ITIF | INFORMATION TECHNOLOGY & INNOVATION FOUNDATION
HAMILTON CENTER ON INDUSTRIAL STRATEGY

The State Hamilton Index: Most States Underperform in Advanced Industries

MEGHAN OSTERTAG | MAY 2025

Innovation-driven production is key to reclaiming U.S. dominance on the international stage. Yet, all but a few U.S. state economies are less concentrated in advanced industries than the world average—and only one is ahead of China.

KEY TAKEAWAYS

- Washington, Virginia, and Indiana rank highest in the 2025 *State Hamilton Index*, while Wyoming, Louisiana, and Hawaii are the worst performers.
- Thirty-one states and the District of Columbia underperform in advanced industries. Strengthening these industries nationwide is critical to economic growth and national security, especially in the face of rising competition from China.
- Only four states outperform the global average in advanced industries, underscoring the need for all states, including top performers, to focus on building strategic sectors.
- Most advanced industries are geographically concentrated in just a few states (e.g., biotech in Massachusetts and aerospace in Kansas). Targeted growth efforts such as regional technology hubs can reduce national dependence on these states.
- Strengthening America's advanced industries will require policies that combine federal funding with state-level specialization—such as technology grant programs similar to the CHIPS Act.
- China is more specialized in Hamilton industries than are 98 percent of U.S. states. States must stop subsidizing Chinese firms with taxpayer dollars and instead focus on attracting foreign investment from allied nations.

CONTENTS

INTRODUCTION

The United States faces fierce competition for global market share in traded-sector, advanced technology industries, wherein success directly impacts national economic strength and security. As China's economy continues to grow and innovate—surpassing expectations from just a few years ago—the United States must look to expand its innovation and production capacity. China's gains have come at the expense of the United States and its allies, making this challenge even more pressing. While the Information Technology and Innovation Foundation (ITIF) has conducted analysis of the U.S. share of a variety of advanced industries relative to other nations, it's worth conducting that analysis at a more granular level: U.S. states.

Innovation-driven production is key to reclaiming U.S. dominance on the international stage. Once the leader in the production of advanced technologies, the United States now finds itself with less capabilities than the global average. Over the past several decades, the erosion of domestic industry has slowed economic growth, weakened the terms of trade, degraded national security, and made America vulnerable to China's innovation mercantilist tactics.

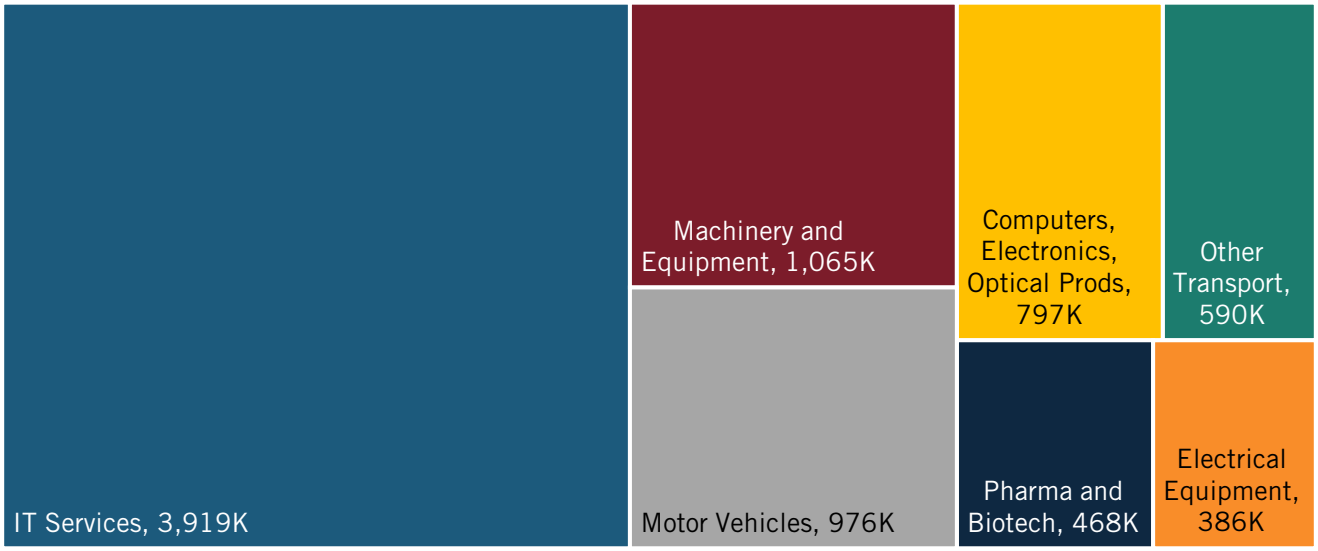
If the United States wants to grow domestic production, the federal and state governments must coordinate a national industrial strategy in which U.S. states prioritize the development of industries that strengthen the national economy—not just their own. Today, most states are indifferent to what industries they foster and what jobs are available to their citizens (e.g., a job producing potato chips is just as valuable as a job producing computer chips). However, computer chips are far more strategically important than potato chips, and organizing a national strategy to develop advanced industries state-by-state will bring the United States closer to its industrial goals.[1]

A domestic industrial strategy could help improve U.S. regional economic development in two key ways. First, policies supporting the collaboration and coordination between relevant firms could help to develop regional clusters or hubs, areas of inter-firm information sharing where high-skill workers develop and share new technologies. There is a deep literature on innovation hubs, their successful efforts to create them in the United States, and their benefits.[2] Second, a regional industrial strategy could attract firms of one industry and reorient the economy, breaking cities and states out of economic ruts dependent on legacy industries with minimal growth outlook.[3]

To assess the industrial performance of U.S. states and the District of Columbia, ITIF examined their share of U.S. output in seven industry sectors, which are aggregated into the Hamilton Index of Advanced-Technology Performance: information technology (IT) and information services; computer, electronic, and optical products; pharmaceuticals and biotechnology; electrical equipment; machinery and equipment; motor vehicles; and other transport equipment. We also compared each state's total concentration with the globe's and China's, and used data from the United States Census Bureau's dataset on total employees in 2022.[4]

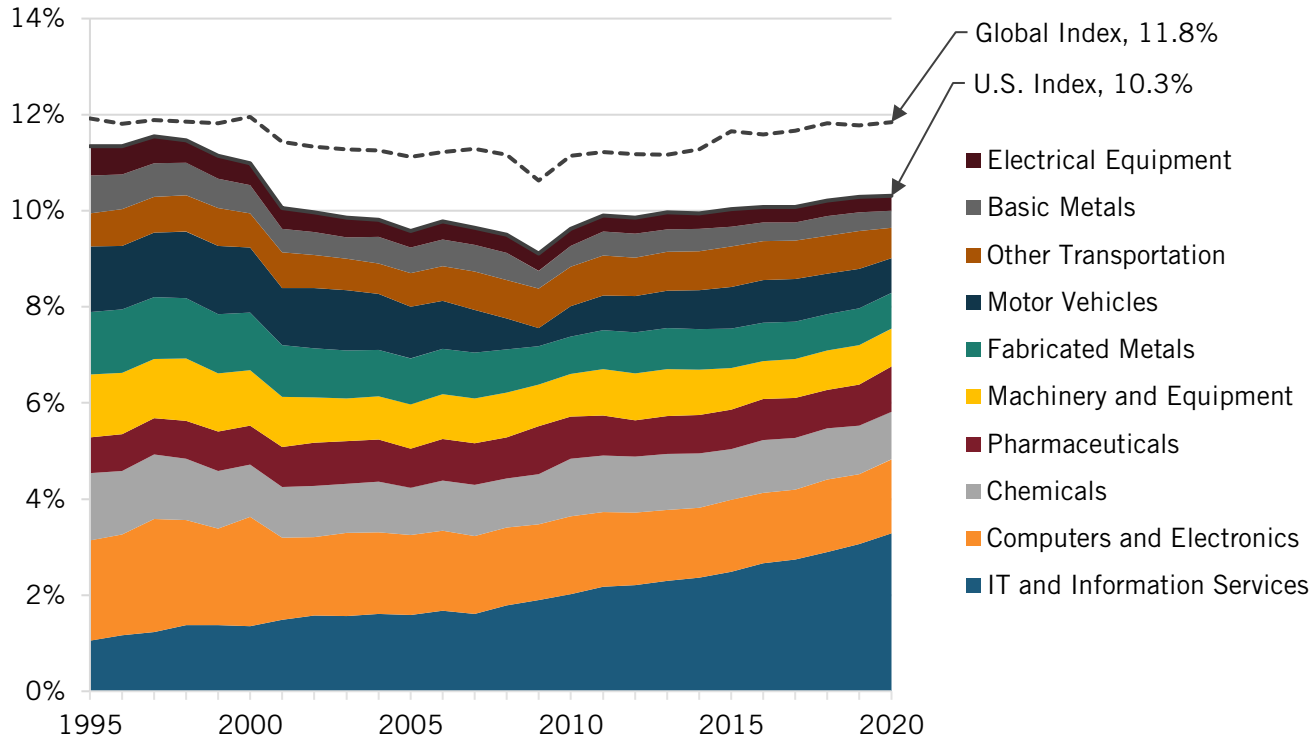
The seven industries included in the Hamilton Index together accounted for 8 million workers in the United States in 2022 (figure 1). The IT and information services industry (including software and Internet services) is the largest of the 10, accounting for 48 percent of all employees in Hamilton Index industries.

Figure 1: Total employment in industries included in Hamilton Index, 2022 (8.2 million)



Using data from the Hamilton Index published in 2023, America's aggregate performance in advanced industries has been weak over the last two-plus decades, barring the IT and information services industry, which has seen growth due to leading U.S. firms such as Google, Meta, and Microsoft (figure 2).[5] Overall, the domestic market share of Hamilton industries in the United States has fallen by over 1 percentage point; excluding the IT and information services industry, market share has fallen by over 3 points.

Figure 2: Hamilton industry shares of the U.S. economy



Domestic market shares or total employees in advanced industries cannot serve as the only metric of national competitiveness—or even the primary one—because states have different-sized economies. To assess states' relative performance in strategically important industries, ITIF used an analytical statistic known as a location quotient (LQ), which measures any region's level of industrial specialization relative to a larger geographic unit—in this case, a state relative to the United States as a whole. LQs have long been used for regional economic analysis to assess the industrial specialization of a region. However, our research shows that no such assessment has been done on U.S. states in recent years.[6] For this analysis, all states with LQs at or above 1.00 are considered over-performing, while all LQs below 1.00 are considered underperforming.

Methodology

The LQ is calculated as an industry's share of a state's economy divided by the national industry's share of the U.S. economy or as a state's share of domestic output in an industry divided by the state's overall share of the national economy. In this report, the share of the industry's output is calculated using the number of employees working in that industry. An LQ greater than 1 means the state's share of the national output in an industry is greater than the national average, and an LQ less than 1 means a state's share is less than the national average. For example, Michigan's motor vehicle output in 2022 was 16.92 percent of national motor vehicle production, while Michigan's economy overall was 2.47 percent of the national economy. Thus, the Michigan LQ in the motor vehicles industry was 16.92 percent divided by 2.47 percent, or 6.84, meaning Michigan significantly over-performed in the industry: its output was 684 percent of the level we would expect based on the size of the Michigan economy.

Within each of the seven industries previously listed, there are subindustries. For example, the other transportation industry has three subindustries: aerospace product and parts manufacturing, railroad rolling stock manufacturing, and ship and boat building. Some industries, such as machinery and equipment, have only one subindustry. States are ranked in relative performance and absolute employment in each of the 21 subindustries. Employment in each subindustry is used to calculate each state's overall LQ. Composite LQs are calculated by dividing a state's share of employees in Hamilton industries by the national share of employees in Hamilton industries. LQs are found to be stable and accurate measures of industry specialization in analyses of three-digit NAICS industries for populations between 100,000 and 1 million. Both of these criteria are true in this analysis.[7]

In addition to composite LQs, a global LQ is calculated for each state. Each state's global LQ is the share of all Hamilton industries in a state's economy divided by the share of all Hamilton industries in the global economy. For example. Hamilton industries account for 9.11 percent of Michigan's output, while they account for 8.37 percent of global output.[8] Thus, the global LQ of Michigan is 9.11 percent divided by 8.37 percent, or 1.09, meaning Michigan over-performs in Hamilton industries relative to the world.[9]

FINDINGS

Specialization Rankings

Figure 3 ranks the states and D.C. according to their relative performance, or LQ, in the composite Hamilton Index. Nineteen states have LQs above 1.00, indicating that they are above the national average in the aggregate output in the 21 Hamilton subindustries analyzed. Washington state ranks first with an LQ of 1.79, driven by its diverse landscape of advanced technology companies, mainly in Seattle, including IT and aerospace firms. States focusing on high-tech industries, such as Virginia, California, and Massachusetts, ranked second, fifth, and sixth, respectively. At the same time, manufacturing hubs such as Indiana, Michigan, and Kansas were third, fourth, and eighth overall, respectively.

The composite rankings revealed both surprising and expected findings. Rural states such Oklahoma (0.66) and Wyoming (0.33) underperformed in the composite score, revealing the dependence on low-tech, agrarian, and service-based industries. At the same time, states with large urban centers, such as Texas (0.84), New York (0.73), and Florida (0.50), were below the national average. Thirty-one U.S. states and the District of Columbia underperformed in the composite of all Hamilton industries, reemphasizing the fact that advanced industries tend to be somewhat concentrated geographically.

Only four states—Washington, Virginia, Indiana, and Michigan—have a greater concentration of advanced industries than the global average. And just Washington has a greater concentration than China.

The United States is underperforming the world average in the seven Hamilton Index industries included in this analysis (LQ of 0.98).[10] This means a state that performs at par with the country (composite LQ of 1.00) is still underperforming when considering the rest of the world. As such, it's valuable to see how individual states perform on a global scale. Figure 4 shows that only Washington, Virginia, Indiana, and Michigan have a greater concentration of advanced industries than the global average. And only Washington has a greater concentration than China, while 25 states have an LQ half or less than China's LQ. In other words, virtually all U.S. states have economies less concentrated in advanced industries than the world average and China. Every state must consider growing its advanced industries to be the number one priority in the race against China.

Figure 3: States' national LQs

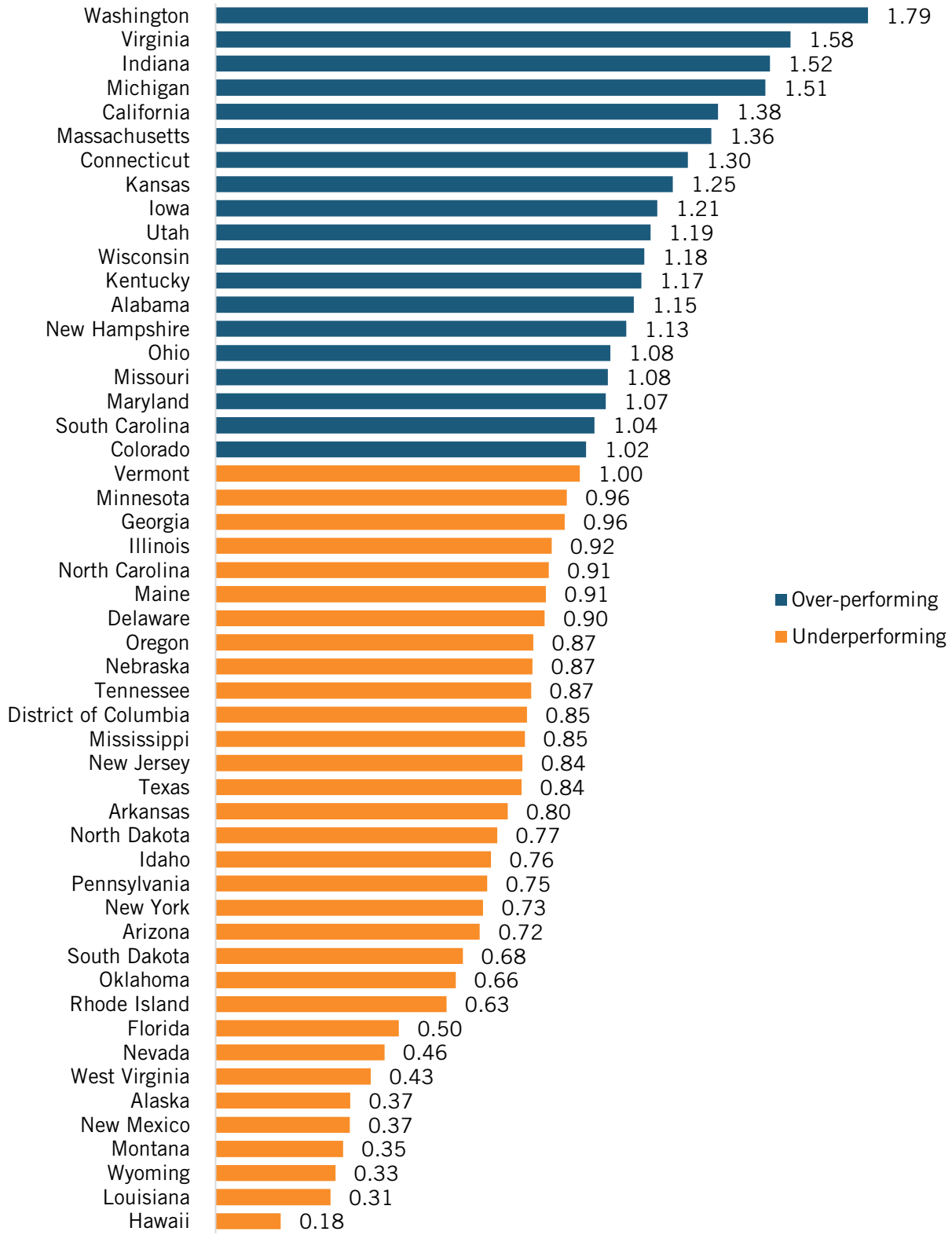
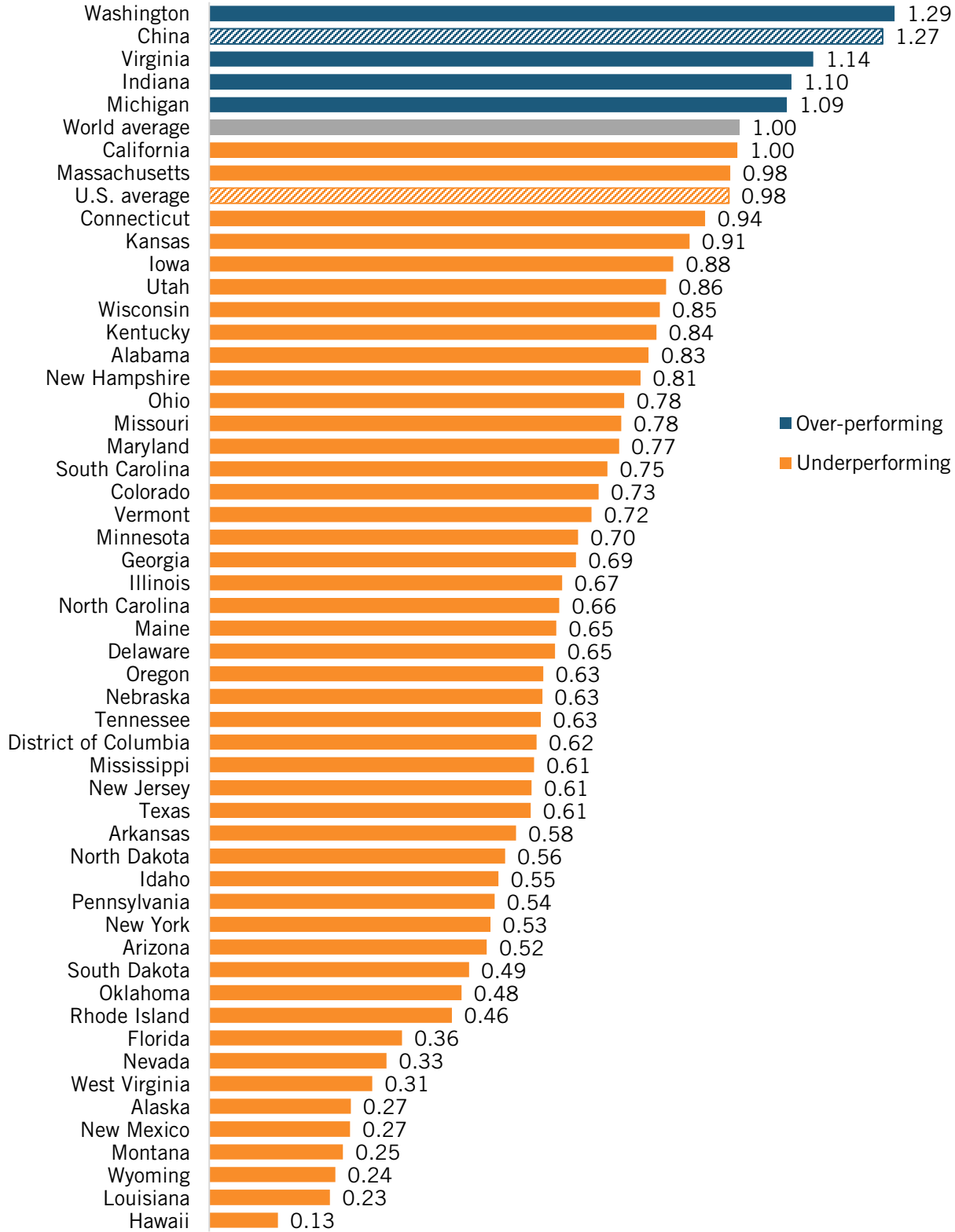
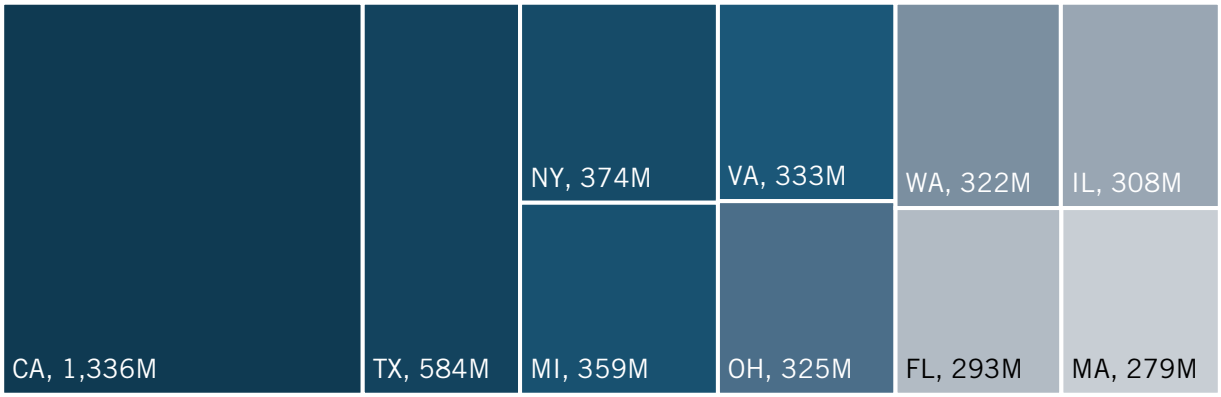


Figure 4: States' global LQs



In terms of absolute employment, the results are to be expected. The largest states in the country, California and Texas, lead the Hamilton Index with 1.3 million and 584,000 individuals working in Hamilton industries, respectively (figure 5). Less-populated states, such as Washington and Massachusetts, also make the top 10, reflecting the density of advanced industries in their largest cities.

Figure 5: Number of employees in Hamilton Index industries (top 10 states)



Some industries are more concentrated than others, with certain states having significant comparative advantages over others in the sector. For example, Virginia, the leader in IT and information services, had an LQ of 2.44 (table 1.) Meanwhile, the relative leader of the motor vehicles industry, Indiana, had an LQ of 7.94, showing extreme dominance relative to other states. Some states with relative specializations have small populations, such as Maine and New Hampshire, making it easier for a specific industry to dominate the economy. However, other states, such as Virginia or Wisconsin, excel in broader industries and benefit from strategic locations, helping them to outperform all other states.

Table 1: State Hamilton Index industry leaders, 2022

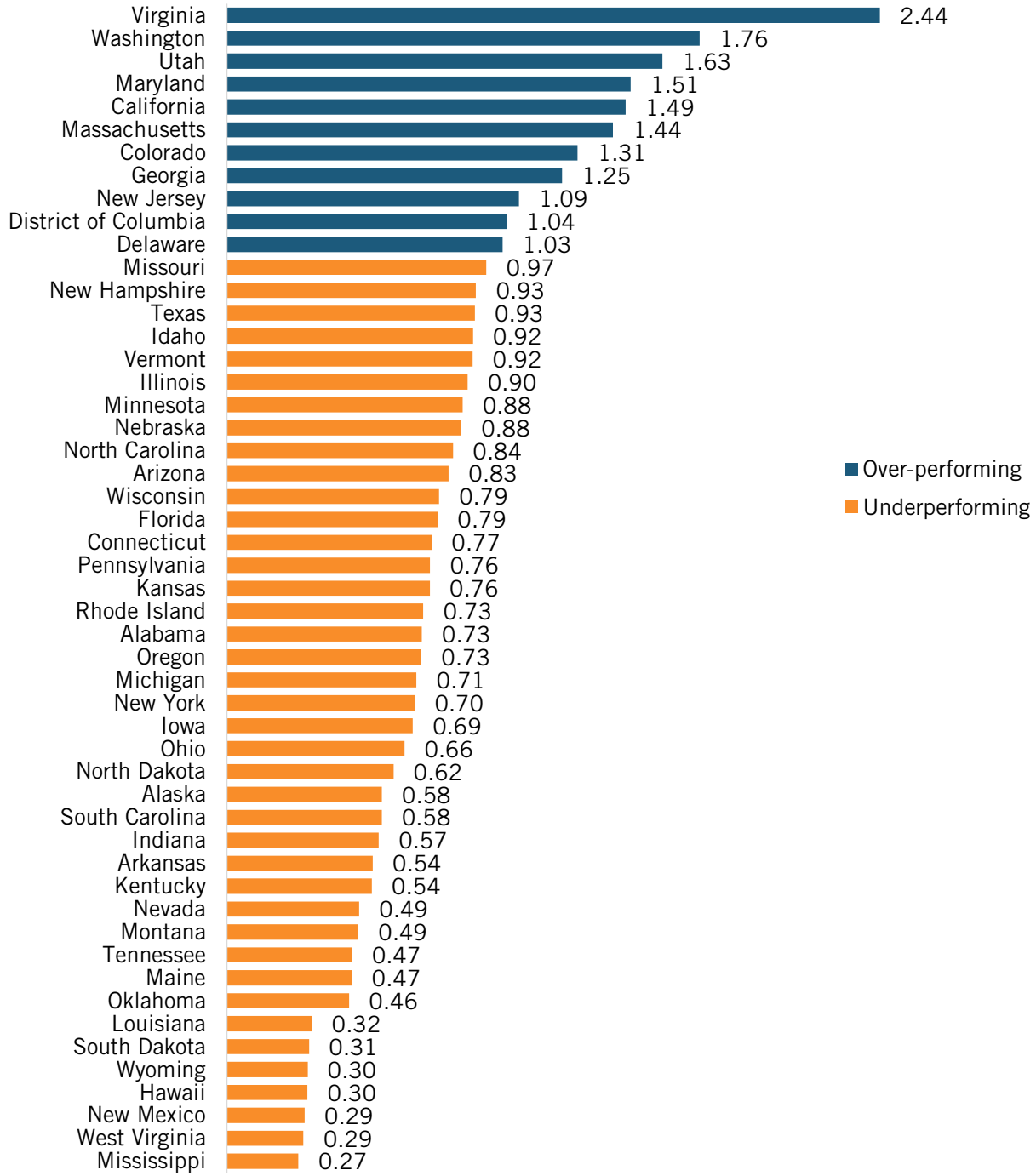
Industry	Total U.S. Workforce	Leading Producer	Leader's Share	Leading Specialist	Leader's LQ
IT and information services	3,919,000	California	21.6%	Virginia	2.44
Computers, electronics, and optical products	797,000	California	20.2%	New Hampshire	3.12
Pharma and biotech	468,000	California	24.2%	Maine	4.30
Machinery and equipment	1,065,000	Ohio	7.3%	Iowa	4.10
Motor vehicles	976,000	Michigan	16.9%	Indiana	7.94
Other transportation	590,000	California	12.6%	Kansas	5.40
Electrical equipment	386,000	California	7.5%	Wisconsin	4.70
Composite state index	**8,201,000**	**California**	**16.3%**	**Washington**	**1.79**

INDUSTRY PROFILES

IT and Information Services

The IT and information services industry group is comprised of four subindustries: software publishing; data processing, hosting, and related services; Internet publishing, broadcasting, and web search portals; and computer systems design and related services.

