in productivity and earnings per job, the sector’s employment base remains shaped by long-run structural challenges that have constrained its full growth potential.

2014–2024 Window

The bubble plots (2021–2024 and 2014–2024) place each industry group in a four-quadrant map based on its local competitive advantage in jobs (vertical axis) and productivity (horizontal axis), with bubble size proportional to Hawai‘i’s employment base. The sign of the local competitive effect for earnings per job indicates whether workers shared in the gains (Table 6a).

The Technology Sector remains one of Hawai‘i’s moderately sized but economically significant sectors, accounting for roughly 6–7% of statewide civilian employment and spanning high-skill services, R&D, niche manufacturing, and advanced energy. While smaller than sectors such as Health & Wellness or Tourism, its wage levels are among the highest in the state, and its activities anchor Hawai‘i’s long-run diversification strategy. Against this backdrop, the performance maps for the 2014–2024 and 2021–2024 windows reveal how this mid-sized but high-value sector has evolved, highlighting clear productivity strengths alongside uneven job dynamics.

Over the full decade, the Technology Sector exhibited local competitive moderate strength in productivity, while its job performance was mixed. The bubble charts show many industry groups positioned to the right on the productivity axis, indicating that Hawai‘i’s tech base has become more productive and specialized. These moderate gains are nonetheless important, since sector already pays well above the state average; rising productivity therefore helps support Hawai‘i’s high-wage footprint in tech even without large increases in job scale.

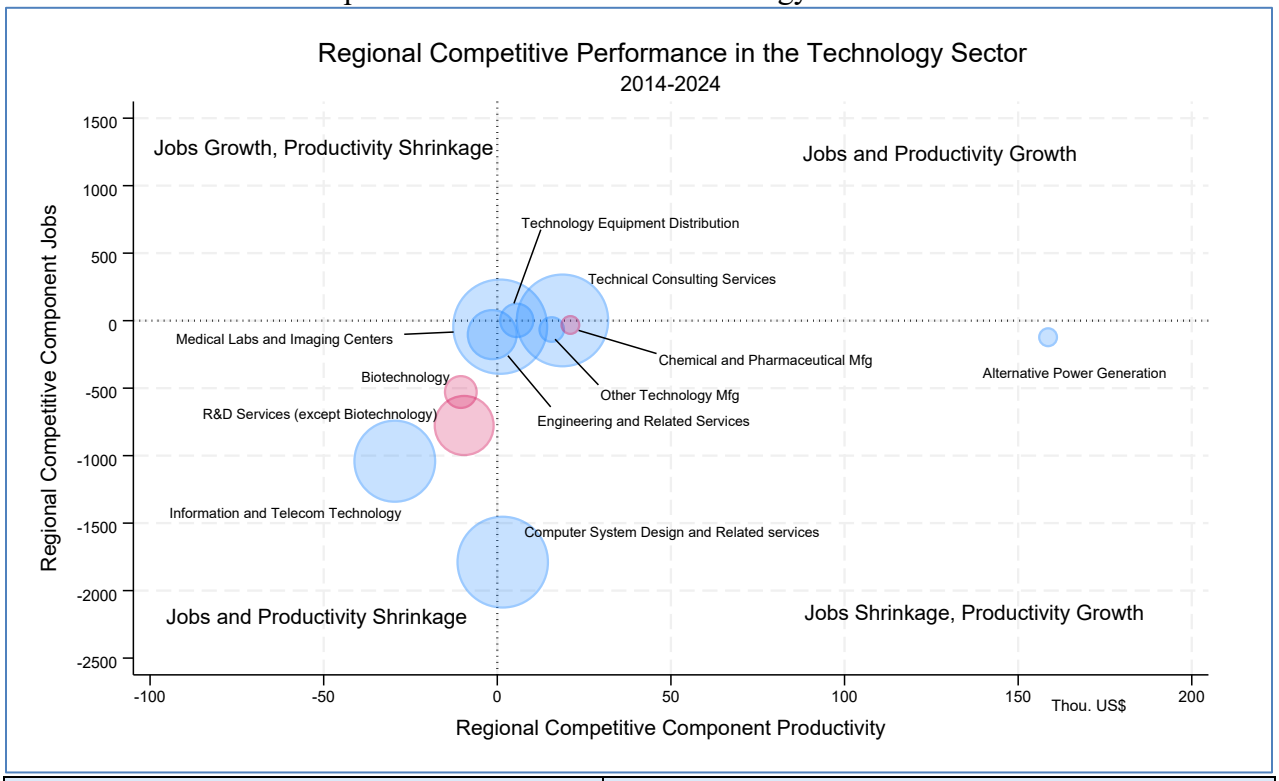
At the same time, the sector's employment base is relatively small, and local competitive job growth proved more difficult. Several industries experienced negative job competitive effects, suggesting that technological adoption, automation, and global specialization constrained the expansion of the local workforce.

Two industries—Technical Consulting Services and Technology Equipment Distribution—stand out. Each posted positive local competitive effects in both jobs and productivity, indicating that Hawai‘i hosts specialized niches. Importantly, both also recorded positive local competitive gains in earnings per job, showing that workers directly benefited from these productivity improvements.

The quadrant of Jobs Shrinkage, Productivity Growth, contains five industries: Alternative Power Generation; Chemical and Pharmaceutical Manufacturing; Computer System Design and Related Services; Engineering and Related Services; and Other Technology Manufacturing. These represent high value but small-scale industries in Hawai‘i, where productivity is rising even though employment is not. For a mid-sized sector like tech, these patterns suggest a transition to relatively higher productivity per worker, even as total job counts flatten or contract.

By contrast, the Jobs and Productivity Shrinkage quadrant includes industries such as R&D Services; Information and Telecom Technology; Biotechnology; and Medical Labs and Imaging Centers. These tend to be highly scale-dependent activities where Hawai‘i's small market size, cost structure, and distance from mainland innovation hubs may limit local competitive positioning. Declines in both job and productivity components signal structural headwinds.

Table 6a. Performance Map Classifications for the Technology Sector 2014-2024



Jobs and Productivity Growth (J+, P+, E±)	Jobs Growth, Productivity Shrinkage (J+, P–, E±)
Technical Consulting Services Technology Equipment Distribution	
Jobs Shrinkage, Productivity Growth (J–, P+, E±)	**Jobs and Productivity Shrinkage (J–, P–, E±)**
Alternative Power Generation Chemical and Pharmaceutical Mfg Computer System Design and Related services Engineering and Related Services Other Technology Mfg	Biotechnology Information and Telecom Technology R&D Services (except Biotechnology) Medical Labs and Imaging Centers

J±, P±, E±: Sign of change for local competitive components of Jobs, Productivity and Earnings per Job during the period. Blue bubbles (E+); red bubbles (E-); Size of bubbles is correlated with number of jobs in the industry groups. Data sources: Lightcast™ and DBEDT calculations.

2021–2024 Window

During the 2021–2024 window, the Technology Sector's local competitive dynamics shifted, reflecting the unique conditions of the post-pandemic recovery. The maps show that many industries moved into positive local competitive job growth, indicating positive hiring trends. This stands out because tech is not a large employer in Hawai'i; thus, even modest local competitive gains affect the sector's overall positioning (Table 6b).

Crucially, many industries also continued to strengthen their local productivity advantage, meaning that employment growth did not come at the expense of productivity. Five industries—Computer System Design; Alternative Power Generation; Chemical and Pharmaceutical Manufacturing; Other Technology Manufacturing; and Technical Consulting Services—recorded simultaneous local competitive gains in jobs and productivity. This suggests that the recovery phase brought renewed activity into some of the most specialized, high-paying industries within Hawai‘i’s tech base.

However, earnings per job did not rise as uniformly. In several high-growth industries, local competitive earnings per job effects were negative, implying that while Hawai‘i gained productivity, national wage growth outpaced Hawai‘i’s, or that post-pandemic hiring pressures held down wage premiums.

The Jobs Growth, Productivity Shrinkage case—Medical Labs & Imaging Centers—likely reflects pandemic-related surges in demand that expanded employment more rapidly than productivity.

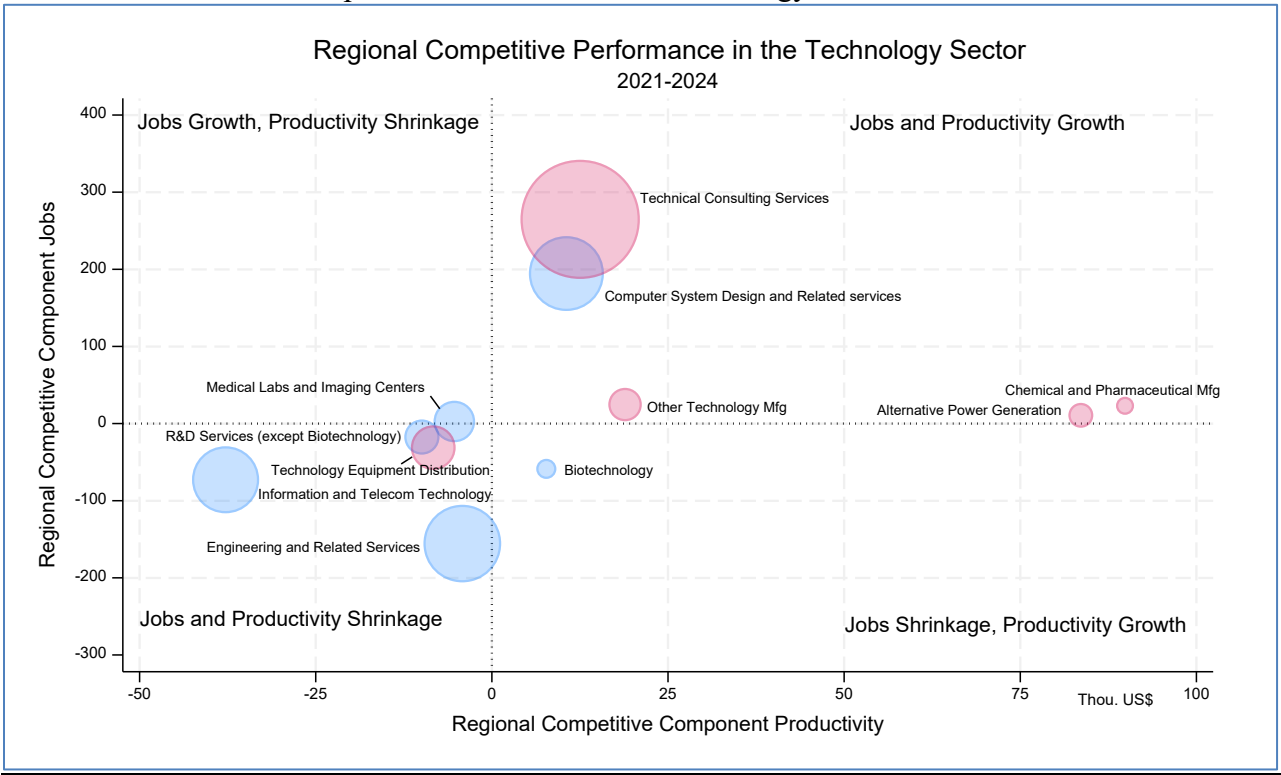
Meanwhile, Biotechnology recorded Jobs Shrinkage, Productivity Growth, a pattern consistent with national consolidation in biotech research and venture-funded activity. Earnings per job negative effects suggest that Hawai‘i’s biotech subsector is stabilizing at a smaller, more specialized scale.

Finally, four industries—Engineering and Related Services; Information and Telecom Technology; R&D Services (except Biotechnology); and Technology Equipment Distribution—showed combined declines in job and productivity components. These subsectors tend to rely on scale economies, high R&D intensity, or national hub connections, making them more exposed to Hawai‘i’s structural constraints.

Across both time windows, the Technology Sector stands out as:

- Small to mid-sized in job scale, but central to economic diversification.
- High-wage, consistently paying some of the highest earnings per job in the state.
- Productivity-driven, with most long-run gains concentrated in productivity rather than job expansion.
- Post-pandemic resilient, with broader local competitive job recovery between 2021 and 2024.
- Uneven in its distribution of gains, with local competitive earnings per job not always matching productivity improvements.

Table 6b. Performance Map Classifications for the Technology Sector 2021-2024



Jobs and Productivity Growth (J+, P+, E±)	**Jobs Growth, Productivity Shrinkage (J+, P–, E±)**
Computer System Design and Related services Alternative Power Generation Chemical and Pharmaceutical Mfg Other Technology Mfg Technical Consulting Services	Medical Labs and Imaging Centers
Jobs Shrinkage, Productivity Growth (J–, P+, E±)	**Jobs and Productivity Shrinkage (J–, P–, E±)**
Biotechnology	Engineering and Related Services Information and Telecom Technology R&D Services (except Biotechnology) Technology Equipment Distribution

J±, P±, E±: Sign of change for local competitive components of Jobs, Productivity and Earnings per Job during the period. Blue bubbles (E+); red bubbles (E-); Size of bubbles is correlated with number of jobs in the industry groups. Data sources: Lightcast™ and DBEDT calculations.

CREATIVE SECTOR

DBEDT's Research and Economic Analysis Division, together with the Creative Industries Division, collaborated to update the data and industry definitions for Hawai'i's Creative Sector. This update draws on a review of national models and best practices used to define and measure creative-industry ecosystems across the United States.[5]

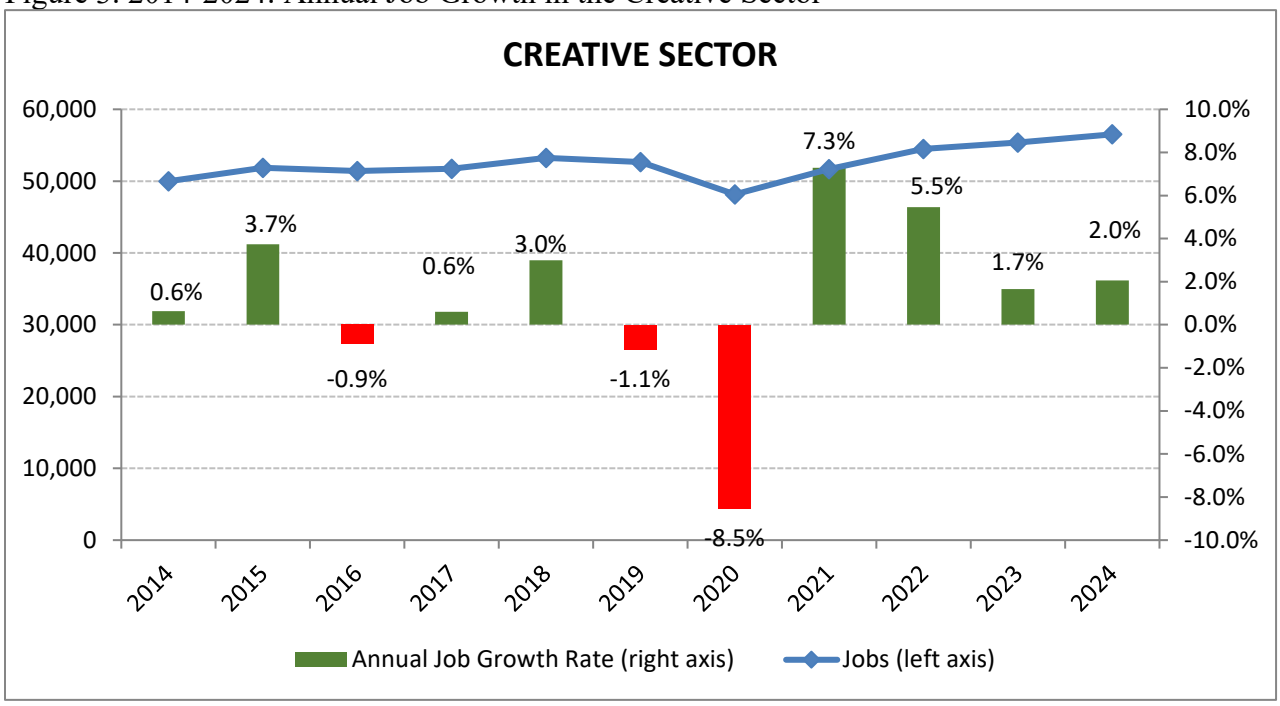
Size & Growth

The thirteen creative industry groups accounted for an estimated 56,517 jobs in 2024, about 6.3% of all civilian jobs in Hawai'i. Art Education, Marketing, Photography and Related, and Business Consulting were the three largest industry groups, together representing about 52% of creative-sector jobs in 2024. The remaining ten industry groups accounted for 27,279 jobs.

From 2014 to 2024, the Creative Sector's average annual job growth rate was 1.2%, roughly 0.5 percentage points higher than that of the state's civilian economy.

In the post-pandemic period, the sector posted positive annual growth rates (Figure 3). By 2024, total creative-sector employment was 7.3% above its 2019 level. Recovery has been uneven across industry groups: all but three—Film, TV, Video Production/Distribution; Cultural Activities; and Marketing, Photography and Related—recorded job gains over the latest period.

Figure 3. 2014-2024: Annual Job Growth in the Creative Sector



Source: Lightcast™ and DBEDT calculations.

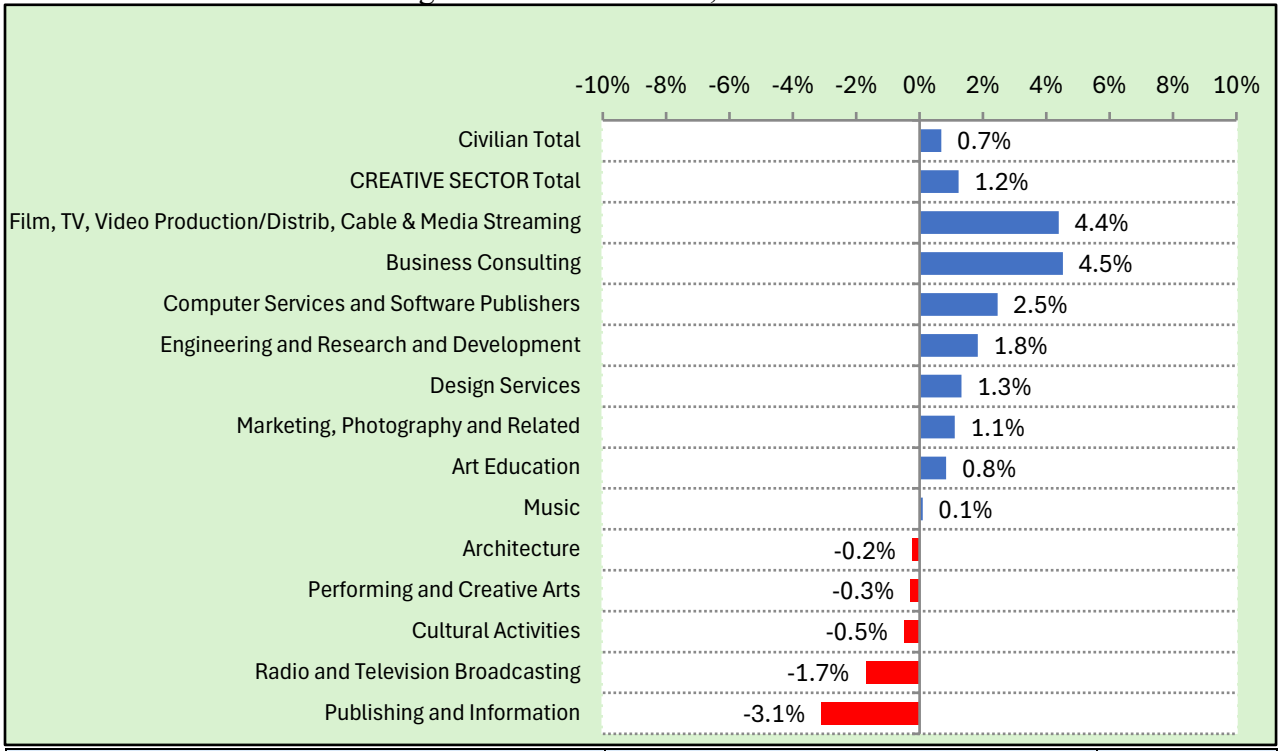
[5] DBEDT, *Hawai'i's Creative Industries: Update Report 2010*, June 2010. http://dbedt.hawaii.gov/economic/reports_studies/hawaii-creative-report/

As shown in Table 7, the Creative Sector's average annual job growth rate was 0.5 percentage points above the civilian economy's rate over 2014–2024, 1.2 percentage points above the statewide rate over 2014–2021, and 0.1 percentage points below it during 2021–2024.

Business Consulting, Computer Services and Software Publishing, and Film, TV, Video Production/Distribution recorded the highest average annual job growth rates over the 2014–2024 period—4.5%, 4.4%, and 2.5%, respectively.

Five industry groups—Publishing and Information, Radio/TV Broadcasting, Cultural Activities, Performing and Creative Arts, and Architecture—failed to gain jobs over the 2014–2024 period, with annual job declines of 1.7%, 1.5%, and 0.4%, respectively.

Table 7. Creative Sector : Average Annual Job Growth, 2014-2024



Industry Sector/Group	Annual Job Growth			Jobs in 2024
	2014-2024	2014-2021	2021-2024	
Civilian Total	0.7%	-0.3%	3.1%	894,787
CREATIVE SECTOR Total	1.2%	0.5%	3.0%	56,517
Film, TV, Video Production/Distrib, Cable & Media Streaming	4.4%	6.9%	-1.3%	2,367
Business Consulting	4.5%	4.2%	5.2%	7,518
Computer Services and Software Publishers	2.5%	1.8%	3.9%	6,224
Engineering and Research and Development	1.8%	-1.9%	7.5%	911
Design Services	1.3%	-4.0%	10.3%	1,375
Marketing, Photography and Related	1.1%	0.0%	-0.9%	8,779
Art Education	0.8%	-0.2%	4.2%	12,940
Music	0.1%	1.6%	2.4%	6,587
Architecture	-0.2%	0.6%	3.0%	2,319
Performing and Creative Arts	-0.3%	-0.4%	0.2%	1,925
Cultural Activities	-0.5%	-4.9%	10.7%	3,263
Radio and Television Broadcasting	-1.7%	-3.0%	1.3%	841
Publishing and Information	-3.1%	-3.4%	-2.3%	1,467

Source: Lightcast™ and DBEDT calculations.

National Comparisons

As shown in Table 8, nearly all creative industry groups in Hawai‘i lost job share relative to the U.S. economy over 2014–2024. The only exception was Film, TV, Video

Production/Distribution, Cable, and Media Streaming, whose job growth rate exceeded that of its national counterpart.

Several creative industry groups are substantially more concentrated in Hawai‘i than nationally. Cultural Activities are more than three times as concentrated in Hawai‘i as in the nation overall. Music, Architecture, Performing and Creative Arts, and Radio and Television Broadcasting also exhibit above-average local concentrations. In contrast, business- and technology-oriented groups—such as Business Consulting, Computer Services and Software Publishers, and Publishing and Information—are much less concentrated in Hawai‘i than nationally. In 2024, average annual earnings per job in Hawai‘i’s Creative Sector were $72,924—essentially equal to the statewide civilian-economy average. However, creative-sector earnings per job in Hawai‘i were only 84% of the national average for the same set of industries. This earnings per job gap was present in both technology-oriented and artistic-oriented industry groups. Among the thirteen groups, only Architecture and Art Education reported higher average earnings per job in Hawai‘i than in the nation. The largest gaps between Hawai‘i and U.S. earnings per job were in Publishing and Information; Marketing, Photography and Related; and Film, TV, Video Production/Distribution, Cable, and Media Streaming.

Table 8. Hawai‘i’s Creative Sector Performance Compared with the Nation

Industry Groups	Jobs 2024	Jobs per Establishment 2024	Avg Annual Earnings 2024	Avg Ann Job Growth		When U.S. = 100%		
				2014-2024	Above USA	Concentration 1/	Jobs per Establishment	Avg Annual Earnings
Total Civilian	894,787	14.9	$72,356.2	0.7%	-1.1%	100%	82%	94%
CREATIVE SECTOR	56,517	9.7	$72,923.9	1.2%	-1.3%	84%	89%	66%
Art Education	911	11.0	$21,514.1	0.8%	-1.6%	71%	56%	135%
Music	1,375	18.0	$36,719.8	0.1%	-1.5%	142%	114%	68%
Performing and Creative Arts	8,779	22.8	$34,507.0	-0.3%	-1.4%	114%	87%	89%
Publishing and Information	1,467	8.8	$75,497.6	-3.1%	-2.3%	58%	61%	49%
Radio and Television Broadcasting	841	22.4	$71,331.2	-1.7%	-1.0%	124%	81%	83%
Architecture	1,925	7.9	$103,343.7	-0.2%	-1.5%	133%	83%	106%
Business Consulting	7,518	8.7	$81,955.0	4.5%	0.2%	68%	103%	78%
Computer Services and Software Publishers	6,224	3.6	$132,555.3	2.5%	-1.2%	45%	50%	75%
Cultural Activities	3,263	27.3	$71,749.4	-0.5%	-2.2%	353%	225%	91%
Design Services	2,319	11.3	$39,708.5	1.3%	-1.2%	97%	100%	68%
Engineering and Research and Development	6,587	8.5	$128,700.6	1.8%	-0.7%	82%	57%	89%
Film, TV, Video Production/Distrib, Cable & Media Streaming	2,367	9.6	$98,014.2	4.4%	2.8%	89%	68%	50%
Marketing, Photography and Related	12,940	14.6	$41,081.4	1.1%	-1.4%	94%	119%	58%

1/ Proportion of jobs in the industry groups in the region compared to the proportion nationally.
Source: Lightcast™ and DBEDT calculations.

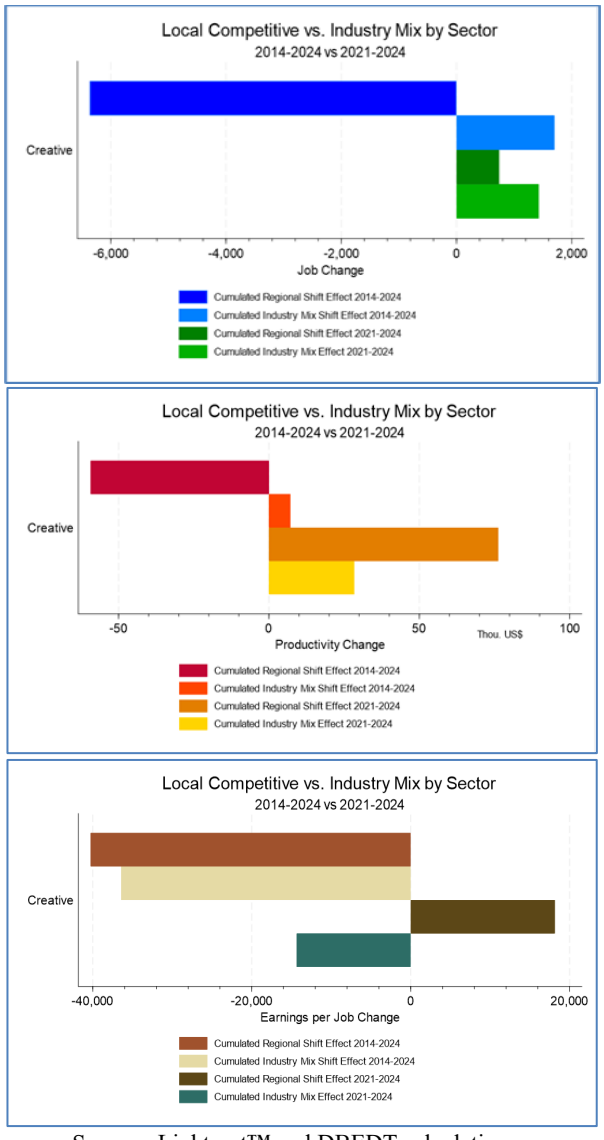
Competitive Map Analysis of the Creative Sector

The competitive map for the Creative Sector is based on the Dynamic Deterministic Shift–Share (DDSS) competitive components for Jobs (CE_J), Productivity (CE_P), and Earnings per Job (CE_EPJ). It compares each technology industry group's local performance with that of its national counterpart. This national industry mix component is calculated net of national general employment growth. Figure 4 reports the DDSS decomposition for jobs, productivity, and earnings per job for the Creative sector aggregates.

Taken together, the decompositions of job change, productivity, and earnings per job provide a consistent picture of long-run structural headwinds in Hawai'i's Creative Sector. In contrast, the 2021–2024 window reveals a reversal: local drivers became positive and reinforced the national industry mix effects.