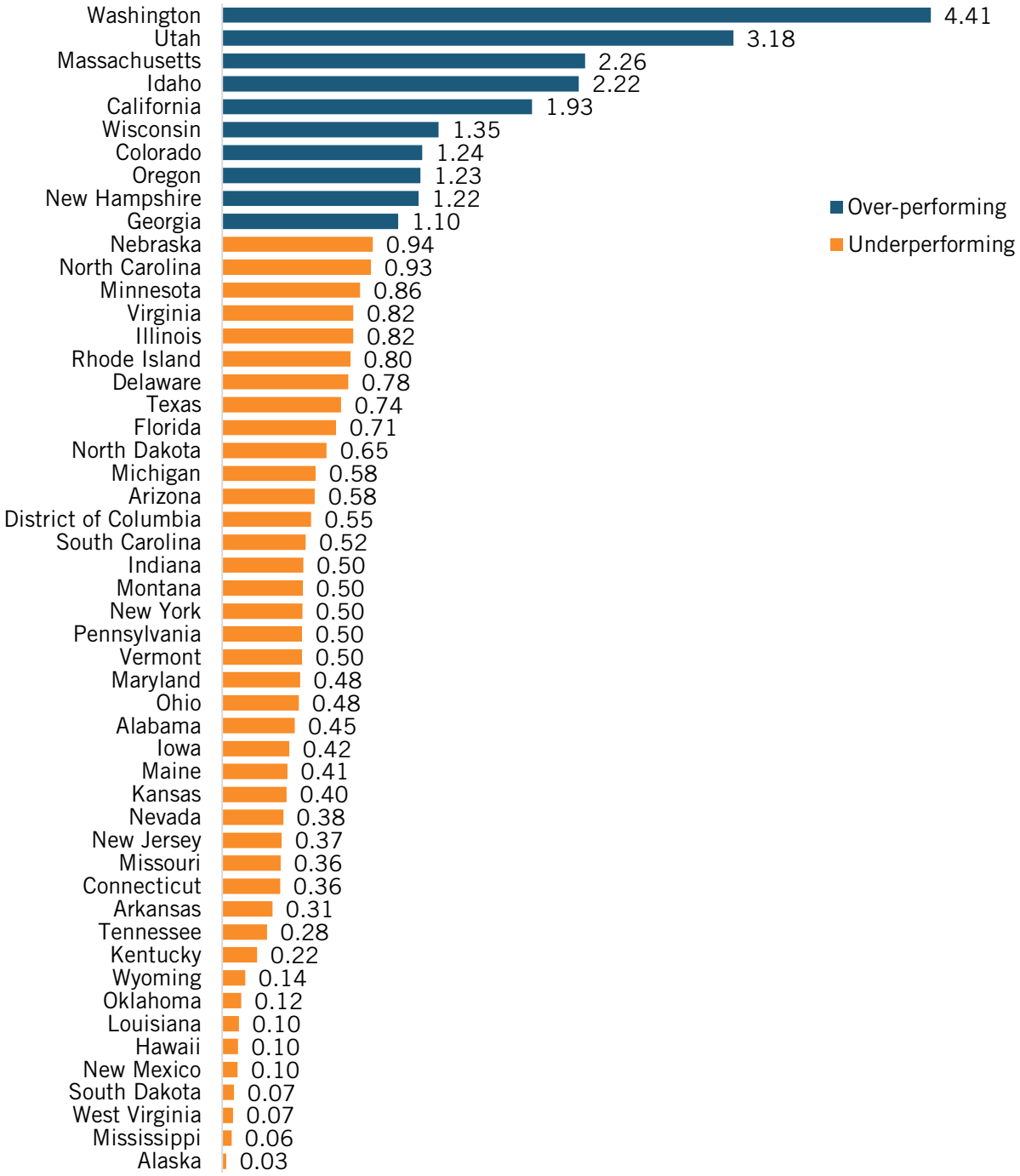
Figure 6: IT and information services industry group LQ, 2022



Software Publishing

The software publishing industry includes employees engaged in computer software creation and publication.

Figure 7: Software publishing LQ, 2022



Everyday applications, including Microsoft Word, video games, and the iOS platform Apple devices run on depend on software publishing, as does novel and innovative technology, such as

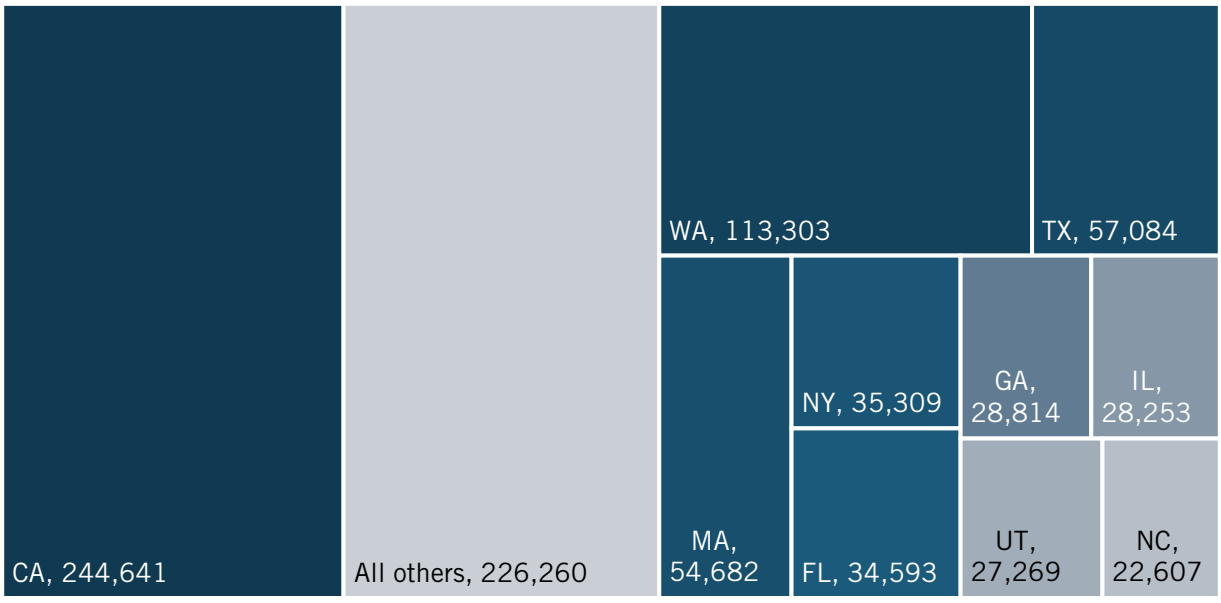
artificial intelligence (AI). Software publishers are key innovation drivers and essential for the United States to maintain technology dominance.

Washington state, home to tech giants such as Microsoft and Amazon and countless start-up firms, leads the nation in relative performance in software publishing with an LQ of 4.41. (See figure 7.) Other high-ranking states include Utah (3.18), Massachusetts (2.26), Idaho (2.22), and California (1.93), all of which punch far above their weight in the number of software publishers relative to the size of their economies.

Most states underperformed in this industry, underscoring the clustered nature of tech companies in just a few major cities nationwide. Even states with large urban centers, including Texas (0.74), Florida (0.71), and New York (0.50), employ fewer software engineers than expected based on the size of their urban centers.

In terms of absolute employees (figure 8), the story is slightly different. California employs more than 240,000 individuals, over twice as many as Washington (113,303). Even though California has just the fifth-highest relative performance in software publishing, over 28 percent of employees in this industry live in the state, which is unsurprising given that global tech leaders such as Google, Meta, and Oracle call the state home. Silicon Valley has become an innovative technology hub, attracting the largest tech firms in the world and fostering an environment of entrepreneurship in the tech space. Texas and Massachusetts each employ over 50,000 people in the software publishing industry. Thirty-five states employ less than 1 percent of the total software publishers nationwide.

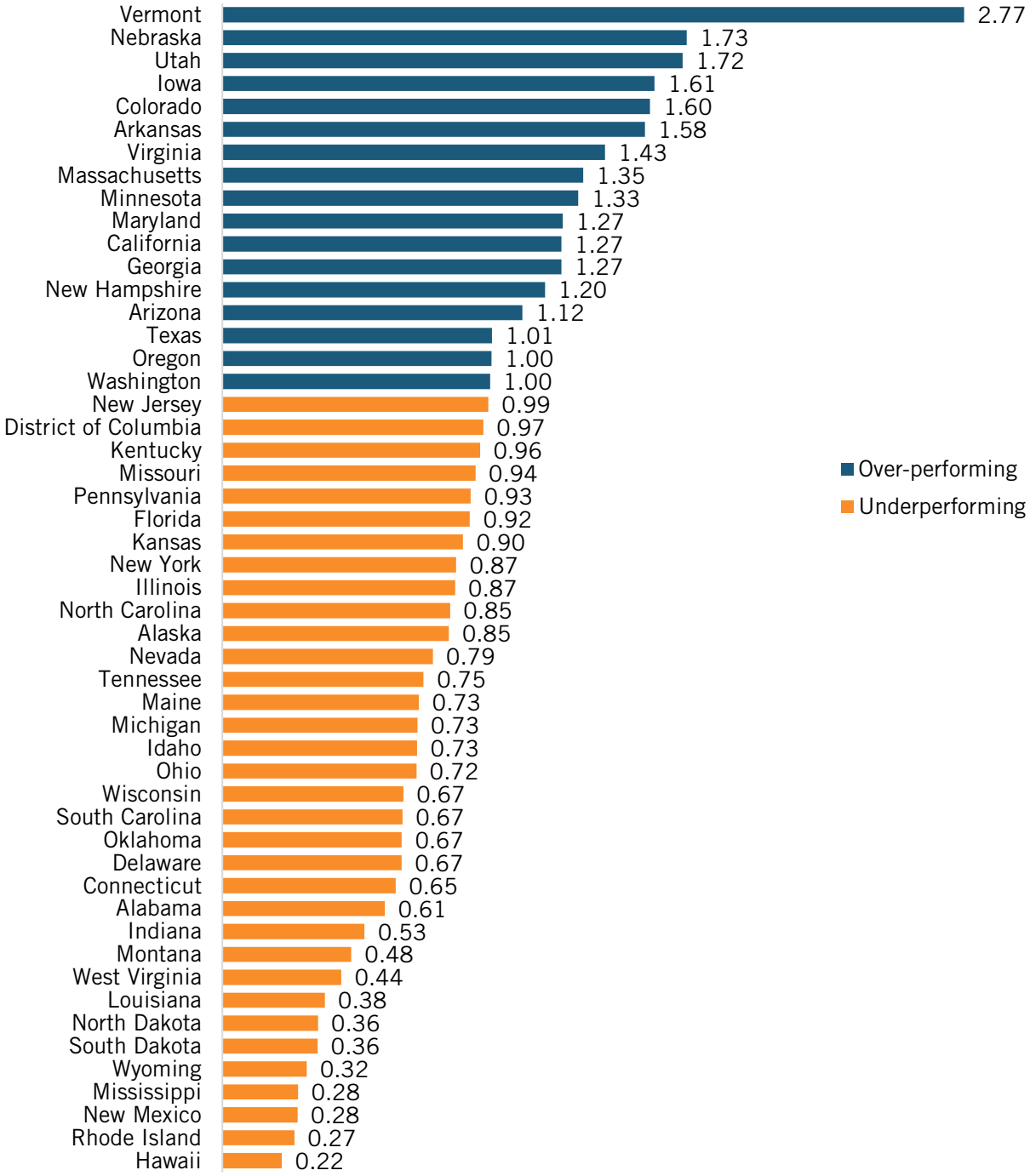
Figure 8: Number of employees in software publishing by state (top 10 states, and all others)



Data Processing, Hosting, and Related Services

The data processing, hosting, and related services industry encompasses businesses that provide computing, data storage, and online services infrastructure. This includes cloud computing providers, data centers, web hosting, and companies managing large-scale data analytics.

Figure 9: Data processing, hosting, and related services LQ, 2022



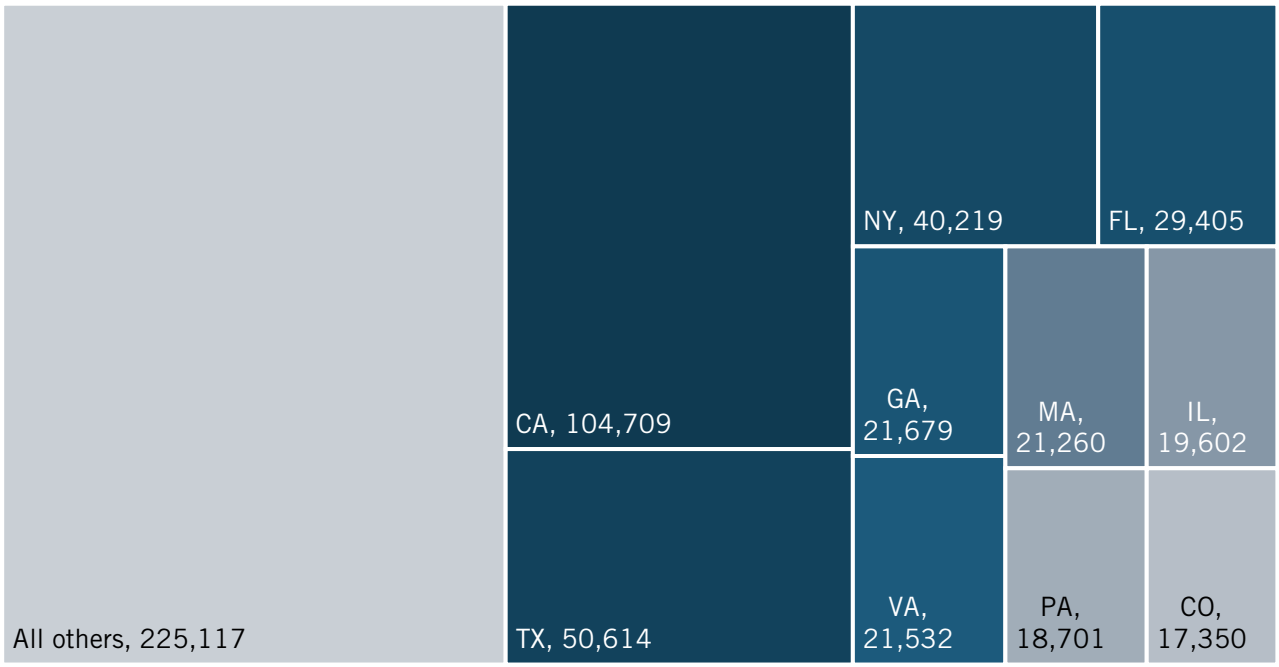
As businesses and consumers increasingly rely on digital platforms, the industry has become a crucial backbone of modern technology, supporting e-commerce, finance, healthcare, and many other sectors.

Vermont leads the nation in relative performance in data processing, hosting, and related services with an LQ of 2.77, significantly outperforming other states. (See figure 9.) Other high-ranking states include Nebraska (1.73), Utah (1.72), Iowa (1.61), and Colorado (1.60), all of which have an intense concentration of data-related businesses relative to their overall economies. These states likely benefit from favorable business environments, lower costs for operating data centers, and investments in digital infrastructure that attract technology firms.

Many states underperform in this industry, highlighting the clustered nature of the technology sector in specific regions. States with an LQ below 1.00, such as Florida (0.92), New York (0.87), and North Carolina (0.85), employ fewer data processing and hosting professionals than expected based on their economic size. The lowest-ranking states, including New Mexico (0.28), Rhode Island (0.27), and Hawaii (0.22), face challenges such as high operational costs, limited broadband infrastructure, or less focus on tech-driven industries.

California again leads in absolute employment (figure 10) with over 104,000 employees working in its data processing, hosting, and related services, more than twice as many as Texas, which employs around 50,000. While California dominates in absolute employment, Texas, New York, and Florida also play significant roles, each employing tens of thousands in the industry. Georgia, Virginia, and Massachusetts each have over 20,000 employees, reflecting their growing influence in data services. However, a large portion of employment in this sector is spread across other states, with all other states accounting for over 39 percent (225,000) of jobs. Despite California's dominance, the industry is widely distributed, with many states contributing to the nation's data infrastructure and cloud computing capabilities.

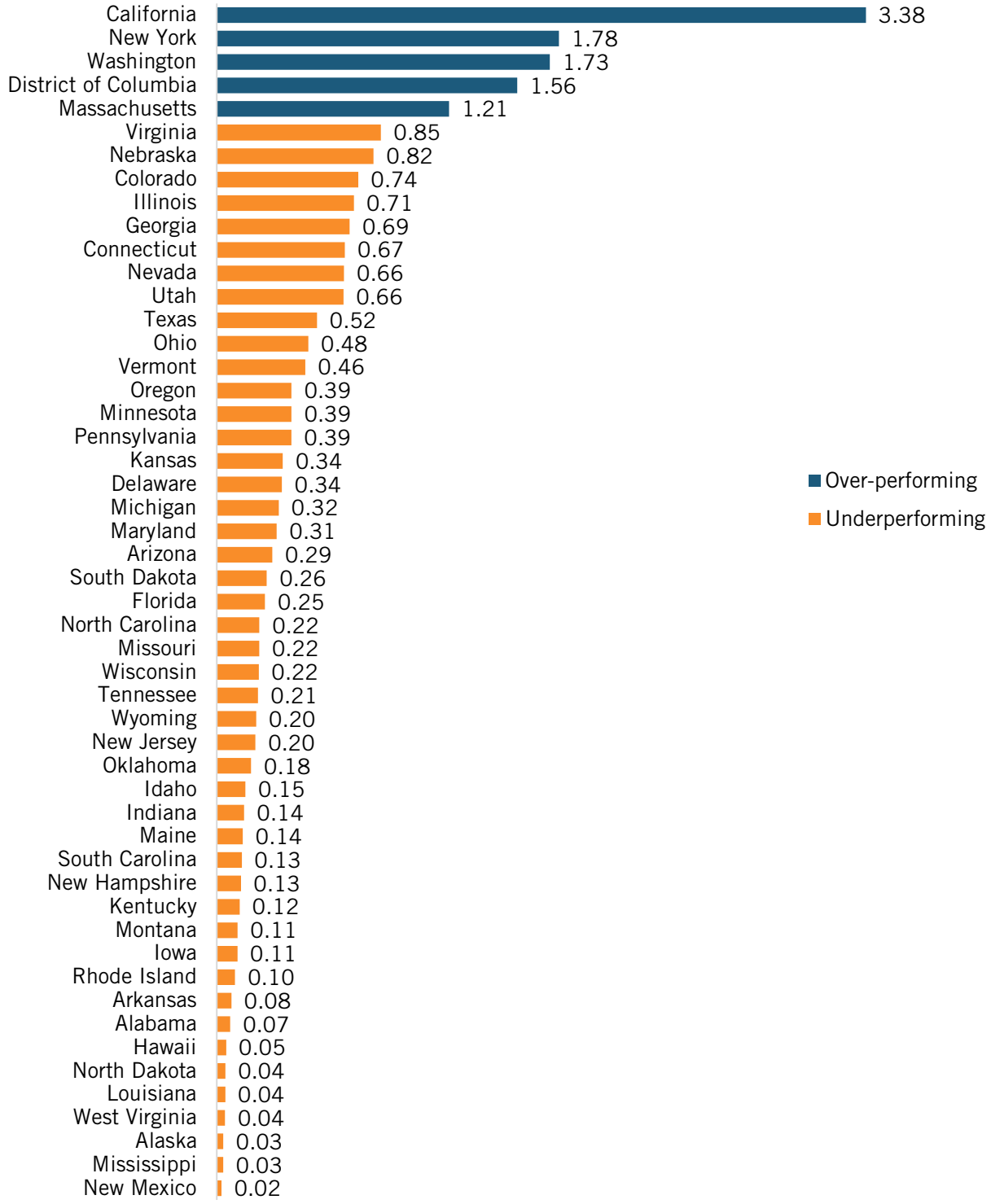
Figure 10: Number of employees in data processing, hosting, and related services (top 10 states, and all others)



Internet Publishing and Broadcasting and Web Search Portals

The Internet publishing, broadcasting, and web search portals industry includes businesses that create, distribute, and manage digital content and online information services.

Figure 11: Internet publishing, broadcasting, and web search portals LQ, 2022



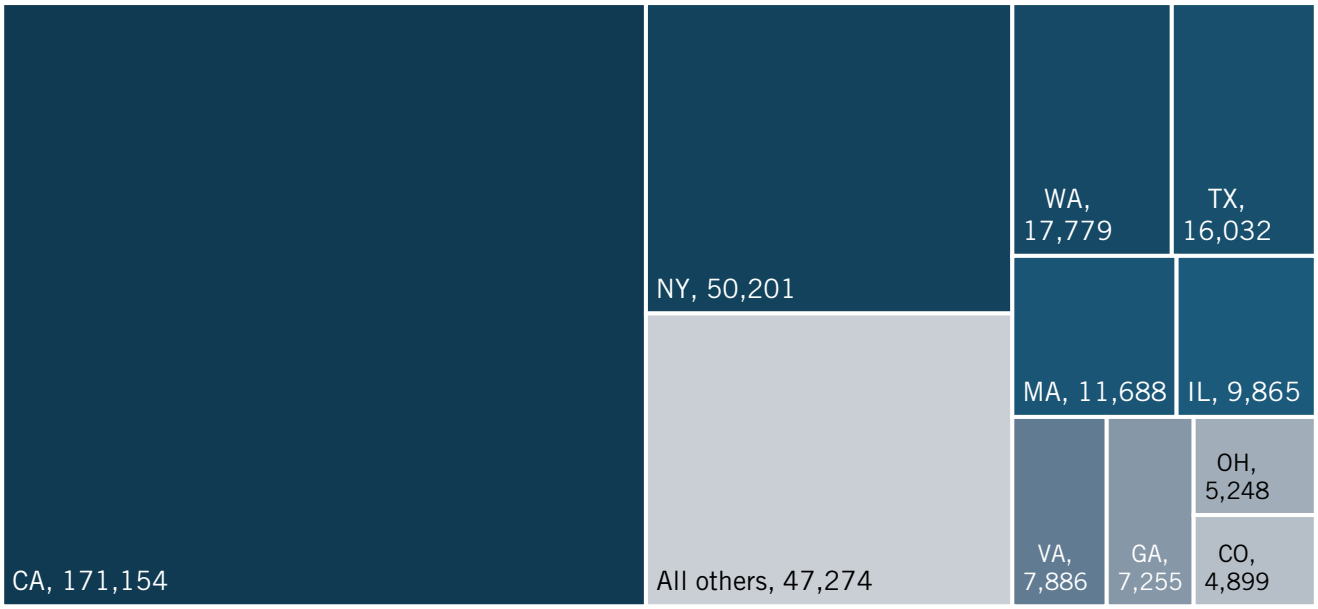
This sector encompasses news websites, streaming platforms, social media companies, and search engines that facilitate the discovery and dissemination of digital media. As consumer behavior increasingly shifts toward online content consumption, this industry plays a crucial role in information accessibility, digital advertising, and global connectivity.

California leads the nation in this industry with an LQ of 3.38, far exceeding any other state (figure 11). Other high-ranking states include New York (1.78), Washington (1.73), and the District of Columbia (1.56), all of which have a strong presence of major tech firms, media companies, and online service providers. Massachusetts (1.21) also stands out due to its concentration of digital media and tech-driven businesses. These states benefit from innovation hubs, venture capital funding, and high demand for digital content creation.

All but five states underperform in this industry. Even states with large populations, such as Texas (0.52), Pennsylvania (0.39), and Florida (0.25), employ fewer professionals in this sector than expected based on their overall economies. The lowest-ranking states, including Mississippi (0.03), Alaska (0.03), and New Mexico (0.02), likely struggle with limited digital infrastructure and fewer large-scale media firms. This geographic disparity underscores the industry's reliance on established tech hubs and suggests potential growth opportunities in underrepresented areas.

California leads the Internet publishing, broadcasting, and web search portals industry with over 171,000 employees (figure 12), far surpassing New York, which follows with just over 50,000. While other states contribute significantly, California remains the industry's epicenter, home to innovative big tech companies. Washington, Texas, and Massachusetts also have substantial employment in the sector, with Washington employing nearly 18,000 workers and Texas around 16,000. Despite these numbers, employment in this industry is heavily concentrated in a few states, with California alone accounting for almost 50 percent of the domestic workforce. Many states, including Virginia, Georgia, and Illinois, employ smaller but notable numbers, while most other states contribute relatively little to overall employment in this sector.

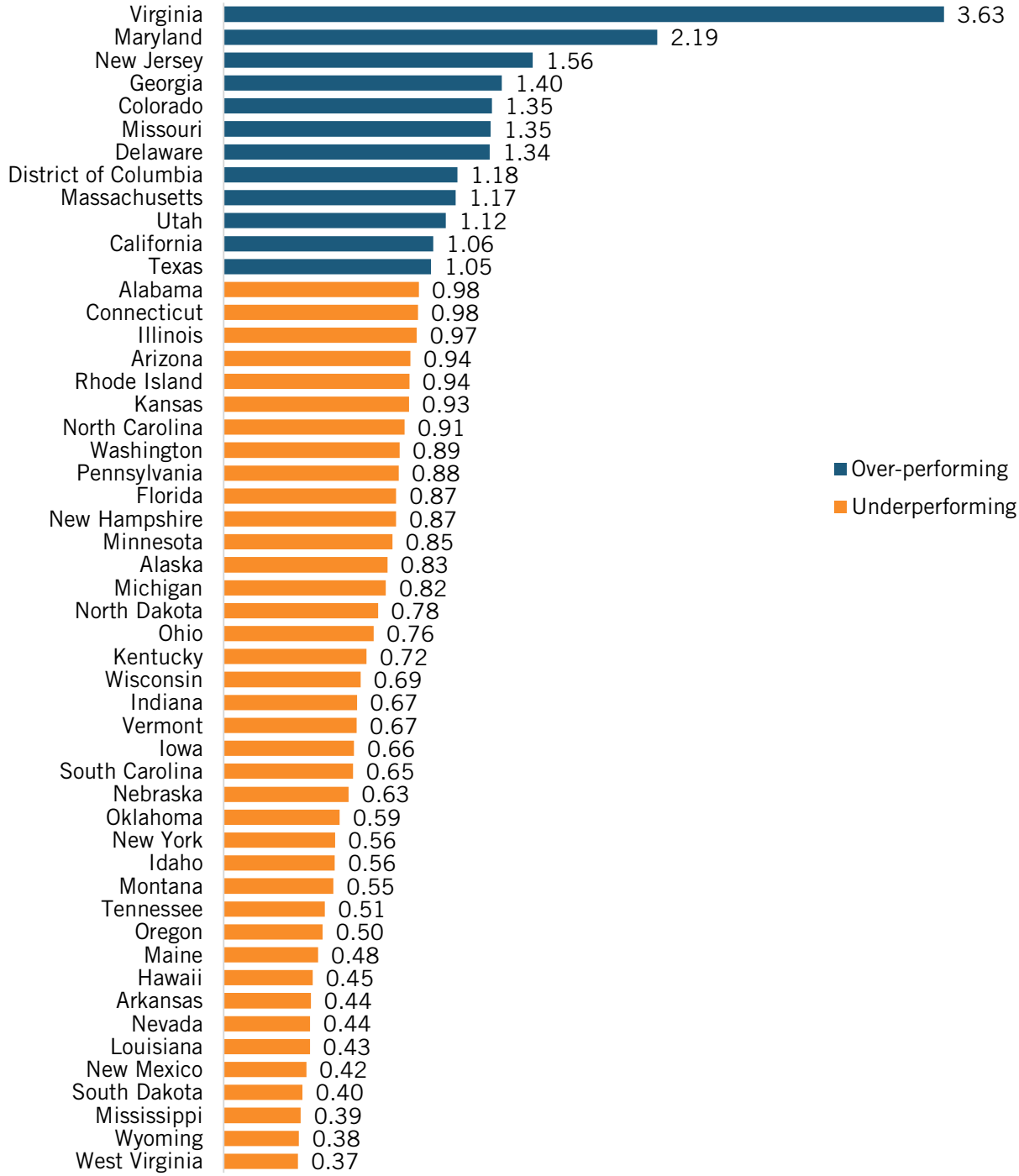
Figure 12: Number of employees in Internet publishing, broadcasting, and web search (top 10 states and all others)



Computer Systems Design and Related Services

Computer systems design and related services firms provide IT expertise through software development, systems integration, network design, and consulting. These companies help businesses implement and maintain technology infrastructure, from cybersecurity to cloud computing services.

Figure 13: Computer systems design and related services LQ, 2022

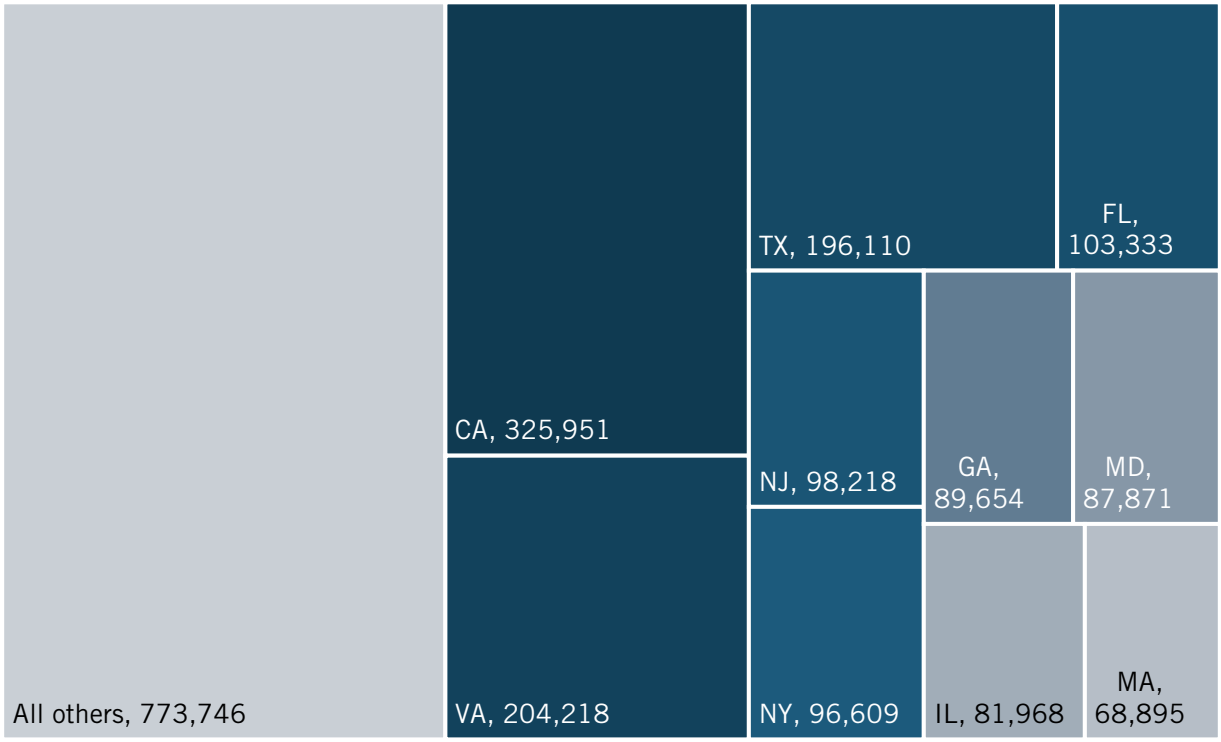


Virginia leads with an LQ of 3.63 (figure 13), driven by federal agencies and defense contractors near D.C. Maryland follows at 2.19, with New Jersey (1.56), Georgia (1.40), and Colorado (1.35) next. These states benefit from government contracts, tech corridors, and access to technical talent.

Most states have LQs below 1.00, demonstrating an overall underperformance in this industry. Despite large economies, Illinois (0.97) and New York (0.56) underperform. The Deep South and Mountain West show low concentrations, with Mississippi (0.39), Wyoming (0.38), and West Virginia (0.37) at the bottom. This suggests that the industry clusters in regions with government presence or established tech hubs.

Like other tech industries, California leads the nation in computer systems design and related services employment (figure 14), with over 325,000 individuals working in the industry—far more than any other state. Virginia and Texas also have a strong presence, employing over 200,000 and 196,000 people, respectively, reflecting their roles as major technology and government contracting hubs. Florida and New Jersey each have close to 100,000 jobs in this industry, while New York, Georgia, and Maryland also have large workforces. Despite California's dominance, employment in this industry is more evenly distributed than in certain other IT sectors, with many states playing a key role in IT services and consulting. 773,746 employees work in states outside the top contributors, emphasizing the industry's broad national reach.

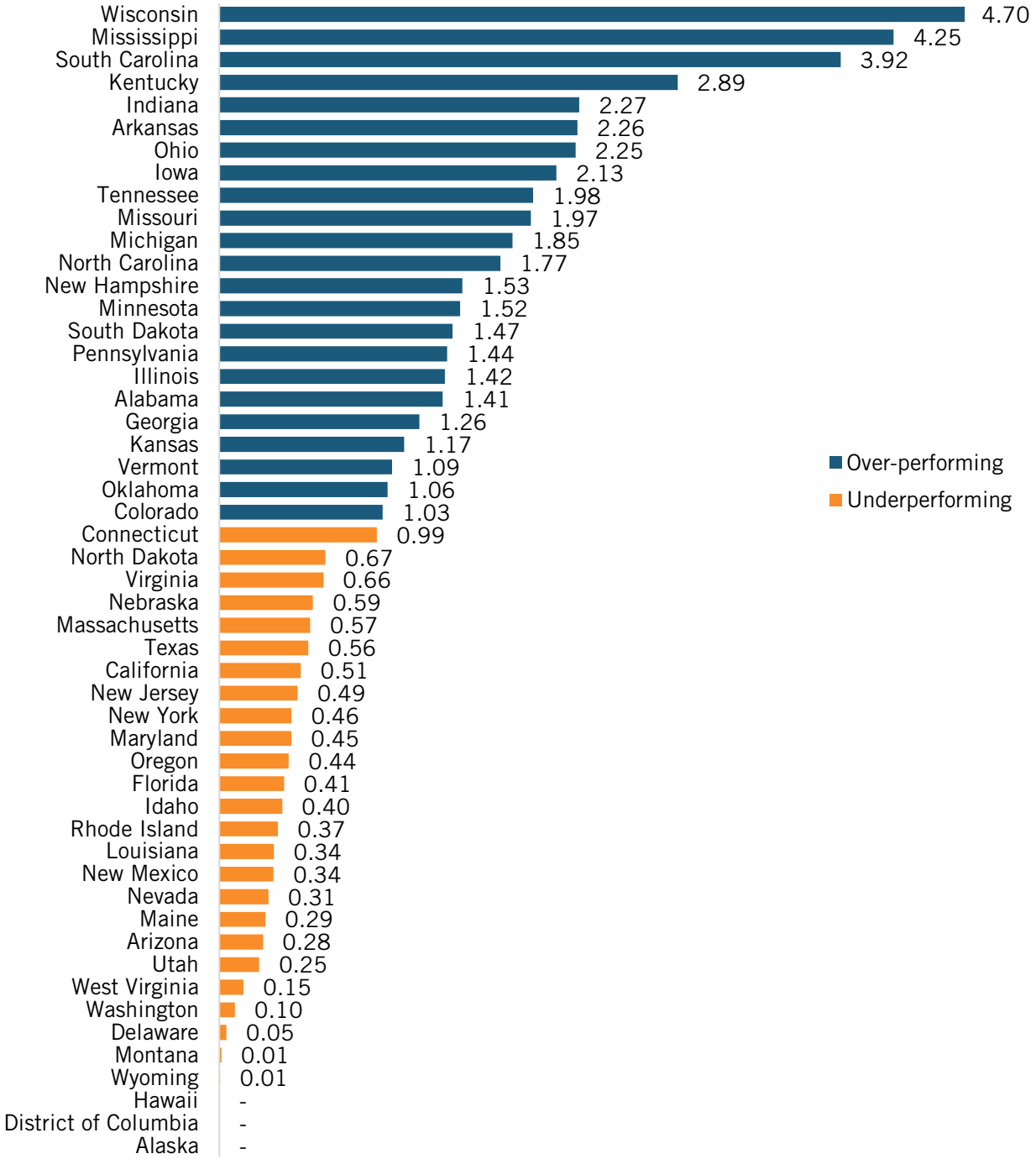
Figure 14: Number of employees in computer systems design and related services (top 10 states, and all others)



Electrical Equipment

The electrical equipment industry grouping is comprised of seven subindustries: engine, turbine, and power transmission equipment; household appliances; electric lamp bulbs and parts; power equipment; batteries; fiber optic cable; and wire devices.

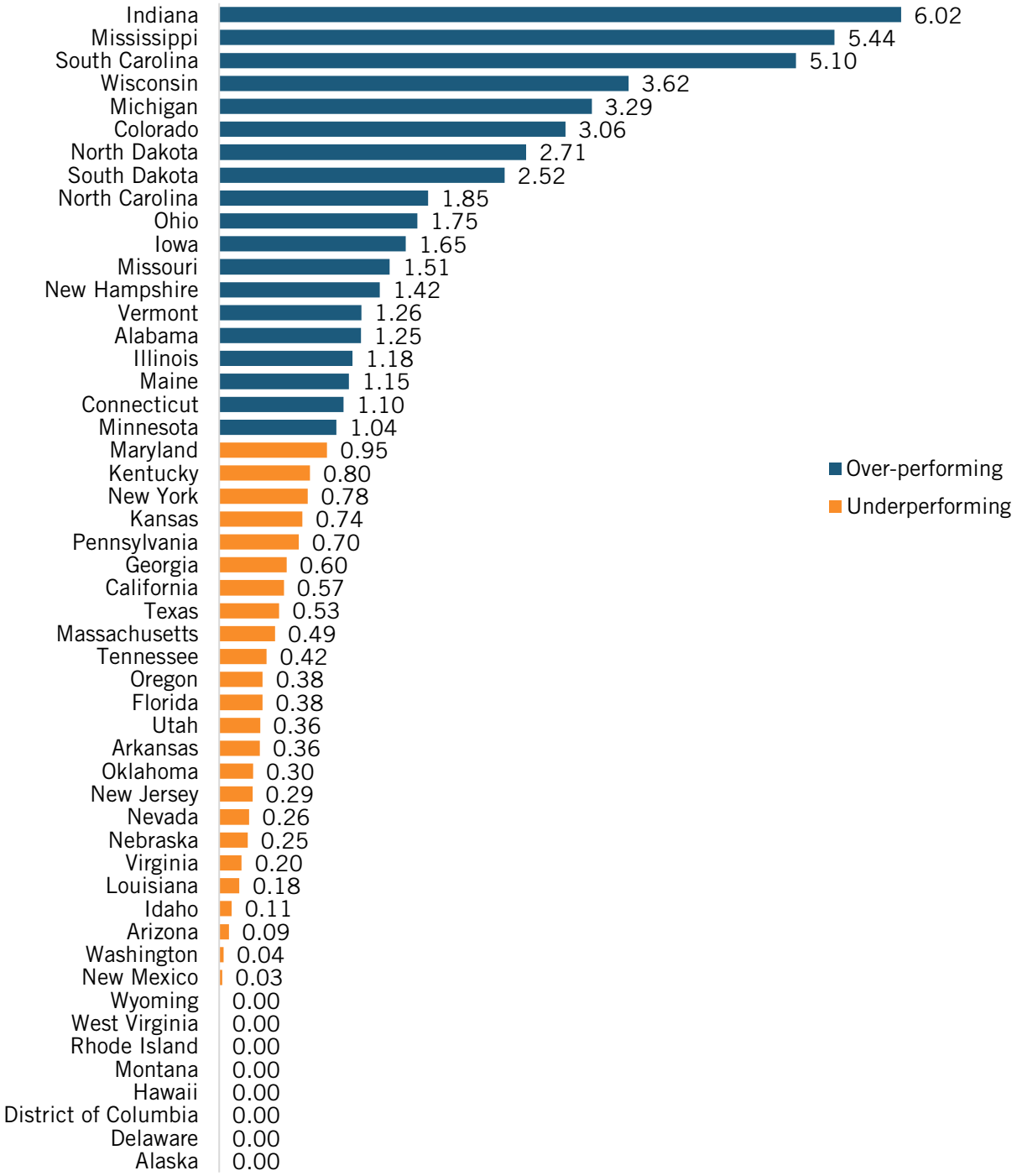
Figure 15: Electrical equipment manufacturing industry group LQ, 2022



Engine, Turbine, and Power Transmission Equipment Manufacturing

Engine, turbine, and power transmission equipment manufacturing involves the production of power generation and transfer equipment. This includes power plant turbines, industrial machinery engines, gears, speed changers, and other mechanical power transmission equipment.

Figure 16: Engine, turbine, and power transmission equipment manufacturing equipment LQ, 2022



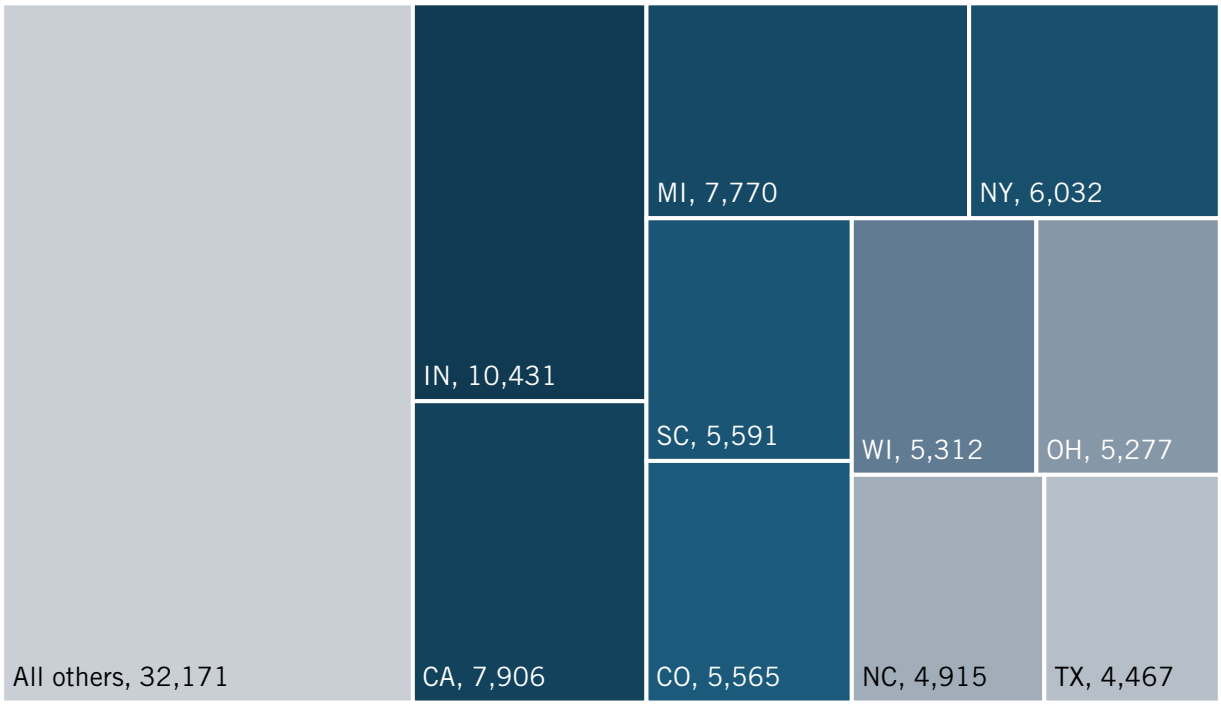
These manufacturers are critical to energy production, transportation, and industrial operations across the United States.

Indiana leads the nation with an LQ of 6.02, followed by Mississippi (5.44) and South Carolina (5.10). (See figure 16.) Wisconsin (3.62), Michigan (3.29), and Colorado (3.06) also show strong concentration in this industry. These states have developed manufacturing clusters supported by skilled labor, proximity to end users, and established supply chains.

Many states underperform, with LQs below 1.00 or even at 0.00. Several states, including Hawaii, D.C., Delaware, and Alaska, have a minimal presence in this industry, all showing LQs of 0.00. Even states with significant manufacturing bases, such as Kentucky (0.80) and Georgia (0.60), show lower concentrations than expected. Ten states record no measurable employment in this sector, highlighting its geographic concentration in specific regions.

Indiana leads the engine, turbine, and power transmission equipment manufacturing industry in LQ and absolute employment (10,431 employees), making it the top state in this sector (figure 17). Despite its modest LQ, California follows with 7,906 workers, closely trailed by Michigan at 7,770. Several states with high LQs, such as Mississippi (2,714) and North Dakota (650), do not employ many employees relative to other states. All other states outside the top 10 employ over 32,000 individuals, or one-third of total employees in the domestic industry.

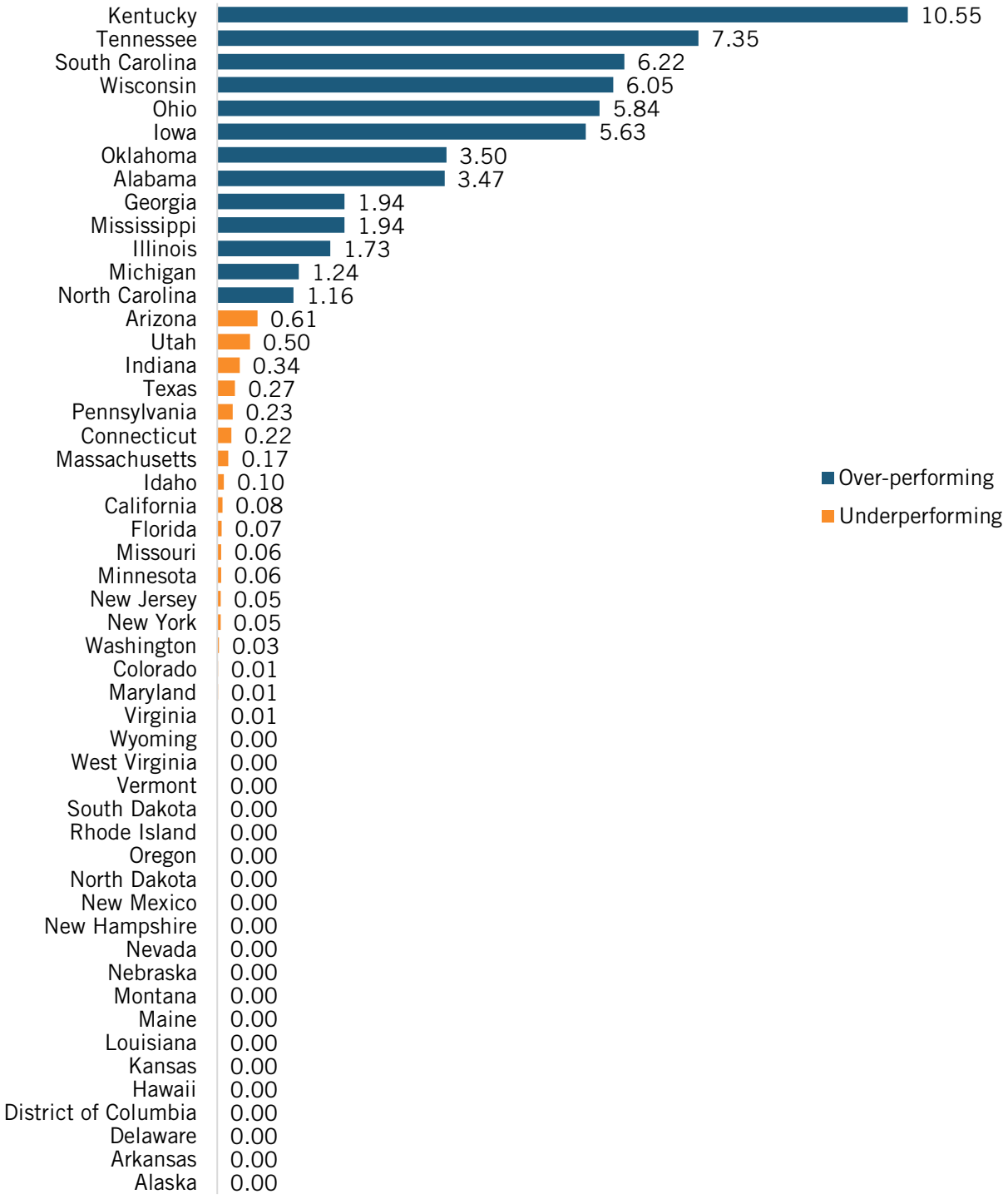
Figure 17: Number of employees in engine, turbine, and power transmission equipment manufacturing (top 10 states, and all others)



Household Appliance Manufacturing

The household appliance manufacturing industry produces electrical and gas-powered appliances for home use. These include major appliances such as refrigerators, washing machines, and ovens, and smaller appliances such as microwave ovens, blenders, and vacuum cleaners.

Figure 18: Household appliance manufacturing LQ, 2022



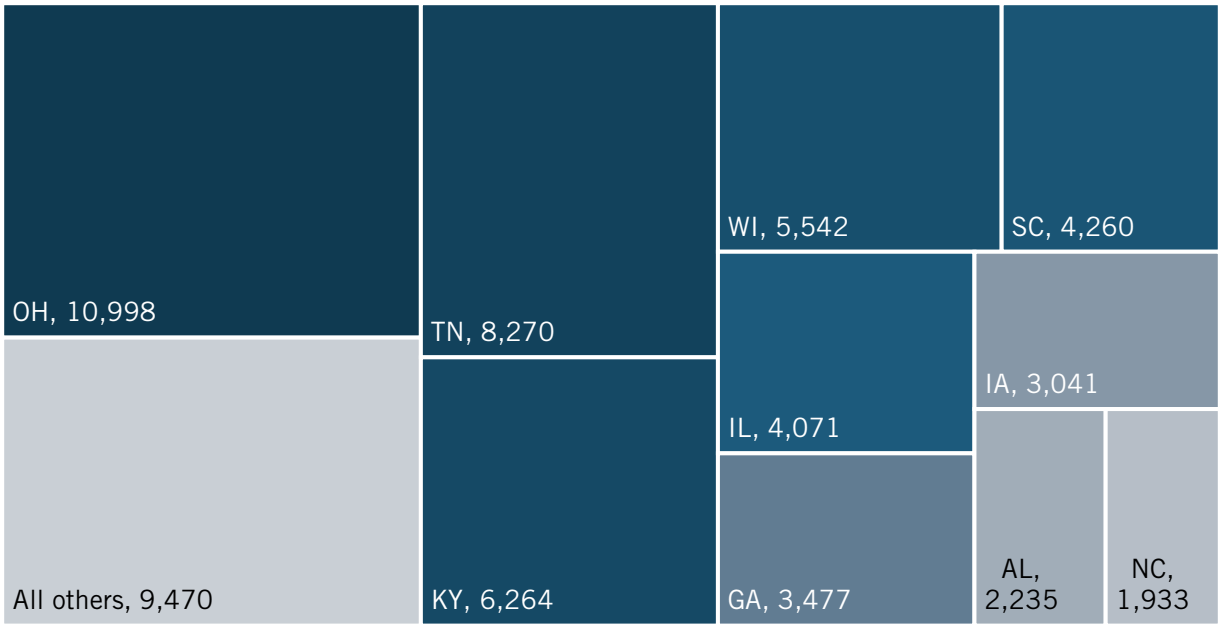
This industry is essential for modern domestic life and represents a significant segment of consumer durables manufacturing in the United States. Many of the goods produced in this industry are traditionally imported from nations such as China, so developing a manufacturing base is essential for U.S. trade independence.

Kentucky dominates the industry with an LQ of 10.55 (figure 18), indicating an appliance manufacturing concentration over 10 times the national average. Tennessee follows with an LQ of 7.35, while South Carolina (6.22), Wisconsin (6.05), Ohio (5.84), and Iowa (5.63) also show strong concentrations. These states benefit from established manufacturing infrastructure, skilled labor forces, and strategic locations for distribution across the country.

Most states show minimal presence in this industry, with many recording LQs of 0.00, indicating no significant appliance manufacturing activity. Even large manufacturing states such as Indiana (0.34), Texas (0.27), and Pennsylvania (0.23) show surprisingly low concentrations. California and New York, despite their large economies, have very low LQs of 0.08 and 0.05, respectively. Twenty-three states show no measurable employment in this sector, highlighting its concentrated nature in specific manufacturing regions.

In absolute terms (figure 19), Ohio employs the most workers in the household appliance manufacturing industry, with 10,998 employees. Tennessee follows with 8,270 workers, while Kentucky, the leading state in relative employment, employs 6,264 individuals. Almost 50 percent of all household appliance manufacturing industry employees are located in those three states. Wisconsin and South Carolina also play notable roles, with 5,542 and 4,260 employees, respectively. The remaining 40 states and D.C. collectively employ 9,470 individuals.

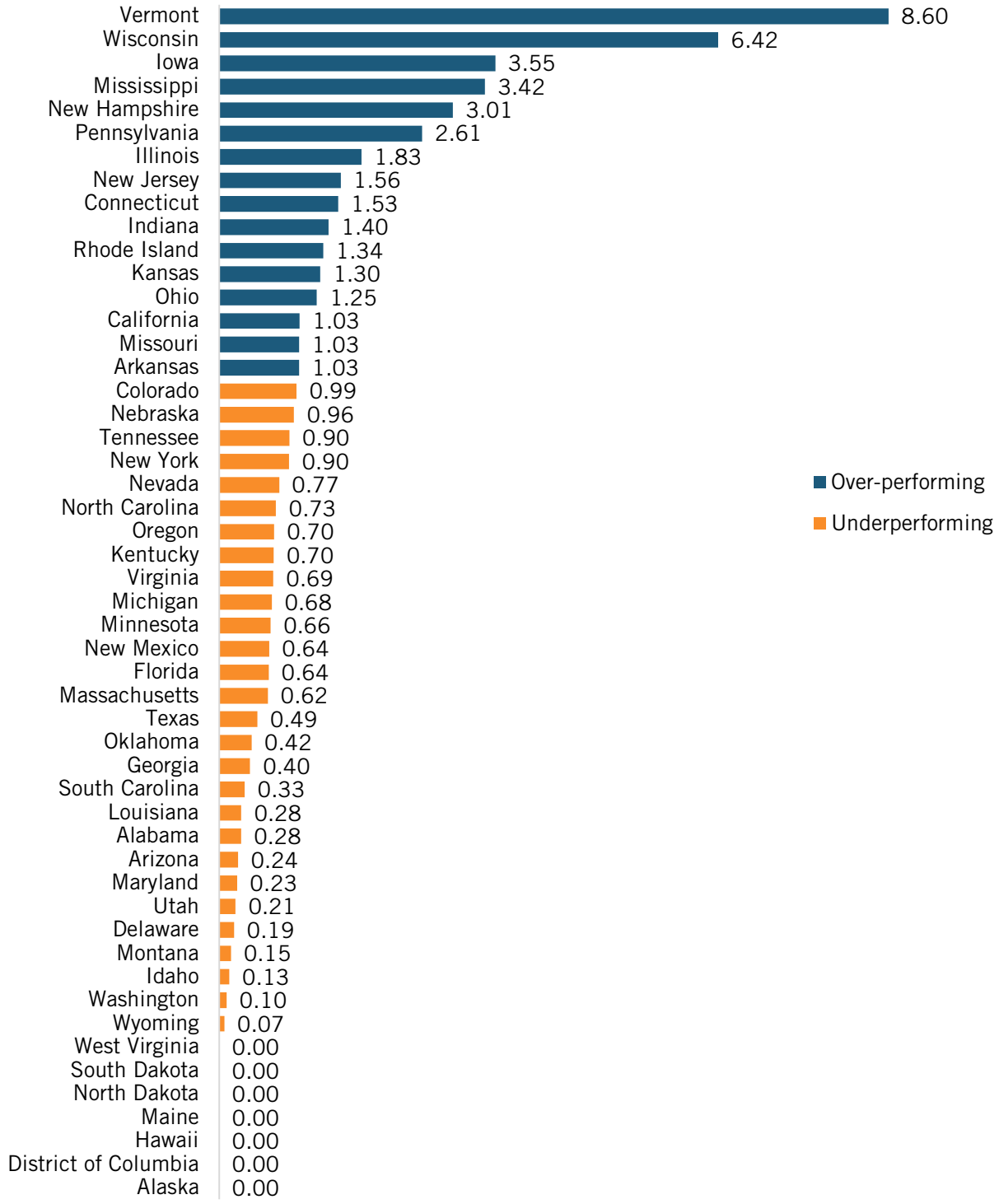
Figure 19: Number of employees in household appliance manufacturing (top 10 states, and all others)



Electric Lamp Bulb and Part Manufacturing

The electric lamp bulb and part manufacturing industry produces lighting components from incandescent bulbs to LED lights, fluorescent tubes, and parts. It provides residential and commercial lighting while adapting to energy-efficient technologies and smart lighting systems.

Figure 20: Electric lamp bulb and part manufacturing LQ, 2022

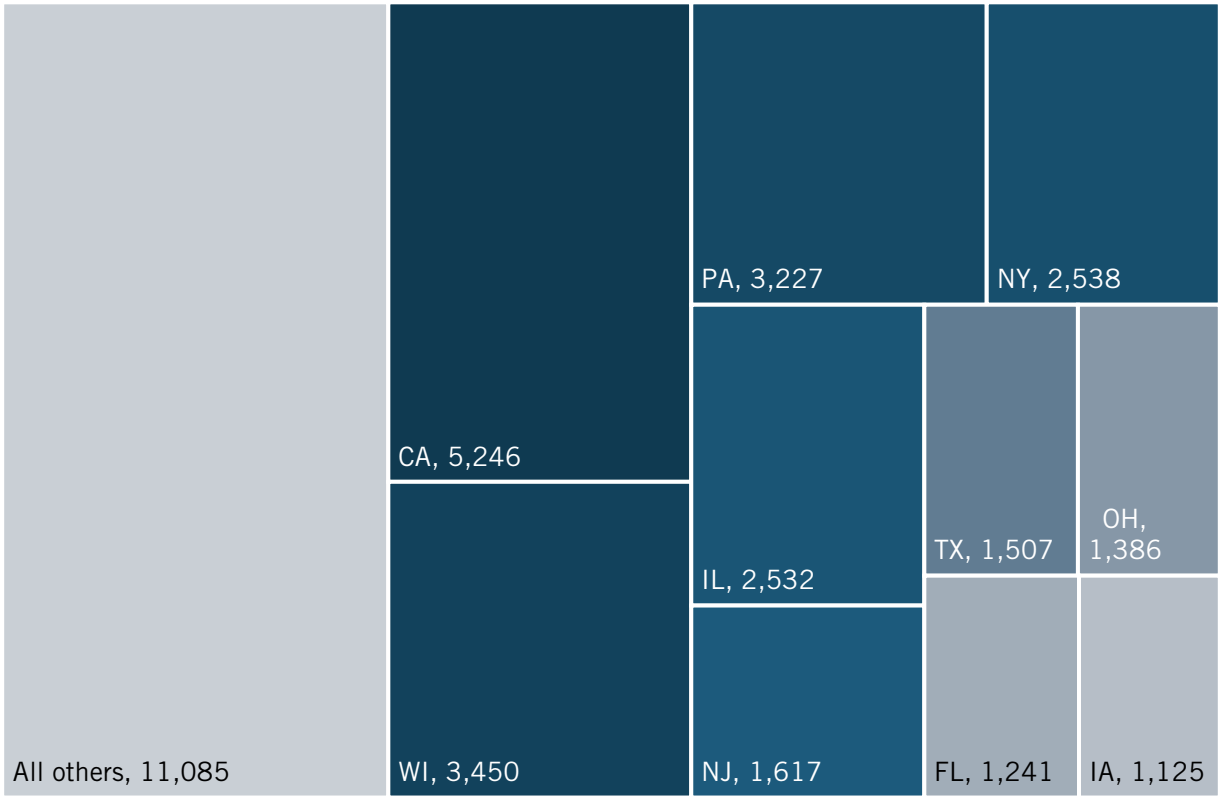


Vermont leads with an LQ of 8.60, followed by Wisconsin at 6.42. Iowa (3.55), Mississippi (3.42), and New Hampshire (3.01) also show strong concentrations (figure 20). These states combine manufacturing capabilities with established supply chains and skilled labor.