From 2014 to 2024, the Creative Sector experienced large negative local shift effects in employment, productivity, and earnings per job. The job decomposition shows that Hawai'i lost more than 5,000 jobs due to local competitive pressures, even though the sector's national peers expanded. Similarly, the decade-long productivity decomposition displays a strong negative local effect, meaning that Hawai'i's creative activities became less efficient relative to the U.S. benchmark. Earnings per job followed the same pattern: the local component was significantly negative, indicating that competitive conditions in Hawai'i suppressed wage growth compared to national creative industries. These three results point to a decade in which high operating costs, scale constraints, fragmented subsectors, and pandemic impacts held back overall creative-sector performance—even as the national creative economy expanded in digital media, design, software, and cultural production.

Figure 4. Local and National Component Decomposition for the Creative Sector



Source: Lightcast™ and DBEDT calculations.

At the same time, the industry mix effects over 2014–2024 were uniformly positive for jobs, and productivity. This means that the composition of Hawai‘i’s Creative Sector—its mix of media, design, arts, and digital-adjacent activities—positioned it to benefit from growing national demand. In sum, national trends pulled the sector upward, but local factors pulled it downward, resulting in slow growth or net decline across all three metrics over the decade.

The 2021–2024 period, however, reveals a turning point. In all three graphs, the local (regional shift) component becomes positive, indicating that Hawai‘i’s Creative Sector began outperforming the national baseline in the post-pandemic recovery phase. Job creation shifted into positive territory due to local drivers, suggesting stronger demand for creative services, the reopening of tourism-related creative activity, and expansions in media production and digital creative work. Productivity also shows a positive local competitive effect, reflecting restructuring, consolidation, or productivity improvements in key creative subsectors. Finally, earnings per job exhibit a positive local shift, suggesting that wage growth accelerated as labor markets tightened and demand recovered.

Together, these patterns indicate that the Creative Sector might be entering a recovery and repositioning period, marked by improving job creation, rising productivity, and strengthening wages—all supported by both local and national forces. The alignment of local and national effects after 2021 suggests that the Creative Sector is better positioned for growth than at any point in the decade prior.

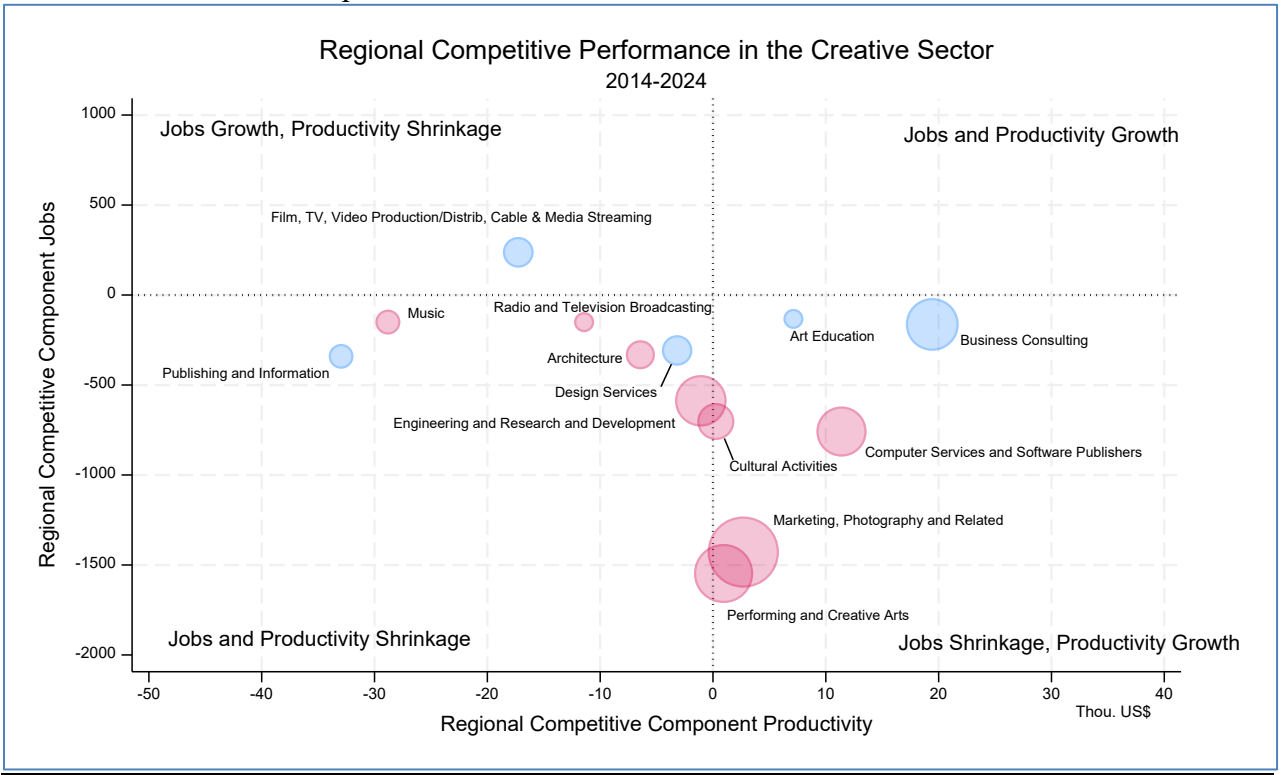
2014–2024 Window

The Creative Sector’s local competitive-performance trajectory fits within a broader pattern observed across Hawai‘i’s major emerging and targeted industries: during 2014–2024, many sectors exhibited productivity strengthening and selective specialization, while the 2021–2024 period reflected uneven—but often productivity-enhancing—post-pandemic adjustments.

Against this backdrop, the Creative Sector provides a salient example of how Hawai‘i’s emerging industries are adapting to technological change and shifting market demand. Over the 2014–2024 window, many creative fields—such as Business Consulting, Computer Services and Software Publishers, Marketing and Photography, and Art Education—achieved local competitive productivity gains, reflecting a transition toward higher-value, skill-intensive, and digitally enabled activity.

Yet, as in Technology and Education, the creative field also includes segments facing persistent structural headwinds. Architecture, Design Services, Publishing, Music, and Radio and Television Broadcasting remain constrained by small market size, rising production costs, and increased global competition from digital platforms.

Table 9a. Performance Map Classifications for the Creative Sector 2014-2024



Jobs and Productivity Growth (J+, P+, E±)	Jobs Growth, Productivity Shrinkage (J+, P–, E±)
	Film, TV, Video Production/Distrib, Cable & Media Streaming
Jobs Shrinkage, Productivity Growth (J–, P+, E±)	**Jobs and Productivity Shrinkage (J–, P–, E±)**
Art Education Business Consulting Computer Services and Software Publishers Cultural Activities Marketing, Photography and Related Performing and Creative Arts	Architecture Design Services Engineering and Research and Development Music Publishing and Information Radio and Television Broadcasting

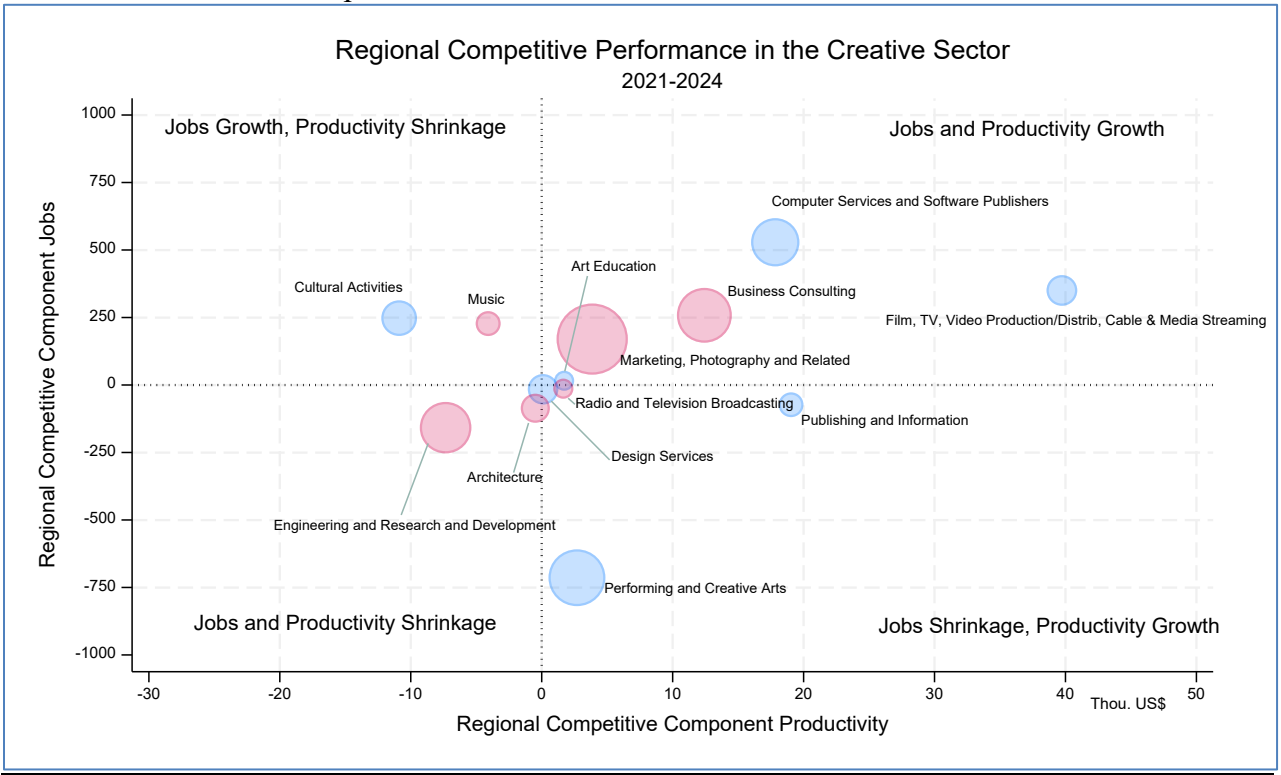
J±, P±, E±: Sign of change for local competitive components of Jobs, Productivity and Earnings per Job during the period. Blue bubbles (E+); red bubbles (E-); Size of bubbles is correlated with number of jobs in the industry groups. Data sources: Lightcast™ and DBEDT calculations.

2021–2024 Window

The 2021–2024 recovery period reinforces these themes. In both Technology and Creative sectors, post-pandemic local competitive improvements were concentrated in digitally oriented, knowledge-intensive, and project-based subsectors. In contrast, more traditional or scale-dependent activities—whether in R&D, broadcasting, design, or specialized engineering, posted weaker local competitive outcomes. For Creative industries, this pattern reflects broader national trends, with digital content creation, multimedia production, and specialized consulting services expanding rapidly, while legacy print, traditional media, and certain design fields continue to decline or restructure.

In sum, the Creative Sector aligns closely with the transformation observed across Hawai‘i’s emerging industries. Over the decade, the sector displayed a clear bifurcation between industries achieving productivity-driven specialization and those undergoing contraction. The post-2021 window, meanwhile, underscores the growing importance of digital capability, agility, and occupational mix in determining local competitive outcomes. Together, these patterns highlight a broader message for the state’s economic strategy: Hawai‘i’s competitive advantages increasingly arise from specialized skills, digital capabilities, and knowledge-intensive activities, rather than from large-scale employment growth.

Table 9b. Performance Map Classifications for the Creative Sector 2021-2024



Jobs and Productivity Growth (J+, P+, E±)	Jobs Growth, Productivity Shrinkage (J+, P–, E±)
Art Education Computer Services and Software Publishers Film, TV, Video Production/Distrib, Cable & Media Streaming Business Consulting Marketing, Photography and Related	Cultural Activities Music
Jobs Shrinkage, Productivity Growth (J–, P+, E±)	**Jobs and Productivity Shrinkage (J–, P–, E±)**
Design Services Performing and Creative Arts Publishing and Information Radio and Television Broadcasting	Architecture Engineering and Research and Development

J±, P±, E±: Sign of change for local competitive components of Jobs, Productivity and Earnings per Job during the period. Blue bubbles (E+); red bubbles (E-); Size of bubbles is correlated with number of jobs in the industry groups. Data sources: Lightcast™ and DBEDT calculations.

AGRIBUSINESS SECTOR

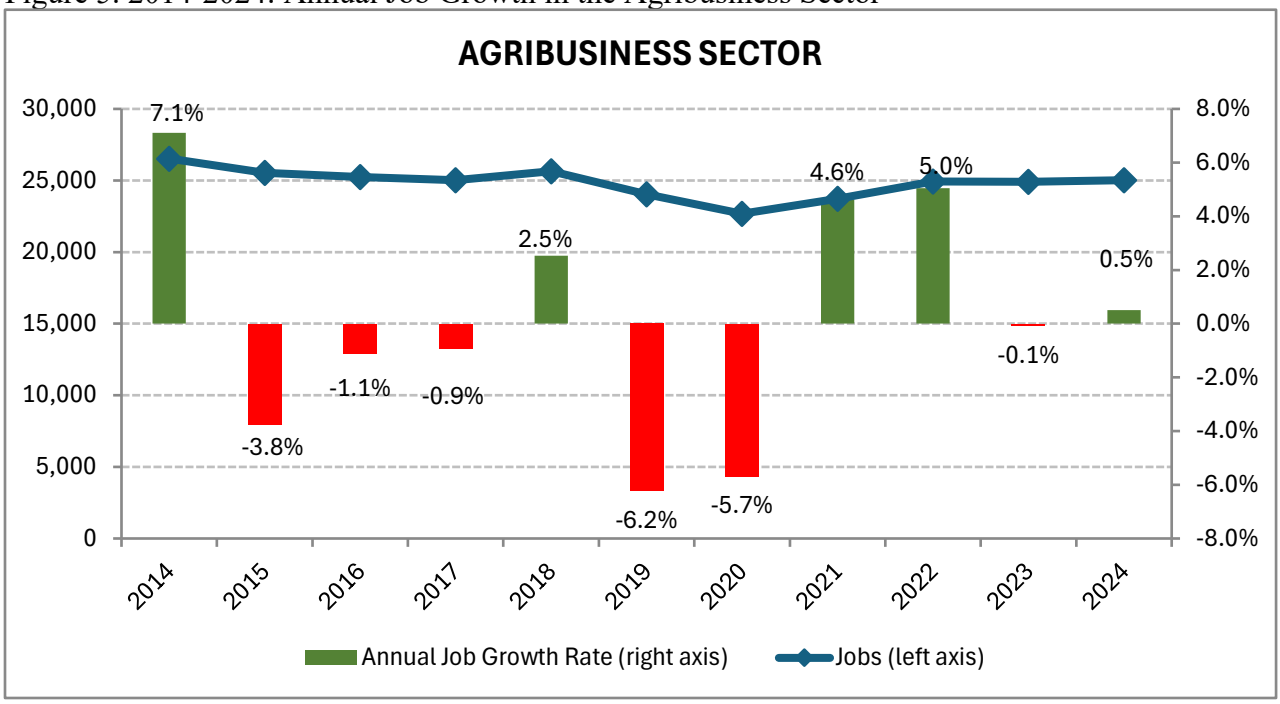
In 2024, Hawai‘i’s Agribusiness Sector supported an estimated 25,033 jobs across a set of inter-related industry groups that complement the core farm sector. Farm Production remained the largest component, accounting for 54% of all agribusiness employment, followed by Agricultural Processing, which represented 25% of sector jobs.

Size & Growth

From 2014 to 2024, agribusiness employment declined at an average annual rate of 0.6%. Five of the sector’s seven industry groups experienced job losses over the decade, with only Aquaculture and Agricultural Support Services recording gains. The sector’s largest industry group—Farm Production, declined at an average annual rate of 1.3%, reflecting longer-term structural challenges such as land-use constraints, rising input costs, and continued consolidation.

In the post-pandemic period, however, the sector returned to growth. Between 2021 and 2024, agribusiness employment increased by 1.8%, although still below the 3.1% growth rate of the statewide civilian economy (Figure 5). By 2024, total agribusiness jobs reached 104.1% of their 2019 level, indicating a modest but uneven recovery across industry groups. Agricultural Processing and Agricultural Support Services recorded the strongest gains during 2021-2024, reflecting increased local demand for value-added food products, diversified crops, and support activities for farming.

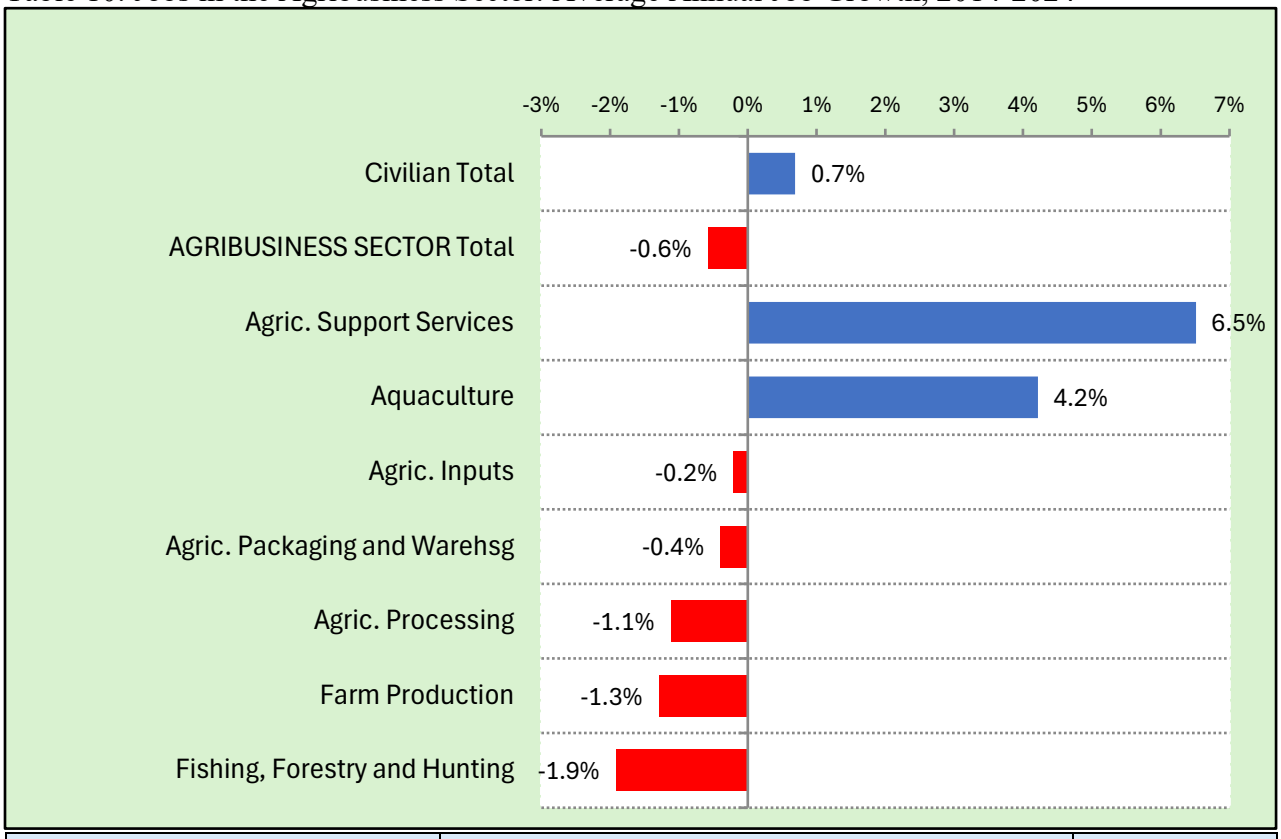
Figure 5. 2014-2024: Annual Job Growth in the Agribusiness Sector



Source: Lightcast™ and DBEDT calculations.

The best-performing agribusiness industry groups from 2014 to 2024 were Agricultural Support Services and Aquaculture, recording 6.5% and 4.2% average annual job growth rates.

Table 10. Jobs in the Agribusiness Sector: Average Annual Job Growth, 2014-2024



Industry Sector/Group	Annual Job Growth			Jobs in 2024
	2014-2024	2014-2021	2021-2024	
Civilian Total	0.7%	-0.3%	3.1%	894,787
AGRIBUSINESS SECTOR Total	-0.6%	-1.6%	1.8%	25,033
Agric. Support Services	6.5%	5.1%	9.9%	2,788
Agric. Inputs	-0.2%	-0.2%	-0.2%	458
Farm Production	-1.3%	-2.2%	0.9%	13,398
Agric. Processing	-1.1%	-2.4%	1.8%	6,382
Fishing, Forestry and Hunting	-1.9%	-2.0%	-1.6%	1,404
Agric. Packaging and Warehsg	-0.4%	-0.5%	-0.2%	202
Aquaculture	4.2%	5.8%	0.5%	402

Source: Lightcast™ and DBEDT calculations.

National Comparisons

Table 11 shows the average annual job growth rate difference between Hawai‘i and the nation for the agribusiness sector and its industry groups. Over the 2014-2024 period, Hawai‘i’s agribusiness sector’s growth rate was 1.3 percentage points below the national rate. Two groups,

Aquaculture and Agricultural Support Services, outperformed the same industry groups for the nation by 2.0 and 2.6 percentage points, respectively.

Table 11. Hawai‘i Agribusiness Sector Performance Compared with Nation

Industry Groups	Jobs 2024	Jobs per Establishment 2024	Avg Annual Earnings 2024	Avg Ann Job Growth		When U.S. = 100%		
				2014-2024	Above USA	Concentration 1/	Jobs per Establishment	Avg Annual Earnings
Total Civilian	894,787	14.9	$72,356.2	0.7%	-1.1%	100%	82%	94%
AGRIBUSINESS SECTOR	25,033	22.0	$47,362.3	-0.6%	-1.7%	93%	72%	79%
Agric. Inputs	458	11.5	$63,403.5	-0.2%	-0.7%	42%	83%	69%
Agric. Packaging and Warehsg	202	25.3	$78,433.7	-0.4%	-2.2%	24%	70%	104%
Agric. Processing	6,382	16.4	$62,396.5	-1.1%	-3.2%	79%	39%	83%
Agric. Support Services	2,788	17.9	$60,519.3	6.5%	2.6%	84%	107%	86%
Farm Production	13,398	30.0	$37,561.0	-1.3%	-1.3%	102%	85%	84%
Fishing, Forestry and Hunting	1,404	21.0	$32,460.2	-1.9%	-1.1%	326%	73%	82%
Aquaculture	402	11.8	$62,231.0	4.2%	2.0%	1333%	165%	121%

1/ Proportion of jobs in the industry groups in the region compared to the proportion nationally.
Source: Lightcast™ and DBEDT calculations.

Agribusiness had a lower concentration level in Hawai‘i than the nation for most industry groups. Clear exceptions were Aquaculture and Fishing, Forestry and Hunting, which were significantly more concentrated in Hawai‘i than the nation.

In 2024, Hawai‘i’s Agribusiness sector average annual earnings per job, at $45,996, were lower than the state’s civilian economy’s, at $47,362. Also, the sector’s average annual earnings per job were 79% of the national average for the same industry groups. The lower average annual earnings per job in Hawai‘i were found in all sectors, except for Aquaculture and Agriculture Packaging and Warehousing.

Competitive Map Analysis of the Agribusiness Sector

The competitive map for the Agribusiness Sector uses the Dynamic Deterministic Shift–Share (DDSS) local competitive components for Jobs (CE_J), Productivity (CE_P), and Earnings per Job (CE_EPJ) to compare each agribusiness industry group with its national counterpart. Figure 6 reports the DDSS decomposition for jobs, productivity, and earnings per job for the Agribusiness Sector aggregates.

The decomposition of job change, productivity, and earnings per job for Hawai‘i’s Agribusiness Sector presents a clear and consistent picture of long-run structural contraction, driven predominantly by negative local competitive conditions, combined with mostly negative support from national industry trends. Over the 2014–2024 period, the job decomposition shows a large

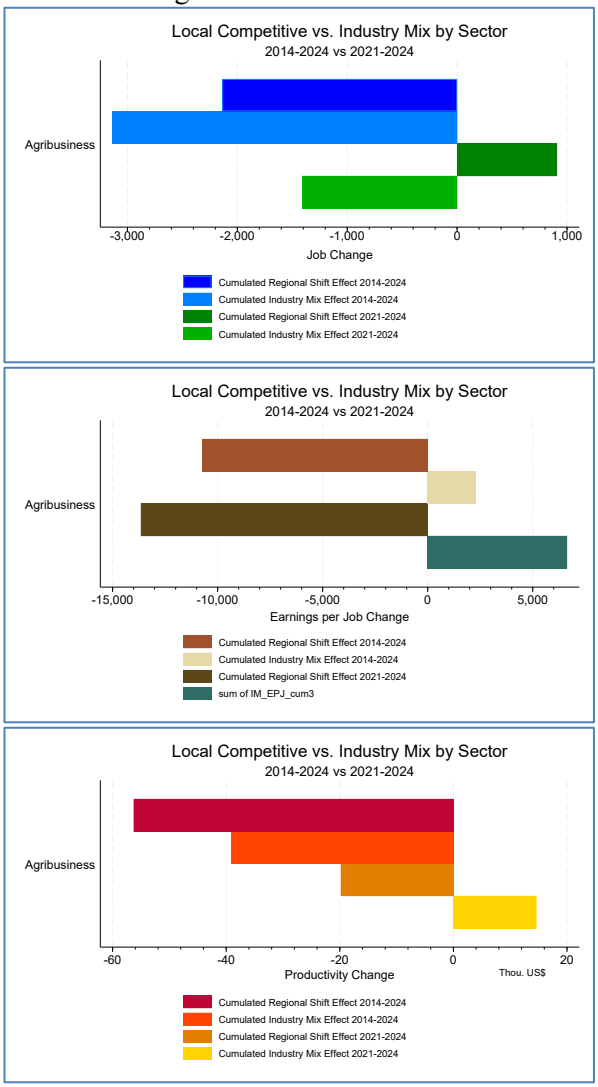
negative local shift effect, reflecting the loss of nearly 3,000 jobs due to Hawai‘i-specific factors such as high production costs, land pressures, regulatory burdens, aging agricultural infrastructure, and the long decline of plantation agriculture. Also, the national industry mix job effect for agribusiness is strongly negative, indicating that national agricultural services and niche food industries significantly declined. The result over the decade is clear: strong local job losses in agribusiness reinforced by negative national growth in related industries.

The 2021–2024 period, however, shows a partial shift for jobs, adding a modest number of jobs attributable to Hawai‘i-specific post-pandemic recovery dynamics. The national industry mix effect also remains negative in this short-run window, indicating continued declining national momentum in specialty agriculture and food-related industries. Although these local job gains are not enough to reverse the decade-long job decline, they might mark a transition toward stabilization.

The productivity decomposition reinforces the long-run pattern. Over 2021–2024, the Agribusiness Sector exhibits a large negative local productivity effect, showing that local competitive pressures reduced output per worker more than in national peer industries.

The earnings-per-job results mirror the productivity story. Over 2021–2024, agribusiness shows strong negative local earnings per job effect, reflecting wage stagnation or decline relative to national agricultural industries. These downward pressures are consistent with the sector’s structural challenges: thin margins, limited scale economies, and commodity and input prices.

Figure 6. Local and National Component Decomposition for the Agribusiness Sector



Source: Lightcast™ and DBEDT calculations.

The national industry mix earnings effect is moderately positive—indicating rising wages in U.S. agricultural support and value-added food industries—but Hawai‘i’s local earnings per job losses dominate. In the 2021–2024 period, the local competitive effect remains negative, though smaller, while the national structural effect turns more clearly positive, suggesting that national wage momentum is strengthening even as Hawai‘i’s sector continues to struggle to pass higher costs onto prices or expand compensation.

Taken together, the decompositions show that Hawai‘i’s Agribusiness Sector experienced a decade of local competitive decline, with job losses, falling productivity, and stagnant wages overshadowing the modest positive influence of national agricultural trends.