Most states have LQs below 1.00. Large industrial states such as Michigan (0.68), Texas (0.49), and Georgia (0.40) show low concentrations. Eight states, including Alaska, Hawaii, and Maine, report no employment in the sector. This shows that the industry remains concentrated in specific manufacturing regions, such as the Midwest and Northeast.

Despite its modest LQ, California leads the electric lamp bulb and part manufacturing industry with 5,246 employees (figure 21). Wisconsin follows with 3,450 workers, while Pennsylvania and New York employ 3,227 and 2,538 individuals. Vermont, which leads the country in relative employment in this industry, employs just 477 employees, or 1 percent of total domestic employment. Other manufacturing hubs in the Midwest, such as Illinois, Ohio, and Iowa, also have many employees in this sector. Due to the wide disbursement of this industry across the country, one in three employees in lamp bulb and part manufacturing are located outside the top 10 states.

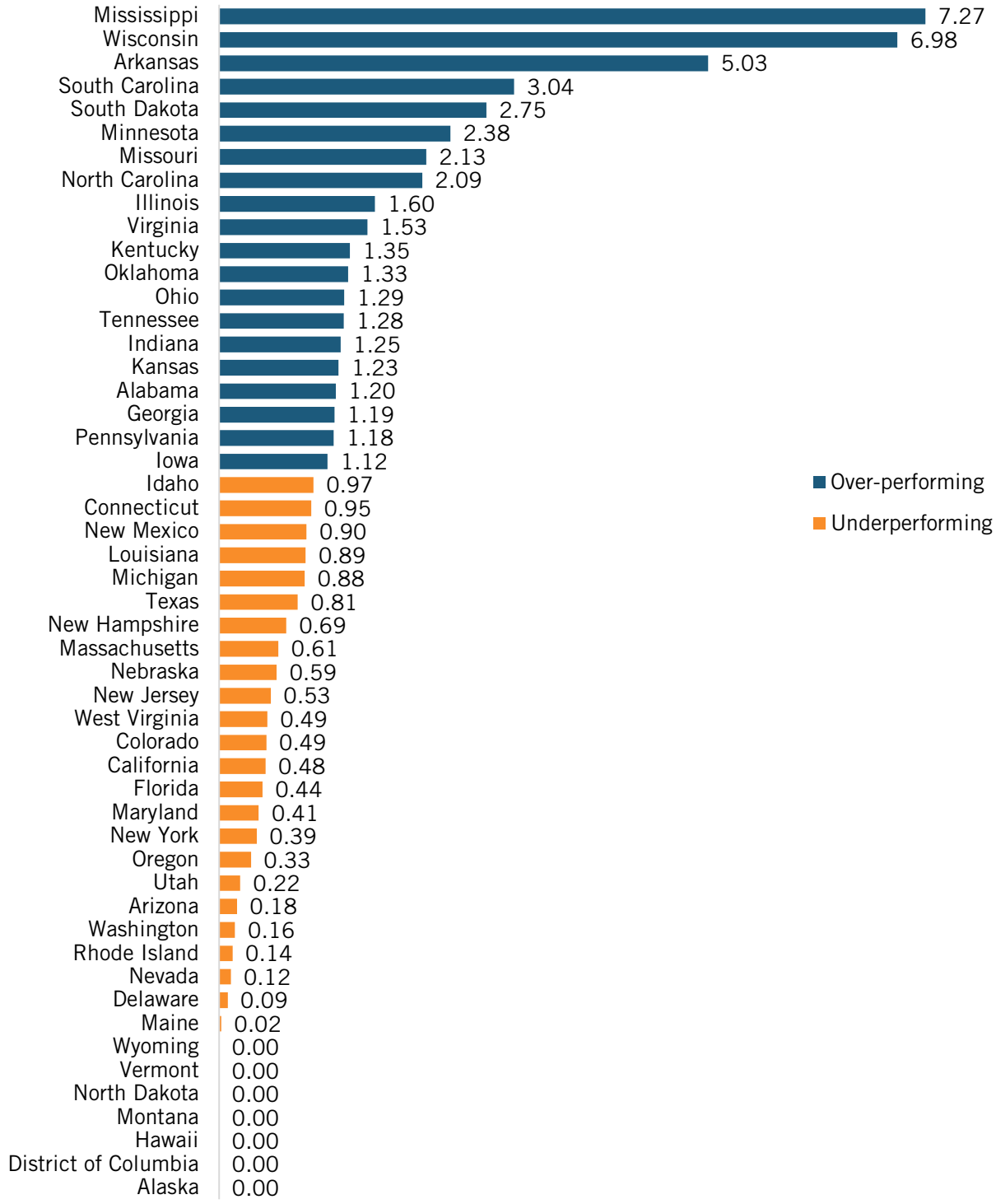
Figure 21: Number of employees in electric lamp bulb and parts manufacturing (top 10 states, and all others)



Power Equipment Manufacturing

The power equipment manufacturing industry produces components, machinery, and household and industrial use equipment. It supports energy, transportation, and telecommunications by manufacturing transformers, motors, and switchgear for power generation and distribution.

Figure 22: Power equipment manufacturing LQ, 2022

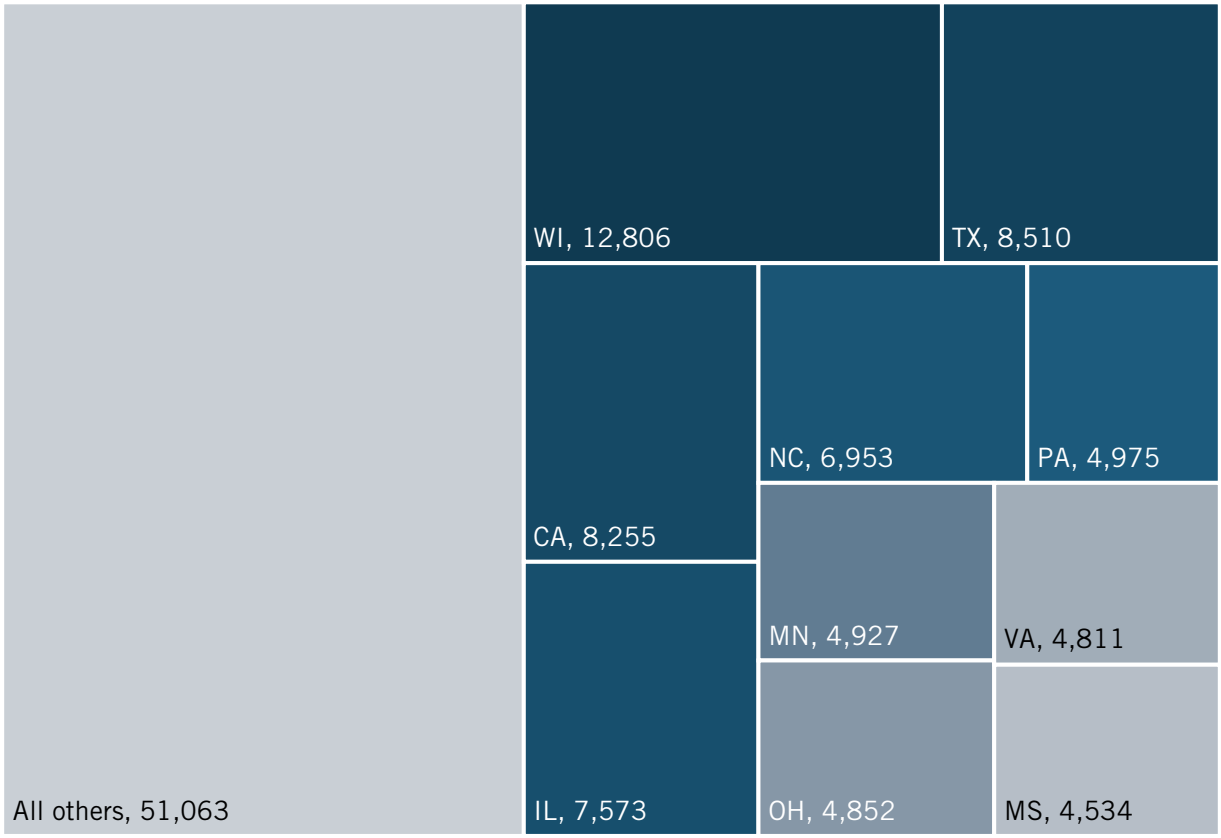


Mississippi leads with an LQ of 7.27, followed by Wisconsin (6.98), Arkansas (5.03), and South Carolina (3.04). (See figure 22.) The Midwest and South dominate due to established manufacturing bases, skilled labor, and business-friendly policies. Other states, such as Kentucky (1.35), Oklahoma (1.33), and Kansas (1.23), over-perform what is expected based on their size.

Several states underperform, with LQs below 1.00. California (0.48), Florida (0.44), and New York (0.39) have fewer industry jobs than expected. Washington (0.16), Nevada (0.12), Rhode Island (0.14), and Delaware (0.09) also lag behind. Alaska, Hawaii, and Vermont have an LQ of 0.00, indicating no significant industry presence.

Wisconsin leads the power equipment manufacturing industry with over 12,800 employees, making it the top contributor. Texas and California follow closely, employing over 8,000 workers each, while Illinois employs more than 7,500. Mississippi, the leading state in relative employment, is home to just 4 percent of all individuals working in power equipment manufacturing, making it the state with the 10th-most employees in the country in this industry. Like many other manufacturing sectors, many of the employees in this industry are concentrated in the Midwest, with Pennsylvania, Minnesota, and Ohio all employing just under 5,000 individuals. The remaining states account for over 51,000 individuals or 43 percent of domestic employees in this sector.

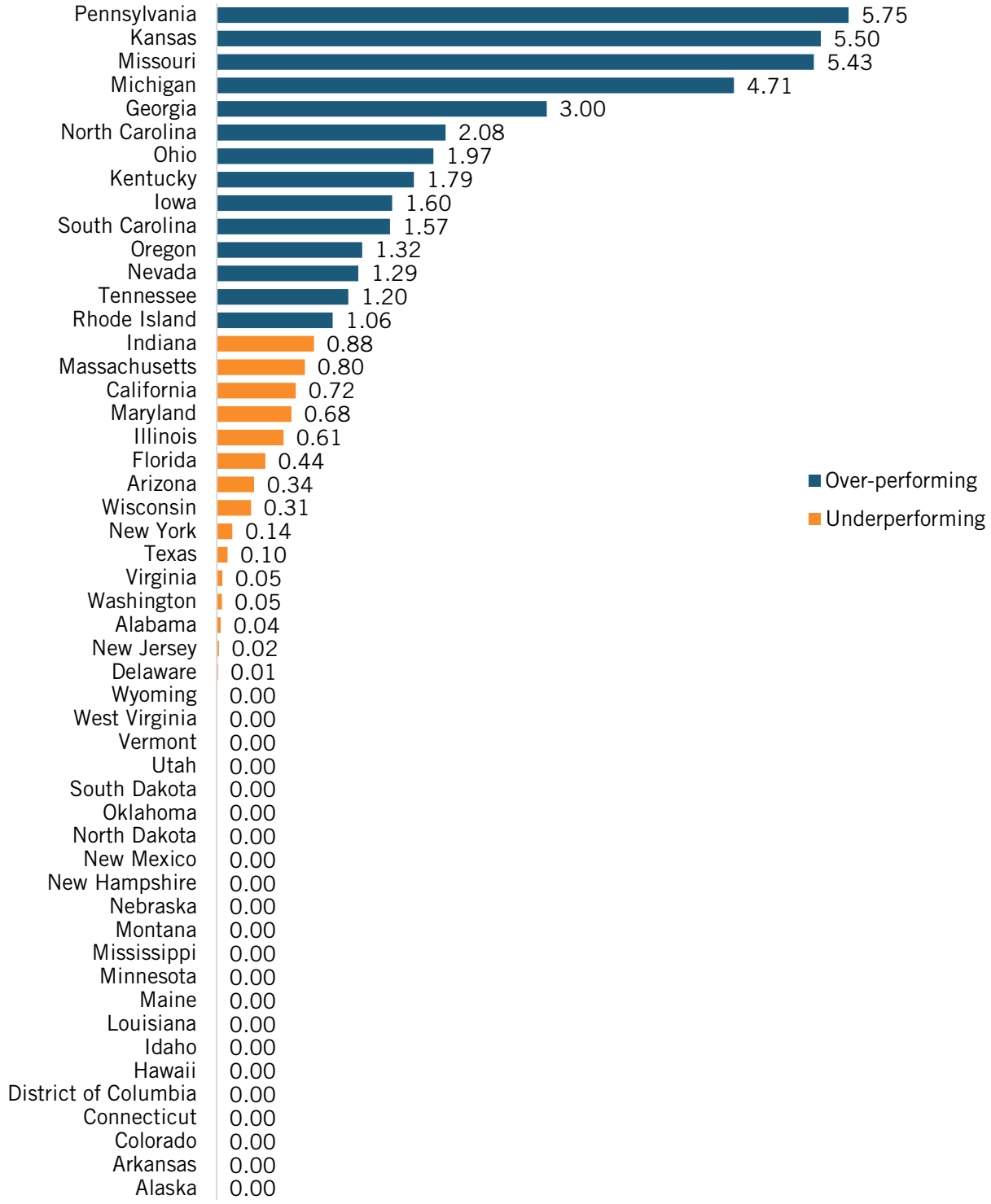
Figure 23: Number of employees in power equipment manufacturing (top 10 states, and all others)



Battery Manufacturing

The battery industry includes companies producing energy storage solutions, from small consumer batteries to large-scale industrial and automotive applications.

Figure 24: Battery manufacturing LQ, 2022



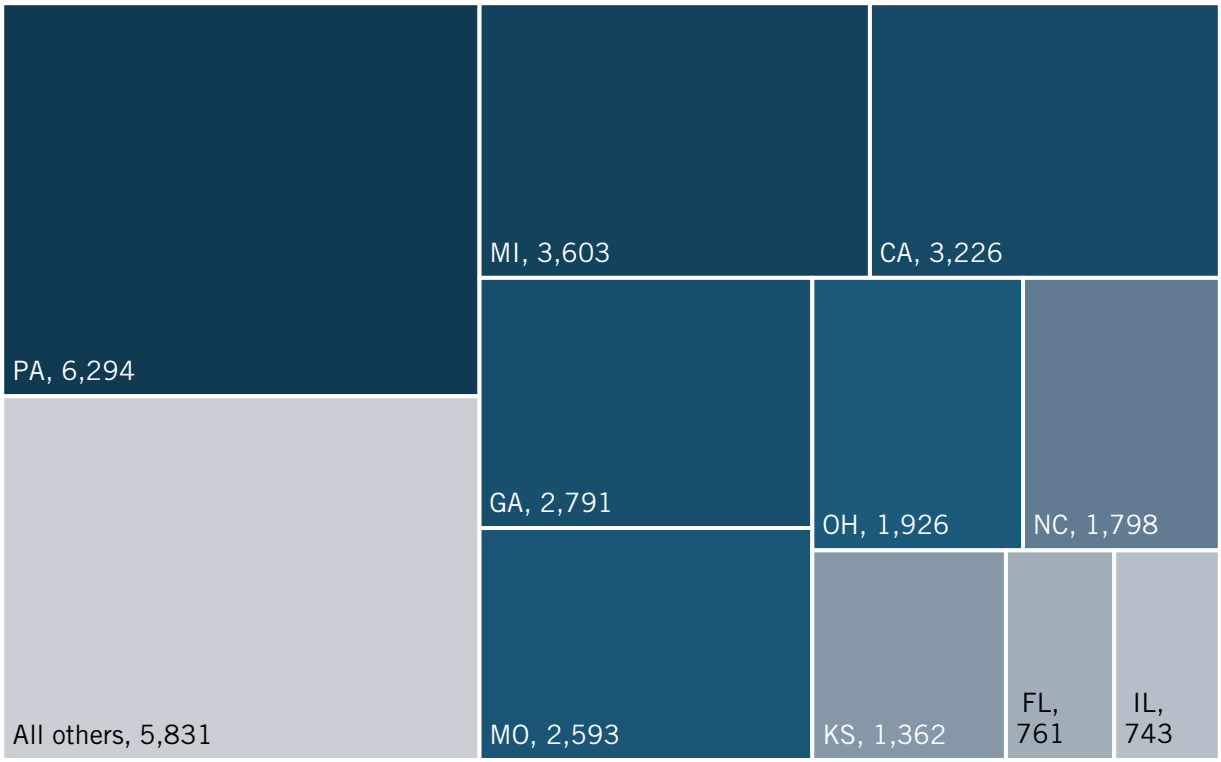
With the rise of electric vehicles, renewable energy storage, and portable electronics, battery manufacturing has become critical for technological advancement and energy sustainability. This industry plays a key role in innovating power sources in the clean energy sector.

Pennsylvania leads the nation in battery manufacturing with an LQ of 5.75, followed by Kansas (5.50), Missouri (5.43), and Michigan (4.71). (See figure 24.) Georgia (3.00) and North Carolina (2.08) also have substantial concentrations of battery industry employment. These states benefit from major manufacturing facilities, raw materials access, and investments in energy storage technologies. The Midwest and Southeast regions dominate, reflecting their growing role in battery production, particularly for electric vehicles and grid storage.

Many states underperform in this industry, with LQs below 1.00. Large states such as California (0.72), Florida (0.44), and Texas (0.10) have fewer battery manufacturing jobs than expected, despite their size. Other underperforming states include Arizona (0.34), New York (0.14), and Washington (0.05). Several states, including Colorado, Connecticut, and Mississippi, have an LQ of 0.00, indicating little to no battery manufacturing presence.

Unsurprisingly, given its high LQ, Pennsylvania leads the battery manufacturing industry with 6,294 employees (figure 25). Michigan and California follow with 3,603 and 3,226 workers, respectively. Georgia employs 2,791 individuals, while Missouri contributes 2,593. Similar to other electrical equipment manufacturing industries, all other major employers in the battery industry are located in the Midwest and Southeast. Ohio, North Carolina, and Kansas are all significant employers as well. Nineteen percent of employees in the battery manufacturing sector are located in states outside the top 10.

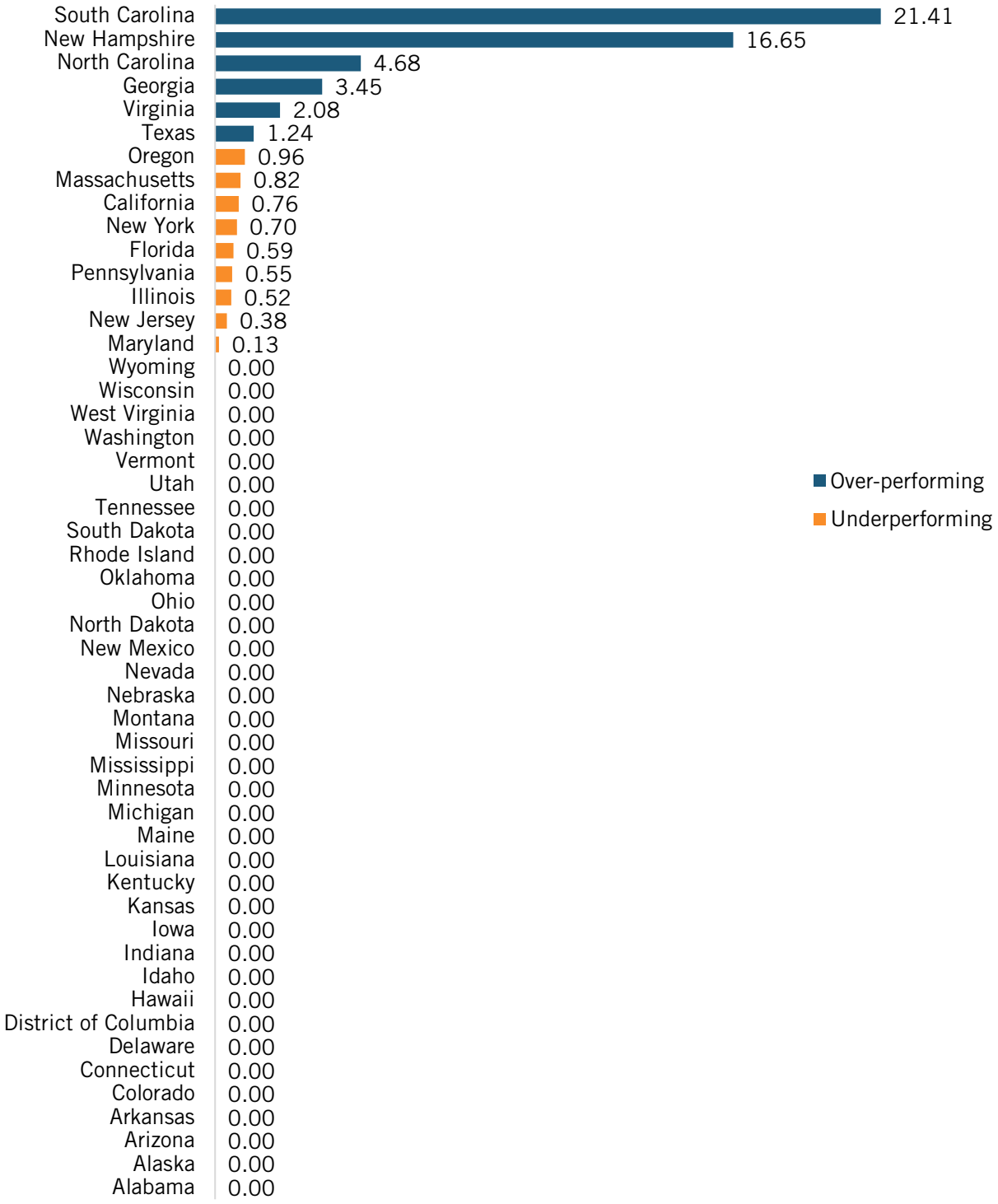
Figure 25: Number of employees in battery manufacturing (top 10 states, and all others)



Fiber Optic Cable Manufacturing

The fiber optic cable manufacturing industry produces high-speed telecommunications cables, Internet infrastructure, and data transmission. These cables, made from thin strands of glass or plastic, enable faster and more reliable data transfer than does traditional copper wiring.

Figure 26: Fiber optic cable manufacturing LQ, 2022



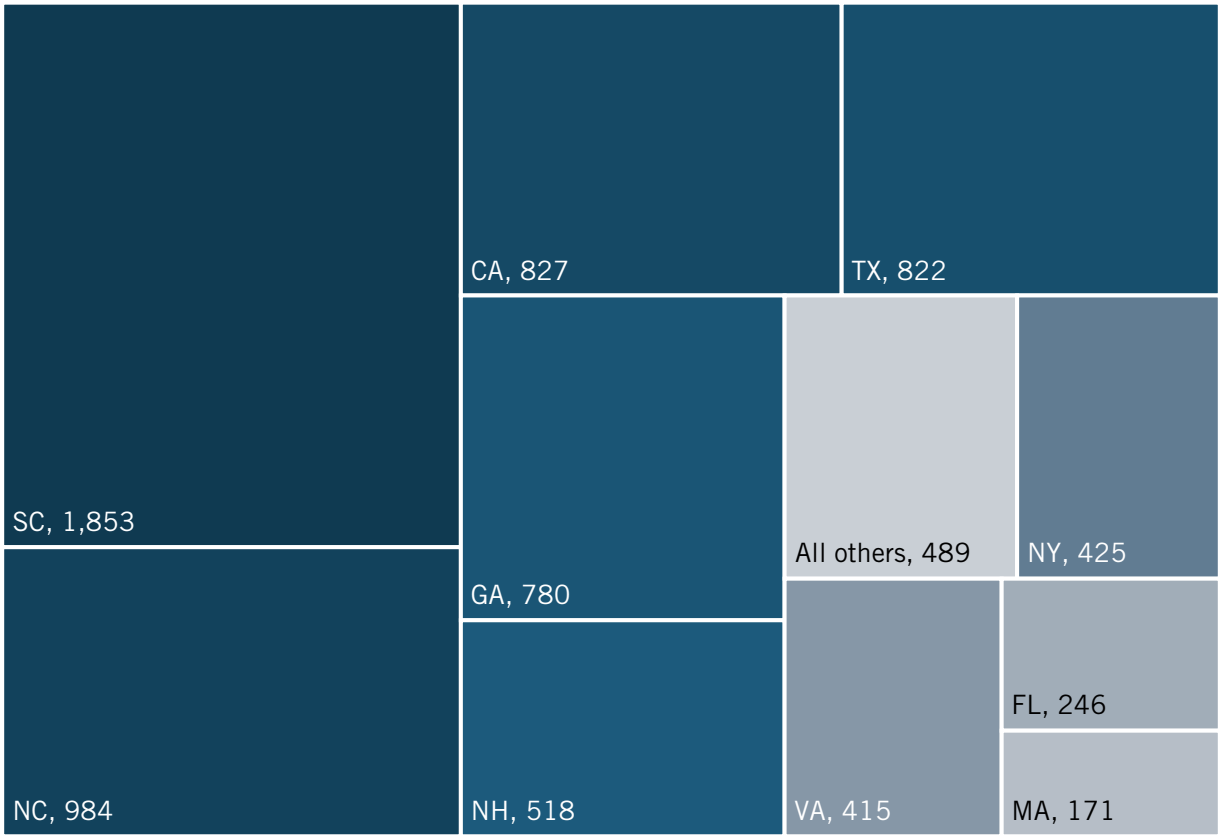
As global demand for broadband and 5G networks increases, fiber optic manufacturing is crucial in expanding connectivity and supporting digital transformation.

South Carolina leads the nation in fiber optic cable manufacturing by far (figure 26), with an LQ of 21.41, followed by New Hampshire (16.65), North Carolina (4.68), and Georgia (3.45). These states have a strong industry presence due to significant investment in broadband infrastructure. Virginia (2.08) and Texas (1.24) also outperform, benefiting from proximity to technology hubs and a growing demand for fiber networks.

Many states underperform in this industry, with LQs below 1.00. Large economies such as California (0.76), New York (0.70), and Florida (0.59) have fewer fiber optic manufacturing jobs than expected. Other underperforming states include Pennsylvania (0.55), Illinois (0.52), and New Jersey (0.38). Thirty-six states, including Ohio, Michigan, and Arizona, have an LQ of 0.00, indicating little to no industry presence.

One-fourth of all fiber optic cable manufacturing employees are employed in South Carolina (1,853), almost twice as many as the second largest employer, North Carolina (984). California (827), Texas (822), and Georgia (780) also have a significant presence in the industry (figure 27). Considering the small size of the fiber optic cable industry (only 7,530 total employees in the United States), few other states manufacture this complex technology; 70 percent of all fiber optic cable manufacturing workers are employed in the previously listed five states.

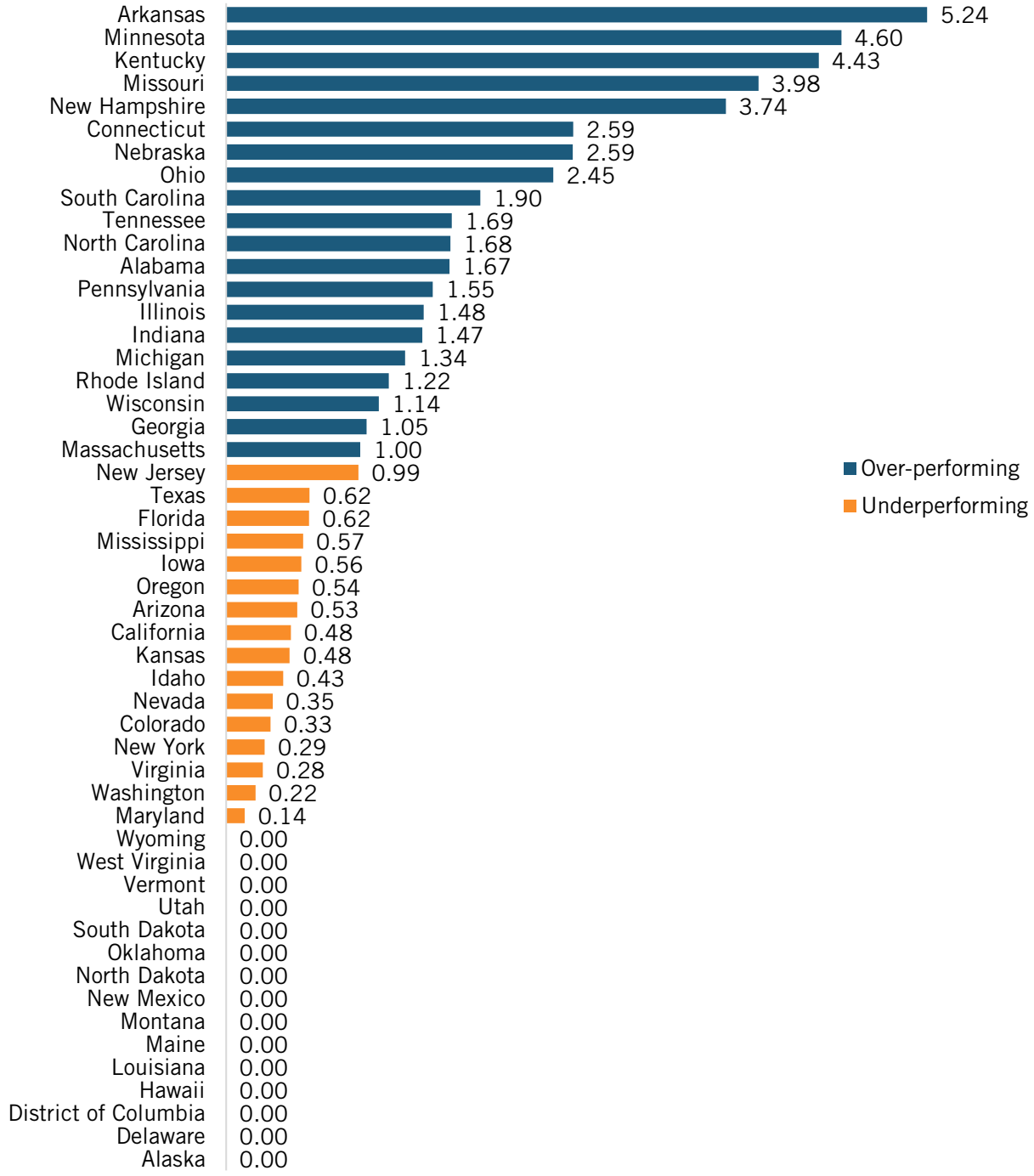
Figure 27: Number of employees in fiber optic cable manufacturing (top 10 states, and all others)



Wiring Device Manufacturing

The wiring device manufacturing industry produces electrical components such as switches, outlets, and connectors for residential, commercial, and industrial electrical systems. These products support modern infrastructure, from home wiring to large-scale power distribution.

Figure 28: Wiring device manufacturing LQ, 2022

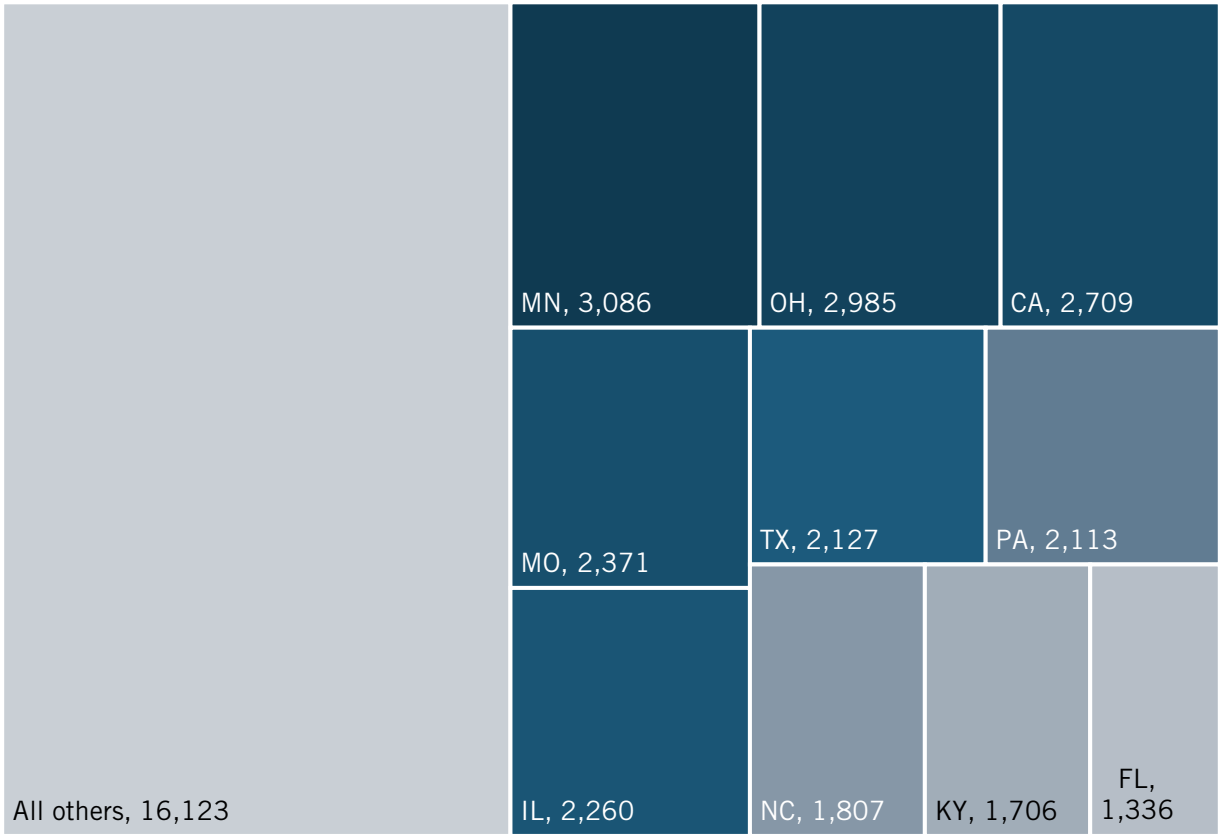


Arkansas leads with an LQ of 5.24 (figure 28), followed by Minnesota (4.60), Kentucky (4.43), and Missouri (3.98). Other strong states include New Hampshire (3.74), Connecticut (2.59), Nebraska (2.59), and Ohio (2.45). The states over-performing in wiring device manufacturing differ significantly in geographic location, indicating the broad range of technologies included within wiring device technologies.

Many states underperform, with LQs below 1.00, indicating less employment in wiring device manufacturing than expected. Large states such as Texas (0.62), California (0.48), and New York (0.29) fall below average. Fifteen states, including West Virginia, North Dakota, and Montana, have an LQ of 0.00, showing no industry presence.

Minnesota leads the wiring device manufacturing industry with 3,086 employees, followed closely by Ohio with 2,985 workers (figure 29). California has 2,709 employees, while Missouri, Illinois, Texas, and Pennsylvania employ over 2,000 individuals each. Arkansas, the state with the highest LQ, employs 1,274 individuals, placing it just out of the top 10 in absolute employment ranks. The remaining states account for 16,123 employees, highlighting a dispersed but focused workforce, with Minnesota at the forefront.

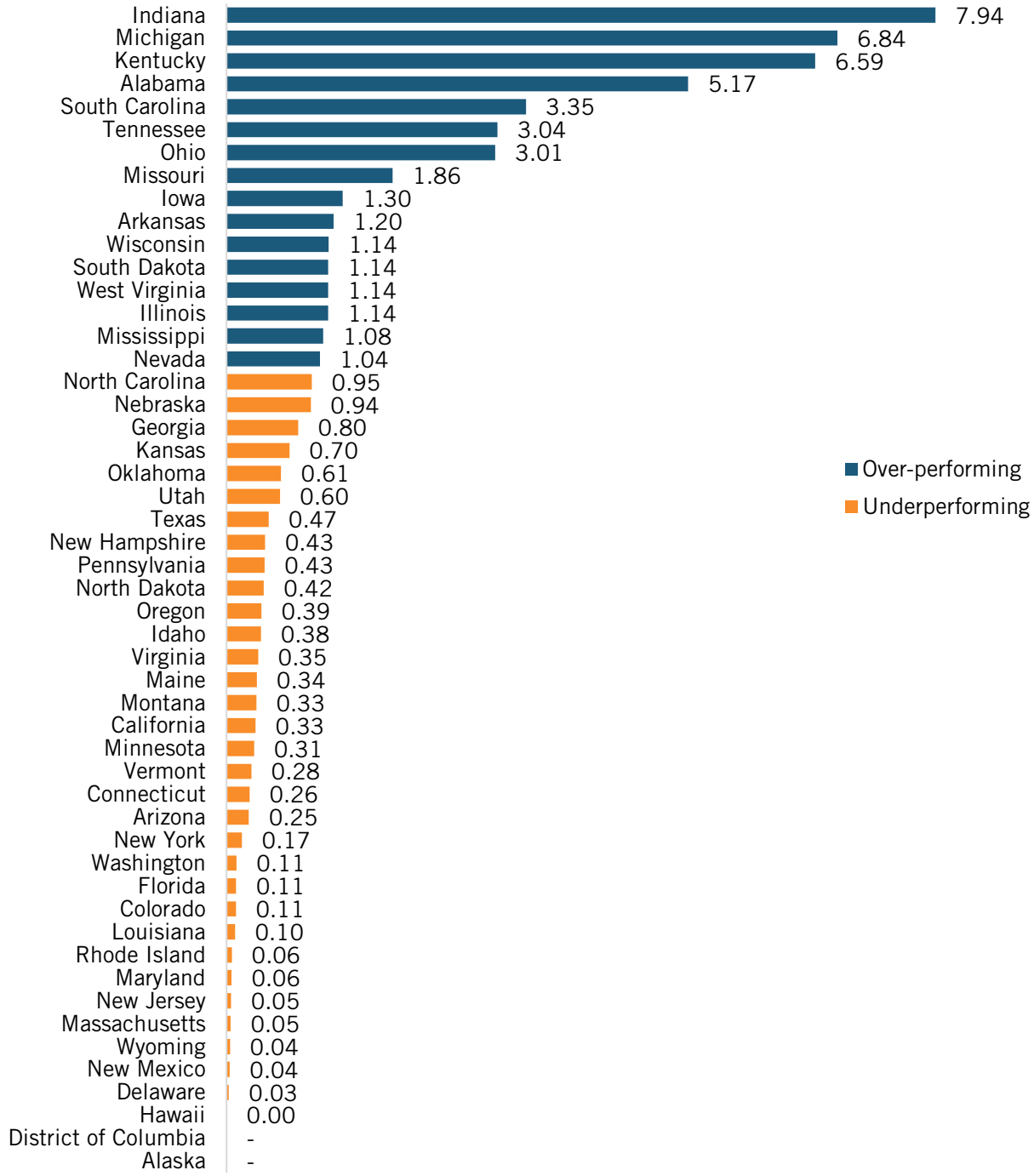
Figure 29: Number of employees in wiring device manufacturing (top 10 states, and all others)



Motor Vehicles

The motor vehicles industry group is comprised of three subindustries: automobiles and light-duty motor vehicles; motor vehicles bodies and trailers; and motor vehicle parts.

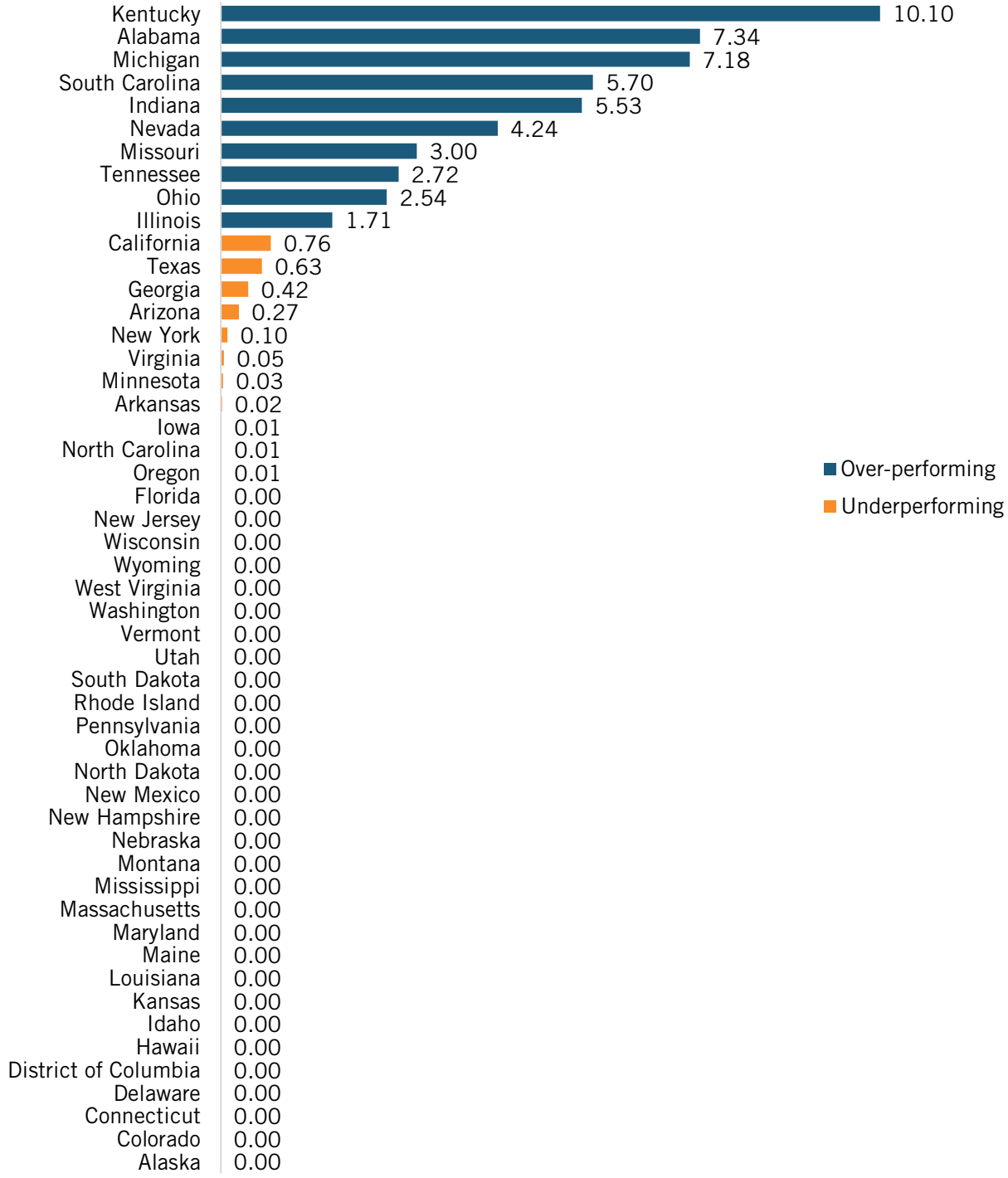
Figure 30: Motor vehicle manufacturing industry group LQ, 2022



Automobile and Light-Duty Motor Vehicle Manufacturing

The automobile and light-duty motor vehicle manufacturing industry produces passenger cars, SUVs, and light trucks.

Figure 31: Automobile and light-duty motor vehicle manufacturing LQ, 2022



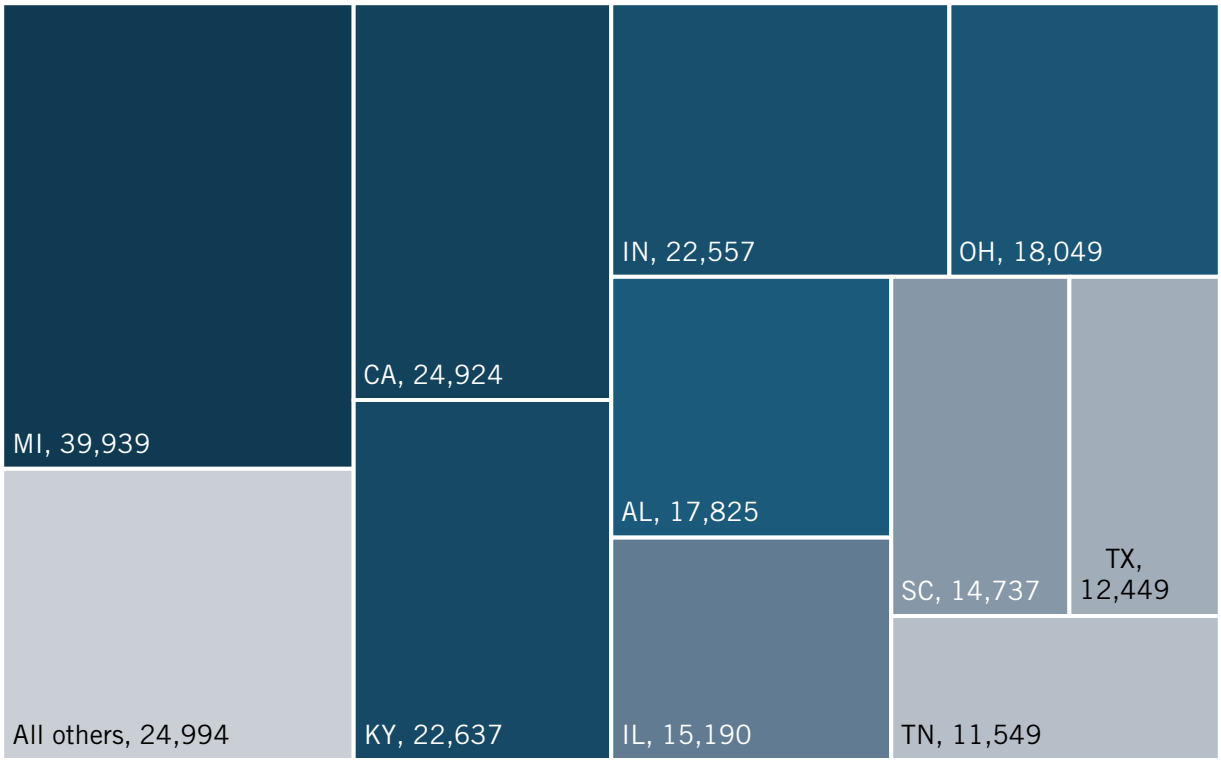
This sector includes vehicle assembly, parts production, and technological innovations in fuel efficiency and electric vehicles. It plays a vital role in the U.S. economy, supporting manufacturing, engineering, and supply chain jobs. The motor vehicles sector has become more innovative due to new electric and self-driving car developments.

Kentucky leads the nation with an LQ of 10.10 (figure 31), followed by Alabama (7.34), Michigan (7.18), and South Carolina (5.70). Other strong performers include Indiana (5.53), Nevada (4.24), Missouri (3.00), and Tennessee (2.72). These states benefit from established automotive plants, skilled labor, and proximity to suppliers, making them key vehicle producers.

Many states underperform, with LQs below 1.00, indicating a lower concentration of employment in this industry. Large states such as California (0.76), Texas (0.63), and New York (0.10) fall below average. Others, including Arizona (0.27), Virginia (0.05), and Minnesota (0.03), have minimal industry presence. Several states, such as Florida, Massachusetts, and Colorado, have an LQ of 0.00, showing no significant employment in vehicle manufacturing.

Michigan employs 39,939 individuals in the automobile and light-duty motor vehicle manufacturing industry, leading all other states in absolute employment. California has 24,924 employees, while Indiana and Kentucky employ over 22,000 people. States in the South and Midwest round out the top 10, with Ohio, Alabama, and Illinois each accounting for more than 15,000 persons employed in the industry. The remaining states collectively employ 24,994 workers, indicating a more minor but notable presence in the industry (11 percent of all employees domestically). Nevada, which over-performs in this industry with an LQ of 4.24, is not featured in the top 10.

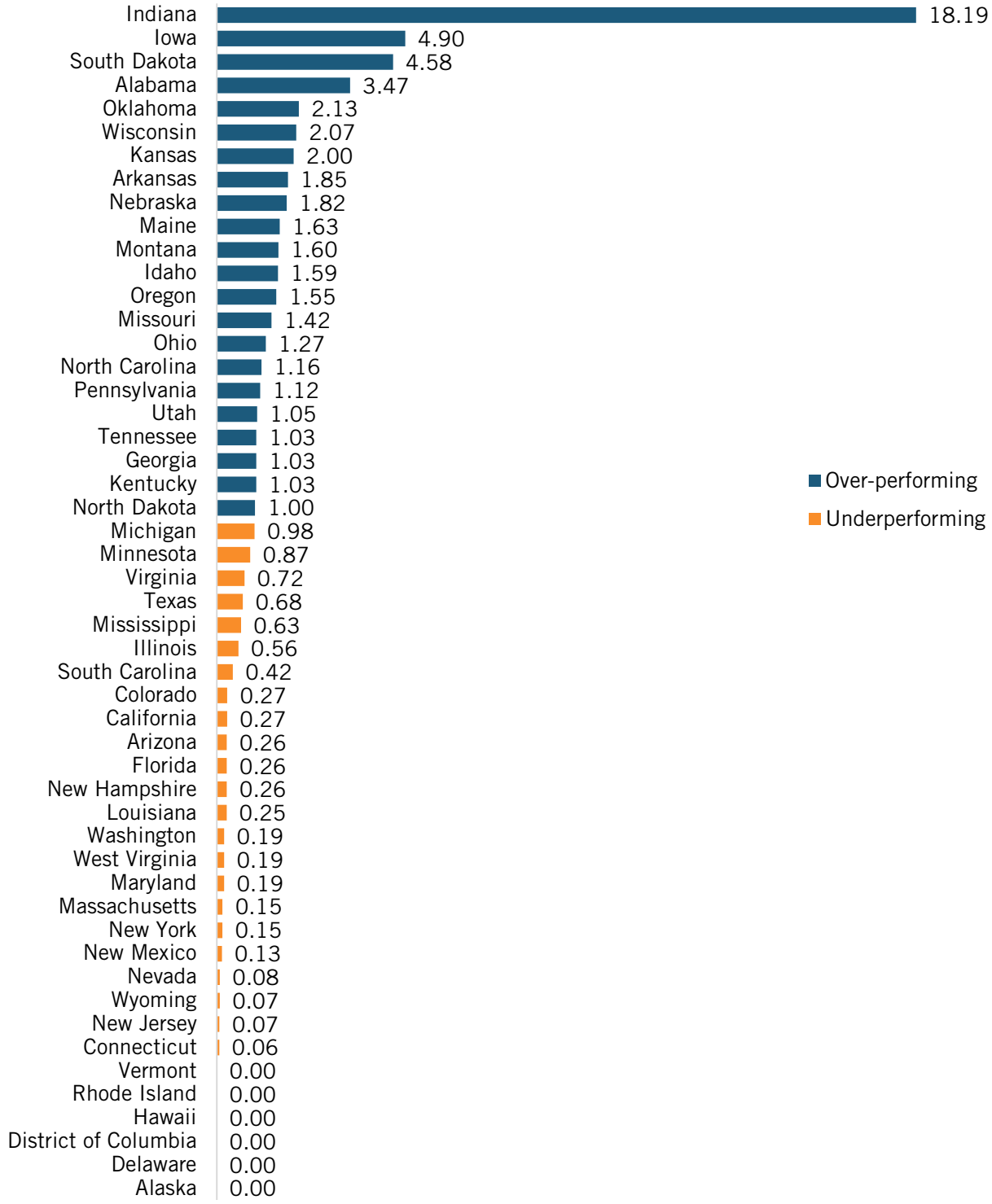
Figure 32: Number of employees in automobile and light-duty motor vehicle manufacturing by state (top 10 states, and all others)



Motor Vehicle Body and Trailer Manufacturing

The motor vehicle body and trailer manufacturing industry produces vehicle frames, truck trailers, and specialty vehicle bodies, which are essential for transportation and logistics.

Figure 33: Motor vehicle body and trailer manufacturing LQ, 2022



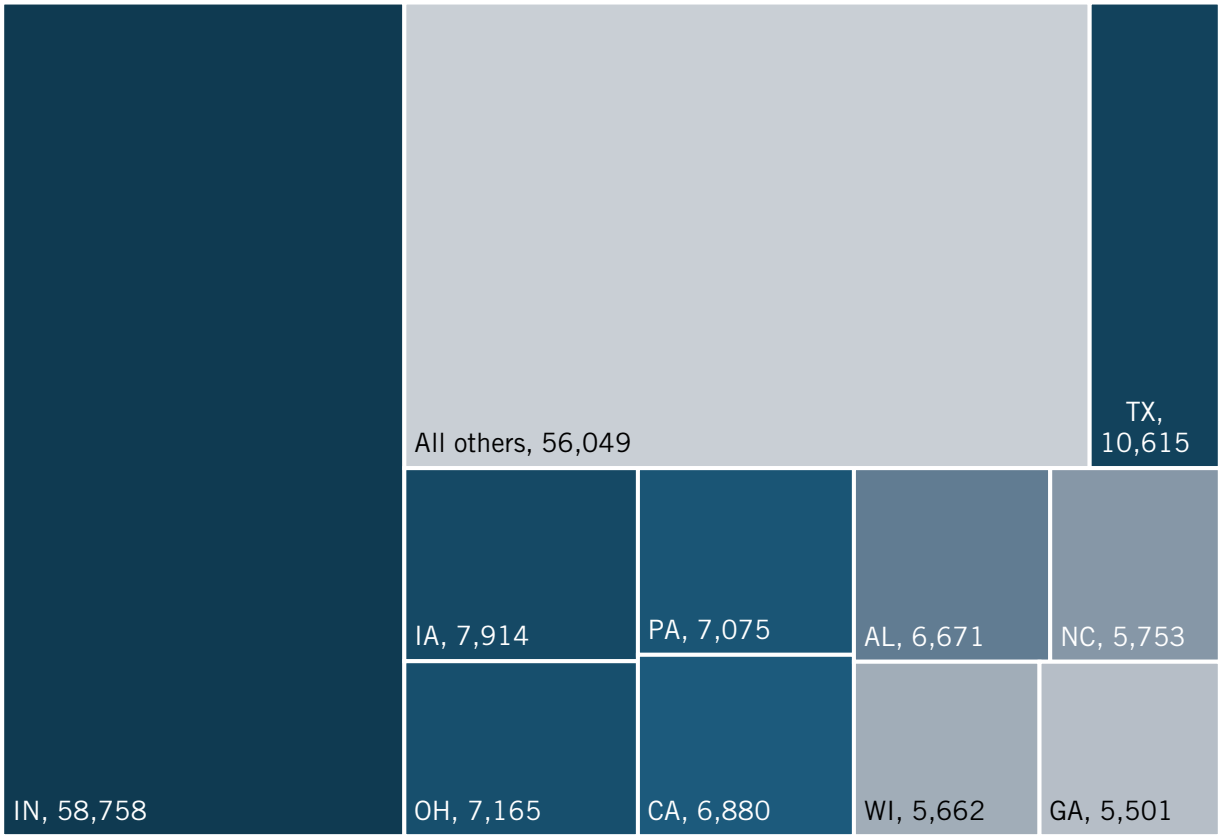
This sector is crucial in the automotive supply chain, supporting commercial transportation, logistics, and personal vehicle markets. It also contributes significantly to the industrial and transportation economy.

Indiana leads with an LQ of 18.19 (figure 33), followed by Iowa (4.90), South Dakota (4.58), and Alabama (3.47). Strong performers include Oklahoma (2.13) and Wisconsin (2.07), which benefit from industrial expertise and a strategic location surrounded by other states with large car manufacturing capacities.

Many states underperform, including California (0.27), Florida (0.26), and New York (0.15), where service and tech industries dominate. Vermont, Rhode Island, and several other small Northeastern and Mid-Atlantic states (0.00) lack the infrastructure and workforce for large-scale manufacturing, keeping the industry concentrated in the Midwest and South.

Unsurprisingly, given its significant LQ, Indiana leads the motor vehicle body and trailer manufacturing industry, employing 58,758 individuals, one-third of domestic employment (figure 34). Texas follows with 10,615 employees, while the Midwestern manufacturing centers of Iowa (7,914), Ohio (7,165), and Pennsylvania (7,075) round out the top five states. Like other manufacturing industries, the prevalence of the South and Midwestern regions is significant. All other states account for 56,049 employees, 31 percent of total domestic employment. Indiana plays a dominant role in the industry, while other states maintain a smaller, supportive presence.