2014–2024 Window

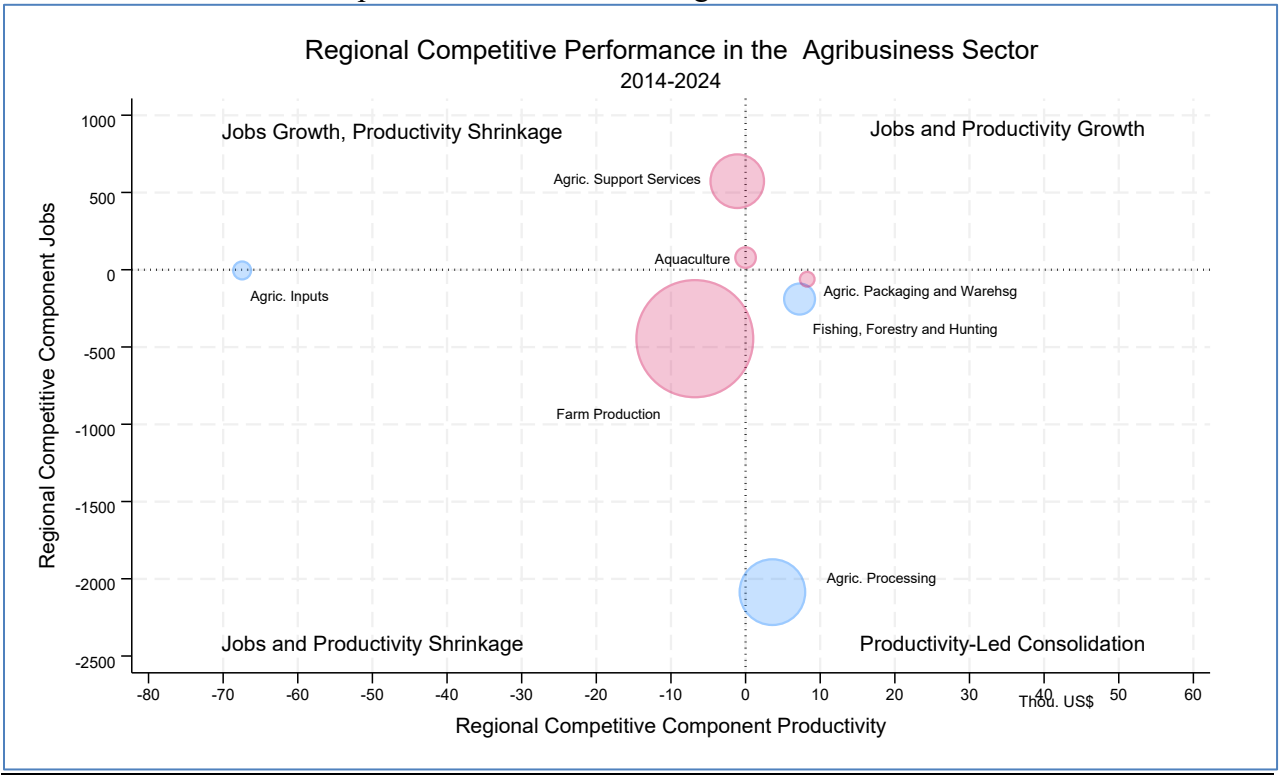
The local competitive-performance maps for the agribusiness sector reveal a pattern of gradual structural adjustment rather than broad-based expansion, with the decade-long 2014–2024 window highlighting deep, long-run pressures and the post-2021 period capturing a more mixed but still uneven recovery. In the long-run map, no agribusiness industry group achieved simultaneous local competitive gains in both jobs and productivity, distinguishing the sector from others—such as technology—where at least a few activities posted dual improvements. Instead, the agribusiness landscape shows that employment and productivity advantages have moved in different directions depending on the type of activity. Service-oriented activities such as Agricultural Support Services and Aquaculture expanded their local job base competitively but did so at the expense of productivity, suggesting that Hawai‘i was able to attract or retain employment while experiencing relative productivity declines, likely due to scale constraints, high operating costs, or intensified labor requirements.

At the same time, core primary-production industries such as Farm Production and Agricultural Inputs recorded the opposite pattern: local competitive losses in both jobs and productivity over the decade. Their location in the lower-left quadrant of the map underscores the structural pressures facing these activities, including high logistics costs, intense mainland and international competition, and limited economies of scale.

The remaining segments—Agricultural Processing, Agricultural Packaging and Warehousing, and Fishing, Forestry & Hunting—experienced local competitive job losses paired with local competitive productivity gains. In the maps, these industries appear with declining local job components but positive local productivity advantages, reflecting consolidation, and adoption of more advanced production techniques. These gains, however, did not signal a broad turnaround; instead, they indicate that parts of the industry are becoming more capital-intensive, with fewer but more productive workers.

Taken together, the decade-long map depicts a sector in gradual transition, with productivity-oriented adjustments occurring alongside continued contraction in several foundational industries.

Table 12a. Performance Map Classifications for the Agribusiness Sector 2014-2024



Jobs and Productivity Growth (J+, P+, E±)	Jobs Growth, Productivity Shrinkage (J+, P–, E±)
	Agric. Support Services Aquaculture
Jobs Shrinkage, Productivity Growth (J–, P+, E±)	**Jobs and Productivity Shrinkage (J–, P–, E±)**
Agric. Packaging and Warehsg Agric. Processing Fishing, Forestry and Hunting	Agric. Inputs Farm Production

J±, P±, E±: Sign of change for local competitive components of Jobs, Productivity and Earnings per Job during the period. Blue bubbles (E+); red bubbles (E-); Size of bubbles is correlated with number of jobs in the industry groups. Data sources: Lightcast™ and DBEDT calculations.

2021–2024 Window

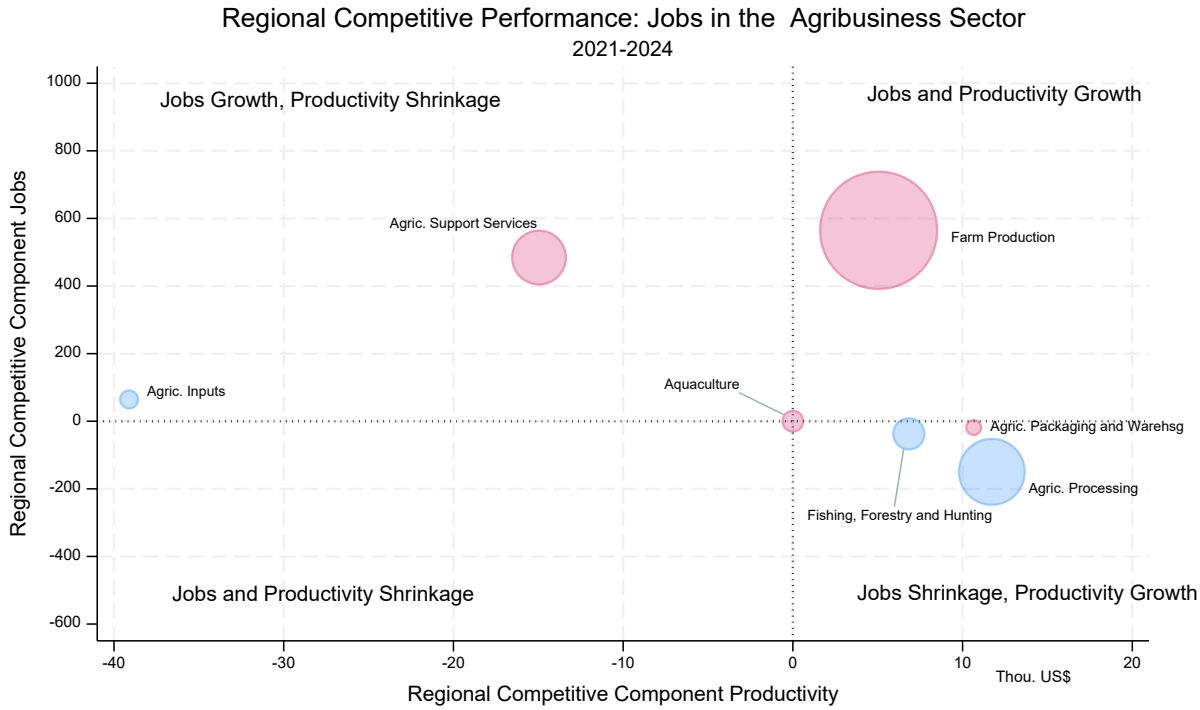
The short-run 2021–2024 map presents a more nuanced and, in some respects, more favorable picture. During the post-pandemic recovery period. Farm Production emerges as the only agribusiness industry to achieve local competitive gains in both jobs and productivity, shifting into the upper-right quadrant and signaling short-term strengthening in both scale and productivity. This improvement, however, was not replicated across the sector, as most industry groups continued to show a divergence between job performance and productivity performance. Agricultural Inputs, Agricultural Support Services, and Aquaculture all posted local competitive job gains but local

competitive productivity losses, suggesting that recent employment expansion has been driven more by workforce growth and recovery from pandemic disruptions than by increases in operational productivity. In contrast, Agricultural Processing, Fishing, Forestry & Hunting, and Agricultural Packaging and Warehousing recorded local competitive job shrinkage but mild productivity advantages, consistent with post-pandemic restructuring and consolidation.

Notably, unlike the long-run pattern, no agribusiness industry group fell into the quadrant characterized by local competitive losses in both jobs and productivity during the 2021–2024 period. This absence suggests that, although structural headwinds remain, the sector's short-run performance reflects stabilization rather than continued erosion. Still, local competitive earnings per job effects remained weak throughout the sector, indicating that even where job or productivity advantages strengthened, workers did not fully share in the gains. This disconnect mirrors patterns seen in several other sectors, where post-pandemic labor market tightening generated wage increases that were not necessarily linked to productivity improvements.

Overall, the combined evidence from the decade-long and short-run maps portrays agribusiness as a sector navigating a complex transition. Long-run dynamics reflect deep structural challenges, including high operating costs, limited land availability, and competition from larger-scale producers. Short-run dynamics show pockets of recovery, particularly in Farm Production, but continued fragility in productivity trends across many activities. The agribusiness sector thus embodies an evolving mix of consolidation, selective mechanization, and labor-intensive expansion, with neither jobs nor productivity gains distributed evenly across its constituent industries. This pattern underscores the need for continued modernization, investment in technology and infrastructure, and targeted policy support to strengthen the sector's long-term competitiveness in Hawai‘i's constrained economic environment.

Table 12b. Performance Map Classifications for the Agribusiness Sector 2021-2024



Jobs and Productivity Growth (J+, P+, E±)	**Jobs Growth, Productivity Shrinkage (J+, P–, E±)**
Farm Production	Agric. Inputs Agric. Support Services Aquaculture
Jobs Shrinkage, Productivity Growth (J–, P+, E±)	**Jobs and Productivity Shrinkage (J–, P–, E±)**
Agric. Processing Fishing, Forestry and Hunting Agric. Packaging and Warehsg	

J±, P±, E±: Sign of change for local competitive components of Jobs, Productivity and Earnings per Job during the period. Blue bubbles (E+); red bubbles (E-); Size of bubbles is correlated with number of jobs in the industry groups. Data sources: Lightcast™ and DBEDT calculations.

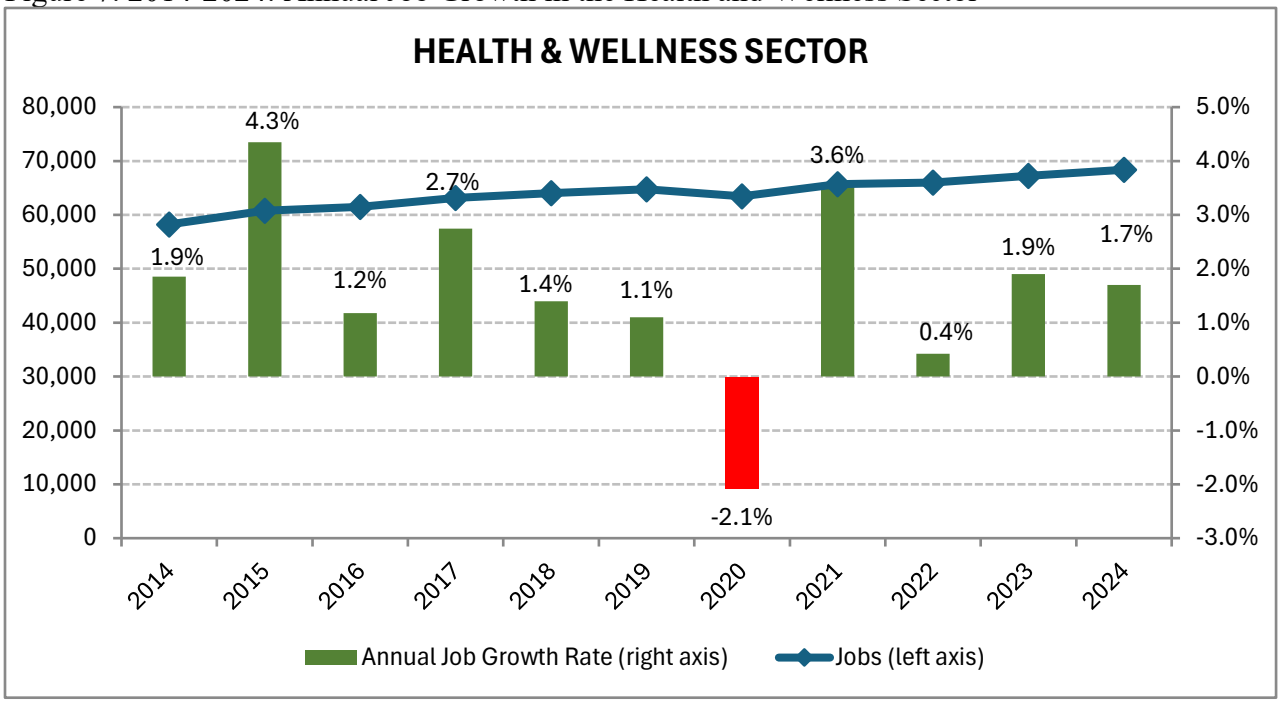
HEALTH AND WELLNESS SECTOR

To provide some underlying data to support future discussions on the topic of the Health and Wellness sector, DBEDT used a definition for Health and Wellness developed by researchers on Kaua‘i for that county’s Comprehensive Economic Development Strategy in 2005.[6] This definition identifies the major industry groups of Hawai‘i’s healthcare sector.

Size & Growth

Hawai‘i’s Health and Wellness sector accounted for an estimated 68,377 jobs in 2024, with Health Practitioners and Hospitals & Nursing Facilities making up about 71% of total employment. With the exception of Pharmacies, all industry groups expanded their job base over the 2014–2024 period.

Figure 7. 2014-2024: Annual Job Growth in the Health and Wellness Sector



Source: Lightcast™ and DBEDT calculations.

From 2014 to 2024, sector employment grew at an average annual rate of 1.7%, outpacing the 0.7% growth rate of the state’s civilian economy (Figure 7). By 2024, total Health and Wellness employment reached 105.6% of its 2019 level, indicating a full recovery from pandemic-era losses.

Short-run recovery patterns between 2021 and 2024 were more uneven across subsectors. Health Practitioners and Medical Labs and Imaging Centers increased employment by 3.7 and 1.1

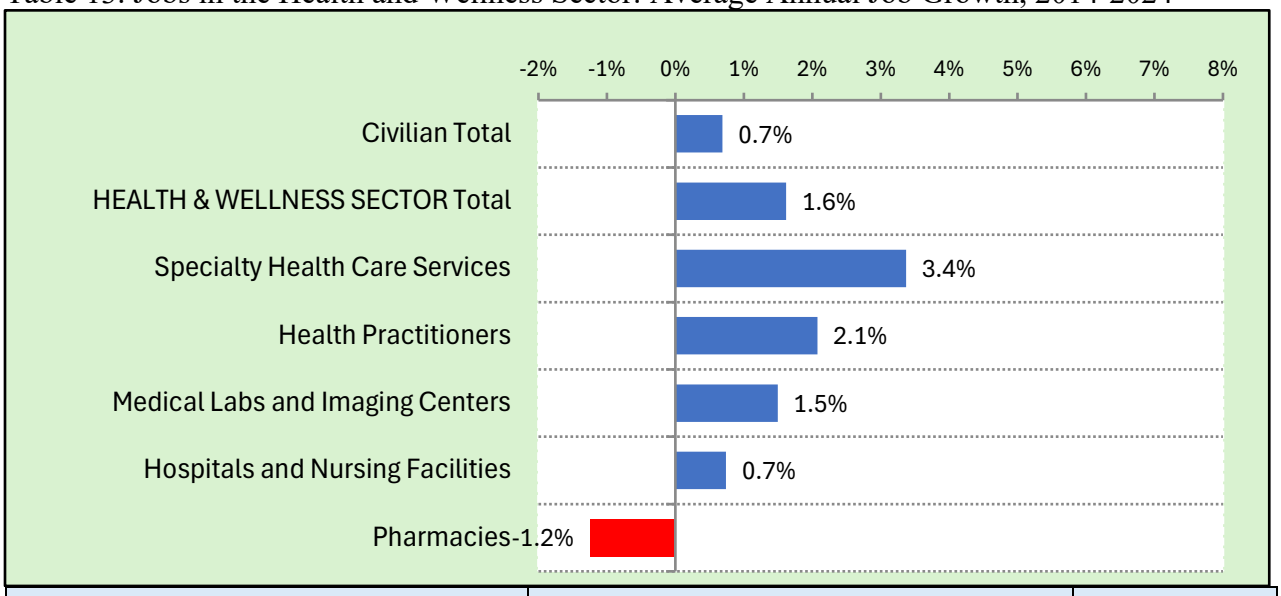
[6] Hawai‘i Office of Planning, *Hawai‘i Statewide Comprehensive Economic Development Strategy (CEDS)*, 2005. Modifications included translating from the 1997 to the 2002 NAICS industry codes. Report is at http://hawaii.gov/dbedt/op/projects.htm .

percentage points, respectively. In contrast, Specialty Health Care Services, Hospitals, and Nursing Facilities experienced slower job growth, while Pharmacies contracted by 3.8 percentage points.

Over the longer window, the sector consistently outperformed the statewide economy. From 2014 to 2021, Health and Wellness expanded at 1.7% per year, followed by 1.3% during the 2021–2024 period. The fastest growth was in Specialty Health Care Services, a smaller but rapidly expanding segment, which grew at an average annual rate of 3.4% from 2014 to 2024. Health Practitioners also posted strong long-term growth at 2.1% annually, while Medical Labs and Imaging Centers grew at 1.5% per year.

Overall, the Health and Wellness sector remains one of Hawai‘i’s most stable and resilient growth areas, with sustained long-term expansion and a near-complete post-pandemic recovery, even as performance varied across individual industry groups.

Table 13. Jobs in the Health and Wellness Sector: Average Annual Job Growth, 2014-2024



Industry Sector/Group	Annual Job Growth			Jobs in 2024
	2014-2024	2014-2021	2021-2024	
Civilian Total	0.7%	-0.3%	3.1%	894,787
HEALTH & WELLNESS SECTOR Total	1.6%	1.7%	1.3%	68,377
Specialty Health Care Services	3.4%	4.5%	0.8%	13,793
Health Practitioners	2.1%	1.4%	3.7%	27,156
Medical Labs and Imaging Centers	1.5%	1.7%	1.1%	1,982
Pharmacies	-1.2%	-0.1%	-3.8%	4,305
Hospitals and Nursing Facilities	0.7%	1.1%	0.0%	21,141

Source: Lightcast™ and DBEDT calculations.

National Comparisons

Over the 2014-2024 period, the average annual job growth rate in Hawai‘i’s Health and Wellness Sector was above the national average for the same sector.

Table 14. Hawai‘i Health and Wellness Sector Performance Compared with Nation

Industry Groups	Jobs 2024	Jobs per Establishment 2024	Avg Annual Earnings 2024	Avg Ann Job Growth		When U.S. = 100%		
				2014-2024	Above USA	Concentration 1/	Jobs per Establishment	Avg Annual Earnings
Total Civilian	894,787	14.9	$ 72,356.2	0.7%	-1.1%	100%	82%	94%
HEALTH & WELLNESS SECTOR	68,377	17.3	$ 95,183.5	1.6%	-0.2%	92%	77%	111%
Health Practitioners	27,156	8.5	$ 106,503.3	2.1%	-0.4%	104%	77%	110%
Hospitals and Nursing Facilities	21,141	226.1	$ 102,705.5	0.7%	-0.2%	74%	115%	111%
Medical Labs and Imaging Centers	1,982	30.0	$ 85,126.1	1.5%	-0.5%	144%	260%	89%
Pharmacies	4,305	20.0	$ 44,651.1	-1.2%	-0.5%	121%	143%	79%
Specialty Health Care Services	13,793	34.9	$ 78,584.7	3.4%	-0.3%	97%	103%	129%

1/ Proportion of jobs in the industry groups in the region compared to the proportion nationally.
Source: Lightcast™ and DBEDT calculations.

At $95,183, the average annual earnings per job for the sector exceeded the national average in 2024 by about 11%. Specialty Health Care Services was the sector in the targeted industry portfolio that had average annual earnings per job significantly above the U.S. average for the same sector (29%). Medical Labs and Imaging Centers and Pharmacies were the two groups in the sector that had average annual earnings per job below the nation’s comparable industries.

Regarding concentration, industry groups Hospitals and Nursing Facilities, and Specialty Health Care Services underperformed the same group for the entire nation.

Competitive Map Analysis of the Health and Wellness Sector

The Health and Wellness Sector displays a distinctive pattern of decline in both its long-run and short-run decomposition results—marked by persistent local competitive losses, mostly negative national structural effects, and no clear improvements in the post-2021 period.

Over the 2014–2024 period, the job decomposition shows a negative local competitive effect. This is notable, given that healthcare employment rose in absolute terms across the state. The negative local effect indicates that Hawai‘i faced local constraints—such as staffing shortages, high operating costs, regulatory complexity, and limited clinical training capacity—that limited job creation.

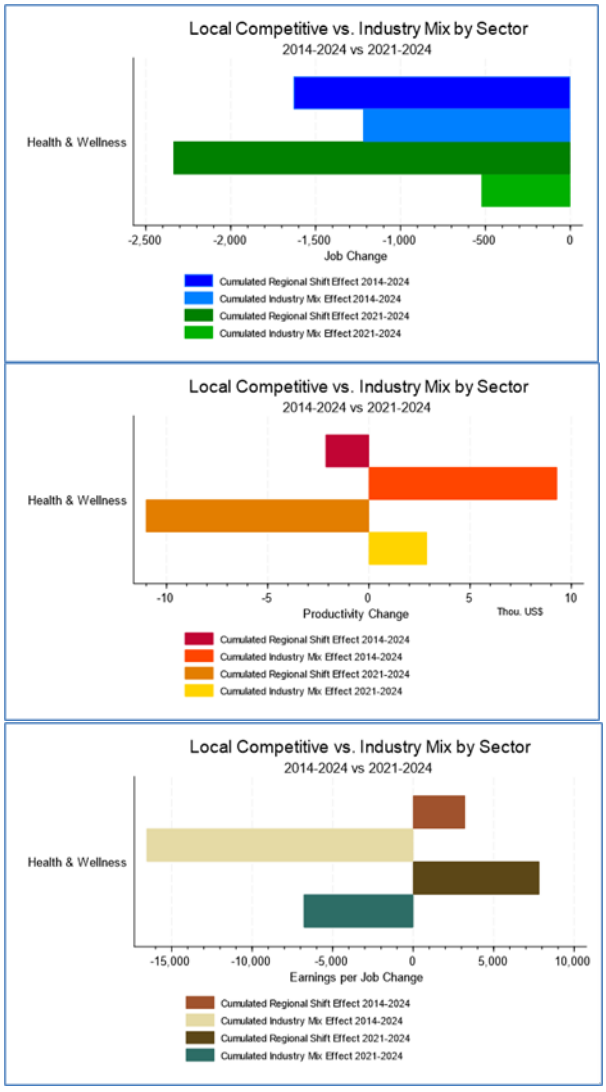
Over the 2014–2024 decade, the job decomposition reveals that both national industry trends and Hawai‘i-specific conditions exerted downward pressure on employment growth. The national industry mix effect is negative, indicating that the U.S. industries corresponding to this definition of Health and Wellness expanded more slowly—or contracted—relative to other parts of the national economy. This means Hawai‘i began the period facing a structurally weaker national environment

for the subsectors included in this portfolio. Local competitive conditions also depressed job growth: the regional shift effect is clearly negative, reflecting Hawai‘i-specific challenges such as staffing shortages, high operating costs, tight facility capacities, and limited clinical training pipelines.

This combination of negative national and local components underscores that the decade-long expansion of the sector was driven primarily by baseline demographic and service-demand fundamentals rather than by competitive advantages.

The productivity decomposition deepens this view. Nationally, the comparable Health and Wellness subsectors experienced productivity gains over the decade, reflected in a positive industry mix effect. Hawai‘i, however, failed to capture these gains. The regional shift component for productivity is negative over the full decade, showing that Hawai‘i’s productivity improvements lagged behind national momentum. Workforce shortages, limited economies of scale, and pandemic-driven operational strain likely constrained productivity growth. In the post-pandemic window, this negative regional effect becomes even larger. The overall picture for productivity is thus one in which Hawai‘i failed to benefit from national structural advancements, underperforming relative to national peers.

Figure 8. Local and National Component Decomposition for the Health and Wellness Sector



Source: Lightcast™ and DBEDT calculations.

By contrast, the earnings-per-job decomposition tells a different and more favorable story. In both periods, the national industry mix effect is negative, meaning that wage growth in the national subsectors included in this definition was weak or declining in real terms. Yet Hawai‘i’s local competitive effect on earnings per job is positive over the decade and becomes even more positive in the 2021–2024 period. This reflects the state’s intense labor-market pressures in health care—particularly in nursing, diagnostics, and specialized outpatient care—where strong local demand, high cost of living, and staffing shortages contributed to faster wage growth than in the national baseline. The acceleration of the regional earnings effect after 2021 indicates that the recovery period magnified these competitive wage dynamics, with Hawai‘i’s providers increasing compensation to attract and retain workers in a tight labor market. Thus, even though national wage trends were pulling the sector downward, Hawai‘i-specific conditions more than offset these structural headwinds and produced strong local competitive earnings gains.

Taken together, the competitive-effect patterns across jobs, productivity, and earnings suggest that Hawai‘i’s Health and Wellness Sector has grown steadily but under meaningful structural constraints. Employment and productivity were shaped by a combination of negative national forces and local operational challenges, while wages expanded strongly due to localized labor-market pressures rather than competitive productivity improvements. In the post-pandemic period, the sector shows early signs of stabilization: local job effects become less negative, productivity conditions begin to firm, and wage competitiveness strengthens further. The results depict a sector that is large, essential, and demand-driven, but whose competitive performance depends heavily on workforce capacity, system efficiency, and the evolving balance between national pressures and Hawai‘i-specific cost and labor dynamics.

2014–2024 Window

The Health and Wellness Sector—one of Hawai‘i’s largest across all emerging and targeted sectors—continues to show a mixed local competitive profile when decomposed into its job-based and productivity-based local components. The long-run (2014–2024) and short-run (2021–2024) competitive maps position each industry group according to Hawai‘i’s ability to retain or expand employment (vertical axis) and improve relative productivity (horizontal axis), with bubble sizes reflecting the underlying employment footprint.

Across both windows, the sector displays structural pressures in large, labor-intensive activities—especially Hospitals and Nursing Facilities and Pharmacies—while more specialized services exhibit pockets of local competitive productivity strength.

Over the decade, no Health and Wellness industry group achieved simultaneous local competitive gains in both employment and productivity—a pattern that distinguished this sector from others, including Technology and parts of the Creative Sector, where several industry groups posted dual local competitive gains. The absence of J+P+ industries suggests that Hawai‘i’s health-related activities operate under tight structural constraints: high fixed costs, limited economies of scale, specialized labor shortages, and competition from vertically integrated systems and mainland providers.