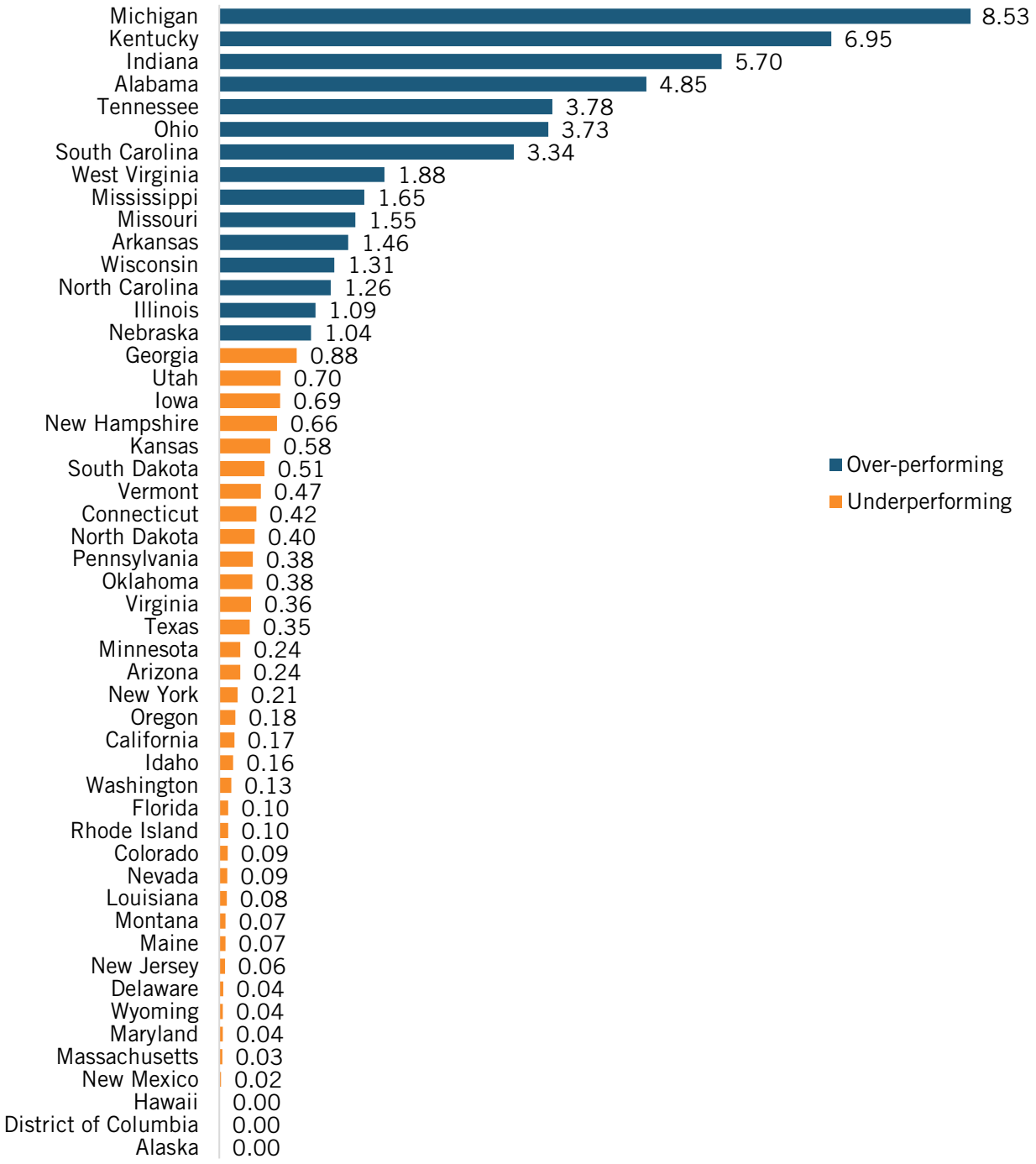
Figure 34: Motor vehicle body and trailer manufacturing (top 10 states, and all others)



Motor Vehicle Parts Manufacturing

The motor vehicle parts manufacturing industry produces essential automobile components, including engines, transmissions, and electrical systems. This sector supports vehicle assembly plants and the aftermarket repair industry, which is critical in the automotive supply chain.

Figure 35: Motor vehicle parts manufacturing LQ, 2022

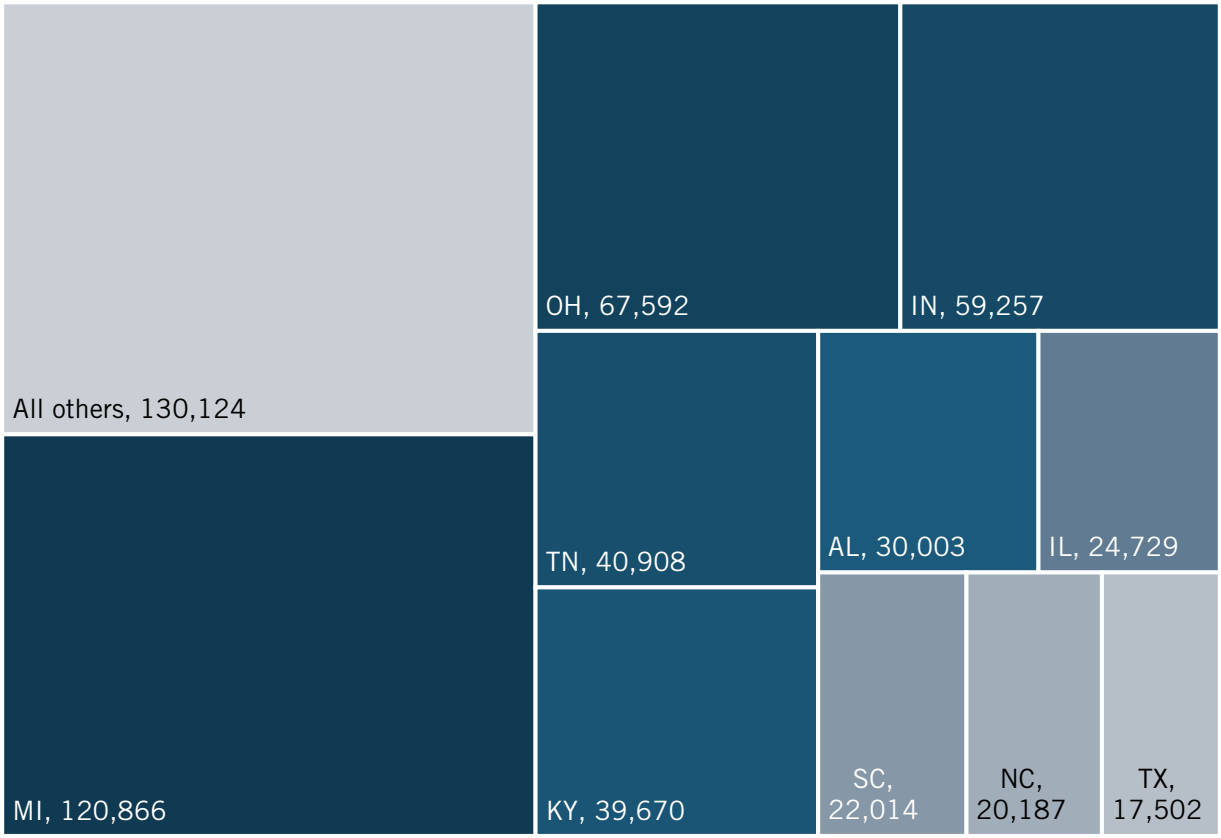


Michigan leads with an LQ of 8.53, reflecting its deep automotive roots (figure 35). Kentucky (6.95), Indiana (5.70), and Alabama (4.85) follow, benefiting from significant auto plants and supplier networks. Strong performers include Tennessee (3.78) and Ohio (3.73), reinforcing the Midwest and South as manufacturing hubs.

Many states underperform, including Texas (0.35), New York (0.21), and California (0.17), where tech and service industries dominate. Coastal states such as Washington (0.13) and Massachusetts (0.03) lack the necessary industrial infrastructure, while Alaska, D.C., and Hawaii (0.00) have no significant presence in the sector.

Michigan dominates motor vehicle parts manufacturing with 120,866 employees (figure 36), followed by Ohio (67,592), Indiana (59,257), and Tennessee (40,908). Half of all employment in this industry is concentrated in these four states. Kentucky and Alabama employ over 30,000 each, while Southern states such as South Carolina, North Carolina, and Texas round out the top 10 largest producers of motor vehicle parts. Despite significant concentration in four states, this industry is widely dispersed among many U.S. states. The remaining states collectively account for over 130,000 employees.

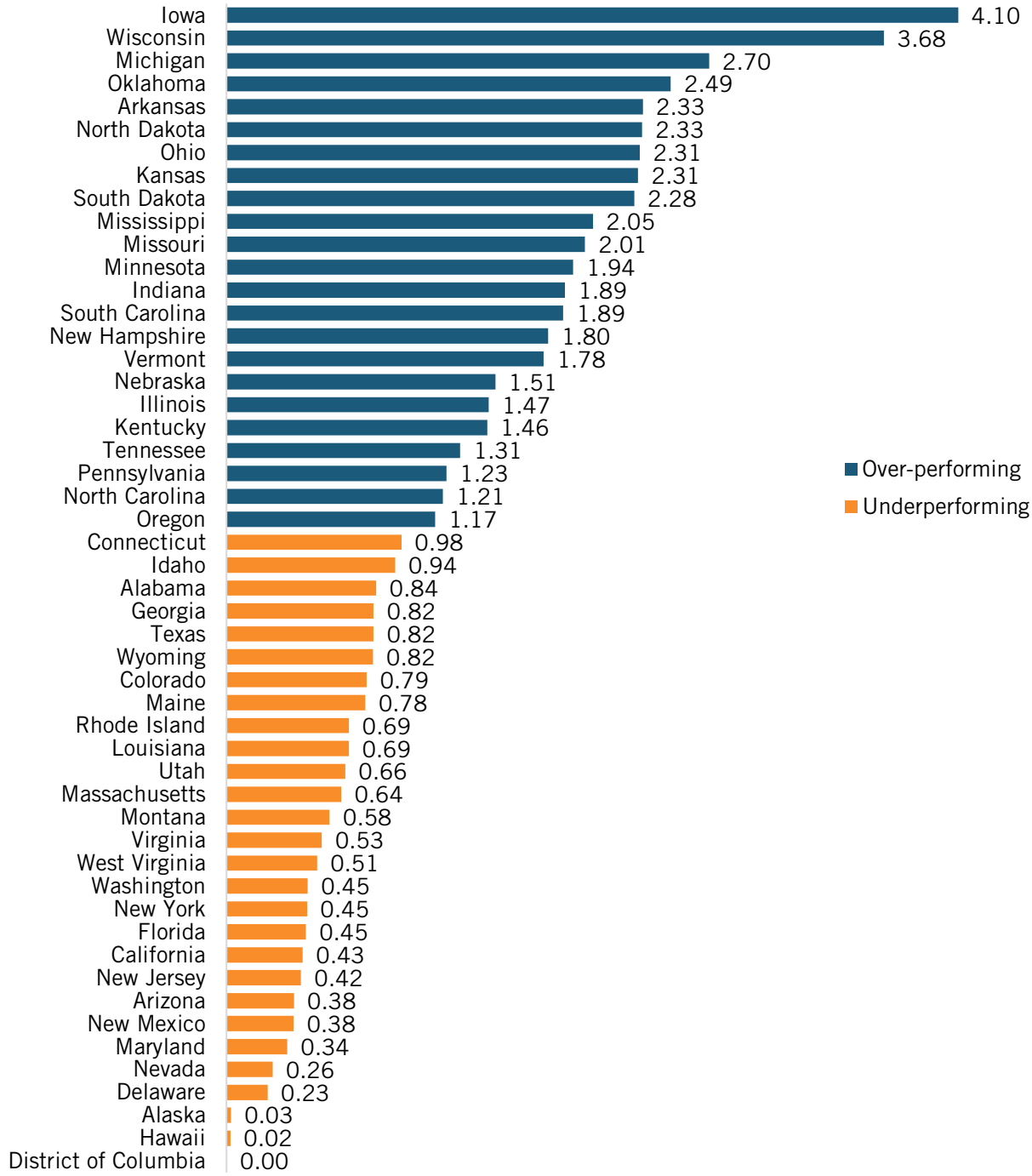
Figure 36: Motor vehicle parts manufacturing (top 10 states, and all others)



Machinery and Equipment

The machinery manufacturing industry produces equipment for agriculture, construction, and industrial applications, including machine tools, mechanical systems, and heavy machinery.

Figure 37: Machinery manufacturing LQ, 2022



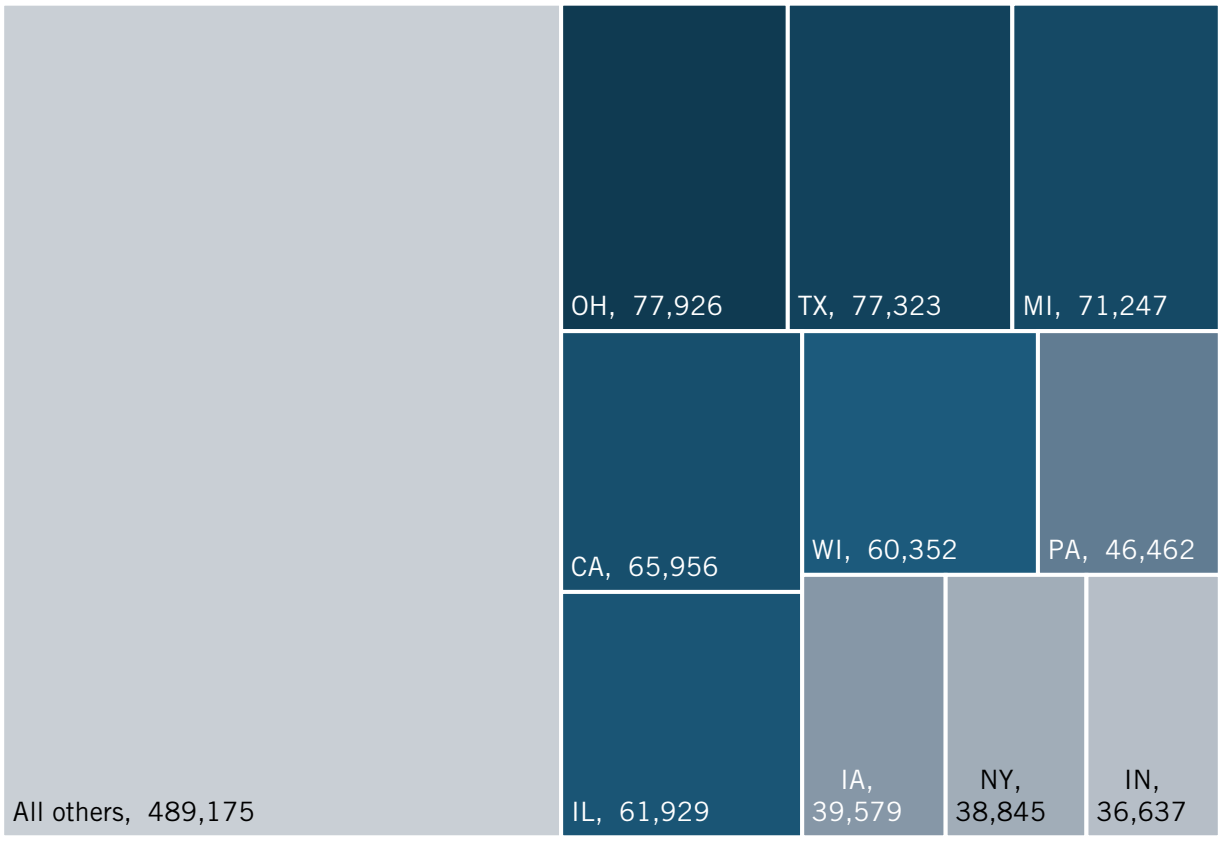
This sector supports infrastructure, transportation, and automation, making it essential for various industries.

Iowa leads with an LQ of 4.10 (figure 37), followed by Wisconsin (3.68) and Michigan (2.70), another indication of the strong manufacturing sector concentrated in the Midwest. Other top states include Arkansas (2.33), North Dakota (2.33), and Oklahoma (2.49), all of which have large agricultural sectors requiring a significant amount of machinery stock.

Underperforming states include New York (0.45), Florida (0.45), and California (0.43), where service-based and advanced technology industries dominate. Generally, states specializing in high-tech industries underperform in machinery manufacturing, with Massachusetts (0.64) and Washington (0.45) lacking a strong manufacturing presence. Alaska (0.03) and Hawaii (0.02), states specializing in energy production and tourism, respectively, have minimal industry activity.

In absolute terms, Ohio leads the machinery manufacturing industry with 77,926 employees, followed closely by Texas with 77,323 and Michigan with 71,247. California, Illinois, and Wisconsin also contribute significantly, each employing 6 percent of total machinery manufacturing employees nationwide. Iowa, an agricultural hub that benefits from producing agrarian machinery, employs close to 40,000 individuals. The remaining states collectively account for 489,175 workers (46 percent of the nationwide workforce), highlighting the widespread distribution of this industry.

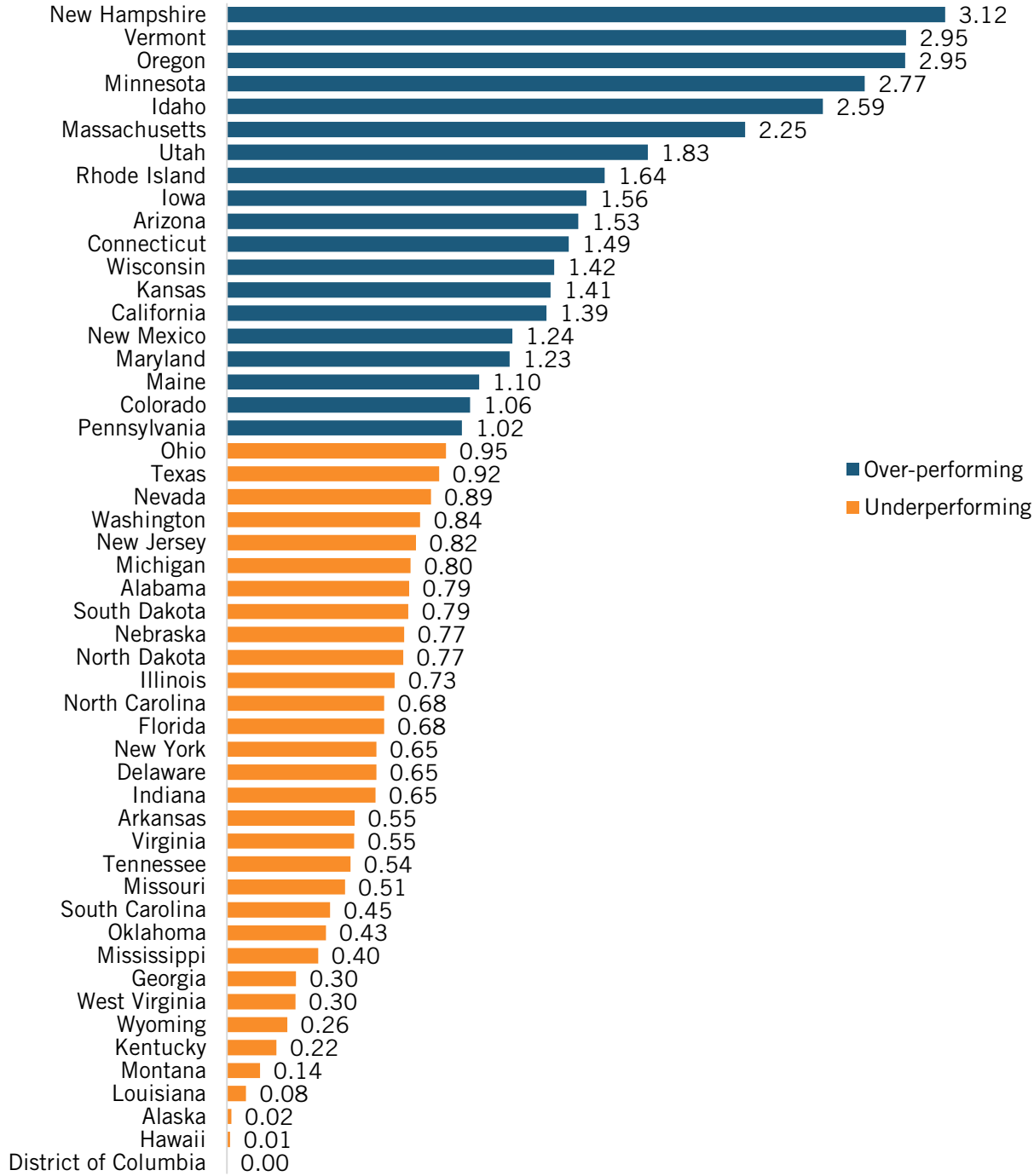
Figure 38: Number of employees in machinery manufacturing (top 10 states, and all others)



Computers, Electronics, and Optical Products

The computer and electronic product manufacturing industry designs and produces computers, semiconductors, and electronic devices essential to many sectors, including telecommunications, aerospace, and healthcare.

Figure 39: Computer and electronic manufacturing LQ, 2022

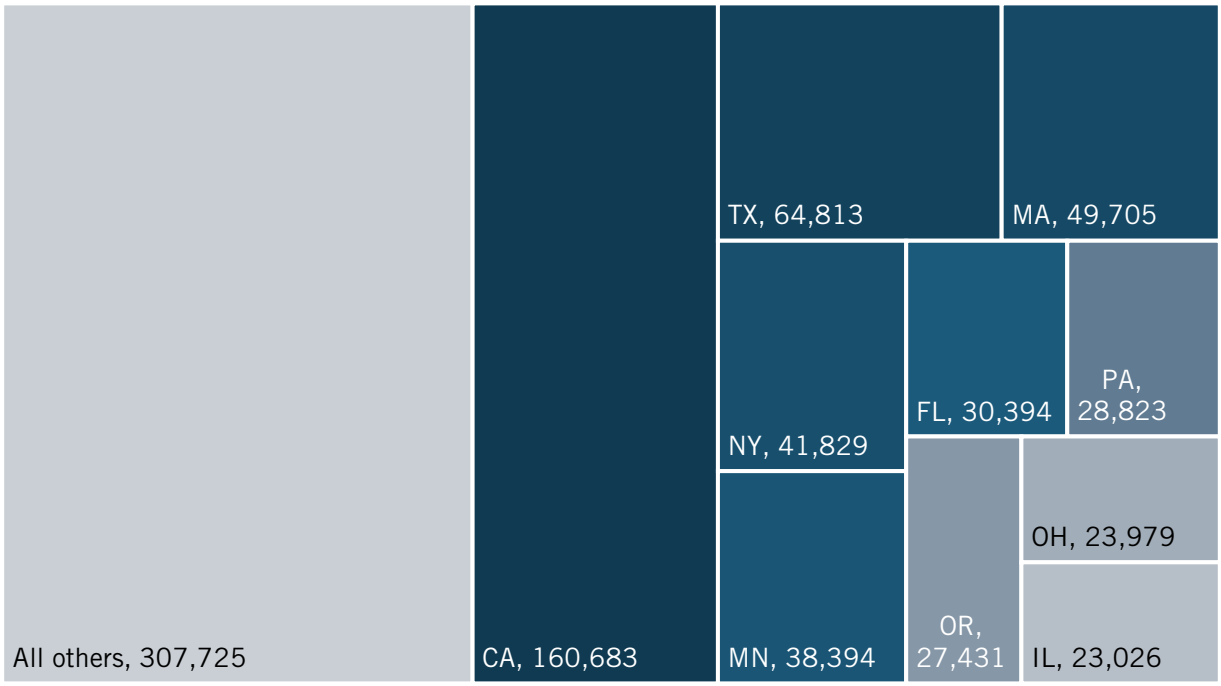


This industry drives technological innovation and strengthens U.S. global competitiveness. As this industry includes semiconductors, it is now fiercely competed over internationally. New Hampshire leads the nation in relative employment concentration in this industry, with an LQ of 3.12, indicating that it has more than three times the national average concentration of computer and electronic product manufacturing jobs. Other high-performing states include Vermont and Oregon (2.95), Minnesota (2.77), and Idaho (2.59), all of which have strong technology and manufacturing ecosystems. These states benefit from skilled labor, investment in research and development (R&D), and proximity to major tech hubs or specialized industries that drive growth in computer and electronics manufacturing.

Many states underperform in this industry, highlighting the geographic concentration of high-tech manufacturing in certain regions. States such as Texas (0.92), Nevada (0.89), Washington (0.84), and New Jersey (0.82) fall below the national average in employment concentration in this sector. The lowest-performing states include Louisiana (0.08), Alaska (0.02), and Hawaii (0.01), with the District of Columbia (0.00) having virtually no presence in the industry.

With 160,683 employees, California dominates the computer and electronic product manufacturing industry, far ahead of other states (figure 40). Texas ranks second with 64,813 workers, less than half that of California's computer and electronic workforce. Massachusetts and New York employ 49,705 and 41,829 individuals, respectively. Minnesota and Florida contribute significantly as well, with over 30,000 employees each. Despite their high LQs, New Hampshire and Vermont employ 1 percent and less than 1 percent of employees in computer and electronic production, respectively, indicating that while these industries are very concentrated in these states, they are not very large in absolute terms. The remaining states collectively account for 307,725 employees (39 percent of domestic employment), showcasing the industry's broad national presence despite California's clear leadership.

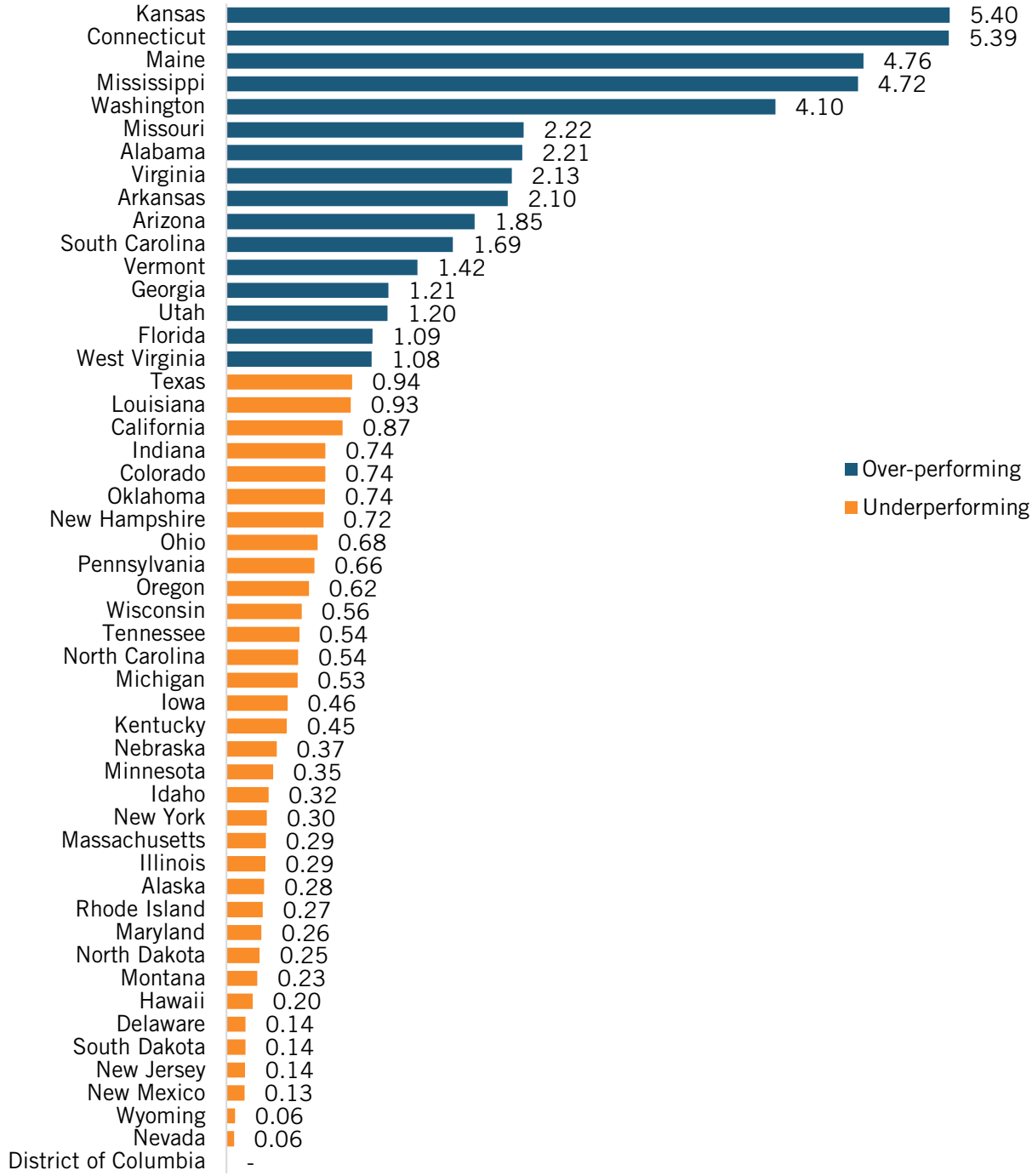
Figure 40: Employees in computer and electronic product manufacturing (top 10 states, and all others)



Other Transportation

The other transportation industry group is comprised of three subindustries: aerospace products and parts; railroad rolling stock; and ship and boat building.

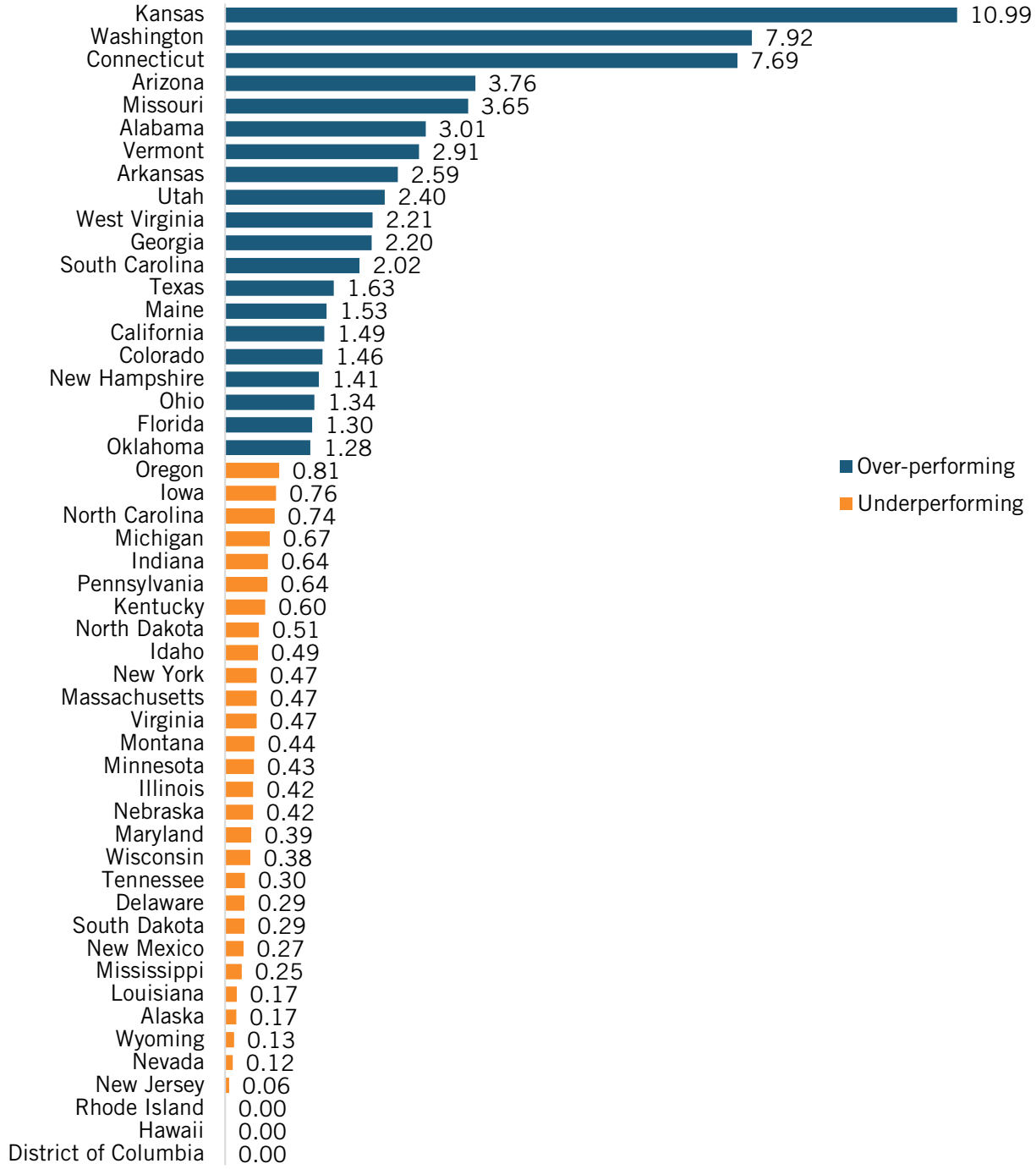
Figure 41: Other transportation industry group LQ, 2022



Aerospace Product and Parts Manufacturing

The aerospace product and parts manufacturing industry involves designing, producing, and assembling aircraft, spacecraft, and related components.

Figure 42: Aerospace product and parts manufacturing LQ, 2022



This sector is critical to national defense, commercial aviation, space exploration, driving engineering, materials science, and technological innovation. The industry supports a highly

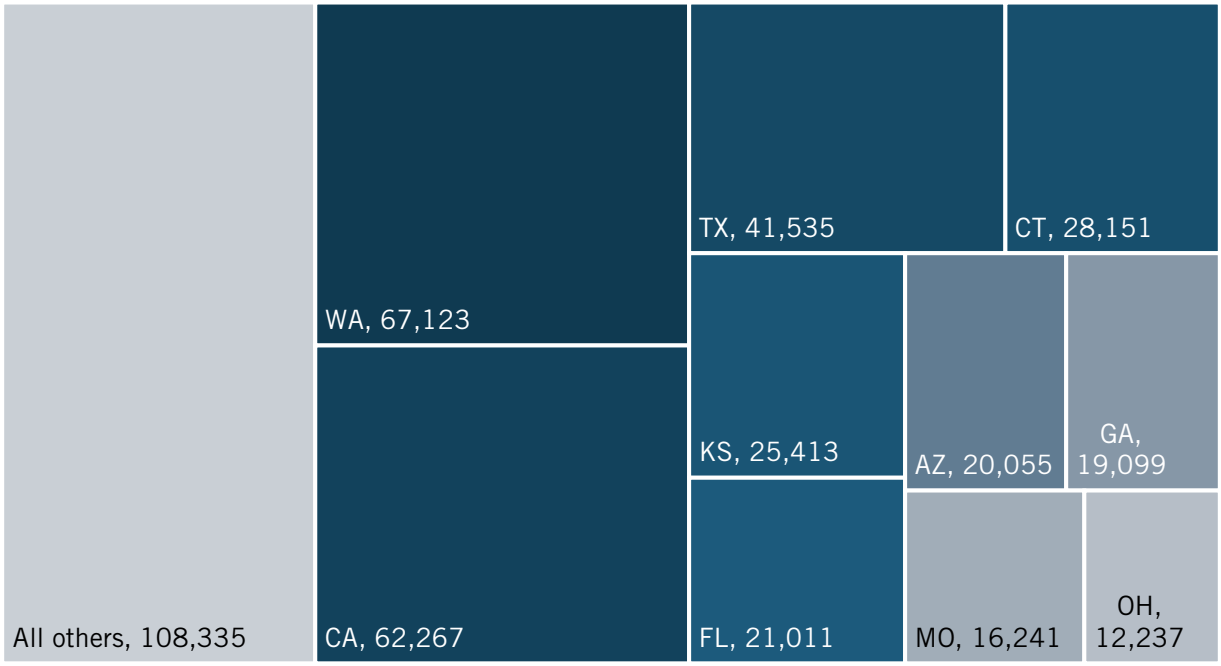
skilled workforce and contributes significantly to the U.S. economy through exports and technological advancements.

Kansas leads the nation in aerospace manufacturing concentration with an LQ of 10.99 (figure 42), followed by Washington (7.92) and Connecticut (7.69), reflecting their strong aerospace infrastructure and major industry players such as Boeing and Pratt & Whitney. Other high-performing states include Arizona (3.76), Missouri (3.65), and Alabama (3.01), all of which have well-established aerospace clusters benefiting from government contracts, skilled labor, and research institutions.

Many states underperform in this industry, with Oregon (0.81), Iowa (0.76), and North Carolina (0.74) falling below the national average. The lowest LQs are found in Rhode Island (0.00), Hawaii (0.00), and the District of Columbia (0.00), indicating little to no aerospace manufacturing presence.

Washington leads the aerospace product and parts manufacturing industry with 67,123 employees, establishing itself as the dominant hub (figure 43). California has 62,267 workers, while Texas, home to SpaceX and many other NASA contracting firms, employs 41,535 employees. Connecticut and Kansas, which have high LQs, also play significant roles, employing 28,151 and 25,413 individuals, respectively. Employees in the aerospace industry are widely dispersed around the United States, with 26 percent of the nationwide workforce located outside the 10 largest states in the industry.

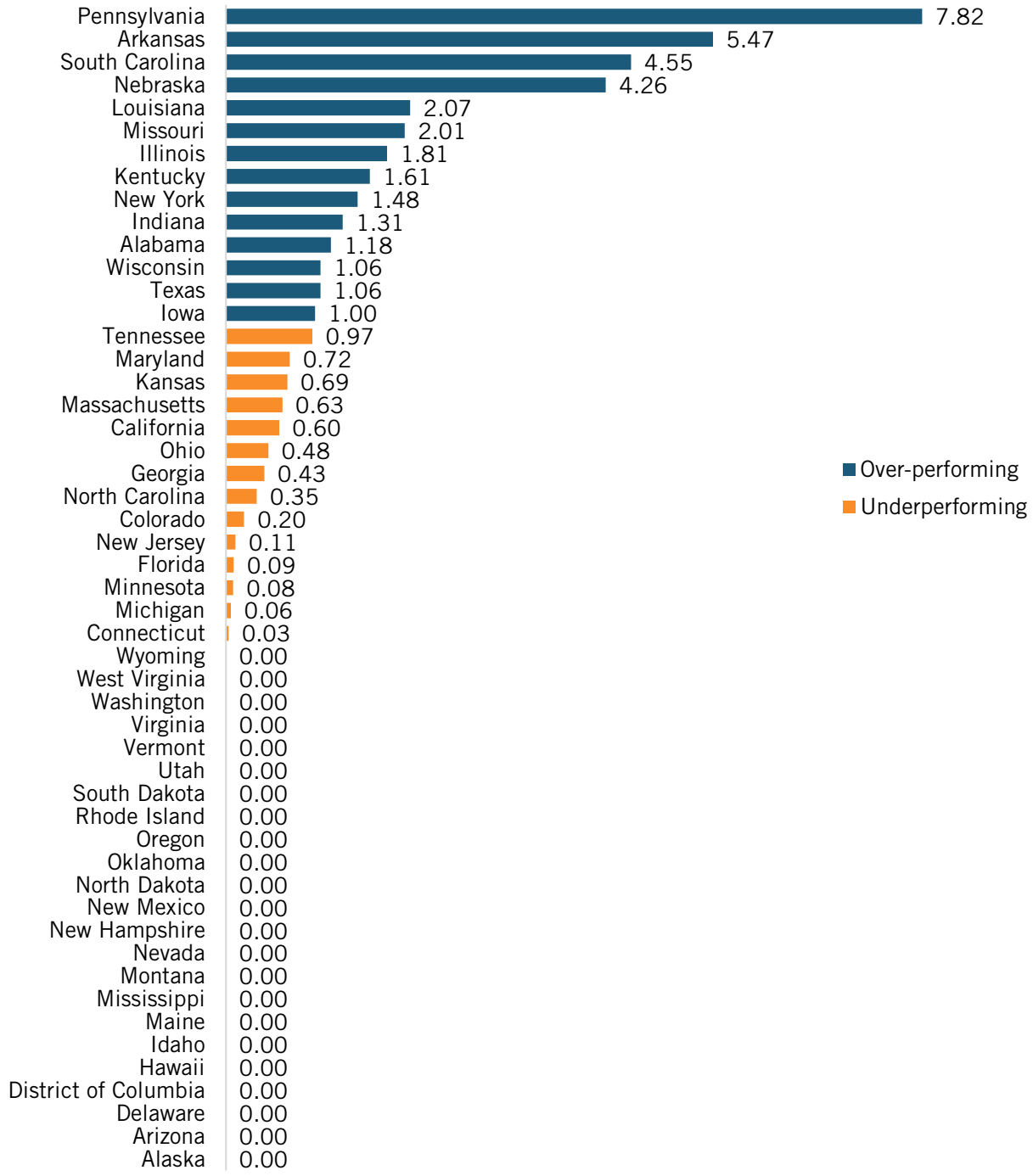
Figure 43: Number of employees in aerospace product and parts manufacturing (top 10 states, and all others)



Railroad Rolling Stock Manufacturing

The railroad rolling stock manufacturing industry produces locomotives, railcars, and related equipment essential for freight and passenger transportation. This sector supports infrastructure, economic growth, and sustainability through specialized manufacturing and innovation.

Figure 44: Railroad rolling stock manufacturing LQ, 2022

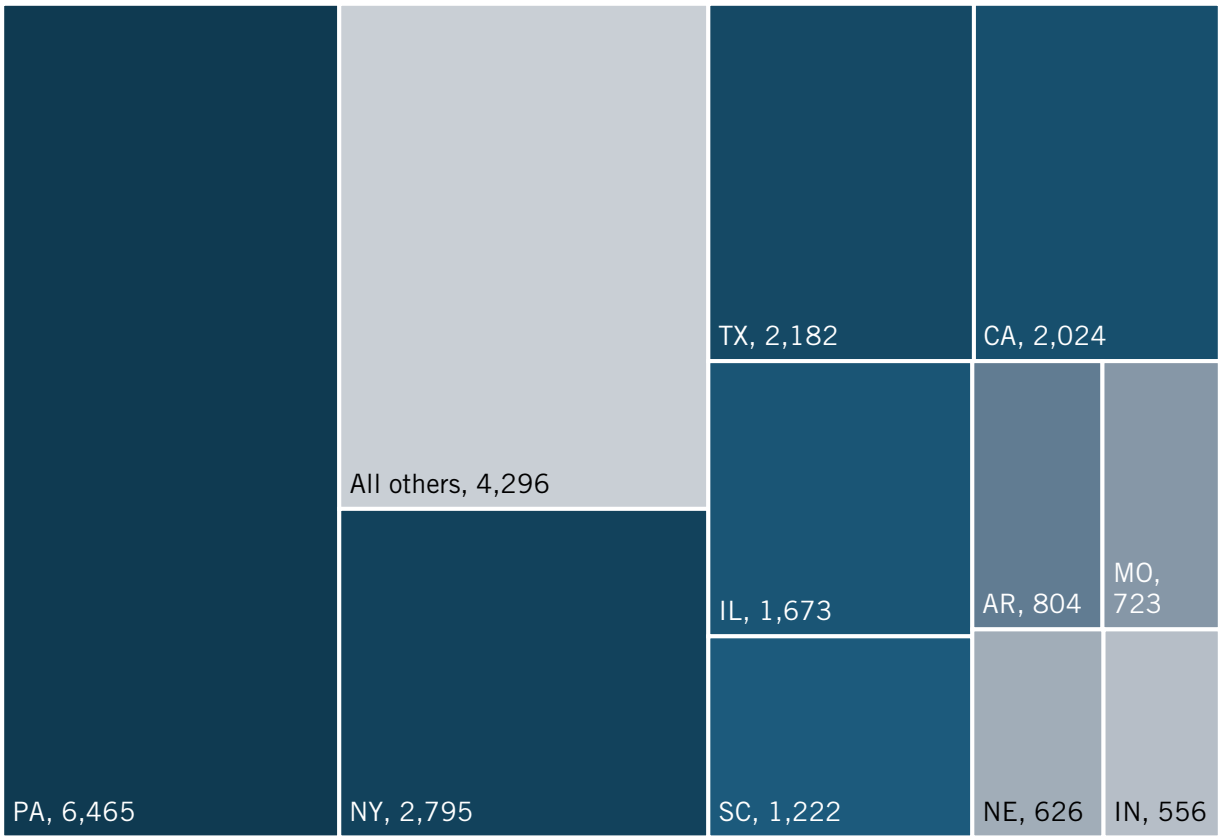


Pennsylvania leads with an LQ of 7.82, followed by Arkansas (5.47), South Carolina (4.55), and Nebraska (4.26) (Figure 44.) Other strong performers include Louisiana (2.07), Missouri (2.01), and Kentucky (1.61), benefiting from industry hubs and transportation networks.

Many states have some industry presence but underperform, including Tennessee (0.97) and Maryland (0.72). Several, such as Virginia, Washington, and Arizona, have an LQ of 0.00, reflecting little to no rail manufacturing presence due to infrastructure and workforce limitations.

Pennsylvania leads the railroad rolling stock manufacturing industry in LQ and absolute employment with 6,465 employees (figure 45). New York and Texas follow, employing 2,795 and 2,182 workers, respectively. California, Illinois, South Carolina, and Arkansas also employ many employees in the industry, illustrating the scattered nature of the railroad industry in states nationwide. 4,296 individuals are employed outside the 10 states where this industry is most concentrated.

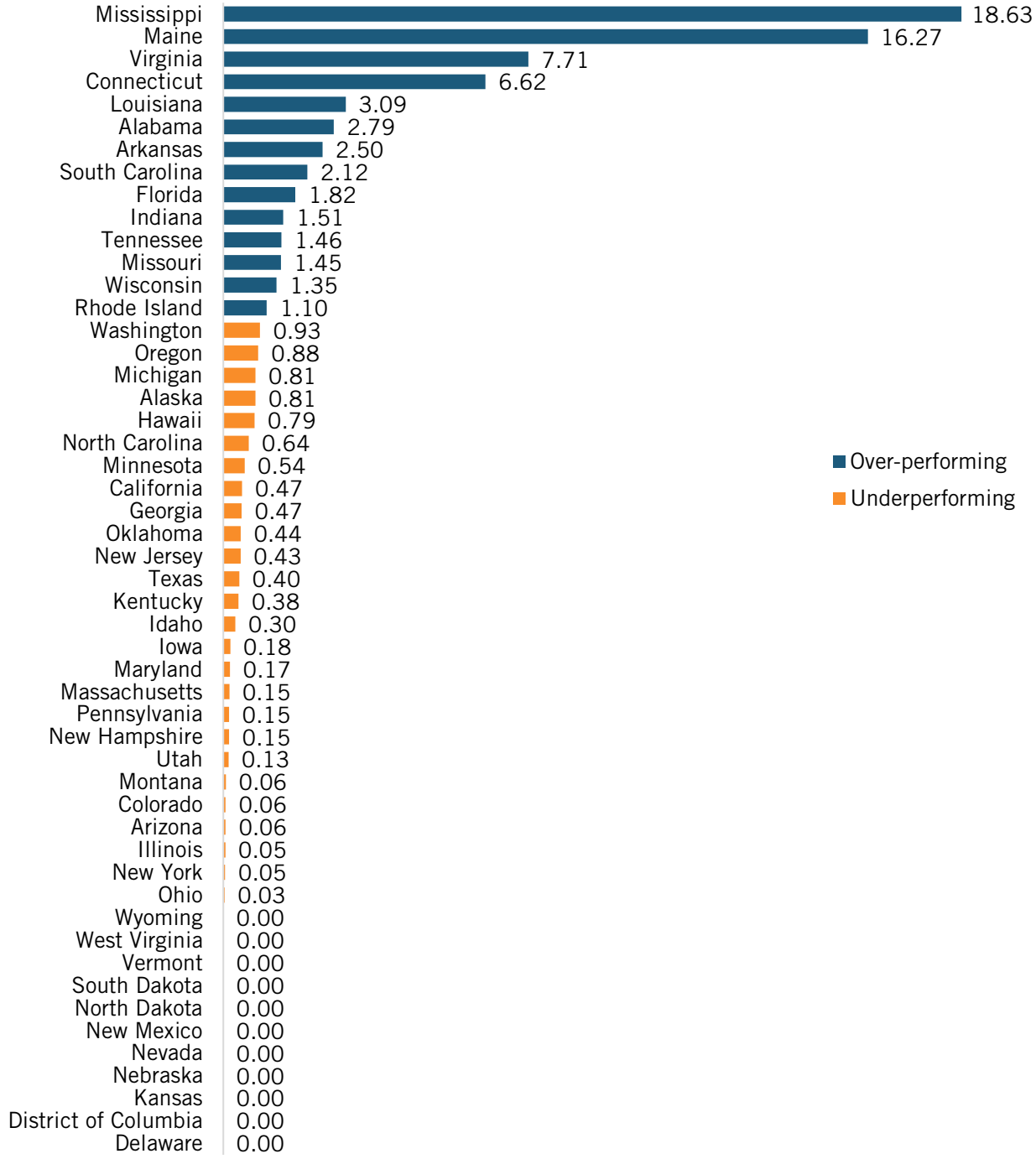
Figure 45: Number of employees in railroad rolling stock manufacturing (top 10 states, and all others)



Ship and Boat Building

The ship and boat building industry encompasses the construction, repair, and maintenance of vessels ranging from small recreational boats to large commercial ships. This sector is crucial for maritime transportation, defense, recreation, and commercial fishing, requiring specialized skills in metalworking, engineering, and marine systems integration.

Figure 46: Ship and boat building LQ, 2022

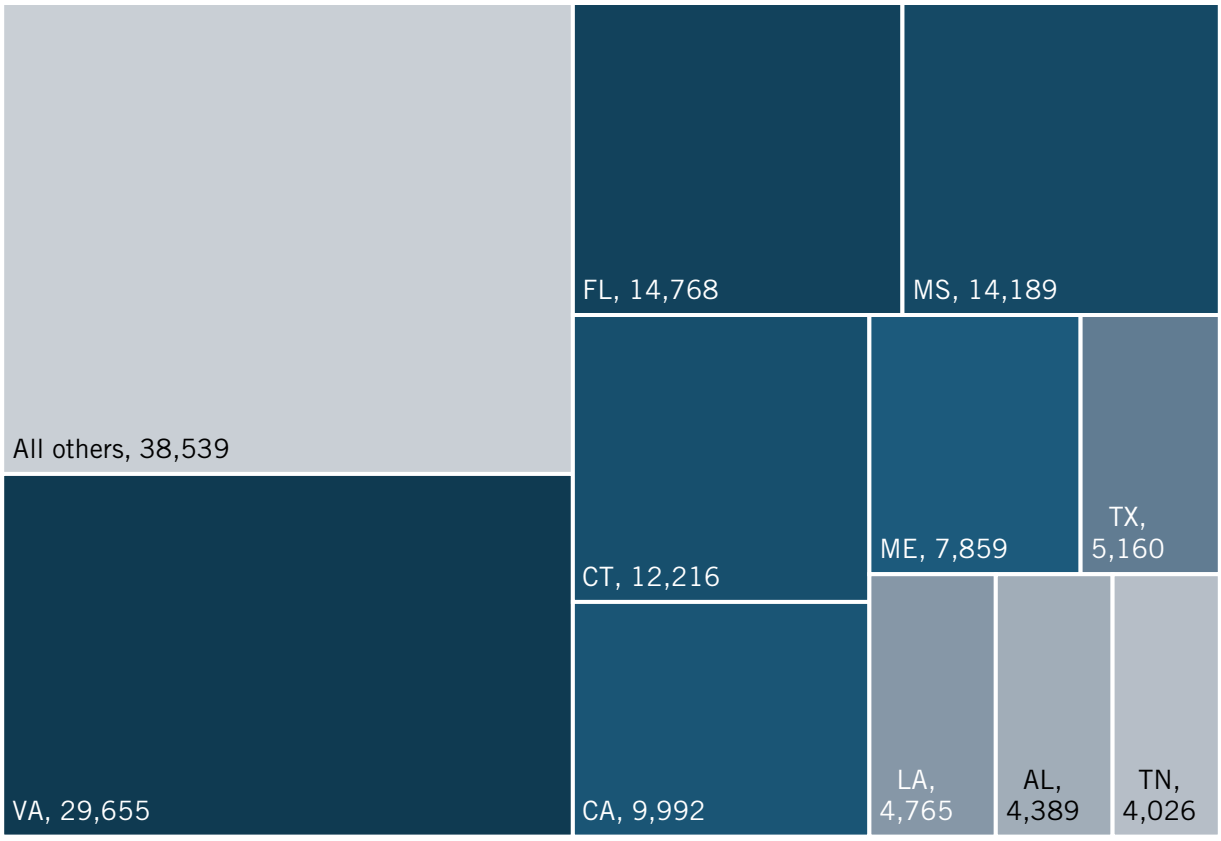


Mississippi dominates the industry with an LQ of 18.63 (figure 46), followed by Maine (16.27) and Virginia (7.71). These states' high concentrations reflect their historic maritime traditions and continued investment in shipbuilding infrastructure, particularly for military vessels. Connecticut (6.62) and Louisiana (3.09) also show strong performance, likely due to their coastal locations and naval facilities.

Most states underperform in shipbuilding, with 38 states showing LQs below 1.00. States such as California (0.47) and Texas (0.40) have surprisingly low concentrations despite their lengthy coastlines and large economies. Eleven states, including Kansas, Delaware, and Nevada, show no significant shipbuilding activity (0.00), presumably due to their inland location and focus on other industries.

Virginia, home to several naval and civilian shipyards along its coast, leads the ship and boat building industry with 29,655 employees, nearly double the workforce of Florida, which employs 14,768 (figure 47). Mississippi and Maine, states with LQs far greater than any other states, employ 14,189 and 7,859 individuals, respectively. Coastal states, such as Connecticut, California, and Texas, are also hubs for ship and boat building. Collectively, the states outside the top 10 employ 26 percent of all employees in the ship and boat building industry. Most states with a presence in this industry have a major coastline.

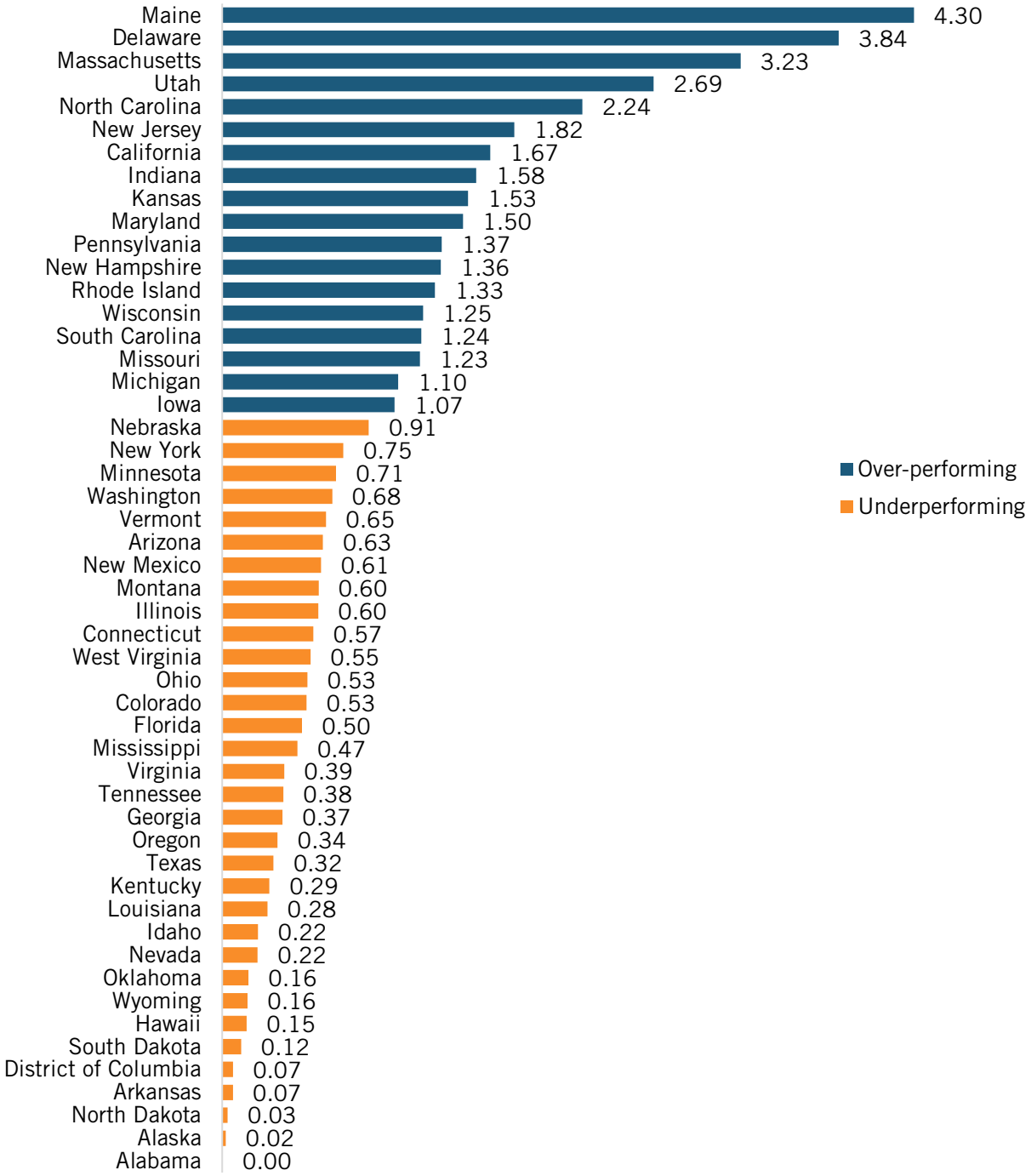
Figure 47: Number of employees in ship and boat building (top 10 states, and all others)



Pharmaceuticals and Biotech

The pharmaceuticals and biotechnology industry group is comprised of two subindustries: pharmaceuticals and medicines, and biotechnology R&D.

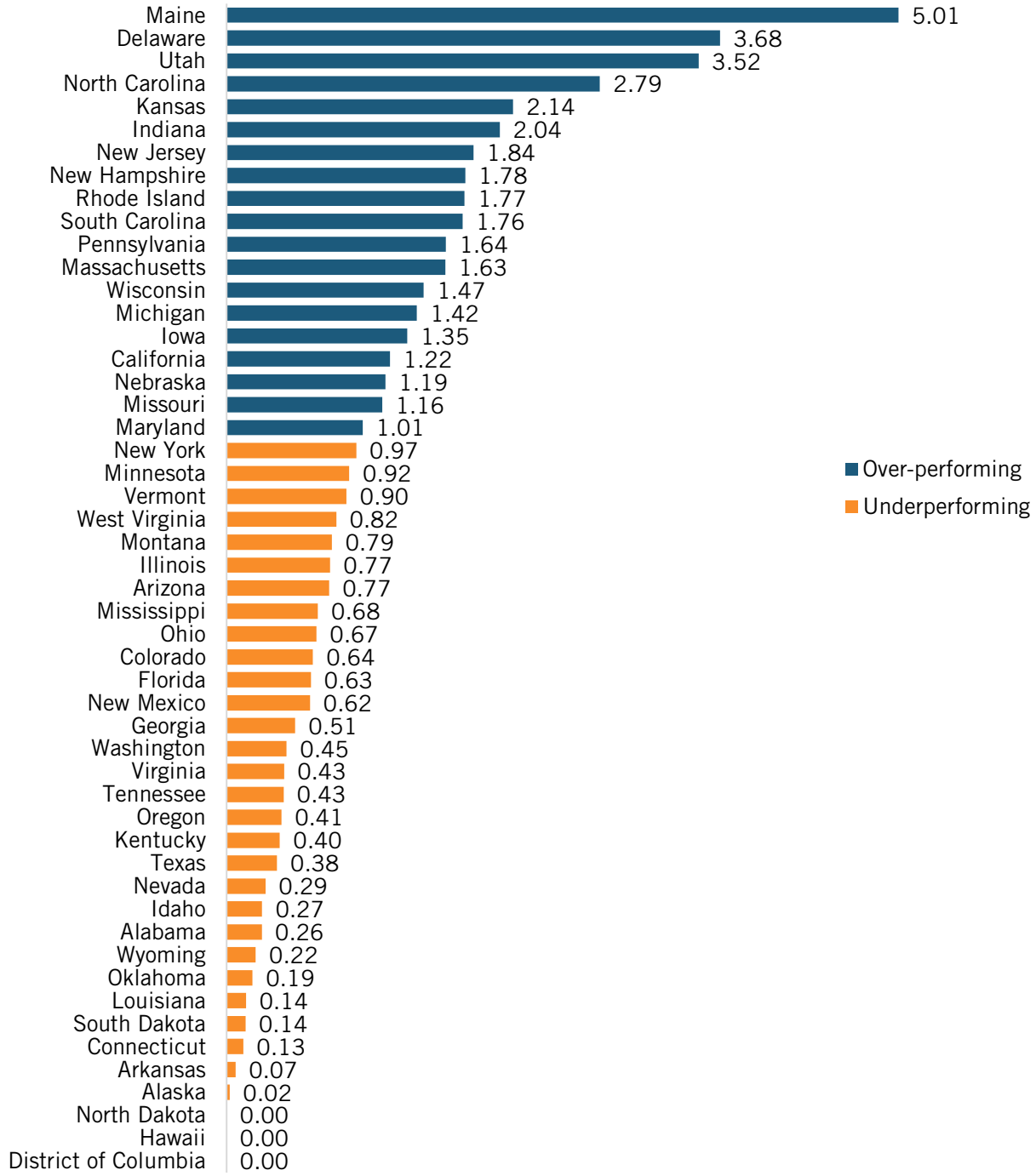
Figure 48: Pharmaceuticals and biotech industry group LQ, 2022



Pharmaceutical and Medicine Manufacturing

The pharmaceutical and medicine manufacturing industry includes the research, development, and production of drugs, medications, and other medical products.