Similarly, the long-run data show no cases where industry groups achieved local competitive job growth while losing ground in productivity (J+P–). This is an important structural marker. It

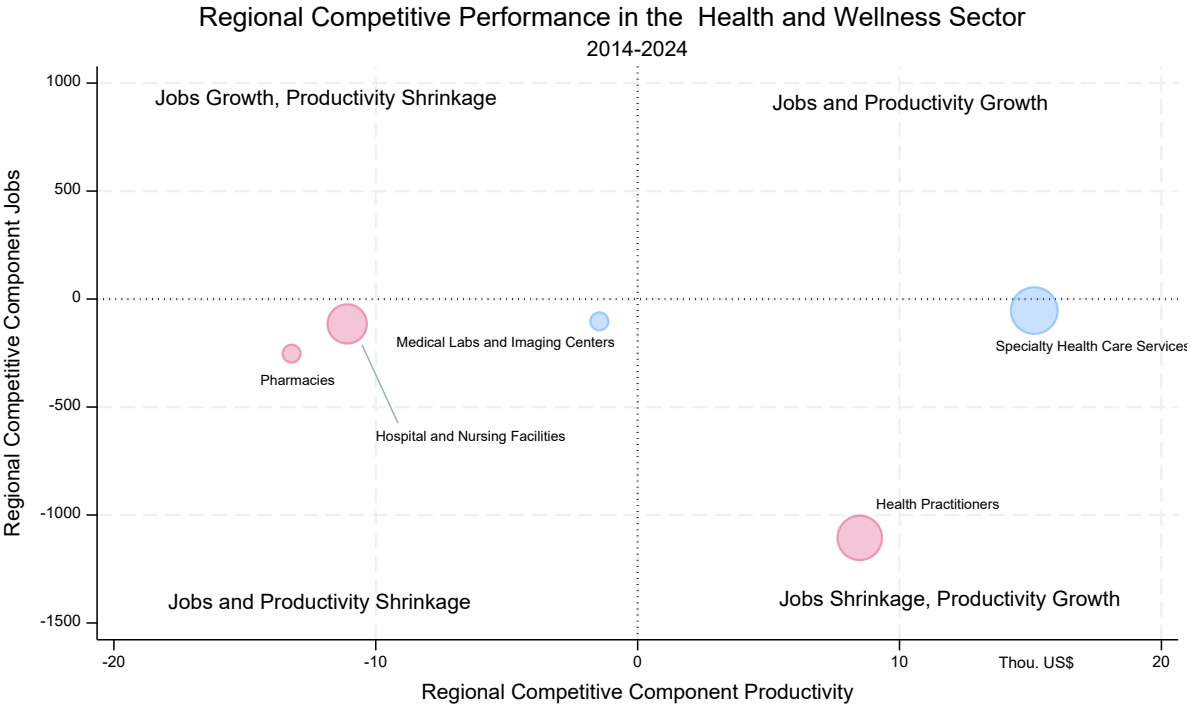
indicates that employment expansion—where it occurred—was not driven by rising labor intensity or reduced productivity; instead, job gains were modest and largely neutral in their productivity impact.

The most dynamic quadrant in the long-run period is Jobs Shrinkage, Productivity Growth (J–P+), where Specialty Education and Specialty Health Care Services recorded declining local competitive employment but improving local competitive productivity. These industries appear to be modernizing and consolidating, possibly through digital scheduling tools, tele-specialty integration, workflow redesign, or more extensive outsourcing of administrative tasks. Importantly, local competitive earnings per job rose for several of these groups, indicating at least part of the value from enhanced productivity accrued to workers.

By contrast, three large and foundational health industries—Hospitals and Nursing Facilities, Medical Labs and Imaging Centers, and Pharmacies—fell into the Jobs and Productivity Shrinkage (J–P–) category. These activities continue to face entrenched structural challenges: staffing shortages in nursing and allied health occupations, high cost of facilities and utilities, difficulties achieving scale economies, reimbursement constraints, and vulnerability to national consolidation trends in pharmaceuticals, diagnostics, and managed care. These structural headwinds have produced locally competitive losses on both the employment and productivity fronts.

Overall, the decade-long picture is one of selective modernization in specialized segments, alongside persistent structural decline in large-scale, system-critical activities. The sector remains essential in size but not strongly competitive in either scale or productivity, and its long-run trajectory reflects broader national pressures facing healthcare systems, amplified by Hawai‘i’s geography and cost structures.

Table 15a. Performance Map Classifications for the Health and Wellness Sector 2014-2024



Jobs and Productivity Growth (J+, P+, E±)	Jobs Growth, Productivity Shrinkage (J+, P–, E±)
Jobs Shrinkage, Productivity Growth (J–, P+, E±)	**Jobs and Productivity Shrinkage (J–, P–, E±)**
Specialty Education Specialty Health Care Services	Hospitals and Nursing Facilities Medical Labs and Imaging Centers Pharmacies

J±, P±, E±: Sign of change for local competitive components of Jobs, Productivity and Earnings per Job during the period. Blue bubbles (E+); red bubbles (E-); Size of bubbles is correlated with number of jobs in the industry groups. Data sources: Lightcast™ and DBEDT calculations.

2021–2024 Window

The post-pandemic window shows several important breaks from the decade-long pattern, reflecting both temporary recovery dynamics and early structural adaptations. Unlike the long-run map, the short-run period features at least one industry group—Health Practitioners—that achieved dual local competitive gains in both employment and productivity (J+P+).

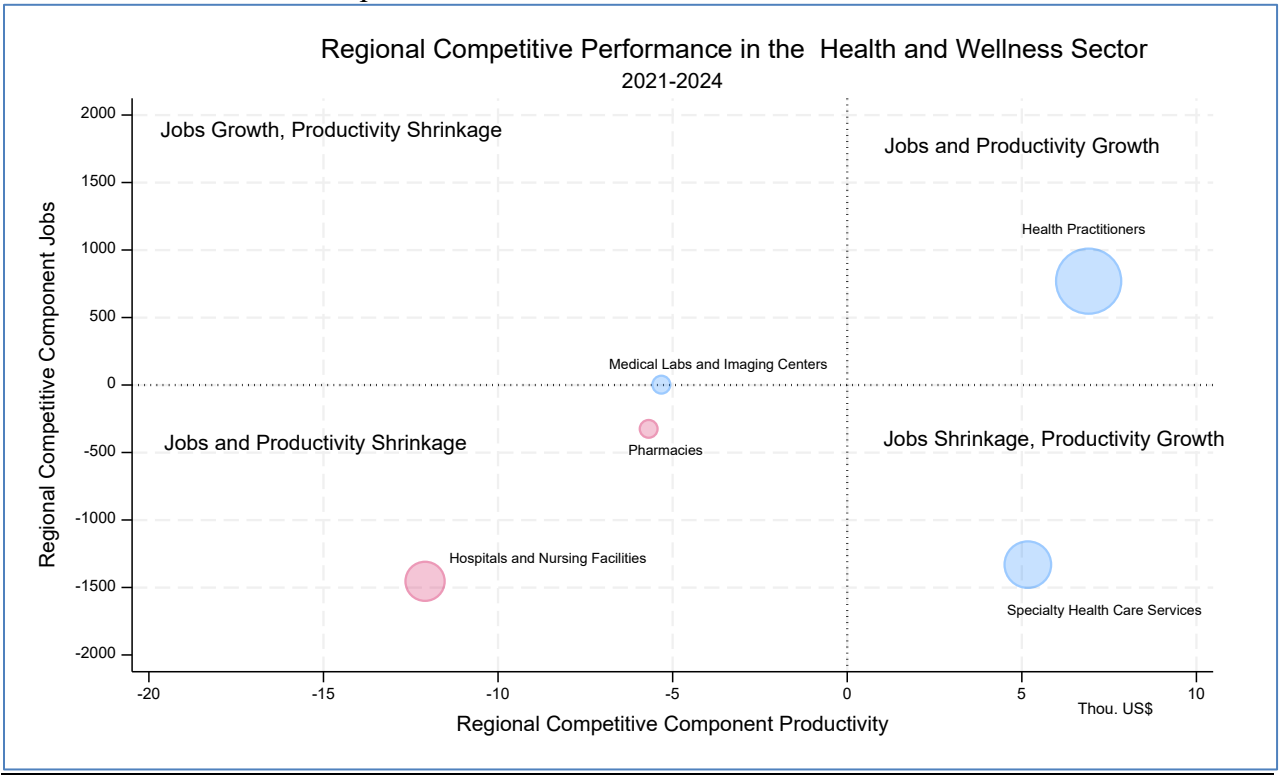
Medical Labs and Imaging Centers posted job gains at the expense of productivity (J+P–). This reinforces the pattern of limited labor-intensive expansion and suggests that short-run job additions were generally aligned with, or neutral to, productivity trends.

A key finding in the short run is that Specialty Health Care Services continued to display productivity-led local competitive improvements (J–P+), even as local competitive job effects remained negative. This is consistent with targeted modernization and more efficient deployment of specialized staff. Local competitive earnings per job increased in several cases, implying that workers captured part of the generated productivity value.

At the same time, Hospitals and Nursing Facilities and Pharmacies again fell into Jobs and Productivity Shrinkage (J–P–)—a continuation of long-run structural decline. Workflow pressures from staffing shortages, rising costs of medical supplies, uneven reimbursement structures, and national consolidation continue to anchor these industries in a local competitive deficit. While these are large pillars of the state's healthcare system, they remain challenged both operationally and competitively during the recovery period.

Across the short-run window, the sector shows isolated strength in diagnostic services and specialized outpatient care, but persistent structural fragility in large-scale inpatient and pharmaceutical services. Most local competitive gains, even when present, did not translate into generalized earnings-per-job advantages, indicating that improvements in scale or productivity are only partially benefiting workers and may be offset by wage compression or high operating expenses.

Table 15b. Performance Map Classifications for the Health and Wellness Sector 2021-2024



Jobs and Productivity Growth (J+, P+, E±)	**Jobs Growth, Productivity Shrinkage (J+, P–, E±)**
Health Practitioners	Medical Labs and Imaging Centers
Jobs Shrinkage, Productivity Growth (J–, P+, E±)	**Jobs and Productivity Shrinkage (J–, P–, E±)**
Specialty Health Care Services	Hospitals and Nursing Facilities Pharmacies

J±, P±, E±: Sign of change for local competitive components of Jobs, Productivity and Earnings per Job during the period. Blue bubbles (E+); red bubbles (E-); Size of bubbles is correlated with number of jobs in the industry groups. Data sources: Lightcast™ and DBEDT calculations.

Taken together, the long-run and short-run competitive maps depict a Health and Wellness Sector that is large, essential, and structurally constrained, with pockets of modernization in specialized and diagnostic segments but continuing headwinds in the traditional backbone of the system. No broad-based local competitive turn is visible yet, but the post-pandemic gains in Specialty Health Care Services demonstrate where sectoral renewal is emerging. For policymakers and stakeholders, the results highlight the need for targeted support that fosters productivity, workforce stabilization, and innovation—particularly in hospitals, nursing, and pharmaceutical services, where local competitive gaps remain persistent.

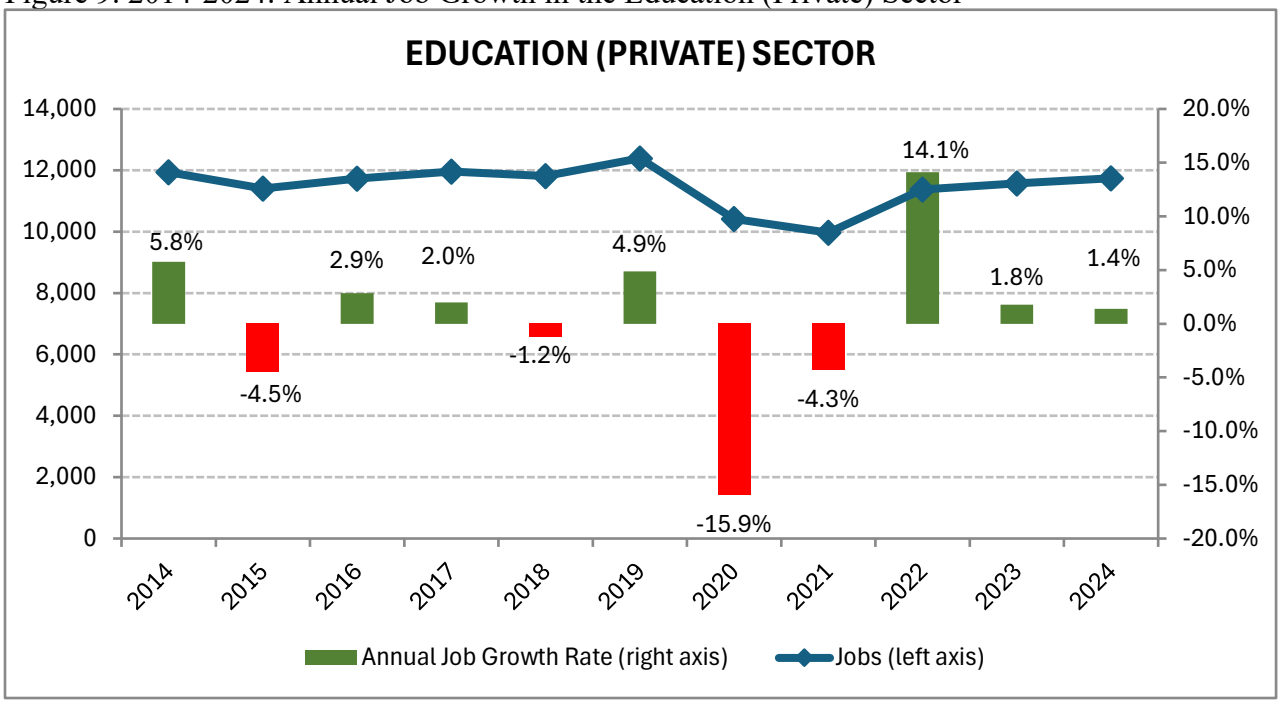
EDUCATION SECTOR

The private Education Sector, which includes private colleges and specialty schools, is an important segment of Hawai‘i’s economy. The following section examines the growth and performance of the education activity of private sector colleges and specialty schools.

Size & Growth

Private post-secondary and specialty education in Hawai‘i accounted for 11,736 jobs in 2024. For the 2014- 2024 period, it had an average annual job *decline* rate of 0.2%. In 2024, the sector's job numbers had not recovered to their 2019 levels.

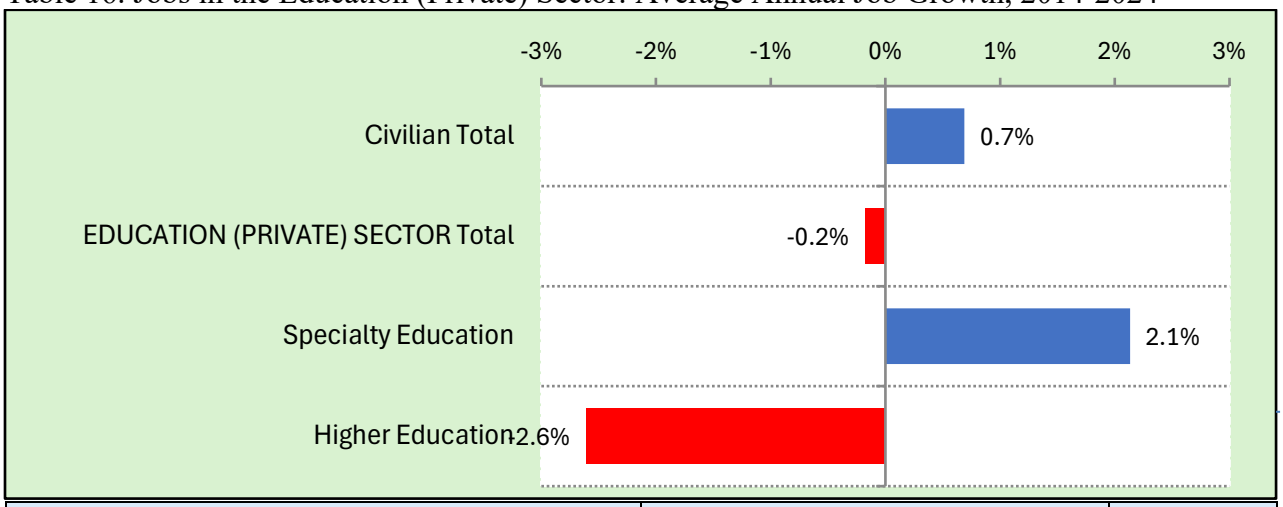
Figure 9. 2014-2024: Annual Job Growth in the Education (Private) Sector



Source: Lightcast™ and DBEDT calculations.

From 2014 to 2024, the average annual job growth rate for Specialty Education was 2.1% and for Higher Education was a negative 2.6%. From 2014 to 2021, the average annual job growth rate for Specialty Education was 0.4%, and for Higher Education, it was negative 5.6%. From 2021 to 2024, the average annual job growth rate for Specialty Education was 6.3%, and for Higher Education, it was a positive 4.7%.

Table 16. Jobs in the Education (Private) Sector: Average Annual Job Growth, 2014-2024



Industry Sector/Group	Annual Job Growth			Jobs in 2024
	2014-2024	2014-2021	2021-2024	
Civilian Total	0.7%	-0.3%	3.1%	894,787
EDUCATION (PRIVATE) SECTOR Total	-0.2%	-2.6%	5.6%	11,736
Specialty Education	2.1%	0.4%	6.3%	6,782
Higher Education	-2.6%	-5.6%	4.7%	4,953

Source: Lightcast™ and DBEDT calculations.

National Comparisons

From 2014 to 2024 for Hawai‘i, Higher Education had average annual job growth rates below the nation’s comparable industries. On the other hand, Specialty Education gained jobs faster than the national industry group. The average annual earnings per job of Specialty Education in Hawaii in 2024 was $36,110, which was about 52% of the state’s civilian economy’s average but about 102% of the nation’s average for the comparable industries. In 2023 for Hawai‘i, the average annual earnings per job of Higher Education were $47,494, which was 68% of the state’s civilian economy’s average and about 65% of the nation’s average for the comparable industries.

Table 17. Hawai‘i Private Education Sector Performance Compared with Nation

Industry Groups	Jobs 2024	Jobs per Establishment 2024	Avg Annual Earnings 2024	Avg Ann Job Growth		When U.S. = 100%		
				2014-2024	Above USA	Concentration 1/	Jobs per Establishment	Avg Annual Earnings
Total Civilian	894,787	14.9	$ 72,356.2	0.7%	-1.1%	100%	82%	94%
EDUCATION (PRIVATE) SECTOR	11,736	12.9	$ 40,490.3	-0.2%	-1.2%	79%	46%	72%
Higher Education	4,953	32.1	$ 43,762.1	-2.6%	-2.5%	62%	25%	59%
Specialty Education	6,782	9.0	$ 38,100.9	2.1%	-0.4%	98%	61%	106%

1/ Proportion of jobs in the industry groups in the region compared to the proportion nationally. Source: Lightcast™ and DBEDT calculations.

Competitive Map Analysis of the Education (Private) Sector

The performance maps for Hawai‘i’s private Education Sector reveal two distinct stories across the 2014–2024 decade and the post-pandemic 2021–2024 period. Together, the graphs show a sector undergoing long-run contraction driven by losses in Higher Education, alongside strong local competitive gains in Specialty Education—an increasingly important growth segment within the education landscape.

The decade-long map shows a clear divergence between the two major subcomponents of the private education sector:

Specialty Education occupies the bottom-right quadrant, showing productivity growth but net job losses attributed to local competitive conditions. The positive productivity effect suggests that the segment improved productivity relative to national peers—possibly through restructuring, technological adoption, and higher returns per instructor or per program—but these gains were not enough to generate net job creation over the decade.

Higher Education lies in the bottom-left quadrant, indicating that Hawai‘i experienced simultaneous job losses and declines in local competitive productivity relative to national benchmarks. The negative job component points to a structurally contracting segment facing sustained challenges. These are likely to include demographic shifts, declining enrollment, competition from online alternatives, and the financial pressures faced by private colleges and training institutions.

The negative productivity effect reinforces this interpretation: resources and staffing did not keep pace with national improvements in instructional productivity, program specialization, or technology adoption. Higher Education emerges from the decade as a structural weak spot in the state’s workforce and innovation ecosystem.

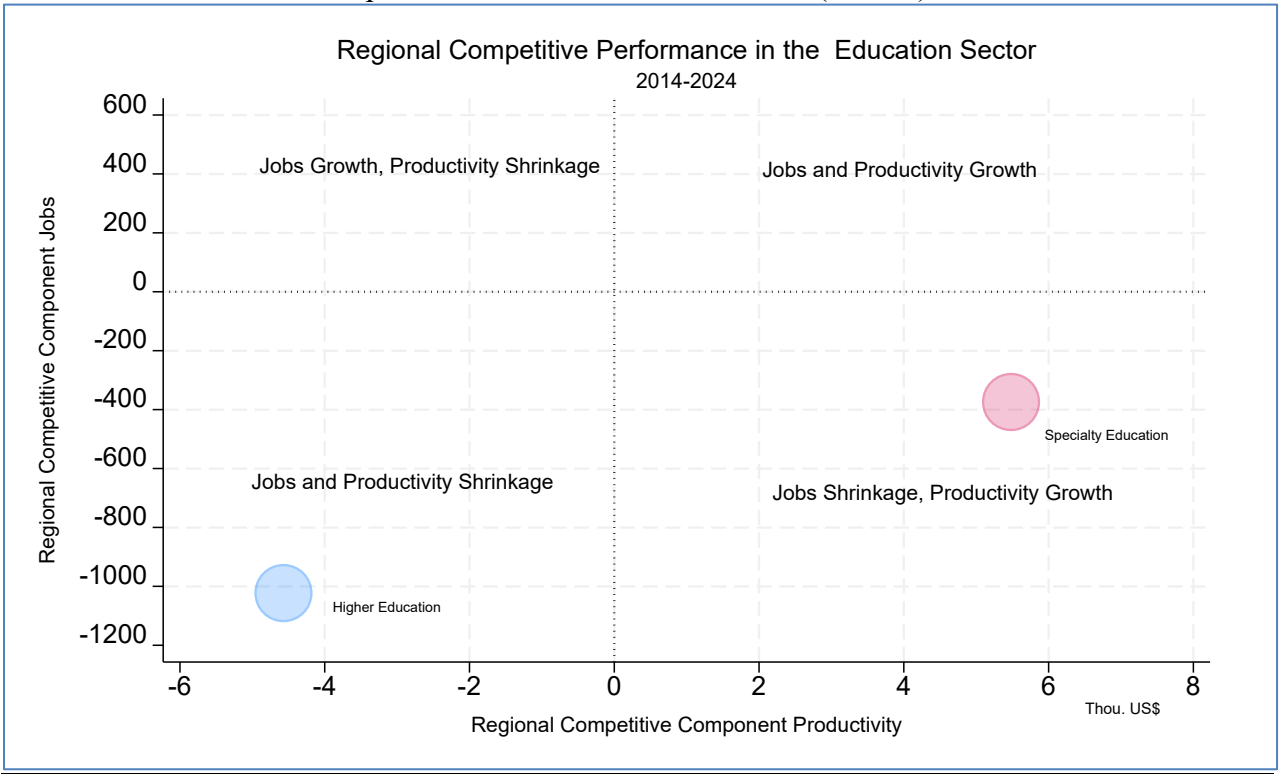
The long-run private education sector was shaped by the sharp contraction of Higher Education, while Specialty Education showed productivity improvements that partially offset broader sector weaknesses.

The post-pandemic performance map presents a markedly different landscape, reflecting the sector’s accelerated restructuring and recovery after COVID-19.

Specialty Education shifts decisively into the top-right quadrant, indicating positive local competitive job growth and productivity gains. This quadrant represents the strongest performance category—activities that are simultaneously expanding employment and becoming more efficient than national counterparts.

This movement suggests that Specialty Education is now a structural growth engine within the broader education sector. Demand for tutoring, early childhood services, special needs support, test preparation, and private training rebounded rapidly after the pandemic, benefiting from both local needs and national trends in individualized and supplemental education. This is one of the clearest post-pandemic competitive turnarounds in the entire report.

Table 18.a. Performance Map Classifications for the Education (Private) Sector 2014-2024



Jobs and Productivity Growth (J+, P+, E±)	**Jobs Growth, Productivity Shrinkage (J+, P–, E±)**
Jobs Shrinkage, Productivity Growth (J–, P+, E±)	**Jobs and Productivity Shrinkage (J–, P–, E±)**
Specialty Education	Higher Education

J±, P±, E±: Sign of change for local competitive components of Jobs, Productivity and Earnings per Job during the period. Blue bubbles (E+); red bubbles (E-); Size of bubbles is correlated with number of jobs in the industry groups. Data sources: Lightcast™ and DBEDT calculations.

Higher Education moves from the bottom-left into the bottom-right quadrant, indicating job shrinkage but productivity growth. Although Higher Education continues to lose jobs due to local competitive pressures, the positive productivity effect suggests meaningful improvements—potentially through consolidation, hybrid instruction, streamlined programs, or technological integration.

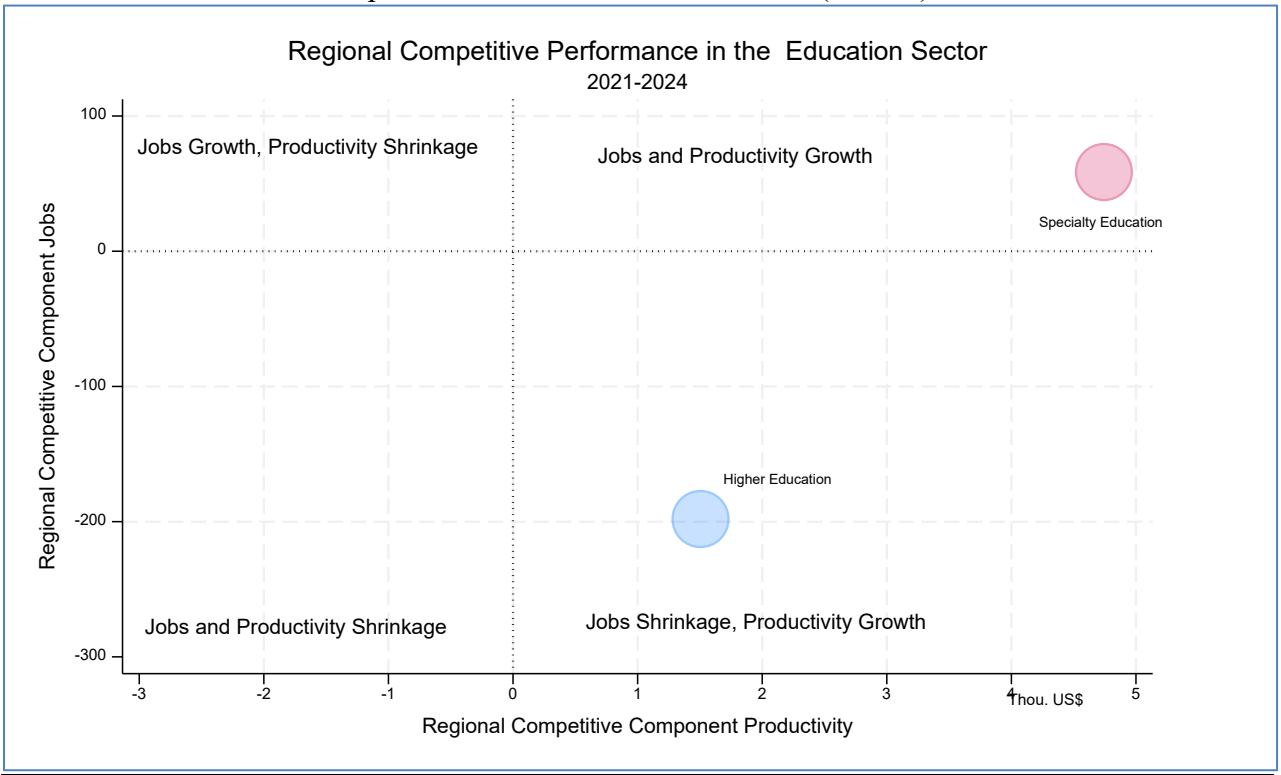
The move into the productivity-growth quadrants marks a significant improvement relative to the prior decade, indicating that the sector is stabilizing, though still not adding net jobs.

Across both periods, the private Education Sector demonstrates a transition from a decade of contraction to a post-pandemic pattern where growth and replenishment are emerging—but concentrated entirely in Specialty Education. Higher Education continues to contract but is

becoming more productive, suggesting a sector in the midst of realignment rather than outright decline.

The combined results indicate that private education in Hawai‘i is not uniformly shrinking; instead, it is reallocating activity toward segments that are more adaptive, more personalized, and more aligned with evolving workforce and household needs. Specialty Education is now the sector's anchor of competitive strength, while Higher Education is working through a longer-term structural adjustment.

Table 18.b. Performance Map Classifications for the Education (Private) Sector 2021-2024



Jobs and Productivity Growth (J+, P+, E±)	Jobs Growth, Productivity Shrinkage (J+, P–, E±)
Specialty Education	
Jobs Shrinkage, Productivity Growth (J–, P+, E±)	**Jobs and Productivity Shrinkage (J–, P–, E±)**
Higher Education	

J±, P±, E±: Sign of change for local competitive components of Jobs, Productivity and Earnings per Job during the period. Blue bubbles (E+); red bubbles (E-); Size of bubbles is correlated with number of jobs in the industry groups. Data sources: Lightcast™ and DBEDT calculations.

OTHER TARGETED INDUSTRY GROUPS

In this section, we refer to two industry groups that have received special public attention in previous years: the Apparel and Call Center industry groups.

The Apparel industry group has been promoted due to Hawai‘i’s unique style and cultural heritage and for bringing Hawaiian/aloha wear to worldwide prominence. However, over the years, a large portion of the garment manufacturing jobs has been outsourced overseas. While local manufacturing of Hawaiian wear continues to exist, it is more common to find garments with labels that say designed in Hawai‘i but manufactured elsewhere.

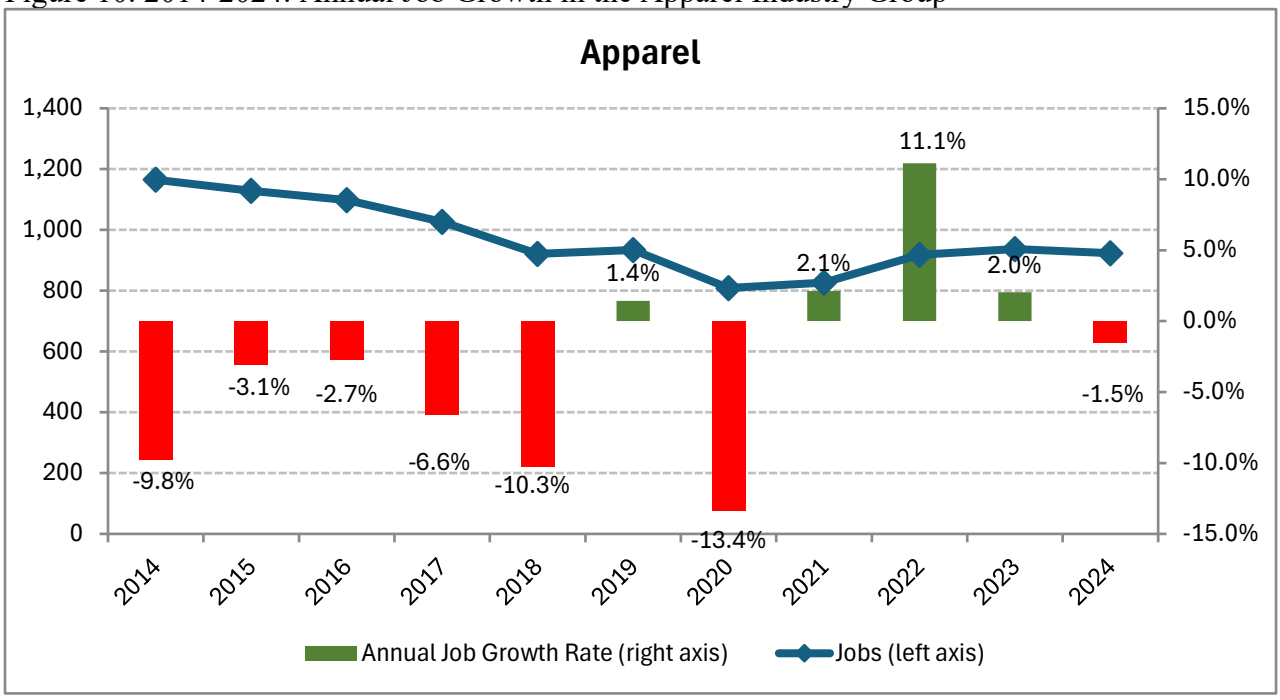
Call Centers have also been promoted based on Hawai‘i’s mid-Pacific location and multilingual resources.

Size & Growth

For both industry groups, annual growth rates in the last four years have been positive. However, when looking at the period from 2014 to 2024, the average annual job growth rate for Apparel was a negative 2.3%, whereas for Call Centers it was positive at 1.9%.

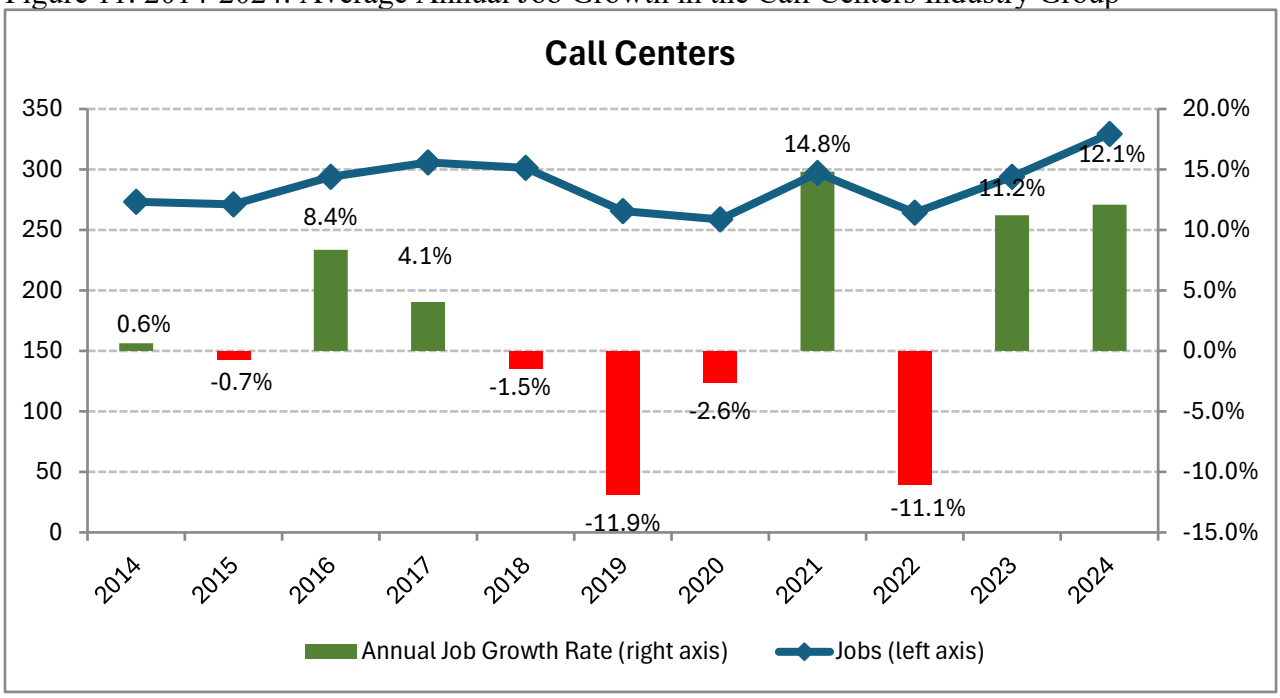
From 2014 to 2021, the average annual job growth rate for Apparel was negative 4.8% and for Call Centers was positive (1.2%). From 2021 to 2024, the average annual job growth rate for Apparel was positive (3.8%), and for Call Centers was also positive (3.5%).

Figure 10. 2014-2024: Annual Job Growth in the Apparel Industry Group



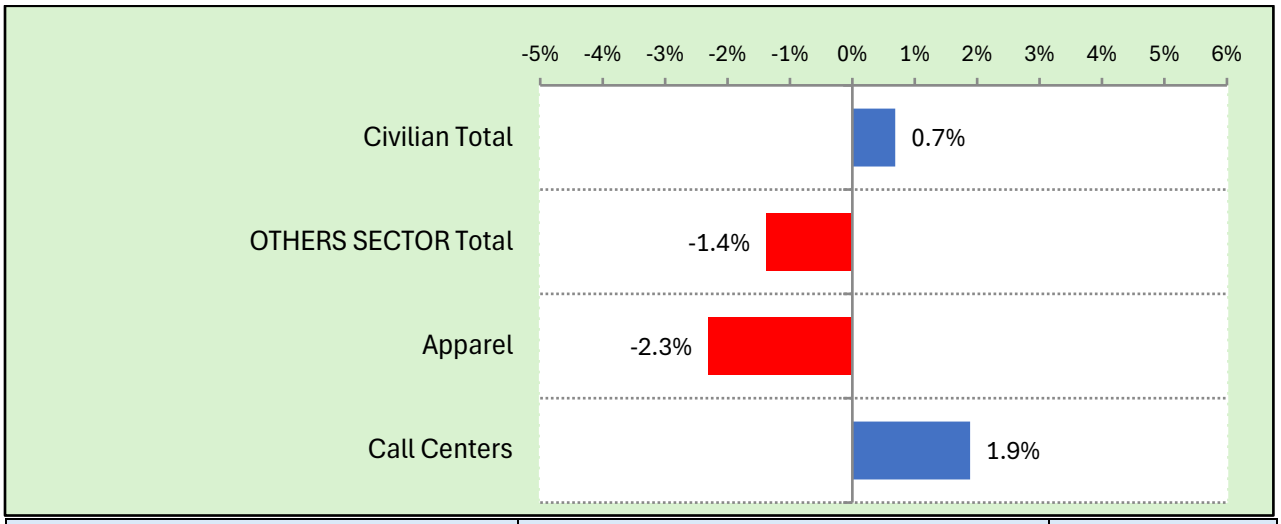
Source: Lightcast™ and DBEDT calculations.

Figure 11. 2014-2024: Average Annual Job Growth in the Call Centers Industry Group



Source: Lightcast™ and DBEDT calculations.

Table 19. Jobs in the Apparel and Call Centers Industry Groups: Average Annual Growth, 2014-2024



Industry Sector/Group	Annual Job Growth			Jobs in 2024
	2014-2024	2014-2021	2021-2024	
Civilian Total	0.7%	-0.3%	3.1%	894,787
OTHERS SECTOR Total	-1.4%	-3.5%	3.7%	1,252
Apparel	-2.3%	-4.8%	3.8%	923
Call Centers	1.9%	1.2%	3.5%	329

Source: Lightcast™ and DBEDT calculations

National Comparisons

During the 2014-2024 period, the average annual job decline rate for Apparel in Hawai‘i was 2.3%, the same as in the U.S. (Table 20).

During the 2014 to 2024 period, the Call Center industry group in Hawai‘i experienced an average annual job increase rate of 1.9%, 4.5 percentage points above the U.S. Call Center industry group during the same period.

In 2024, the job concentration of Apparel in Hawai‘i was 67% above the national concentration; in contrast, the job concentration of Call Centers in Hawai‘i was only 20% of the national concentration. In 2024, the average annual earnings per job for Apparel and Call Centers in Hawai‘i were $28,519 and $38,676, respectively. These averages were about 56% and 63% of the nation’s averages, respectively.

Table 20. Hawai‘i Apparel and Call Centers Performance Compared with Nation

Industry Groups	Jobs 2024	Jobs per Establishment 2024	Avg Annual Earnings 2024	Avg Ann Job Growth		When U.S. = 100%		
				2012-2022	Above USA	Concentration 1/	Jobs per Establishment	Avg Annual Earnings
Total Civilian	894,787	14.9	$72,356.2	0.7%	-1.1%	100%	82%	94%
OTHERS SECTOR	1,252	10.4	$30,664.5	-1.4%	1.2%	57%	42%	54%
Apparel	923	15.5	$28,519.3	-2.3%	0.0%	167%	69%	56%
Call Centers	329	5.4	$36,676.2	1.9%	4.5%	20%	21%	63%

1/ Proportion of jobs in the industry groups in the region compared to the proportion nationally.
Source: Lightcast™ and DBEDT calculations.

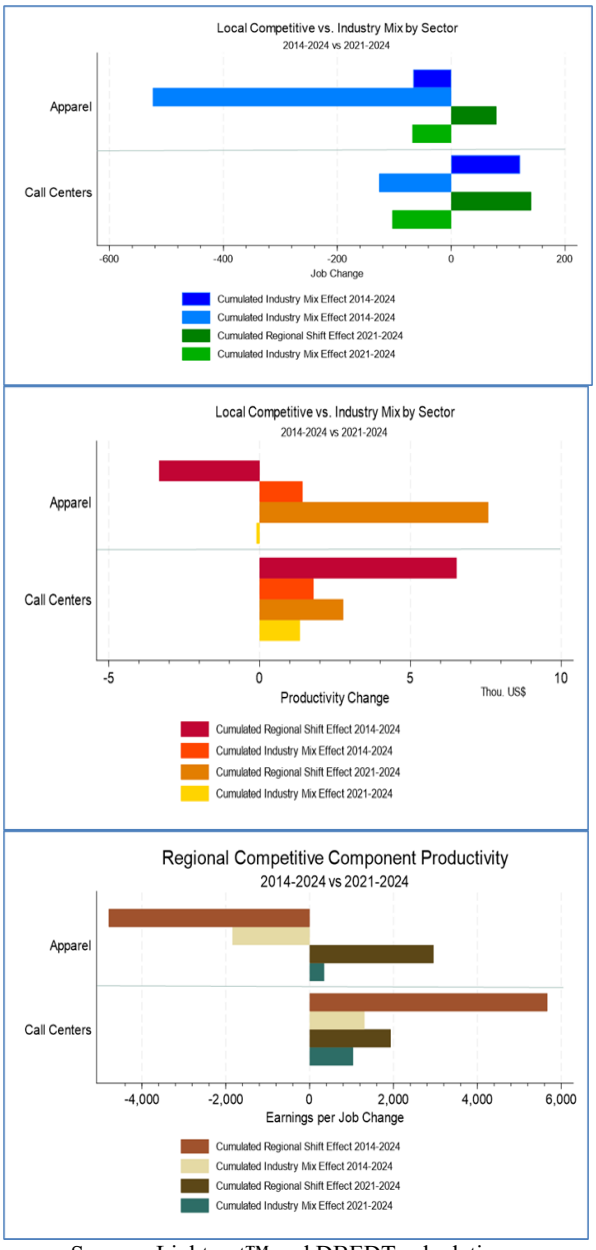
Competitive Map Analysis of Apparel and Call Centers

The competitive-performance results inherent in Hawai‘i’s apparel base—small-scale operations, high input and labor costs, dependence on imported materials, and intense competition from offshore manufacturers. The post-pandemic period from 2021 to 2024 shows some improvement—local job and productivity effects turn slightly positive as tourism recovery and renewed demand for locally designed goods create limited momentum. Yet these short-run gains remain small relative to the scale of long-term losses, suggesting that the industry continues to face structural headwinds even as it stabilizes modestly in the near term.

The graphs for Apparel and Call Centers reveal two distinctly different trajectories within Hawai‘i’s smaller industry groups. The Apparel industry shows clear, long-run structural decline across all dimensions of performance.

Over 2014–2024, the sector exhibits job losses attributable to local competitive factors. The productivity results reinforce this pattern, with apparel activities in the state experiencing a decline in local competitive productivity relative to national peers. Earnings per job follow the same direction, with the local competitive component remaining negative and unable to keep pace with rising wages nationally. These patterns clearly reflect structural challenges.

Figure 12. Local and National Component Decomposition for Apparel and Call Centers Industry Groups



Source: Lightcast™ and DBEDT calculations.

Call Centers present a more positive picture, marked by improving long-run local competitive performance and unmistakable post-pandemic strengthening. Over the decade from 2014 to 2024, the local competitive effect for jobs is positive, indicating that Hawai‘i’ gained call-center employment beyond what national conditions would have predicted. Productivity results also provide a more favorable signal: Hawai‘i’s call-center operations improved productivity relative to national peers, though not enough to reverse long-term job losses. Earnings per job over the decade also show similar results.

The 2021–2024 period shows local competitive conditions clearly into positive territory, with job gains attributable directly to Hawai‘i’s post-pandemic recovery dynamics. Increased customer-service hiring in the tourism sector, re-shoring of certain service functions back into U.S. markets, and expansion of remote work opportunities likely helped the sector regain competitive footing. The national industry mix effect is also positive, reinforcing the sector’s momentum. Productivity and earnings per job effects also improve locally in this period, suggesting that the sector is not only growing but also achieving higher productivity and stronger compensation outcomes than in the past. As a result, Call Centers emerge as one of the few smaller industry groups demonstrating post-pandemic competitive strengthening.

Taken together, these findings illustrate contrasting paths in the “Other Industries” category. Apparel continues to face structural disadvantages despite, short-run productivity and earnings improvements, while Call Centers show competitive stability.

PERFORMANCE BY COUNTY

The following tables summarize the 2014-2024 county performance of the statewide targeted and emerging industries. As shown in Table 22, the total number of jobs in Hawai‘i’s targeted industries without overlaps (“targeted”) was 167,423 in 2023. Honolulu accounted for about 69%, followed by Hawai‘i County at 14%, Maui County at 12%, and Kaua‘i County at 6%. Over the 2014-2024 period, adjusting for overlaps, total jobs in the targeted increased by 13,943 jobs. Honolulu gained 7,156 jobs. It was followed by Maui County (2,768 jobs), Hawai‘i County (2,812 jobs), and Kaua‘i County (924 jobs). In terms of annual average job growth, Maui Country targeted industry jobs increased by 1.54%, Hawai‘i County by 1.21%, Kaua‘i County by 1,24%, and Honolulu County by 0.63%.

Table 22. 2014-2024: Sectoral Job Composition and Changes by County

Sectors	2024 Jobs				
	State	Honolulu	Hawaii	Maui	Kauai
Total Civilian	894,787	612,358	115,355	111,124	49,351
Total Targeted without Overlap	170,302	117,518	24,512	19,723	7,982
TECHNOLOGY SECTOR	32,140	25,033	3,053	2,346	1,281
CREATIVE SECTOR	56,517	40,538	6,227	6,764	2,580
AGRIBUSINESS SECTOR	25,033	10,132	9,283	3,657	1,956
HEALTH & WELLNESS SECTOR	68,377	50,485	7,221	7,870	2,764
EDUCATION (PRIVATE) SECTOR	11,736	9,468	1,086	868	274
OTHERS SECTOR	1,252	1,013	97	94	48
Sectors	**% in State 2024 Jobs**				
	State	Honolulu	Hawaii	Maui	Kauai
Total Civilian	100%	68%	13%	12%	6%
Total Targeted without Overlap	100%	69%	14%	12%	5%
TECHNOLOGY SECTOR	100%	78%	10%	7%	4%
CREATIVE SECTOR	100%	72%	11%	12%	5%
AGRIBUSINESS SECTOR	100%	40%	37%	15%	8%
HEALTH & WELLNESS SECTOR	100%	74%	11%	12%	4%
EDUCATION (PRIVATE) SECTOR	100%	81%	9%	7%	2%
OTHERS SECTOR	100%	81%	8%	8%	4%
Sectors	**Job Change 2014 to 2024**				
	State	Honolulu	Hawaii	Maui	Kauai
Total Civilian	59,389	23,234	14,736	9,386	6,378
Total Targeted without Overlap	13,943	7,156	2,768	2,812	924
TECHNOLOGY SECTOR	4,540	2,578	669	459	468
CREATIVE SECTOR	6,519	4,501	1,029	338	370
AGRIBUSINESS SECTOR	-1,496	-909	178	-773	15
HEALTH & WELLNESS SECTOR	10,139	5,585	1,268	2,901	363
EDUCATION (PRIVATE) SECTOR	-208	-823	281	296	105
OTHERS SECTOR	-186	-223	21	13	5

Source: Lightcast™ and DBEDT calculations.

City & County of Honolulu

As shown in Table 23 and referencing Table 1, Honolulu accounted for 117,518, or 69% of the state's 170,302 targeted jobs in 2024. From 2014 to 2024, Honolulu's targeted average annual job growth rate of 0.6% was above Honolulu's civilian economy's rate of 0.4%, below the state's targeted rate of 1.2%, and below the nation's targeted rate of 1.8%. Average annual earnings per job for both Honolulu's civilian economy and targeted were higher than the state's comparable averages. Average annual earnings per job for Honolulu's civilian economy exceeded the nation's comparable average but fell short for its targeted industries.

Among the six major sectors over the 2014-2024 period, the Health and Wellness Sector gained the greatest number of jobs at 5,585, having also the highest average annual job growth rate at 1.8%. The sector had the second highest concentration of industry compared to the nation's concentration at 107%. The Technology Sector had the highest average annual earnings per job in 2024 at $116,098.

Table 23. Performance of the Major Groups of Honolulu County's Targeted Industry Portfolio

Sectors [2/]	Jobs in Honolulu County		Av. Annual Job Growth 2014-2014		Concentration [1/]		Avg. Annual Earnings 2024	
	2024	Change 2012-2024	Honolulu County	U.S.	2024	Percent-age Point Change 2012-2024	Honolulu County	U.S.
Total Civilian	612,358	23,234	0.4%	1.8%	100.0%	0%	$76,874	$76,675
Total Targeted without Overlap	117,518	7,156	0.6%	1.8%	84.3%	2%	$85,506	$95,216
HEALTH & WELLNESS SECTOR	50,485	5,585	1.2%	1.8%	99.6%	7%	$100,551	$86,034
CREATIVE SECTOR	40,538	4,501	1.2%	2.5%	88.2%	0%	$79,447	$110,391
TECHNOLOGY SECTOR	25,033	2,578	1.1%	2.7%	67.5%	-1%	$116,098	$146,772
AGRIBUSINESS SECTOR	10,132	-909	-0.9%	1.1%	54.8%	-3%	$55,859	$59,852
EDUCATION (PRIVATE) SECTOR	9,468	-823	-0.8%	1.0%	92.9%	-5%	$40,568	$56,621
OTHERS SECTOR	1,013	-223	-2.0%	-2.6%	67.3%	12%	$32,206	$56,699

1/ Proportion of jobs in the sector in the region compared to the proportion nationally.
2/ The sum of the individual sectors is greater than Total Targeted without Overlap since overlaps exist between sectors.
Source: Lightcast™ and DBEDT calculations.

Table 24 shows the performance of detailed targeted and emerging industry groups in Honolulu. In 2024, the Health and Wellness–related industry groups continued to anchor Honolulu County's employment base. Health Practitioners remained the largest group with 19,210 jobs, followed by Hospitals and Nursing Facilities with 17,102 jobs, and Specialty Health Care Services with 9,502 jobs. Over the 2014–2024 period, these same groups accounted for some of the largest absolute job gains. Health Practitioners expanded by 4,001 jobs (2.4% average annual growth), while Specialty Health Care Services added 1,856 jobs (2.2% annually). Among professional and technical services, Business Consulting gained 1,636 jobs (3.7%), Engineering and Research and Development added 1,059 jobs (2.2%), and Engineering and Related Services increased by 1,112 jobs (1.9%). Several creative and support activities also grew at strong rates, including Film, TV,

and Media Production (+735 jobs; 4.5%), Music (+295 jobs; 4.0%), and Agricultural Support Services (+918 jobs; 6.9%).

Relative to U.S. trends, Honolulu saw particularly strong gains in Agricultural Support Services, Film, TV, and Media Production, and Music, all of which substantially outpaced national growth rates. Conversely, several technology-oriented activities underperformed the nation over the decade. Computer Services and Software Publishers, Computer Systems Design, and Biotechnology all grew more slowly than the U.S., with Biotechnology declining by 5.1% annually despite rapid national expansion.

Honolulu County also maintained clear areas of high specialization by 2024. Cultural Activities registered the highest concentration with a location quotient of 470, reflecting employment shares more than four times the national level. Other highly concentrated industries included Fishing, Forestry, and Hunting (218%), Apparel (198%), Medical Labs and Imaging Centers (164%), Architecture (149%), Radio and Television Broadcasting (146%), and Film, TV, and Media Production (112%). Between 2014 and 2024, the largest increases in specialization occurred in Music (+42 points), Film and Media Production (+38), Engineering and Related Services (+17), and several health-related activities.

Average annual earnings per job in 2024 were highest in advanced technical and professional service activities. Technology Equipment Distribution reported the highest compensation at $154,322, followed by Computer Services and Software Publishers ($132,111), Alternative Power Generation ($129,167), and Engineering and Related Services ($128,831). Health Practitioners also paid high wages at $116,370. Despite these competitive wages, Honolulu earnings per job remained below U.S. averages in most technology and media industries. Some exceptions included Architecture, where local earnings per job exceeded national levels, and selected education and cultural fields where Honolulu maintained comparable compensation.

Overall, Honolulu County’s performance from 2014 to 2024 reflects strong job creation in health care, professional services, and creative media, continued specialization in cultural and natural resource–dependent industries, and competitive wage levels in several engineering, technology, and health-related fields.

Table 24. Performance of the Detailed Honolulu Targeted Industry Portfolio

Sectors [2/]	Jobs in Honolulu County		Av. Annual Job Growth 2014-2014		Concentration [1/]		Avg. Annual Earnings 2024	
	2024	Change 2014-2024	Honolulu County	U.S.	2024	Percentage Point Change 2014-2024	Honolulu County	U.S.
Agric. Processing	4,123	-1,080	-2.3%	2.1%	74%	-27%	$64,937	$74,800
Farm Production	3,093	-515	-1.5%	0.0%	34%	-1%	$40,394	$44,955
Agric. Support Services	1,891	918	6.9%	4.0%	83%	28%	$62,404	$70,472
Fishing, Forestry and Hunting	642	-179	-2.4%	-0.8%	218%	-7%	$40,559	$39,529
Agric. Inputs	219	-35	-1.5%	0.5%	29%	-2%	$73,259	$92,469
Agric. Packaging and Warehsg	165	-18	-1.0%	1.8%	28%	-4%	$80,309	$75,465
Marketing, Photography and Related	8,829	771	0.9%	2.5%	94%	-2%	$43,027	$70,549
Engineering and Research and Development	5,508	1,059	2.2%	2.5%	101%	10%	$130,210	$143,827
Business Consulting	5,401	1,636	3.7%	4.3%	71%	5%	$90,603	$105,067
Computer Services and Software Publishers	4,850	797	1.8%	3.7%	52%	-2%	$132,111	$177,162
Performing and Creative Arts	4,662	-126	-0.3%	1.1%	89%	0%	$37,974	$38,704
Cultural Activities	2,972	-226	-0.7%	1.7%	470%	-51%	$72,258	$78,551
Film, TV, Video Production/Distrib, Cable & Media Streaming	2,051	735	4.5%	1.6%	112%	38%	$103,402	$196,157
Design Services	1,524	168	1.2%	2.5%	93%	0%	$38,454	$58,158
Architecture	1,468	-124	-0.8%	1.2%	149%	-10%	$113,002	$97,327
Publishing and Information	1,011	-384	-3.2%	-0.8%	58%	-7%	$63,867	$153,620
Music	909	295	4.0%	1.6%	137%	42%	$41,468	$54,113
Radio and Television Broadcasting	676	-131	-1.8%	-0.7%	146%	4%	$72,709	$86,042
Art Education	675	31	0.5%	2.5%	77%	-5%	$20,056	$15,944
Higher Education	4,744	-1,501	-2.7%	-0.1%	87%	-12%	$43,307	$74,564
Specialty Education	4,724	678	1.6%	2.5%	100%	4%	$37,818	$35,912

Table 24. Performance of the Detailed Honolulu Targeted Industry Portfolio, cont.

Sectors [2/]	Jobs in Honolulu County		Av. Annual Job Growth 2014-2014		Concentration [1/]		Avg. Annual Earnings 2024	
	2024	Change 2014-2024	Honolulu County	U.S.	2024	Percentage Point Change 2014-2024	Honolulu County	U.S.
Health Practitioners	19,210	4,001	2.4%	2.4%	107%	13%	$116,370	$96,512
Hospitals and Nursing Facilities	17,102	-100	-0.1%	0.9%	87%	3%	$104,204	$92,141
Specialty Health Care Services	9,502	1,856	2.2%	3.6%	97%	-1%	$82,417	$60,872
Pharmacies	3,128	-332	-1.0%	-0.7%	128%	13%	$44,953	$56,642
Medical Labs and Imaging Centers	1,544	161	1.1%	2.0%	164%	8%	$87,503	$95,996
Apparel	748	-256	-2.9%	-2.3%	198%	13%	$30,742	$51,321
Call Centers	265	33	1.3%	-2.7%	23%	10%	$36,347	$58,502
Engineering and Related Services	6,370	1,112	1.9%	1.8%	124%	17%	$128,831	$123,778
Computer System Design and Related services	5,619	28	0.0%	2.8%	68%	-10%	$125,620	$161,538
Technical Consulting Services	4,983	1,631	4.0%	4.4%	76%	7%	$91,567	$105,806
Information and Telecom Technology	4,063	-195	-0.5%	2.7%	67%	-13%	$121,554	$169,240
Medical Labs and Imaging Centers	1,544	161	1.1%	2.0%	164%	8%	$87,503	$95,996
Technology Equipment Distribution	861	160	2.1%	1.9%	49%	7%	$154,322	$173,404
R&D Services (except Biotechnology)	822	-187	-2.0%	3.0%	43%	-19%	$97,893	$163,378
Other Technology Mfg	408	47	1.2%	1.0%	10%	2%	$91,544	$140,502
Biotechnology	209	-143	-5.1%	7.0%	25%	-47%	$118,266	$246,393
Alternative Power Generation	129	-8	-0.6%	3.0%	53%	-13%	$129,167	$194,652
Chemical and Pharmaceutical Mfg	25	-28	-7.3%	1.6%	2%	-2%	$96,814	$164,373

1/ Proportion of jobs in the industry groups in the region compared to the proportion nationally.
Source: Lightcast™ and DBEDT calculations.

Hawai‘i County

As shown in Table 25 and referenced in Table 1, Hawai‘i County accounted for 24,512, or 13% of the state’s 170,302 targeted jobs in 2024. From 2014 to 2024, Hawai‘i County’s targeted average annual job growth rate of 1.2% was lower than the overall Hawai‘i County civilian economy’s rate of 1.4%, above the state’s targeted rate of 0.9%, and below the nation’s targeted rate of 1.8%. In 2024, average annual earnings per job for both the Hawai‘i County civilian economy and targeted groups were lower than the state’s comparable averages and nation’s comparable averages.

Among the six major sectors over the 2014-2024 period, the Health and Wellness Sector gained the greatest number of jobs at 1,268, having also the highest average annual job growth rate at 1.9%. The sector had the second highest concentration of industry compared to the nation’s concentration at 266.7%. The second largest sector was the creative sector, adding 1,029 jobs, with an average annual job growth rate of 1.8%. The Technology Sector had the highest average annual earnings per job in 2024 at $146,772.

Table 25. Performance of the Major Groups of Hawai'i' County's Targeted Industry Portfolio

Sectors [2/]	Jobs in Hawaii County		Av. Annual Job Growth 2014-2014		Concentration [1/]		Avg. Annual Earnings 2024	
	2024	Change 2012-2024	Hawaii County	U.S.	2024	Percent-age Point Change 2012-2024	Hawaii County	U.S.
Total Civilian	115,355	14,736	1.4%	1.8%	100.0%	0%	$58,857	$76,675
Total Targeted without Overlap	24,512	2,768	1.2%	1.8%	93.3%	-2%	$53,921	$95,216
AGRIBUSINESS SECTOR	9,283	178	0.2%	1.1%	266.7%	-14%	$38,472	$59,852
HEALTH & WELLNESS SEC-TOR	7,221	1,268	1.9%	1.8%	75.6%	4%	$74,223	$86,034
CREATIVE SECTOR	6,227	1,029	1.8%	2.5%	72.0%	-2%	$51,482	$110,391
TECHNOLOGY SECTOR	3,053	669	2.5%	2.7%	43.7%	1%	$82,077	$146,772
EDUCATION (PRIVATE) SEC-TOR	1,086	281	3.0%	1.0%	56.6%	12%	$39,891	$56,621
OTHERS SECTOR	97	21	2.5%	-2.6%	34.4%	14%	$19,770	$56,699

1/ Proportion of jobs in the sector in the region compared to the proportion nationally.
2/ The sum of the individual sectors is greater than Total Targeted without Overlap since overlaps exist between sectors.
Source: Lightcast™ and DBEDT calculations.

Table 26 shows the performance of detailed targeted and emerging industry groups in Hawai‘i County. In 2024, Hawai‘i County’s industry structure remained anchored by activities tied to agriculture, creative services, and health care. Farm Production was the largest industry group with 6,849 jobs, followed by a range of mid-sized groups including Marketing, Photography and Related (1,489 jobs), Performing and Creative Arts (1,364), Business Consulting (914), and Health Practitioners (3,405). Over the 2014–2024 period, several industry groups generated substantial job gains. Business Consulting added the largest number of jobs at +407, followed by Specialty Health Care Services (+727 jobs; 4.7% annually), Technical Consulting Services (+369; 5.9% annually),

Agricultural Support Services (+230; 6.8% annually), and Computer Services and Software Publishers (+199; 5.4% annually).

Hawai‘i County experienced particularly rapid growth in several specialized creative and professional services. Cultural Activities expanded by 7.0% per year, Film, TV, and Media Production grew at 7.5% annually, and Music increased by 4.0% annually, all significantly outpacing U.S. growth rates. High-growth clusters also included Information and Telecom Technology (+2.7% annually), Computer System Design (+3.0%), and Technology Equipment Distribution (+4.2%). In contrast, several technology-related and publishing industries underperformed or contracted, including Publishing and Information (–6.3% annually), Chemical and Pharmaceutical Manufacturing (–5.0%), and Biotechnology (–5.4%), despite strong national growth in the latter.

Hawai‘i County continues to exhibit areas of very high specialization. Fishing, Forestry, and Hunting stood out with an exceptionally high location quotient of 769%, reflecting the county’s distinctive natural resource base. Other highly concentrated industries included Farm Production (403%), Music (212%), Cultural Activities (143%), Medical Labs and Imaging Centers (135%), and Agricultural Support Services (111%). Between 2014 and 2024, specialization increased most in Music (+50 points), Cultural Activities (+60), Film and Media Production (+18), Agricultural Support Services (+30), and Specialty Health Care Services (+14).

Average annual earnings per job in 2024 were highest in advanced technical and R&D-intensive activities. Alternative Power Generation recorded the highest pay at $188,073, followed by Technology Equipment Distribution ($128,493), Engineering and Research & Development ($117,226), Computer Services and Software Publishers ($94,314), and R&D Services except Biotechnology ($121,744). Health-related groups also offered solid pay, including Health Practitioners ($81,352) and Medical Labs and Imaging Centers ($72,200). As in other neighbor islands, local earnings per job lagged national averages in most high-technology and media industries, but Hawai‘i County matched or exceeded national compensation in selected sectors such as Art Education, Specialty Education, and some agricultural-related activities.

Overall, Hawai‘i County’s targeted portfolio performance over 2014–2024 reflects strong growth in business services, health care, creative media, and several technical fields, broad-based specialization in agriculture and natural resource–based industries, and competitive wages in R&D, renewable energy, and advanced professional services.

Table 26. Performance of the Detailed Hawai‘i County Targeted Industry Portfolio

Sectors [2/]	Jobs in Hawaii County		Av. Annual Job Growth 2014-2014		Concentration [1/]		Avg. Annual Earnings 2024	
	2024	Change 2014-2024	Hawaii County	U.S.	2024	Percentage Point Change 2014-2024	Hawaii County	U.S.
Farm Production	6,849	-414	-0.6%	0.0%	403%	-8%	$33,480	$44,955
Agric. Processing	1,361	389	3.4%	2.1%	130%	20%	$58,807	$74,800
Agric. Support Services	477	230	6.8%	4.0%	111%	30%	$52,490	$70,472
Fishing, Forestry and Hunting	427	-59	-1.3%	-0.8%	769%	-11%	$28,797	$39,529
Agric. Inputs	139	25	2.0%	0.5%	99%	16%	$59,806	$92,469
Agric. Packaging and Warehsg	30	8	3.1%	1.8%	27%	4%	$71,680	$75,465
Marketing, Photography and Related	1,489	189	1.4%	2.5%	84%	-6%	$34,753	$70,549
Performing and Creative Arts	1,364	-1	0.0%	1.1%	137%	-11%	$27,100	$38,704
Business Consulting	914	407	6.1%	4.3%	64%	12%	$49,292	$105,067
Engineering and Research and Development	618	26	0.4%	2.5%	60%	-11%	$117,226	$143,827
Computer Services and Software Publishers	484	199	5.4%	3.7%	27%	5%	$94,314	$177,162
Design Services	326	45	1.5%	2.5%	106%	-7%	$44,621	$58,158
Music	266	87	4.0%	1.6%	212%	50%	$25,079	$54,113
Architecture	190	32	1.9%	1.2%	102%	10%	$74,667	$97,327
Cultural Activities	170	84	7.0%	1.7%	143%	60%	$71,636	$78,551
Film, TV, Video Production/Distrib, Cable & Media Streaming	135	69	7.5%	1.6%	39%	18%	$70,542	$196,157
Publishing and Information	132	-122	-6.3%	-0.8%	40%	-29%	$51,465	$153,620
Art Education	73	1	0.1%	2.5%	44%	-10%	$24,762	$15,944
Radio and Television Broadcasting	67	14	2.4%	-0.7%	77%	22%	$45,302	$86,042
Specialty Education	986	248	2.9%	2.5%	111%	9%	$39,114	$35,912
Higher Education	100	34	4.2%	-0.1%	10%	4%	$47,527	$74,564

Table 26. Performance of the Detailed Hawai‘i County Targeted Industry Portfolio, cont.

Sectors [2/]	Jobs in Hawaii County		Av. Annual Job Growth 2014-2014		Concentration [1/]		Avg. Annual Earnings 2024	
	2024	Change 2014-2024	Hawaii County	U.S.	2024	Percentage Point Change 2014-2024	Hawaii County	U.S.
Health Practitioners	3,405	519	1.7%	2.4%	101%	-4%	$81,352	$96,512
Specialty Health Care Services	1,960	727	4.7%	3.6%	107%	14%	$68,174	$60,872
Hospitals and Nursing Facilities	1,116	51	0.5%	0.9%	30%	0%	$77,855	$92,141
Pharmacies	501	-80	-1.5%	-0.7%	109%	-4%	$42,297	$56,642
Medical Labs and Imaging Centers	239	51	2.4%	2.0%	135%	10%	$72,200	$95,996
Apparel	70	10	1.6%	-2.3%	98%	34%	$15,849	$51,321
Call Centers	28	11	5.3%	-2.7%	13%	7%	$29,726	$58,502
Technical Consulting Services	846	369	5.9%	4.4%	69%	11%	$42,509	$105,806
Information and Telecom Technology	569	132	2.7%	2.7%	50%	1%	$108,107	$169,240
Engineering and Related Services	419	48	1.2%	1.8%	43%	-1%	$93,643	$123,778
Computer System Design and Related services	414	106	3.0%	2.8%	27%	1%	$74,059	$161,538
R&D Services (except Biotechnology)	401	17	0.4%	3.0%	112%	-27%	$121,744	$163,378
Medical Labs and Imaging Centers	239	51	2.4%	2.0%	135%	10%	$72,200	$95,996
Chemical and Pharmaceutical Mfg	50	-33	-5.0%	1.6%	18%	-16%	$89,208	$164,373
Alternative Power Generation	48	4	0.9%	3.0%	104%	-19%	$188,073	$194,652
Other Technology Mfg	32	-15	-3.8%	1.0%	4%	-2%	$31,217	$140,502
Biotechnology	21	-15	-5.4%	7.0%	13%	-30%	$38,846	$246,393
Technology Equipment Distribution	16	5	4.2%	1.9%	5%	1%	$128,493	$173,404

1/ Proportion of jobs in the industry groups in the region compared to the proportion nationally.

Source: Lightcast™ and DBEDT calculations.

Maui County

As shown in Table 27 and referenced in Table 1, Maui County accounted for 19,723, equivalent to 12% of the state's 170,302 targeted and emerging industry jobs in 2024. From 2014-2024, Maui County's targeted average annual job growth rate of 1.5% was above Maui's civilian economy's rate of 0.9%, above the state's targeted rate of 1.2%, and below the nation's targeted rate of 1.8%. In 2024, average annual earnings per job for both Maui's civilian economy and targeted were lower than the state's comparable averages and the nation's comparable averages.

Among the six major sectors over the 2014-2024 period, the Health and Wellness Sector gained the greatest number of jobs at 2,901, having also the highest average annual job growth rate at 4.7%. The sector with the second highest concentration of industry compared to the nation's concentration was Agribusiness at 109,1%. However, this sector lost jobs at an average annual decline rate of 1.9%. The second largest sector was the creative sector at 3,657 jobs, with an average annual job growth rate of 0.5%. The Technology Sector had the highest average annual earnings per job in 2024 at $146,772.

Table 27. Performance of the Major Groups of Maui County Targeted Industry Portfolio

Sectors [2/]	Jobs in Maui County		Av. Annual Job Growth 2014-2014		Concentration [1/]		Avg. Annual Earnings 2024	
	2024	Change 2012-2024	Maui County	U.S.	2024	Percentage Point Change 2012-2024	Maui County	U.S.
Total Civilian	111,124	9,386	0.9%	1.8%	100.0%	0%	$63,241	$76,675
Total Targeted without Overlap	19,723	2,812	1.5%	1.8%	77.9%	5%	$66,127	$95,216
HEALTH & WELLNESS SECTOR	7,870	2,901	4.7%	1.8%	85.6%	26%	$84,044	$86,034
CREATIVE SECTOR	6,764	338	0.5%	2.5%	81.1%	-10%	$55,041	$110,391
AGRIBUSINESS SECTOR	3,657	-773	-1.9%	1.1%	109.1%	-26%	$48,752	$59,852
TECHNOLOGY SECTOR	2,346	459	2.2%	2.7%	34.8%	1%	$98,030	$146,772
EDUCATION (PRIVATE) SECTOR	868	296	4.3%	1.0%	47.0%	15%	$40,164	$56,621
OTHERS SECTOR	94	13	1.5%	-2.6%	34.5%	13%	$27,688	$56,699

1/ Proportion of jobs in the sector in the region compared to the proportion nationally.
2/ The sum of the individual sectors is greater than Total Targeted without Overlap since overlaps exist between sectors.
Source: Lightcast™ and DBEDT calculations.

Table 28 shows the performance of detailed targeted and emerging industry groups in Maui County. In 2024, Maui County's industry composition reflected a mix of established agricultural activities, a large and diverse creative sector, and a steadily expanding health care base. Health Practitioners remained the largest individual industry group with 3,370 jobs. Other mid-sized groups included Farm Production (2,523), Performing and Creative Arts (2,097), Marketing, Photography and Related (1,898), and Hospitals and Nursing Facilities (2,098).

Over the 2014–2024 period, several industry groups generated significant employment gains. The largest increase occurred in Hospitals and Nursing Facilities, which added 1,555 jobs (14.5% average annual growth)—the fastest rate among all major activities in Maui County and far above the national trend. Specialty Health Care Services also grew strongly, adding 1,081 jobs (9.5% annually). Other high-growth industries included Marketing, Photography and Related (+442 jobs; 2.7%), Business Consulting (+174; 3.5%), Information and Telecom Technology (+164; 3.8%), Computer Services and Software Publishers (+169; 3.6%), Technical Consulting Services (+156; 3.4%), and Specialty Education (+258; 3.9%).

Creative and media activities displayed uneven performance. Music experienced the largest contraction, losing 352 jobs (–11.5% annually), while Performing and Creative Arts (–156 jobs; –0.7%) and Publishing and Information (–34 jobs; –1.3%) also declined. Film, TV, Video Production and Media Streaming, however, remained relatively stable with only a modest five-job decline.

Maui County exhibits several areas of high specialization. Farm Production recorded a location quotient of 154%, reflecting employment shares well above the U.S. average. Fishing, Forestry and Hunting was even more concentrated (343%), underscoring the county's strong natural resource base. In the creative sector, Performing and Creative Arts (219%) and Music (121%) continue to represent distinctive local strengths despite recent job losses. Other specialized industries included Design Services (121%), Specialty Health Care Services (102%), Pharmacies (105%), and Apparel (108%). Between 2014 and 2024, the largest concentration increases occurred in Hospitals and Nursing Facilities (44 points), Specialty Health Care Services (48 points), Apparel (+42), and Specialty Education (+19).

Average annual earnings per job in 2024 were highest in technology - and research-intensive industries. Computer Services and Software Publishers reported the highest earnings per job at $142,183, followed by Engineering and Research and Development ($121,490), Information and Telecom Technology ($119,142), Chemical and Pharmaceutical Manufacturing ($86,958), and R&D Services except Biotechnology ($127,030). Among health-related activities, Hospitals and Nursing Facilities paid $107,146, and Health Practitioners earned $80,973. While Maui County's wages tend to fall below U.S. levels in high-technology and media industries, some sectors—such as Art Education and selective healthcare groups—approach or exceed national averages.

Overall, Maui County's targeted portfolio performance from 2014 to 2024 reflects strong expansion in health care, education, consulting, and select technology fields, persistent specialization in agriculture and creative arts, and competitive wages in several professional, technical, and research-oriented industries.

Table 28. Performance of the Detailed Maui County Targeted Industry Portfolio

Sectors [2/]	Jobs in Maui County		Av. Annual Job Growth 2014-2014		Concentration [1/]		Avg. Annual Earnings 2024	
	2024	Change 2014-2024	Maui County	U.S.	2024	Percentage Point Change 2014-2024	Maui County	U.S.
Farm Production	2,523	-677	-2.3%	0.0%	154%	-25%	$47,528	$44,955
Agric. Processing	548	-171	-2.7%	2.1%	54%	-26%	$57,575	$74,800
Agric. Support Services	316	117	4.7%	4.0%	77%	11%	$61,113	$70,472
Fishing, Forestry and Hunting	183	-53	-2.5%	-0.8%	343%	-33%	$17,863	$39,529
Agric. Inputs	83	11	1.4%	0.5%	62%	10%	$47,587	$92,469
Agric. Packaging and Warehsg	5	0	0.8%	1.8%	4%	0%	$73,708	$75,465
Performing and Creative Arts	2,097	-156	-0.7%	1.1%	219%	-22%	$32,521	$38,704
Marketing, Photography and Related	1,898	442	2.7%	2.5%	111%	11%	$36,076	$70,549
Business Consulting	592	174	3.5%	4.3%	43%	0%	$50,186	$105,067
Computer Services and Software Publishers	570	169	3.6%	3.7%	33%	2%	$142,183	$177,162
Design Services	360	55	1.7%	2.5%	121%	0%	$40,324	$58,158
Engineering and Research and Development	320	17	0.5%	2.5%	32%	-4%	$121,490	$143,827
Publishing and Information	247	-34	-1.3%	-0.8%	79%	3%	$145,486	$153,620
Architecture	174	18	1.1%	1.2%	97%	7%	$64,887	$97,327
Music	146	-352	-11.5%	1.6%	121%	-325%	$32,847	$54,113
Art Education	119	23	2.2%	2.5%	74%	4%	$26,834	$15,944
Film, TV, Video Production/Distrib, Cable & Media Streaming	113	-5	-0.4%	1.6%	34%	-4%	$54,980	$196,157
Cultural Activities	66	6	0.9%	1.7%	57%	1%	$62,737	$78,551
Radio and Television Broadcasting	62	-19	-2.6%	-0.7%	73%	-8%	$95,875	$86,042
Specialty Education	806	258	3.9%	2.5%	94%	19%	$37,172	$35,912
Higher Education	62	38	9.7%	-0.1%	6%	4%	$78,955	$74,564

Table 28. Performance of the Detailed Maui County Targeted Industry Portfolio, cont.

Sectors [2/]	Jobs in Maui County		Av. Annual Job Growth 2014-2014		Concentration [1/]		Avg. Annual Earnings 2024	
	2024	Change 2014-2024	Maui County	U.S.	2024	Percentage Point Change 2014-2024	Maui County	U.S.
Health Practitioners	3,370	347	1.1%	2.4%	103%	-5%	$80,973	$96,512
Hospitals and Nursing Facilities	2,098	1,555	14.5%	0.9%	59%	44%	$107,146	$92,141
Specialty Health Care Services	1,812	1,081	9.5%	3.6%	102%	48%	$73,200	$60,872
Pharmacies	462	-122	-2.3%	-0.7%	105%	-9%	$43,829	$56,642
Medical Labs and Imaging Centers	128	40	3.8%	2.0%	75%	17%	$84,981	$95,996
Apparel	74	13	1.9%	-2.3%	108%	42%	$23,319	$51,321
Call Centers	20	0	0.1%	-2.7%	10%	3%	$43,460	$58,502
Technical Consulting Services	544	156	3.4%	4.4%	46%	0%	$51,248	$105,806
Information and Telecom Technology	527	164	3.8%	2.7%	48%	8%	$119,142	$169,240
Computer System Design and Related services	510	70	1.5%	2.8%	34%	-2%	$127,577	$161,538
Engineering and Related Services	377	10	0.3%	1.8%	40%	-3%	$93,485	$123,778
Medical Labs and Imaging Centers	128	40	3.8%	2.0%	75%	17%	$84,981	$95,996
R&D Services (except Biotechnology)	120	22	2.1%	3.0%	35%	0%	$127,030	$163,378
Chemical and Pharmaceutical Mfg	49	18	4.6%	1.6%	18%	6%	$86,958	$164,373
Other Technology Mfg	46	-17	-3.1%	1.0%	6%	-3%	$84,591	$140,502
Alternative Power Generation	24	-4	-1.4%	3.0%	53%	-23%	$118,585	$194,652
Technology Equipment Distribution	15	-4	-2.2%	1.9%	5%	-2%	$77,146	$173,404
Biotechnology	7	4	7.1%	7.0%	5%	0%	$118,692	$246,393

1/ Proportion of jobs in the industry groups in the region compared to the proportion nationally. Source: Lightcast™ and DBEDT calculations.

Kaua‘i County

As shown in Table 29 and referenced in Table 1, Kaua‘i County accounted for 7,982 or 5% of the state’s 170,302 targeted and emerging industry jobs in 2024. From 2014 to 2024, Kaua‘i County’s targeted average annual job growth rate of 1.2% was lower than the overall Kaua‘i civilian economy’s rate of 1.4%, equal to the state’s targeted rate, and below the nation’s targeted rate of 1.8%. Average annual earnings per job for both Kaua‘i County’s civilian and targeted were lower than the state’s comparable averages and lower than the nation’s comparable averages.

Among the six major sectors over the 2014-2024 period, the Technology Sector gained the greatest number of jobs at 468, having also the highest average annual job growth rate at 4.7%. The Agribusiness Sector had the highest concentration of industry compared to the nation’s concentration at 131.4%. The second largest sector was the creative sector, which added 370 jobs, with an average annual job growth rate of 1.6%. The Technology Sector had the highest average annual earnings per job in 2024 at $111,592.

Table 29. Performance of the Major Groups of Kaua’i County Targeted Industry Portfolio

Sectors [2/]	Jobs in Kaui County		Av. Annual Job Growth 2014-2014		Concentration [1/]		Avg. Annual Earnings 2024	
	2024	Change 2012-2024	Kaui County	U.S.	2024	Percentage Point Change 2012-2024	Kaui County	U.S.
Total Civilian	49,351	6,378	1.4%	1.8%	100.0%	0%	$61,022	$76,675
Total Targeted without Overlap	7,982	924	1.2%	1.8%	71.0%	-1%	$65,952	$95,216
HEALTH & WELLNESS SECTOR	2,764	363	1.4%	1.8%	67.7%	0%	$83,223	$86,034
CREATIVE SECTOR	2,580	370	1.6%	2.5%	69.7%	-4%	$55,964	$110,391
AGRIBUSINESS SECTOR	1,956	15	0.1%	1.1%	131.4%	-9%	$42,867	$59,852
TECHNOLOGY SECTOR	1,281	468	4.7%	2.7%	42.8%	9%	$111,592	$146,772
EDUCATION (PRIVATE) SECTOR	274	105	5.0%	1.0%	33.3%	11%	$41,211	$56,621
OTHERS SECTOR	48	5	1.1%	-2.6%	39.3%	13%	$26,052	$56,699

1/ Proportion of jobs in the sector in the region compared to the proportion nationally.
2/ The sum of the individual sectors is greater than Total Targeted without Overlap since overlaps exist between sectors.
Source: Lightcast™ and DBEDT calculations.

Table 30 shows the performance of detailed targeted and emerging industry groups in Kaua‘i County. Kaua‘i County’s economic structure in 2024 reflects a mix of long-established agricultural activity, a smaller but diverse creative sector, and a stable cluster of health and professional services. Farm Production remained the largest single industry group with 1,333 jobs, though it declined by 121 jobs over the decade (–0.9% annually). Other important groups included Marketing, Photography and Related (684 jobs), Performing and Creative Arts (656), Business Consulting (380), and Health Practitioners (1,165).

Over the 2014–2024 period, several industry groups in Kaua‘i delivered notable employment gains. Business Consulting recorded the largest increase with +239 jobs (10.4% average annual

growth), followed by Specialty Health Care Services (+211 jobs; 5.6% annually), Technical Consulting Services (+232; 10.5% annually), and Specialty Education (+102; 5.0% annually). Strong growth also occurred in Computer Services and Software Publishers (+95 jobs; 5.8%), Computer System Design (+83; 4.9%), Engineering and Related Services (+41; 2.6%), and Information and Telecom Technology (+40; 2.6%). Alternative Power Generation experienced one of the most dramatic expansions, adding 52 jobs and growing at 35.7% annually, reflecting Kaua‘i’s rapid scaling of renewable energy capacity.

Creative activities showed mixed performance. Design Services (+18 jobs; 1.9%) and Art Education (+18; 5.5%) grew modestly, while Film, TV, and Media Production (+20 jobs; 4.2%) and Architecture (+26; 3.4%) also expanded. In contrast, Music (–15 jobs; –2.4%), Cultural Activities (–26 jobs; –3.8%), and Radio and Television Broadcasting (–22 jobs; –4.7%) experienced declines over the decade.

Kaua‘i County exhibits several areas of pronounced specialization. Fishing, Forestry and Hunting maintains an exceptionally high location quotient of 640%, driven by the county’s natural resource endowment. Other highly concentrated groups include Farm Production (183%), Alternative Power Generation (280%), Biotechnology (233%), Pharmacies (108%), Music (101%), Design Services (82%), and Architecture (114%). Concentration increased most notably between 2014 and 2024 in Alternative Power Generation (+263 points), Technical Consulting Services (+32), Business Consulting (+28), and several health-related industries including Specialty Health Care Services (+13) and Medical Labs and Imaging Centers (+14).

Average annual earnings per job in 2024 were the highest in advanced technical and energy-related fields. Alternative Power Generation recorded the highest compensation at $174,796, followed by Information and Telecom Technology ($180,526), Technology Equipment Distribution ($169,020), R&D Services except Biotechnology ($142,935), and Engineering and Related Services ($145,739). Professional services such as Computer Services and Software Publishers ($176,735) and Computer System Design ($116,738) also paid well above county averages. Health-related occupations offered solid earnings per job: Health Practitioners earned $91,160, and Medical Labs and Imaging Centers earned $76,251. As in the other counties, however, wages in high-technology and media industries remained below U.S. levels in most cases.

Overall, Kaua‘i County’s 2014–2024 targeted portfolio performance reflects strong gains in business and technical consulting, specialty health care, renewable energy, and selected professional and creative activities, continued specialization in agriculture and natural resource–based industries, and competitive compensation in technology, engineering, and energy-related sectors.

Table 30. Performance of the Detailed Kaua'i County Targeted Industry Portfolio

Sectors [2/]	Jobs in Kaui County		Av. Annual Job Growth 2014-2014		Concentration [1/]		Avg. Annual Earnings 2024	
	2024	Change 2014-2024	Kaui County	U.S.	2024	Percentage Point Change 2014-2024	Kaui County	U.S.
Farm Production	1,333	-121	-0.9%	0.0%	183%	-9%	$40,475	$44,955
Agric. Processing	350	114	4.0%	2.1%	78%	16%	$53,970	$74,800
Fishing, Forestry and Hunting	152	-7	-0.5%	-0.8%	640%	41%	$26,153	$39,529
Agric. Support Services	103	38	4.7%	4.0%	56%	6%	$60,643	$70,472
Agric. Inputs	17	-10	-4.5%	0.5%	28%	-17%	$43,056	$92,469
Agric. Packaging and Warehsg	3	1	4.7%	1.8%	6%	2%	$47,728	$75,465
Marketing, Photography and Related	684	-9	-0.1%	2.5%	91%	-23%	$37,707	$70,549
Performing and Creative Arts	656	25	0.4%	1.1%	155%	-6%	$31,617	$38,704
Business Consulting	380	239	10.4%	4.3%	62%	28%	$49,765	$105,067
Computer Services and Software Publishers	220	95	5.8%	3.7%	29%	6%	$176,735	$177,162
Engineering and Research and Development	122	5	0.5%	2.5%	28%	-5%	$123,810	$143,827
Design Services	108	18	1.9%	2.5%	82%	-3%	$40,533	$58,158
Architecture	91	26	3.4%	1.2%	114%	25%	$80,623	$97,327
Publishing and Information	69	-4	-0.6%	-0.8%	50%	3%	$43,069	$153,620
Film, TV, Video Production/Distrib, Cable & Media Streaming	60	20	4.2%	1.6%	41%	10%	$49,605	$196,157
Cultural Activities	55	-26	-3.8%	1.7%	108%	-74%	$55,461	$78,551
Music	54	-15	-2.4%	1.6%	101%	-46%	$24,603	$54,113
Art Education	44	18	5.5%	2.5%	62%	18%	$24,139	$15,944
Radio and Television Broadcasting	35	-22	-4.7%	-0.7%	94%	-42%	$51,398	$86,042
Specialty Education	262	102	5.0%	2.5%	69%	17%	$40,710	$35,912
Higher Education	12	4	3.6%	-0.1%	3%	1%	$52,233	$74,564

Table 30. Performance of the Detailed Kaua'i County Targeted Industry Portfolio cont.

Sectors [2/]	Jobs in Kaui County		Av. Annual Job Growth 2014-2014		Concentration [1/]		Avg. Annual Earnings 2024	
	2024	Change 2014-2024	Kaui County	U.S.	2024	Percentage Point Change 2014-2024	Kaui County	U.S.
Health Practitioners	1,165	173	1.6%	2.4%	81%	-4%	$91,160	$96,512
Hospitals and Nursing Facilities	817	-10	-0.1%	0.9%	52%	-4%	$94,175	$92,141
Specialty Health Care Services	501	211	5.6%	3.6%	64%	13%	$63,324	$60,872
Pharmacies	212	-31	-1.3%	-0.7%	108%	-3%	$46,680	$56,642
Medical Labs and Imaging Centers	70	20	3.4%	2.0%	92%	14%	$76,251	$95,996
Apparel	31	-7	-2.0%	-2.3%	101%	6%	$15,758	$51,321
Call Centers	17	12	13.1%	-2.7%	18%	14%	$45,000	$58,502
Technical Consulting Services	367	232	10.5%	4.4%	70%	32%	$50,623	$105,806
Computer System Design and Related services	219	83	4.9%	2.8%	33%	7%	$116,738	$161,538
Engineering and Related Services	179	41	2.6%	1.8%	43%	5%	$145,739	$123,778
Information and Telecom Technology	172	40	2.6%	2.7%	35%	1%	$180,526	$169,240
Biotechnology	159	-1	-0.1%	7.0%	233%	-214%	$112,921	$246,393
Medical Labs and Imaging Centers	70	20	3.4%	2.0%	92%	14%	$76,251	$95,996
Alternative Power Generation	55	52	35.7%	3.0%	280%	263%	$174,796	$194,652
R&D Services (except Biotechnology)	44	-5	-1.2%	3.0%	29%	-13%	$142,935	$163,378
Technology Equipment Distribution	14	11	15.7%	1.9%	10%	7%	$169,020	$173,404
Other Technology Mfg	1	-4	-12.9%	1.0%	0%	-1%	$31,866	$140,502

1/ Proportion of jobs in the industry groups in the region compared to the proportion nationally.
Source: Lightcast™ and DBEDT calculations.

CONCLUSIONS

Hawai‘i’s targeted and emerging industries make up a relatively small but meaningful share of the state’s economy, supporting more than 170,000 jobs and anchoring much of the state’s high-skill, high-wage activity. Although modest in employment scale compared to tourism or government, these industries play an outsized role in economic diversification, innovation, and long-term resilience. Their performance therefore provides an important indicator of Hawai‘i’s ability to compete in knowledge-intensive and specialized national markets.

Across the 2014–2024 period, the data show progress in several high-value niches, but also structural challenges that moderated growth. Many sectors—Technology, Creative, Health and Wellness, and parts of Agribusiness—recorded productivity gains above national benchmarks, even when job gains were limited. Meanwhile, sectors facing high costs, scale constraints, or global competition continued to underperform. The overall picture is neither a story of across-the-board success nor of broad stagnation, but one of selective competitive strengthening amid long-standing constraints.

The post-pandemic years demonstrate clearer improvement. Local competitive effects turned positive in most sectors after 2021, signaling renewed hiring, recovering productivity, and strengthening wage dynamics. This improvement is most visible in Technology, Creative industries, Specialty Health Care, and certain agribusiness niches—suggesting that the state’s industry portfolio is stabilizing and entering a new period of adaptation. These gains remain uneven across counties and industry groups, but they represent a notable shift from the patterns observed during the previous decade. Structural constraints remain significant, particularly in health care, scaling technology industries, and traditional agriculture.

The evidence suggests that Hawai‘i has achieved incremental, targeted successes, but long-run competitiveness will depend on continued investment in productivity, workforce development, and county-specific strengths.

APPENDIX A. DETAILED INDUSTRY GROUPINGS 1/

NAICS	Industry Description	Industry Group Name	Industry Group Abbreviation
111000	Crop Production	Farm Production	AG5
112000	Animal Production	Farm Production	AG5
113110	Timber Tract Operations	Fishing, Forestry and Hunting	AG6
113210	Forest Nurseries and Gathering of Forest Products	Fishing, Forestry and Hunting	AG6
114111	Finfish Fishing	Fishing, Forestry and Hunting	AG6
114112	Shellfish Fishing	Fishing, Forestry and Hunting	AG6
114210	Hunting and Trapping	Fishing, Forestry and Hunting	AG6
115112	Soil Preparation, Planting, and Cultivating	Farm Production	AG5
115113	Crop Harvesting, Primarily by Machine	Farm Production	AG5
115114	Postharvest Crop Activities (except Cotton Ginning)	Farm Production	AG5
115115	Farm Labor Contractors and Crew Leaders	Farm Production	AG5
115116	Farm Management Services	Farm Production	AG5
115210	Support Activities for Animal Production	Agric. Support Services	AG4
115310	Support Activities for Forestry	Agric. Support Services	AG4
221111	Hydroelectric Power Generation	Alternative Power Generation	TS1
221113	Nuclear Electric Power Generation	Alternative Power Generation	TS1
221114	Solar Electric Power Generation	Alternative Power Generation	TS1
221115	Wind Electric Power Generation	Alternative Power Generation	TS1
221116	Geothermal Electric Power Generation	Alternative Power Generation	TS1
221117	Biomass Electric Power Generation	Alternative Power Generation	TS1
221118	Other Electric Power Generation	Alternative Power Generation	TS1
311111	Dog and Cat Food Manufacturing	Agric. Processing	AG3
311119	Other Animal Food Manufacturing	Agric. Processing	AG3
311211	Flour Milling	Agric. Processing	AG3
311212	Rice Milling	Agric. Processing	AG3
311221	Wet Corn Milling	Other Technology Mfg	TS8
311224	Soybean and Other Oilseed Processing	Other Technology Mfg	TS8
311224	Soybean and Other Oilseed Processing	Agric. Processing	AG3
311314	Cane Sugar Manufacturing	Agric. Processing	AG3
311340	Nonchocolate Confectionery Manufacturing	Agric. Processing	AG3
311351	Chocolate and Confectionery Manufacturing from Cacao Beans	Agric. Processing	AG3
311352	Confectionery Manufacturing from Purchased Chocolate	Agric. Processing	AG3
311411	Frozen Fruit, Juice, and Vegetable Manufacturing	Agric. Processing	AG3
311412	Frozen Specialty Food Manufacturing	Agric. Processing	AG3
311421	Fruit and Vegetable Canning	Agric. Processing	AG3
311423	Dried and Dehydrated Food Manufacturing	Agric. Processing	AG3
311511	Fluid Milk Manufacturing	Agric. Processing	AG3
311513	Cheese Manufacturing	Agric. Processing	AG3
311520	Ice Cream and Frozen Dessert Manufacturing	Agric. Processing	AG3
311611	Animal (except Poultry) Slaughtering	Agric. Processing	AG3
311612	Meat Processed from Carcasses	Agric. Processing	AG3
311613	Rendering and Meat Byproduct Processing	Agric. Processing	AG3
311615	Poultry Processing	Agric. Processing	AG3
311710	Seafood Product Preparation and Packaging	Agric. Processing	AG3
311812	Commercial Bakeries	Agric. Processing	AG3
311813	Frozen Cakes, Pies, and Other Pastries Manufacturing	Agric. Processing	AG3
311821	Cookie and Cracker Manufacturing	Agric. Processing	AG3
311824	Dry Pasta, Dough, and Flour Mixes Manufacturing from Purchased Flour	Agric. Processing	AG3
311830	Tortilla Manufacturing	Agric. Processing	AG3
311213	Malt Manufacturing	Agric. Processing	AG3
311422	Specialty Canning	Agric. Processing	AG3
311911	Roasted Nuts and Peanut Butter Manufacturing	Agric. Processing	AG3
311919	Other Snack Food Manufacturing	Agric. Processing	AG3
311920	Coffee and Tea Manufacturing	Agric. Processing	AG3
311930	Flavoring Syrup and Concentrate Manufacturing	Agric. Processing	AG3
311942	Spice and Extract Manufacturing	Agric. Processing	AG3
311991	Perishable Prepared Food Manufacturing	Agric. Processing	AG3
311999	All Other Miscellaneous Food Manufacturing	Agric. Processing	AG3
312111	Soft Drink Manufacturing	Agric. Processing	AG3

Appendix A. Detailed Industry Groupings (cont'd)

NAICS	Industry Description	Industry Group Name	Industry Group Abbreviation
312112	Bottled Water Manufacturing	Agric. Processing	AG3
312113	Ice Manufacturing	Agric. Processing	AG3
312120	Breweries	Agric. Processing	AG3
312130	Wineries	Agric. Processing	AG3
312140	Distilleries	Agric. Processing	AG3
315210	Cut and Sew Apparel Contractors	Apparel	OT1
315250	Cut and Sew Apparel Manufacturing (except Contractors)	Apparel	OT1
315990	Apparel Accessories and Other Apparel Manufacturing	Apparel	OT1
321920	Wood Container and Pallet Manufacturing	Agric. Packaging and Warehsg	AG2
325193	Ethyl Alcohol Manufacturing	Chemical and Pharmaceutical Mfg	TS3
325199	All Other Basic Organic Chemical Manufacturing	Chemical and Pharmaceutical Mfg	TS3
325211	Plastics Material and Resin Manufacturing	Chemical and Pharmaceutical Mfg	TS3
325220	Artificial and Synthetic Fibers and Filaments Manufacturing	Chemical and Pharmaceutical Mfg	TS3
325311	Nitrogenous Fertilizer Manufacturing	Chemical and Pharmaceutical Mfg	TS3
325311	Nitrogenous Fertilizer Manufacturing	Agric. Inputs	AG1
325312	Phosphatic Fertilizer Manufacturing	Chemical and Pharmaceutical Mfg	TS3
325314	Fertilizer (Mixing Only) Manufacturing	Agric. Inputs	AG1
325315	Compost Manufacturing	Agric. Inputs	AG1
325320	Pesticide and Other Agricultural Chemical Manufacturing	Chemical and Pharmaceutical Mfg	TS3
325320	Pesticide and Other Agricultural Chemical Manufacturing	Agric. Inputs	AG1
325411	Medicinal and Botanical Manufacturing	Chemical and Pharmaceutical Mfg	TS3
325412	Pharmaceutical Preparation Manufacturing	Chemical and Pharmaceutical Mfg	TS3
325413	In-Vitro Diagnostic Substance Manufacturing	Chemical and Pharmaceutical Mfg	TS3
325414	Biological Product (except Diagnostic) Manufacturing	Chemical and Pharmaceutical Mfg	TS3
326160	Plastics Bottle Manufacturing	Agric. Packaging and Warehsg	AG2
332431	Metal Can Manufacturing	Agric. Packaging and Warehsg	AG2
333111	Farm Machinery and Equipment Manufacturing	Agric. Inputs	AG1
333242	Semiconductor Machinery Manufacturing	Other Technology Mfg	TS8
333310	Commercial and Service Industry Machinery Manufacturing	Other Technology Mfg	TS8
334290	Other Communications Equipment Manufacturing	Other Technology Mfg	TS8
334310	Audio and Video Equipment Manufacturing	Other Technology Mfg	TS8
334510	Electromedical and Electrotherapeutic Apparatus Manufacturing	Other Technology Mfg	TS8
334511	Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing	Other Technology Mfg	TS8
334513	Instruments and Related Products Manufacturing for Measuring, Displaying, and Controlling Industrial Process Variables	Other Technology Mfg	TS8
334516	Analytical Laboratory Instrument Manufacturing	Other Technology Mfg	TS8
334517	Irradiation Apparatus Manufacturing	Other Technology Mfg	TS8
334610	Manufacturing and Reproducing Magnetic and Optical Media	Film, TV, Video Production/Distrib, Cable & Media Streaming	CS8
335921	Fiber Optic Cable Manufacturing	Other Technology Mfg	TS8
336411	Aircraft Manufacturing	Other Technology Mfg	TS8
336412	Aircraft Engine and Engine Parts Manufacturing	Other Technology Mfg	TS8
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	Other Technology Mfg	TS8
336414	Guided Missile and Space Vehicle Manufacturing	Other Technology Mfg	TS8
336415	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing	Other Technology Mfg	TS8
336419	Other Guided Missile and Space Vehicle Parts and Auxiliary Equipment Manufacturing	Other Technology Mfg	TS8
339112	Surgical and Medical Instrument Manufacturing	Other Technology Mfg	TS8
339113	Surgical Appliance and Supplies Manufacturing	Other Technology Mfg	TS8
339114	Dental Equipment and Supplies Manufacturing	Other Technology Mfg	TS8
339115	Ophthalmic Goods Manufacturing	Other Technology Mfg	TS8
339116	Dental Laboratories	Other Technology Mfg	TS8
423420	Office Equipment Merchant Wholesalers	Technology Equipment Distribution	TS11
423430	Computer and Computer Peripheral Equipment and Software Merchant Wholesalers	Technology Equipment Distribution	TS11
423450	Medical, Dental, and Hospital Equipment and Supplies Merchant Wholesalers	Technology Equipment Distribution	TS11
424520	Livestock Merchant Wholesalers	Agric. Inputs	AG1
424590	Other Farm Product Raw Material Merchant Wholesalers	Agric. Inputs	AG1
424910	Farm Supplies Merchant Wholesalers	Agric. Inputs	AG1
456110	Pharmacies and Drug Retailers	Pharmacies	HW4
459140	Musical Instrument and Supplies Retailers	Music	CS10
459920	Art Dealers	Performing and Creative Arts	CS11
493120	Refrigerated Warehousing and Storage	Agric. Packaging and Warehsg	AG2

Appendix A. Detailed Industry Groupings (cont'd)

NAICS	Industry Description	Industry Group Name	Industry Group Abbreviation
512110	Motion Picture and Video Production	Film, TV, Video Production/Distrib, Cable & Media Streaming	CS8
512120	Motion Picture and Video Distribution	Film, TV, Video Production/Distrib, Cable & Media Streaming	CS8
512191	Teleproduction and Other Postproduction Services	Film, TV, Video Production/Distrib, Cable & Media Streaming	CS8
512230	Music Publishers	Music	CS10
512240	Sound Recording Studios	Music	CS10
512250	Record Production and Distribution	Music	CS10
512290	Other Sound Recording Industries	Music	CS10
513110	Newspaper Publishers	Publishing and Information	CS12
513120	Periodical Publishers	Publishing and Information	CS12
513130	Book Publishers	Publishing and Information	CS12
513140	Directory and Mailing List Publishers	Publishing and Information	CS12
513191	Greeting Card Publishers	Publishing and Information	CS12
513199	All Other Publishers	Publishing and Information	CS12
513210	Software Publishers	Information and Telecom Technology	TS6
513210	Software Publishers	Computer Services and Software Publishers	CS4
516110	Radio Broadcasting Stations	Radio and Television Broadcasting	CS13
516120	Television Broadcasting Stations	Radio and Television Broadcasting	CS13
516210	Media Streaming Distribution Services, Social Networks, and Other Media Networks and Content Providers	Film, TV, Video Production/Distrib, Cable & Media Streaming	CS8
517111	Wired Telecommunications Carriers	Information and Telecom Technology	TS6
517112	Wireless Telecommunications Carriers (except Satellite)	Information and Telecom Technology	TS6
517410	Satellite Telecommunications	Information and Telecom Technology	TS6
517810	All Other Telecommunications	Information and Telecom Technology	TS6
518210	Data Processing, Hosting, and Related Services	Information and Telecom Technology	TS6
519290	Web Search Portals and All Other Information Services	Publishing and Information	CS12
523160	Commodity Contracts Intermediation	Agric. Support Services	AG4
541310	Architectural Services	Engineering and Related Services	TS5
541310	Architectural Services	Architecture	CS2
541320	Landscape Architectural Services	Engineering and Related Services	TS5
541320	Landscape Architectural Services	Architecture	CS2
541330	Engineering Services	Engineering and Related Services	TS5
541330	Engineering Services	Engineering and Research and Development	CS7
541340	Drafting Services	Design Services	CS6
541360	Geophysical Surveying and Mapping Services	Engineering and Related Services	TS5
541380	Testing Laboratories	Engineering and Related Services	TS5
541410	Interior Design Services	Design Services	CS6
541420	Industrial Design Services	Design Services	CS6
541430	Graphic Design Services	Design Services	CS6
541490	Other Specialized Design Services	Design Services	CS6
541511	Custom Computer Programming Services	Computer System Design and Related services	TS4
541511	Custom Computer Programming Services	Computer Services and Software Publishers	CS4
541512	Computer Systems Design Services	Computer System Design and Related services	TS4
541512	Computer Systems Design Services	Computer Services and Software Publishers	CS4
541513	Computer Facilities Management Services	Computer System Design and Related services	TS4
541519	Other Computer Related Services	Computer System Design and Related services	TS4
541611	Administrative Management and General Management Consulting Services	Technical Consulting Services	TS10
541611	Administrative Management and General Management Consulting Services	Business Consulting	CS3
541612	Human Resources Consulting Services	Business Consulting	CS3
541613	Marketing Consulting Services	Marketing, Photography and Related	CS9
541614	Process, Physical Distribution, and Logistics Consulting Services	Technical Consulting Services	TS10
541614	Process, Physical Distribution, and Logistics Consulting Services	Business Consulting	CS3
541618	Other Management Consulting Services	Business Consulting	CS3
541620	Environmental Consulting Services	Technical Consulting Services	TS10
541620	Environmental Consulting Services	Business Consulting	CS3

Appendix A. Detailed Industry Groupings (cont'd)

NAICS	Industry Description	Industry Group Name	Industry Group Abbreviation
541690	Other Scientific and Technical Consulting Services	Technical Consulting Services	TS10
541690	Other Scientific and Technical Consulting Services	Business Consulting	CS3
541714	Research and Development in Biotechnology (except Nanobiotechnology)	Biotechnology	TS2
541715	Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)	R&D Services (except Biotechnology)	TS9
541715	Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)	Engineering and Research and Development	CS7
541720	Research and Development in the Social Sciences and Humanities	R&D Services (except Biotechnology)	TS9
541720	Research and Development in the Social Sciences and Humanities	Engineering and Research and Development	CS7
541810	Advertising Agencies	Marketing, Photography and Related	CS9
541820	Public Relations Agencies	Marketing, Photography and Related	CS9
541830	Media Buying Agencies	Marketing, Photography and Related	CS9
541840	Media Representatives	Marketing, Photography and Related	CS9
541850	Outdoor Advertising	Marketing, Photography and Related	CS9
541860	Direct Mail Advertising	Marketing, Photography and Related	CS9
541870	Advertising Material Distribution Services	Marketing, Photography and Related	CS9
541890	Other Services Related to Advertising	Marketing, Photography and Related	CS9
541910	Marketing Research and Public Opinion Polling	Marketing, Photography and Related	CS9
541921	Photography Studios, Portrait	Marketing, Photography and Related	CS9
541922	Commercial Photography	Marketing, Photography and Related	CS9
541940	Veterinary Services	Agric. Support Services	AG4
541990	All Other Professional, Scientific, and Technical Services	Marketing, Photography and Related	CS9
561421	Telephone Answering Services	Call Centers	OT2
561422	Telemarketing Bureaus and Other Contact Centers	Call Centers	OT2
611210	Junior Colleges	Higher Education	ED1
611310	Colleges, Universities, and Professional Schools	Higher Education	ED1
611410	Business and Secretarial Schools	Specialty Education	ED2
611420	Computer Training	Computer System Design and Related services	TS4
611420	Computer Training	Specialty Education	ED2
611430	Professional and Management Development Training	Specialty Education	ED2
611511	Cosmetology and Barber Schools	Specialty Education	ED2
611512	Flight Training	Specialty Education	ED2
611519	Other Technical and Trade Schools	Specialty Education	ED2
611610	Fine Arts Schools	Art Education	CS1
611610	Fine Arts Schools	Specialty Education	ED2
611620	Sports and Recreation Instruction	Specialty Education	ED2
611630	Language Schools	Specialty Education	ED2
611699	All Other Miscellaneous Schools and Instruction	Specialty Education	ED2
611710	Educational Support Services	Specialty Education	ED2
621111	Offices of Physicians (except Mental Health Specialists)	Health Practitioners	HW1
621112	Offices of Physicians, Mental Health Specialists	Health Practitioners	HW1
621210	Offices of Dentists	Health Practitioners	HW1
621310	Offices of Chiropractors	Health Practitioners	HW1
621320	Offices of Optometrists	Health Practitioners	HW1
621330	Offices of Mental Health Practitioners (except Physicians)	Health Practitioners	HW1
621340	Offices of Physical, Occupational and Speech Therapists, and Audiologists	Health Practitioners	HW1
621391	Offices of Podiatrists	Health Practitioners	HW1
621399	Offices of All Other Miscellaneous Health Practitioners	Health Practitioners	HW1
621410	Family Planning Centers	Specialty Health Care Services	HW5
621420	Outpatient Mental Health and Substance Abuse Centers	Specialty Health Care Services	HW5
621491	HMO Medical Centers	Specialty Health Care Services	HW5
621492	Kidney Dialysis Centers	Specialty Health Care Services	HW5
621493	Freestanding Ambulatory Surgical and Emergency Centers	Specialty Health Care Services	HW5
621498	All Other Outpatient Care Centers	Specialty Health Care Services	HW5
621511	Medical Laboratories	Medical Labs and Imaging Centers	TS7
621511	Medical Laboratories	Medical Labs and Imaging Centers	HW3
621512	Diagnostic Imaging Centers	Medical Labs and Imaging Centers	TS7
621512	Diagnostic Imaging Centers	Medical Labs and Imaging Centers	HW3
621610	Home Health Care Services	Specialty Health Care Services	HW5
622110	General Medical and Surgical Hospitals	Hospitals and Nursing Facilities	HW2
622210	Psychiatric and Substance Abuse Hospitals	Hospitals and Nursing Facilities	HW2
622310	Specialty (except Psychiatric and Substance Abuse) Hospitals	Hospitals and Nursing Facilities	HW2
623110	Nursing Care Facilities (Skilled Nursing Facilities)	Hospitals and Nursing Facilities	HW2

Appendix A. Detailed Industry Groupings (cont'd)

NAICS	Industry Description	Industry Group Name	Industry Group Abbreviation
711110	Theater Companies and Dinner Theaters	Performing and Creative Arts	CS11
711120	Dance Companies	Performing and Creative Arts	CS11
711130	Musical Groups and Artists	Music	CS10
711190	Other Performing Arts Companies	Performing and Creative Arts	CS11
711310	Promoters of Performing Arts, Sports, and Similar Events with Facilities	Performing and Creative Arts	CS11
711320	Promoters of Performing Arts, Sports, and Similar Events without Facilities	Performing and Creative Arts	CS11
711410	Agents and Managers for Artists, Athletes, Entertainers, and Other Public Figures	Performing and Creative Arts	CS11
711510	Independent Artists, Writers, and Performers	Performing and Creative Arts	CS11
712110	Museums	Cultural Activities	CS5
712120	Historical Sites	Cultural Activities	CS5
712190	Nature Parks and Other Similar Institutions	Cultural Activities	CS5
813211	Grantmaking Foundations	Cultural Activities	CS5

Source: DBEDT

1/ An industry may be counted in more than one sector or industry group. The shaded industries are counted in different sectors.

APPENDIX B. DUPLICATED NAICS

	NAICS Industries	Industry Group	Abbrev.	Industry Group	Abbrev.	2024 jobs
Creative Sector						**22,614**
541614	Process, Physical Distribution, and Logistics Consulting Services	Business Consulting	CS3	Technical Consulting Services	TS10	529
541620	Environmental Consulting Services	Business Consulting	CS3	Technical Consulting Services	TS10	1,152
513210	Software Publishers	Computer Services and Software Publishers	CS4	Information and Telecom Technology	TS6	829
541511	Custom Computer Programming Services	Computer Services and Software Publishers	CS4	Computer System Design and Related services	TS4	1,714
541330	Engineering Services	Engineering and Research and Development	CS7	Engineering and Related Services	TS5	5,196
541611	Administrative Management and General Management Consulting Services	Business Consulting	CS3	Technical Consulting Services	TS10	4,105
541690	Other Scientific and Technical Consulting Services	Business Consulting	CS3	Technical Consulting Services	TS10	1,182
541512	Computer Systems Design Services	Computer Services and Software Publishers	CS4	Computer System Design and Related services	TS4	3,681
541310	Architectural Services	Architecture	CS2	Engineering and Related Services	TS5	1,557
541320	Landscape Architectural Services	Architecture	CS2	Engineering and Related Services	TS5	368
541715	Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)	Engineering and Research and Development	CS7	R&D Services (except Biotechnology)	TS9	1,227
541720	Research and Development in the Social Sciences and Humanities	Engineering and Research and Development	CS7	R&D Services (except Biotechnology)	TS9	164
611610	Fine Arts Schools	Art Education	CS1	Specialty Education	ED2	911
Technology Sector Overlap						**2,139**
325311	Nitrogenous Fertilizer Manufacturing	Chemical and Pharmaceutical Mfg	TS3	Agric. Inputs	AG1	16
325320	Pesticide and Other Agricultural Chemical Manufacturing	Chemical and Pharmaceutical Mfg	TS3	Agric. Inputs	AG1	6
611420	Computer Training	Computer System Design and Related services	TS4	Specialty Education	ED2	119
621511	Medical Laboratories	Medical Labs and Imaging Centers	TS7	Specialty Education	HW3	1,806
621512	Diagnostic Imaging Centers	Medical Labs and Imaging Centers	TS7	Medical Labs and Imaging Centers	HW3	176
311224	Soybean and Other Oilseed Processing	Other Technology Mfg	TS8	Agric. Processing	AG3	16

APPENDIX C – ANALYTICAL FRAMEWORK, OVERLAP TREATMENT, AND DATA SOURCES

C.1. Shift–Share Framework

C.1.1. Classic Shift–Share

Shift–share analysis, widely used in local economics, decomposes local industry growth into three components:

1. National Growth Effect (NG): growth that would have occurred if all local industries had simply followed overall U.S. employment growth.
2. Industry Mix Effect (IM): additional growth (positive or negative) resulting from the national performance of each industry relative to the overall U.S. economy.
3. Regional Shift Effect (RS): the *local competitive effect*, capturing how much faster or slower the local industry grew compared with its national counterpart.

The classic formulation decomposes the change in employment (or any other relevant measure) in industry i in Hawai‘i between two points in time (0 and T):

$$\Delta E_{ir} = NGE_{ir} + IME_{ir} + RSE_{ir}$$

Where:

- $\Delta E_{ir} = change\ in\ employment\ in\ region\ r, industry\ i.$
- National Growth Effect: $NGE_{ir} = E_{ir}^{0} \cdot g_N$; How much the region's industry would have grown if it followed overall national employment growth g_N.
- Industry Mix Effect: $IME_{ir} = E_{ir}^{o} \cdot (g_i - g_N)$. Adjusts for the fact that industries grow at different rates g_i nationally. It shows the advantage/disadvantage of having more employment in fast- or slow-growing industries.
- Regional Shift Effect: $RSE_{ir} = E_{ir}^{o} \cdot (g_{ir} - g_i)$. The "local competitive effect." It measures how much the region's industry outperformed (or underperformed) its national counterpart.

While intuitive and transparent, this classic two-year approach has important limitations for long periods or volatile conditions:

- Sensitivity to start/end years: Results can be distorted if either year corresponds to an unusual event (e.g., recession, pandemic shock, or rebound).
- No intra-period dynamics: Only the endpoints are compared; intermediate booms, contractions, and trend shifts are ignored.

C.1.2. Dynamic Deterministic Shift–Share (DDSS)

To address these limitations, this report applies a Deterministic Dynamic Shift–Share (DDSS) model. Rather than comparing only two points in time, DDSS performs the decomposition year by year and then aggregates the annual effects over the full study window.

Let:

- $t = t_0, t_0 + 1, \ldots, T$
- E_{ir}^t= employment in industry *i*, region *r*, at time *t*
- $\Delta E_{ir}^t = E_{ir}^{t+1} - E_{ir}^t$= annual change in employment

For each interval $[t, t+1]$, the annual change is decomposed as:

$$\Delta E_{ir}^t = NG_{ir}^t + IM_{ir}^t + RS_{ir}^t$$

where:

- $NG_{ir}^t = E_{ir}^t \cdot g_N^t$: national growth effect in year *t*
- $IM_{ir}^t = E_{ir}^t \cdot (g_i^t - g_N^t)$: industry mix effect in year *t*
- $RS_{ir}^t = E_{ir}^t \cdot (g_{ir}^t - g_i^t)$: regional shift (local competitive) effect in year *t*
- To obtain the cumulative effect over the full period from $t_0$to *T*, we sum over all years:

$$\Delta E_{ir} = \sum_{t=t_0}^{T} \Delta E_{ir}^t = \sum_{t=t_0} (NGE_{ir}^t + IME_{ir}^t + RSE_{ir}^t)$$

This dynamic formulation:

- Reduces distortions from a single pair of start and end years.
- Produces a time series of effects, allowing the identification of turning points and structural breaks.
- Supports multiple *windows* (e.g., 2014–2024 and 2021–2024) to distinguish long-run structural shifts from short-run post-pandemic dynamics.

In this report, an analogous dynamic decomposition is applied not only to jobs, but also to productivity (GRP per job) and to earnings per job, generating competitive components for all three indicators.

C.1.3. Concentration as a Complementary Measure

Alongside DDSS, the report uses **employment concentration** to measure Hawai‘i’s specialization in each industry group or sector relative to the nation. Concentration is defined as the ratio of:

- the share of state jobs in a given activity, to
- the share of U.S. jobs in that same activity.

High concentration can signal mature local clusters or export-oriented activities but does not by itself imply a competitive advantage. In this framework:

- Concentration is a *structural* indicator of specialization.
- DDSS local competitive effects (for Jobs, Productivity, and Earnings per Job) indicate whether those specialized industries are currently outperforming or lagging behind their national peers.

Used together, these measures show both where Hawai‘i is most specialized and how those specializations are performing competitively.

C.2. Performance Classification Framework

The DDSS model is applied to three core indicators:

- Jobs (J): Regional competitive component of employment, showing how much faster or slower Hawai‘i’s industries added jobs compared with the same industries nationally.
- Productivity (P): Regional competitive component of Gross Regional Product (GRP) per job, capturing whether local industries improved productivity and value added relative to their national benchmarks.
- Earnings per Job (E): Regional competitive component of earnings per job, indicating whether workers benefited proportionally from local productivity gains.

The classification is based only on these competitive components. It isolates Hawai‘i-specific performance, net of overall U.S. growth and industry-wide trends. This focus highlights local strengths, pressures, and structural adjustments that cannot be explained solely by national conditions.

Each variable J, P, E can be positive (+) or negative (–), indicating whether Hawai‘i’s regional competitive effect was favorable or unfavorable relative to the nation. Combinations of signs for Jobs and Productivity define four primary quadrants in a Performance Map, with Earnings per Job (E) indicating whether gains are shared with workers:

1. Jobs and Productivity Growth (J+, P+, E±):
   Industries adding jobs faster than nationally and improving productivity. This quadrant reflects scalable, high-value activities with durable local advantages. Positive E suggests workers share in these gains; negative E suggests value accrues mainly to firms or upstream suppliers.
2. Jobs Growth, Productivity Shrinkage (J+, P–, E±):
   Industries gaining jobs competitively but lagging in productivity. This pattern may be typical in short-run rebounds but can signal cost pressures or productivity gaps if persistent. Earnings outcomes indicate whether wage growth is sustained by productivity or by cost squeezes elsewhere.
3. Jobs Shrinkage, Productivity Growth (J–, P+, E±):
   Activities with shrinking employment but rising productivity, often due to automation, capital deepening, or a shift toward higher-value segments. Positive E indicates that workers capture part of the productivity gains; negative E suggests that returns accrue primarily to capital or outside owners.
4. Jobs and Productivity Shrinkage (J–, P–, E±):
   Industries losing both jobs and productivity relative to their national peers. This quadrant is

associated with structural decline, downsizing, or relocation. If E is positive, earnings per job may rise within a shrinking base (compositional upskilling); negative E is the classic pattern of decline.

Table C3. Performance Classifications Based on DDSS Framework

Jobs and Productivity Growth (J+, P+, E±)	**Jobs Growth, Productivity Shrinkage (J+, P–, E±)**
Industries are gaining scale and efficiency simultaneously. These activities grow faster than their national counterparts and often support stable or rising wages.	Industries are adding jobs more quickly than the nation but with lagging productivity. These sectors may be scaling through labor rather than efficiency.
Jobs Shrinkage, Productivity Growth (J–, P+, E±)	**Jobs and Productivity Shrinkage (J–, P–, E±)**
Industries with rising productivity but shrinking employment. These typically reflect automation, specialization, or capital deepening. Earnings may rise if gains are shared with workers or stagnate if value accrues mainly to firms or upstream suppliers.	Industries are under structural stress, declining in both jobs and productivity. This pattern often signals long-run contraction, digital disruption, or shifts in demand or national policy.

J±, P±, E±: Sign of change for local competitive components of Jobs, Productivity, and Earnings per Job during the period.

C.3. Accounting for Overlaps in the Technology and Creative Sectors

A distinctive feature of Hawai‘i’s industry structure is that several Technology and Creative sector activities share the same six-digit NAICS codes. These overlaps arise because many innovation-related activities—such as software development, engineering, consulting, architecture, digital media, and R&D—naturally span both technical and creative domains. As documented in Appendix B, a subset of NAICS industries is assigned simultaneously to a Creative-sector industry group and to a Technology-sector industry group.

These shared assignments are not classification errors; they reflect Hawai‘i’s interdisciplinary, knowledge-based economy. However, if left unadjusted, they would double-count employment, earnings per job, and productivity in both sectors. Because these overlaps occur only between the Technology and Creative sectors, adjustments are required only for these two sectors in this report.

C.3.1. Dual-View Framework

To ensure accuracy and transparency, the 2025 update adopts a dual-view framework for the Technology and Creative sectors:

- Full Ecosystem View (With Overlap):
  Includes all NAICS codes assigned to each sector, even those appearing in both. This view

highlights the complete innovation ecosystem and the shared skills and activities spanning creative and technical fields.
- Core View (Without Overlap):
  Removes duplicated NAICS codes so each six-digit NAICS industry is counted only once in the statewide totals.

In practice:

- The Creative Sector excludes 22,614 duplicated jobs (see Appendix B), mostly overlapping with Technology-sector industry groups (e.g., 513210, 541310, 541320, 541330, 541511, 541512, 541611, 541614, 541620, 541690, 541715, 541720, 611610).
- The Technology Sector excludes 2,139 duplicated jobs overlapping with non-Creative sectors (e.g., 325311, 325320, 611420, 621511, 621512, 311224).

These adjustments isolate each sector's distinct contribution to statewide employment, productivity, and earnings per job, while still allowing an ecosystem view that emphasizes cross-sector linkages.

No other sector in the Targeted Industry Portfolio requires an overlap adjustment. A minor exception is Fine Arts Schools (NAICS 611610), which appears in both the Creative Sector (Art Education, CS1) and the Private Education Sector (Specialty Education, ED2). Because the associated job count (911 in 2024) is small relative to the size of those sectors, this overlap does not materially affect totals, growth rates, or DDSS competitive effects. Accordingly, the Private Education Sector is not adjusted for this duplication; Fine Arts Schools remain in both sectors for reporting purposes.

For all Technology and Creative sector tables, charts, and performance classifications, results are presented in both views:

- Core View (Without Overlap): Non-duplicated sector totals.
- Full Ecosystem View (With Overlap): Including shared activities across sectors.

This dual presentation avoids double-counting, preserves comparability across sectors, and acknowledges the highly interconnected nature of Hawai'i's Creative and Technology economies.

C.4. Data Sources

Jobs and earnings per job in this report include wage-and-salary employment, self-employed workers, and proprietors. The primary data source is DBEDT's subscription to **Lightcast™** databases, which integrate multiple federal and proprietary sources to construct detailed state and county series on jobs, occupations, earnings per job, and output.

Key underlying sources include:

- U.S. Bureau of Labor Statistics (BLS), Quarterly Census of Employment and Wages (QCEW) and related datasets.
- U.S. Bureau of Economic Analysis (BEA), Gross State Product (GSP) and state personal income accounts.

- Lightcast's national Input–Output model and associated industry earnings per job data.
- BEA National Income and Product Accounts (NIPA).

Lightcast harmonizes these inputs to produce internally consistent time series for employment, earnings, and Gross Regional Product by detailed NAICS industry. DBEDT then applies the DDSS methodology and sectoral definitions described in Appendices A and B to derive the indicators reported here.

C.5. Selected References

Classic and Dynamic Shift–Share; Regional Decomposition Methods

- Dunn, E. S. (1960). "A Statistical and Analytical Technique for Regional Analysis." *Papers in Regional Science*, 6(1), 97–112.
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- Nazara, S., & Hewings, G. J. D. (2004). "Spatial Structure and Taxonomy of Decomposition in Shift–Share Analysis." *Growth and Change*, 35(4), 476–490.

Performance Mapping and Structural Change

- Markusen, A., & Schrock, G. (2006). "The Distinctive City: Divergent Patterns in Growth, Hierarchy and Specialization." *Urban Studies*, 43(8), 1301–1323.
- Porter, M. E. (1990). *The Competitive Advantage of Nations.* New York: Free Press.

These references underpin the use of dynamic shift–share techniques and the interpretation of four-quadrant performance maps that jointly consider employment, productivity, and earnings per job outcomes.

APPENDIX D

CREATIVE AND TECHNOLOGY SECTORS WITHOUT OVERLAP

Several industries—especially within the Creative Sector—span multiple domains such as digital media, design, software, engineering, consulting, and R&D. These overlaps arise from Hawai‘i’s interdisciplinary, knowledge-based economy and are not classification errors. However, they can produce double-counting if not carefully treated.

To ensure transparency and avoid inflating totals, this appendix presents views of the Technology and creative sectors without overlaps:

This dual-view approach preserves clarity while acknowledging that Hawai‘i’s emerging economy increasingly operates across creative-technical boundaries.

Creative Sector without Overlaps

In the Creative Sector defined without overlapping industries, the competitive map shows broadly dissimilar structural patterns but with clearer attribution of activity to exclusively creative industry groups

2014–2024 Window (Long-Run Structural Performance)

As in the overlap view, the bubble plots for 2014–2024 and 2021–2024 position each industry group by its local competitive effects in jobs (vertical axis) and productivity (horizontal axis), with bubble size proportional to Hawai‘i’s employment base. The earnings-per-job component again indicates whether workers shared in competitive gains.

Over the decade, the Creative Sector (without overlaps) demonstrated broad-based competitive strength in productivity, even where job competitive effects were mixed. Several industry groups fell into the Jobs Shrinkage, Productivity Growth category, and many showed increases in the regional component of earnings per job.

Jobs and Productivity Growth (J+ , P+ , E±)

No industry group recorded positive job competitive effects combined with negative productivity competitive effects over the full 2014–2024 window.

Jobs Growth, Productivity Shrinkage (J+ , P– , E±)

Film, TV, Video Production/Distribution, Cable and Media Streaming occupies this quadrant over the full decade, with positive job competitive effects but lagging productivity. Earnings per job competitive effects were positive, indicating that workers benefited from some of the gains despite productivity pressures.

Jobs Shrinkage, Productivity Growth (J– , P+ , E±)

Four industries experienced declining competitive job effects alongside strong competitive productivity gains:

- Cultural Activities
- Marketing, Photography and Related
- Performing and Creative Arts
- Business Consulting

These patterns suggest automation, digitization, or specialization, with fewer but more productive workers. In many cases, earnings per job rose along with productivity, indicating value captured at the worker level.

Jobs and Productivity Shrinkage (J– , P– , E±)

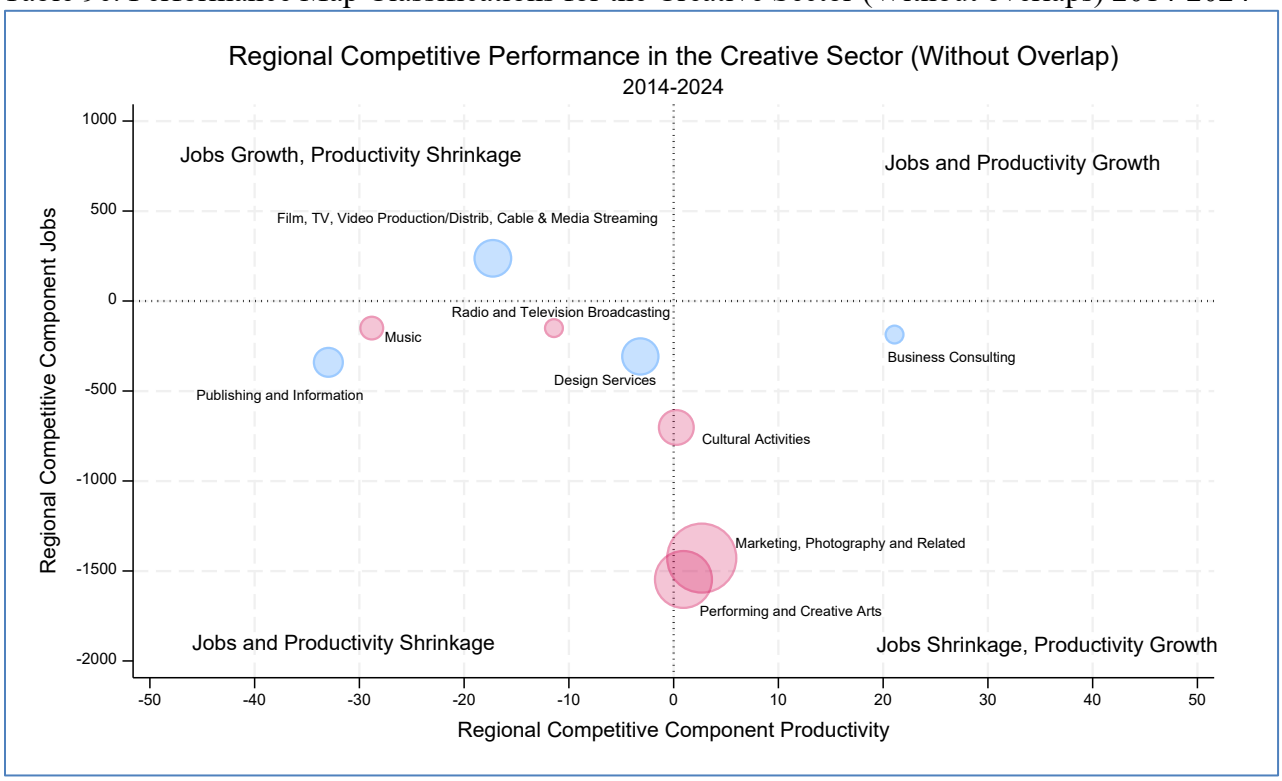
Industries with competitive losses in both jobs and productivity include:

- Design Services
- Music
- Publishing and Information
- Radio and Television Broadcasting

These industries appear structurally constrained in Hawai‘i, reflecting limited scale, cost pressures, or changing market conditions.

Overall, the long-run map for the non-overlapping definition shows a sector that has strengthened its productivity base, while certain activities continue to contract or restructure.

Table 9c. Performance Map Classifications for the Creative Sector (Without overlaps) 2014-2024



J±, P±, E±: Sign of change for regional competitive components of Jobs, Productivity and Earnings per Job during the period. Blue bubbles (E+); red bubbles (E-); Size of bubbles is correlated with number of jobs in the industry groups. Data sources: Lightcast™ and DBEDT calculations.

2021–2024 Window (Short-Run Post-Pandemic Performance)

During the post-pandemic recovery, two non-overlapping creative industry groups exhibited strong competitive gains in both jobs and productivity, consistent with expansions accompanied by productivity improvements.

Jobs and Productivity Growth (J+ , P+ , E±)

The following industry groups recorded positive competitive effects in both jobs and productivity, even though most of the sector showed negative competitive earnings per job effects:

- Film, TV, Video Production/Distribution, Cable and Media Streaming
- Marketing, Photography and Related

Jobs Growth, Productivity Shrinkage (J+ , P– , E±)

Cultural Activities and Music fall into this quadrant, with positive job competitive effects but lagging productivity. Earnings per job competitive effects were generally positive, indicating that workers benefitted despite relative productivity losses. These patterns suggest that job growth has come with rising costs or shifts toward lower-value tasks.

Jobs Shrinkage, Productivity Growth (J– , P+ , E±)

Four industry groups experienced job losses but positive local productivity advantages, consistent with consolidation:

- Performing and Creative Arts
- Publishing and Information
- Design Services
- Radio and Television Broadcasting
- Business Consulting

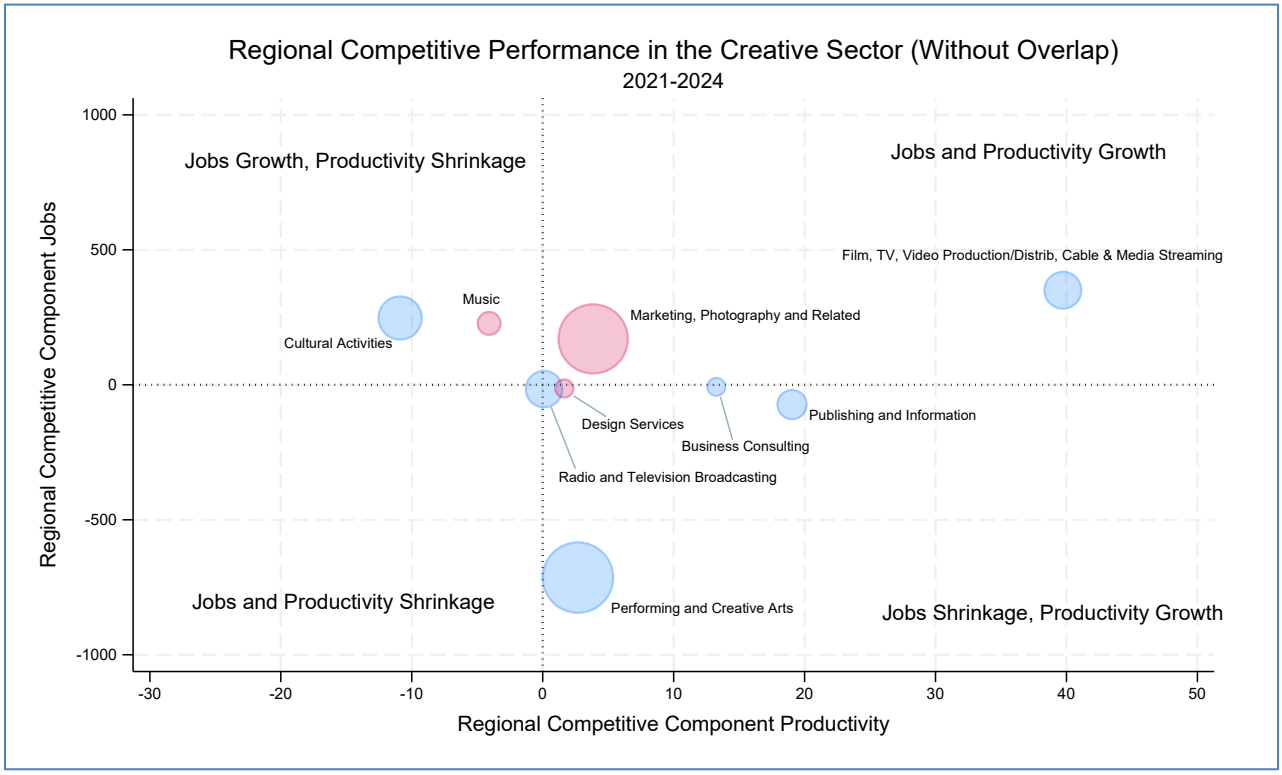
In these industries, productivity gains did not fully translate into higher competitive earnings per job, implying that part of the value created is accrued to firms or upstream suppliers.

Jobs and Productivity Shrinkage (J– , P– , E±)

No industry group in the non-overlapping Creative Sector recorded negative competitive effects in both jobs and productivity over the 2021–2024 window.

Overall, while most non-overlapping creative industry groups consolidated productivity over the decade, the post-2021 period also saw increases in local job scale in key activities. As in the overlap view, these gains have not generally translated into stronger competitive earnings per job components for workers.

Table 9d. Performance Map Classifications for the Core Creative Sector (Without overlaps) 2021-2024



J±, P±, E±: Sign of change for regional competitive components of Jobs, Productivity and Earnings per Job during the period. Blue bubbles (E+); red bubbles (E-); Size of bubbles is correlated with number of jobs in the industry groups. Data sources: Lightcast™ and DBEDT calculations.

Technology Sector without Overlaps

The Technology Sector (no overlaps) accounted for 30,001 jobs in 2024, or 3.4% of all civilian employment in Hawai‘i. Over 2014–2024, this adjusted sector grew at an average annual rate of 1.0%, outpacing the civilian economy by 0.8 percentage points.

Between 2021 and 2024, jobs in the non-overlapping technology sector increased by 2.9%, compared with 3.1% for the statewide civilian economy (Figure 1b). By 2024, total employment in this adjusted sector reached 117% of its 2019 level, again indicating a steady recovery and continued expansion into technical and knowledge-intensive activities.

Across industry groups, growth rates in the non-overlapping sector are nearly identical to those in the definition that includes overlaps, differing only by small margins.

Overall, the level of overlap in the Technology Sector does not materially affect the results. Trends in employment growth, national comparisons, and performance map classifications are very similar whether the sector is defined with or without overlapping industries. As will be shown in the Creative Sector analysis, overlap plays a much more significant role there.

Figure 1b. 2014-2024: Annual Job Growth in the Technology Sector (without overlaps)

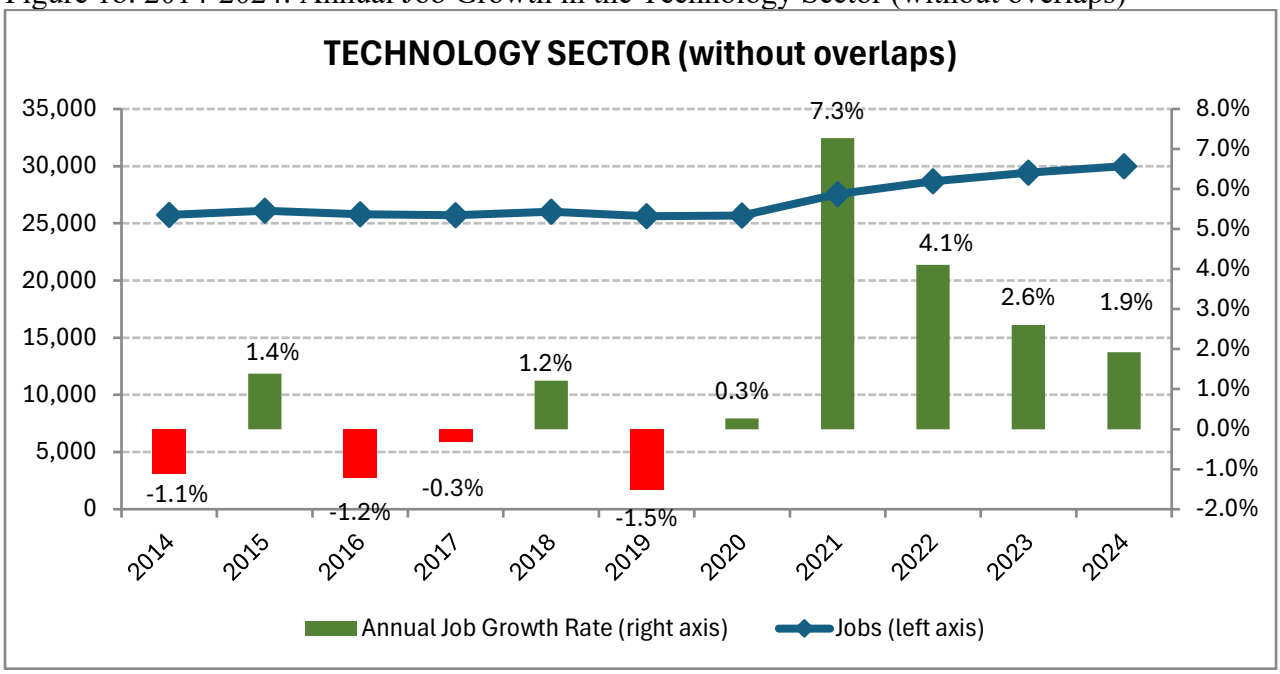
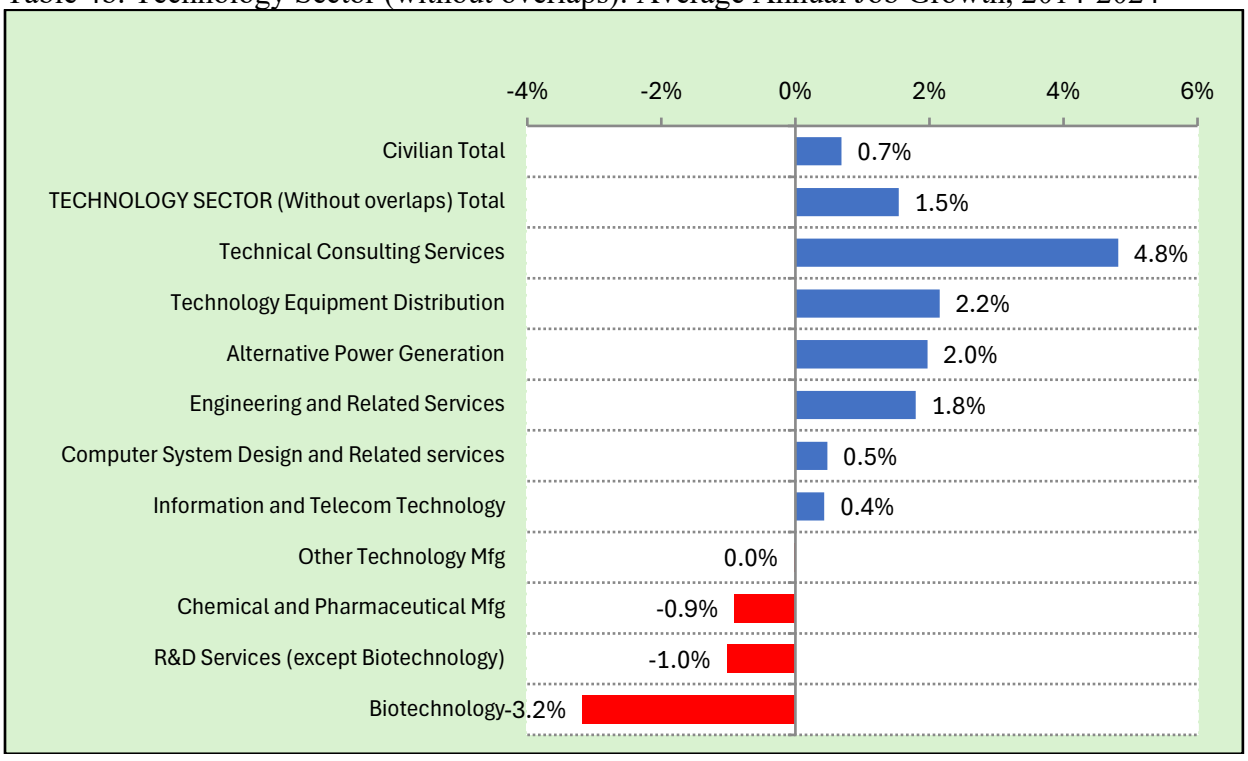


Table 4b. Technology Sector (without overlaps): Average Annual Job Growth, 2014-2024



Industry Sector/Group	Annual Job Growth			Jobs in 2024
	2014-2024	2014-2021	2021-2024	
Civilian Total	0.7%	-0.3%	3.1%	894,787
TECHNOLOGY SECTOR (Without overlaps) Total	1.5%	1.0%	2.9%	30,001
Technical Consulting Services	4.8%	4.6%	5.3%	6,967
Technology Equipment Distribution	2.2%	3.3%	-0.5%	908
Chemical and Pharmaceutical Mfg	-0.9%	-5.5%	10.6%	102
Engineering and Related Services	1.8%	1.8%	1.7%	7,361
Information and Telecom Technology	0.4%	-1.0%	3.7%	5,435
Computer System Design and Related services	0.5%	0.0%	1.7%	6,711
Other Technology Mfg	0.0%	0.0%	0.0%	471
R&D Services (except Biotechnology)	-1.0%	-2.6%	2.7%	1,391
Alternative Power Generation	2.0%	0.3%	6.0%	255
Biotechnology	-3.2%	-5.2%	1.7%	400