Figure 49: Pharmaceutical and medicine manufacturing LQ, 2022



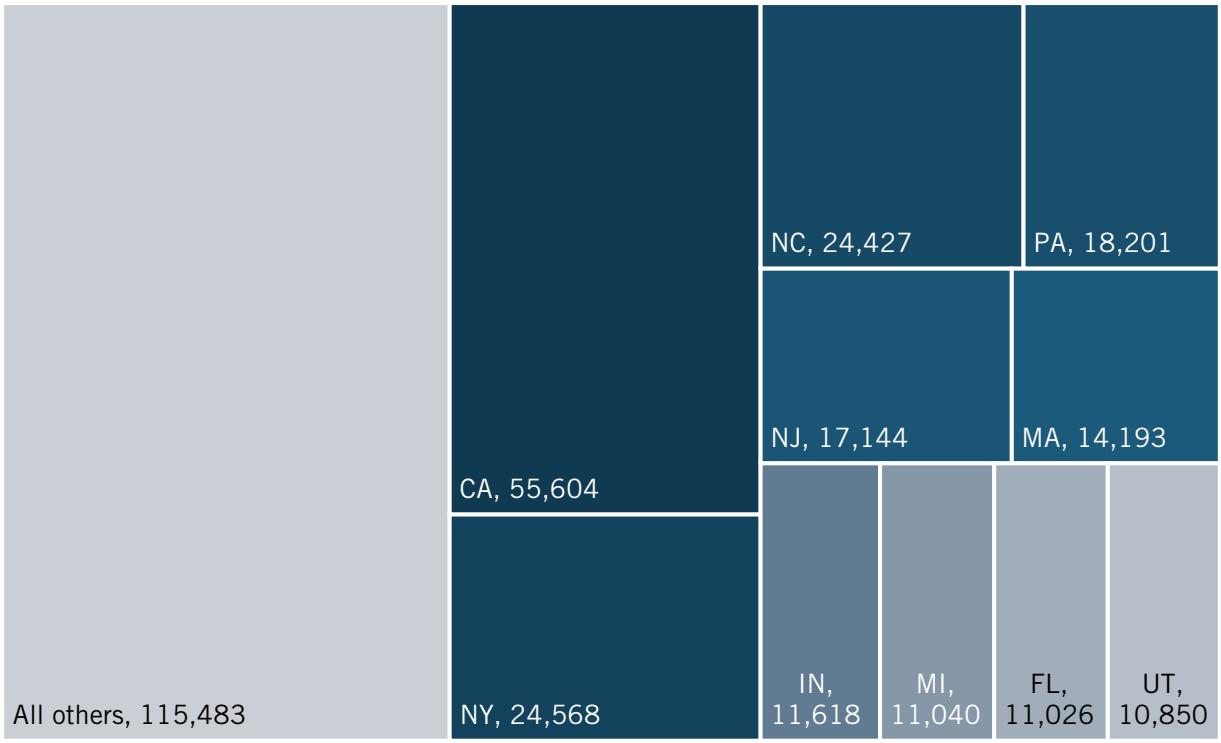
This sector is crucial for public health, combining advanced chemistry, biotechnology, and manufacturing processes to create medications and treatments. It is a strategically important sector because much of it is high wage, traded across borders, and a key driver of innovation.

Maine leads the nation with an LQ of 5.01, indicating a concentration of pharmaceutical manufacturing far above the national average. Delaware (3.68) and Utah (3.52) are relatively large pharmaceutical hubs, likely due to their business-friendly environments and established research infrastructure. North Carolina (2.79) and Kansas (2.14) are among the top five, with a strong pharmaceutical manufacturing presence supported by research universities and specialized industrial hubs. California, while over-performing, has a lower LQ of 1.22.

Most states underperform in pharmaceutical manufacturing, with 29 states showing LQs below 1.00. Surprisingly, some states with large populations and significant research institutions show relatively low concentrations, such as Florida (0.63), Washington (0.45), and Texas (0.38). The lowest-performing states include Arkansas (0.07), Alaska (0.02), and several states with no significant pharmaceutical manufacturing presence (0.00) such as the District of Columbia, Hawaii, and North Dakota.

California leads the pharmaceutical and medicine manufacturing industry with 55,604 employees, making it the top state in this sector in absolute employment despite its modest LQ. New York and North Carolina follow with 24,568 and 24,427 employees, respectively. Pennsylvania, New Jersey, and Massachusetts, with large metropolitan areas and developed healthcare infrastructure, are also leaders in this industry with over 14,000 employees each. Utah has 10,850 employees, while Delaware employs just 1 percent of the nationwide workforce (3,986).

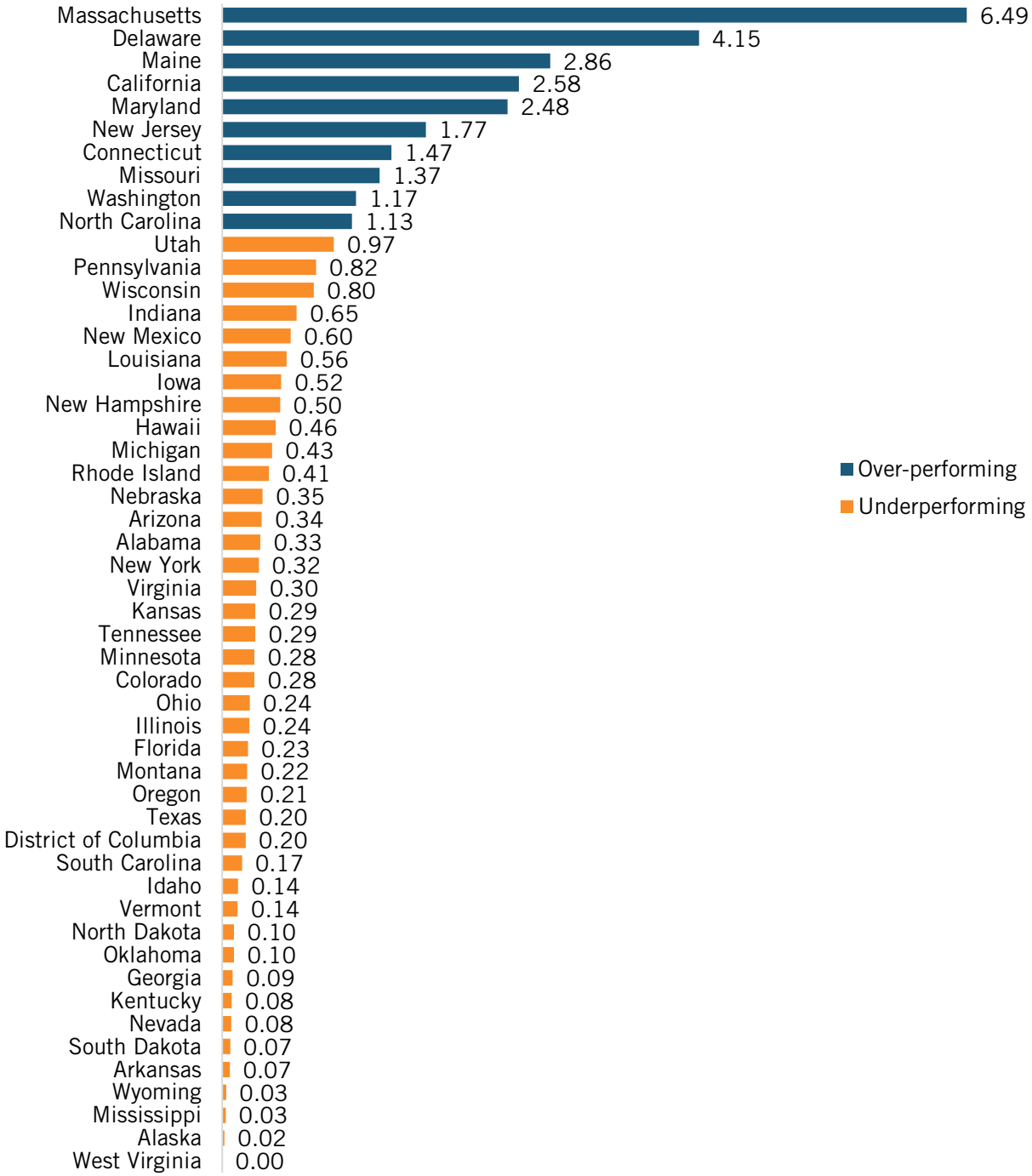
Figure 50: Number of employees in pharmaceutical and medicine manufacturing (top 10 states, and all others)



Biotechnology R&D

The biotechnology R&D industry focuses on harnessing biological processes for medical, agricultural, industrial, and environmental applications.

Figure 51: Biotechnology R&D LQ, 2022



Firms in this industry range from small start-ups developing novel therapies to large multinational corporations with expansive research pipelines. The industry is critical for

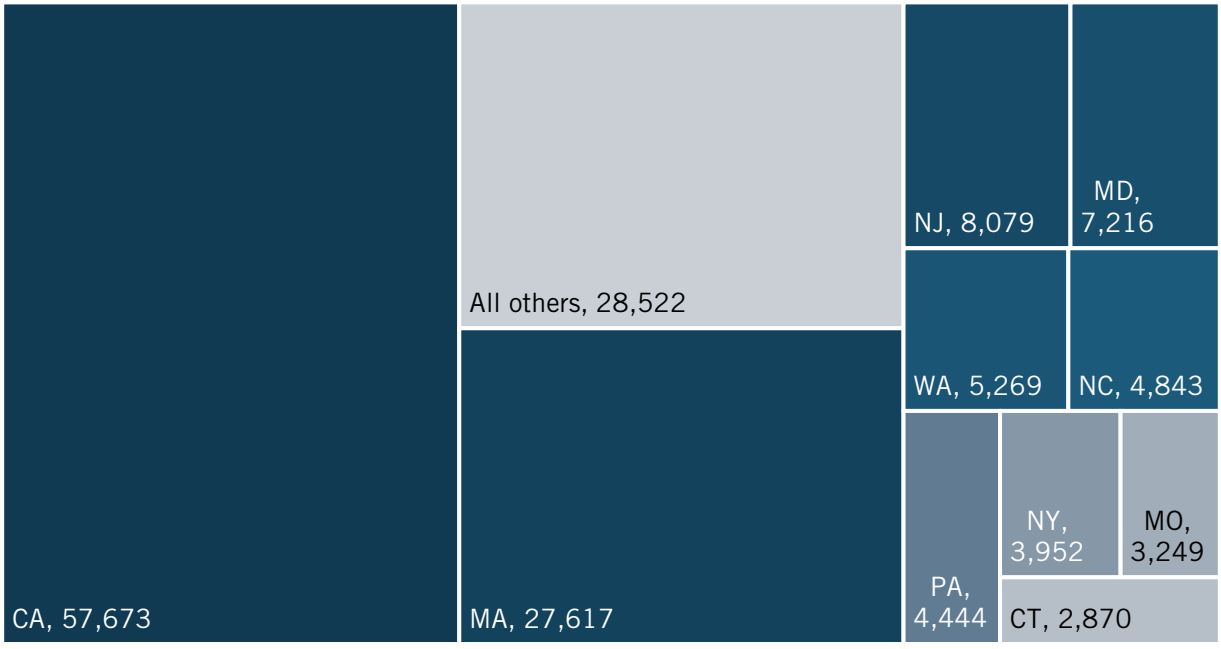
technological advancement, medical breakthroughs, and maintaining the United States' global innovation and scientific discovery leadership.

Massachusetts dominates the biotech R&D landscape with an impressive LQ of 6.49 (figure 51), reflecting its dense concentration of research universities, biotechnology firms, and research hospitals. Delaware follows with an LQ of 4.15, while Maine (2.86), California (2.58), and Maryland (2.48) round out the top five performers. These states benefit from robust academic-industry partnerships, substantial research funding, and established innovation ecosystems attracting top scientific talent and investment.

Most states show a relatively low concentration in scientific R&D services, with 39 states having LQs below 1.00. Notably, several states with large economies underperform significantly, including New York (0.32), Florida (0.23), and Texas (0.20). The lowest-performing states include Wyoming (0.03), Mississippi (0.03), and Alaska (0.02), with West Virginia showing no significant R&D activity (0.00). This distribution highlights the industry's tendency to cluster around major research institutions and established innovation hubs, leaving many regions with limited scientific research activity despite their economic size.

California leads the biotechnology industry with 57,673 employees, far outpacing other states (figure 52). Massachusetts follows with 27,617 employees. Both states are biotechnology hubs, with areas such as Cambridge, Massachusetts, and San Diego, California, acting as magnets for high-caliber biotechnology companies such as Thermo Fisher Scientific and Bristol Meyers Squibb. New Jersey, Maryland, and Washington also play key roles, employing over 5,000 individuals each. The remaining states outside the top 10 collectively account for 28,522 employees. Among these states are Delaware and Maine, which employ 2,199 and 1,457 employees, respectively—modest amounts considering their large LQs in the industry.

Figure 52: Number of employees in biotechnology R&D (top 10 states, and all others)



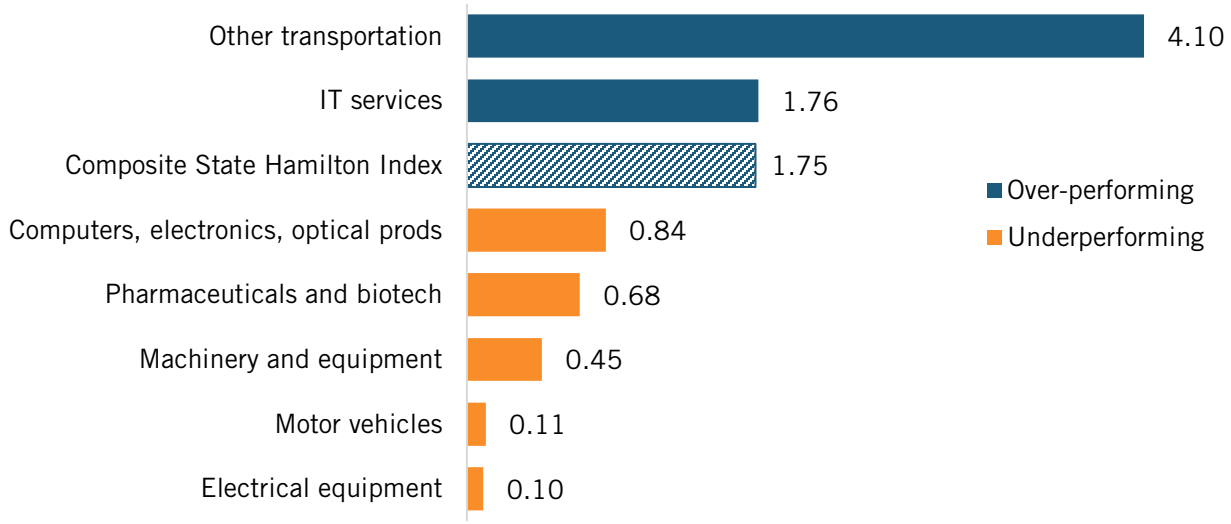
STATE PROFILES

No. 1: Washington

Washington state, the home of global powerhouse firms such as Amazon, Boeing, and Microsoft, has the highest relative score in the Hamilton Index with an overall LQ of 1.75, making it 75 percentage points larger in advanced industries than the national average. As shown in figure 53, the state's strongest industries, and the only two industries in which it over-performs, are the other transportation equipment (4.10) and IT and information services industries (1.76).

In contrast, Washington's share of machinery and equipment, motor vehicles, and electrical equipment are far below average, with LQs below 0.50. Computers, electronics, and optical products (0.84) and pharmaceuticals and biotech (0.68) are also industries in which Washington underperforms.

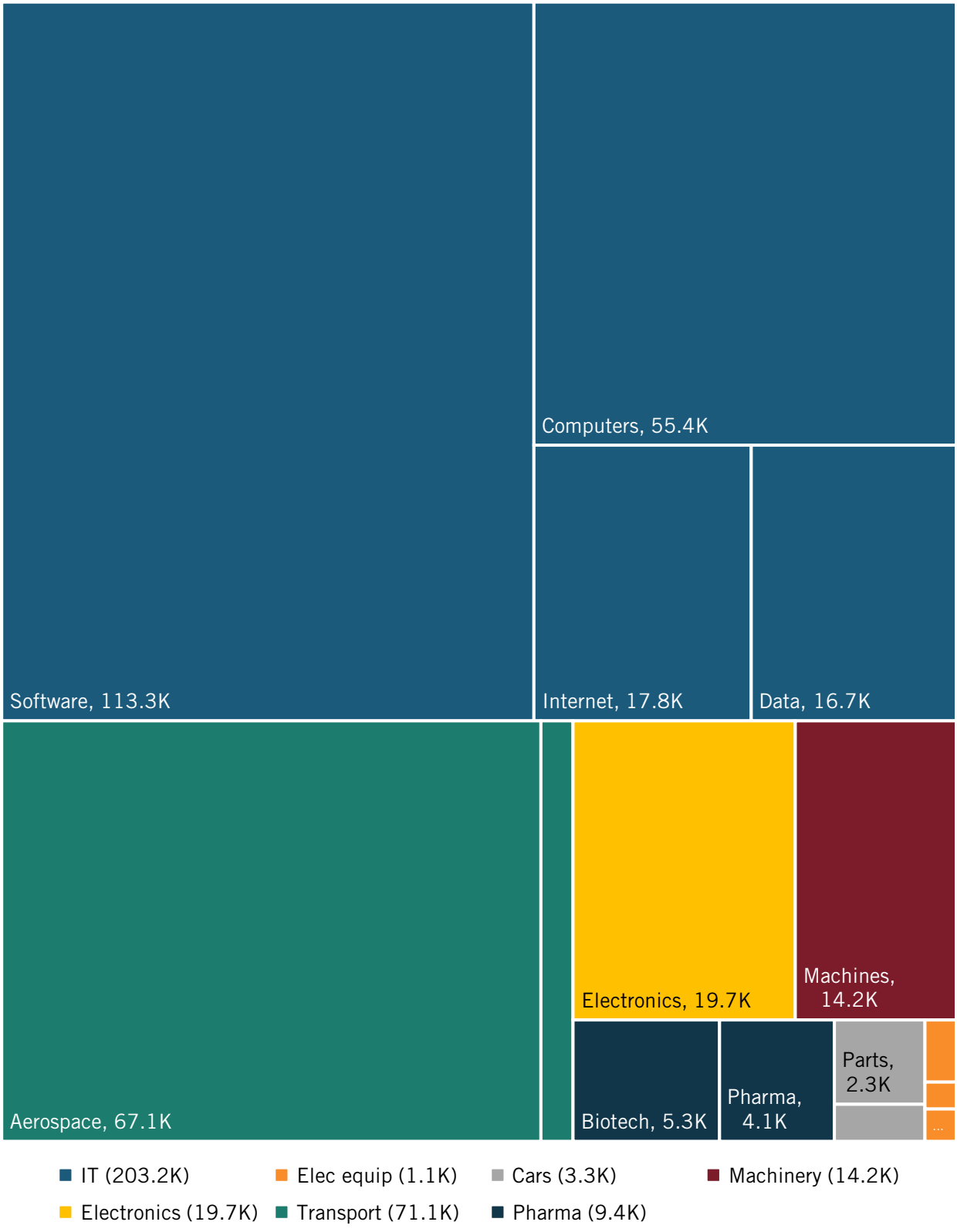
Figure 53: Washington's relative performance in Hamilton Index industries



Several subindustries are used to calculate a composite score within each of the Hamilton Index industries. In Washington, most Hamilton industry workers are employed in the IT and information services industry, with over 203,000 employees (figure 54). Most of them are employed in the software publishing subindustry (113,303), followed by computer systems design and related services (55,391), Internet publishing and broadcasting and web search portals (17,779), and data processing, hosting, and related services (16,726).

In the other transportation industry, which includes the production of airplanes, spacecraft, trains, and ships, the aerospace industry employs the most individuals (67,123), making it the second-largest industry in the state. Boeing, the largest airplane producer in the United States, is the main actor in this significant industry in Washington. Computer and electronic product manufacturing, including cell phones, semiconductors, and optical media products, employs 19,671 individuals.

Figure 54: Number of employees in Hamilton Index subindustries in Washington (322,000 workers total)

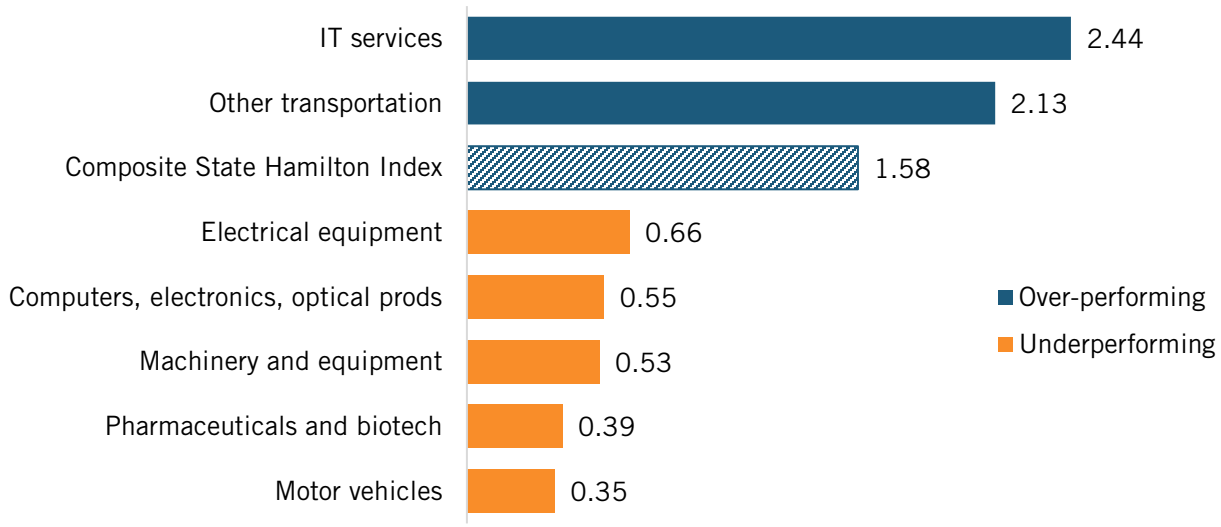


No. 2: Virginia

Virginia, a state recognized for its proximity to federal institutions and a burgeoning tech sector, excels in IT services and other transportation industries. With an LQ of 2.44, IT services stand out as Virginia's strongest advanced industry sector, supported by prominent tech firms and a robust government contracting ecosystem. The state also demonstrates a significant concentration in other transportation industries, with an LQ of 2.13, reflecting its contributions to advanced manufacturing, specifically in maritime industries.

However, Virginia underperforms in several advanced industries relative to the national average. The state's lowest LQs are in pharmaceuticals and biotech (0.39) and motor vehicles (0.35). Similarly, industries such as machinery and equipment (0.53), computers, electronics, and optical products (0.55), and electrical equipment (0.66) also demonstrate underperformance relative to what is expected given the size of Virginia's economy.

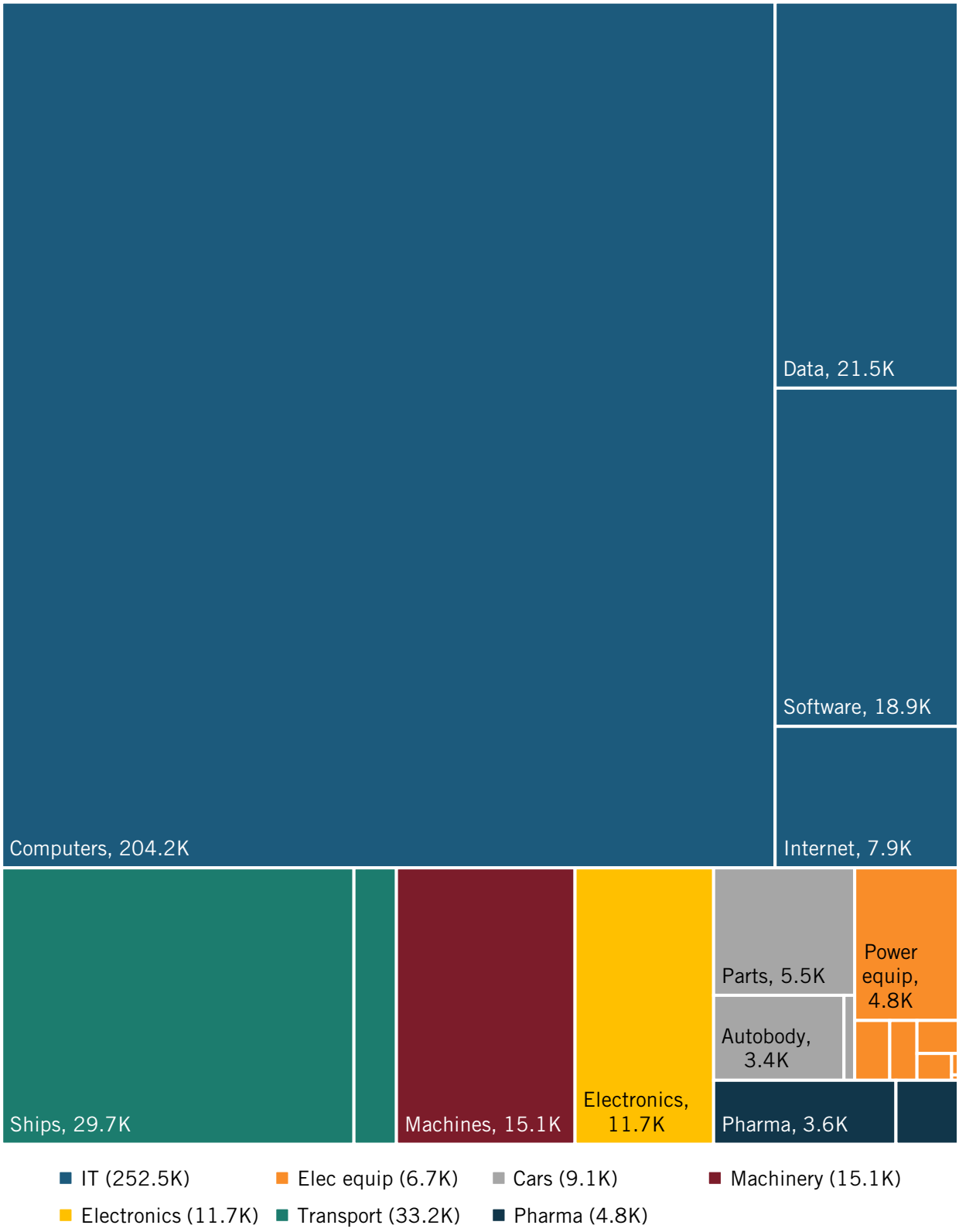
Figure 55: Virginia's relative performance in Hamilton Index industries



Virginia's economy is heavily driven by the IT and information services industry, employing over 333,000 workers. Within this sector, the largest subindustry is computer systems design, which employs 204,218 individuals, followed by the data processing industry with 21,532 employees. Software publishing and the Internet publishing, broadcasting, and web search portal industry are also significant employers in the state, with much of their business concentrated in the Northern Virginia area.

In the transportation industry, ship building is the most prominent employer (about 29,700 employees), making it the second largest Hamilton industry in Virginia. Aerospace is also a relatively large employer (3,592 employees), with government contracting companies such as Northrop Grumman and Lockheed Martin establishing themselves in the cities outside D.C. in northern Virginia. Machinery manufacturing employs over 15,000 individuals in the state.

Figure 56: Number of employees in Hamilton Index subindustries in Virginia (333,100 workers total)

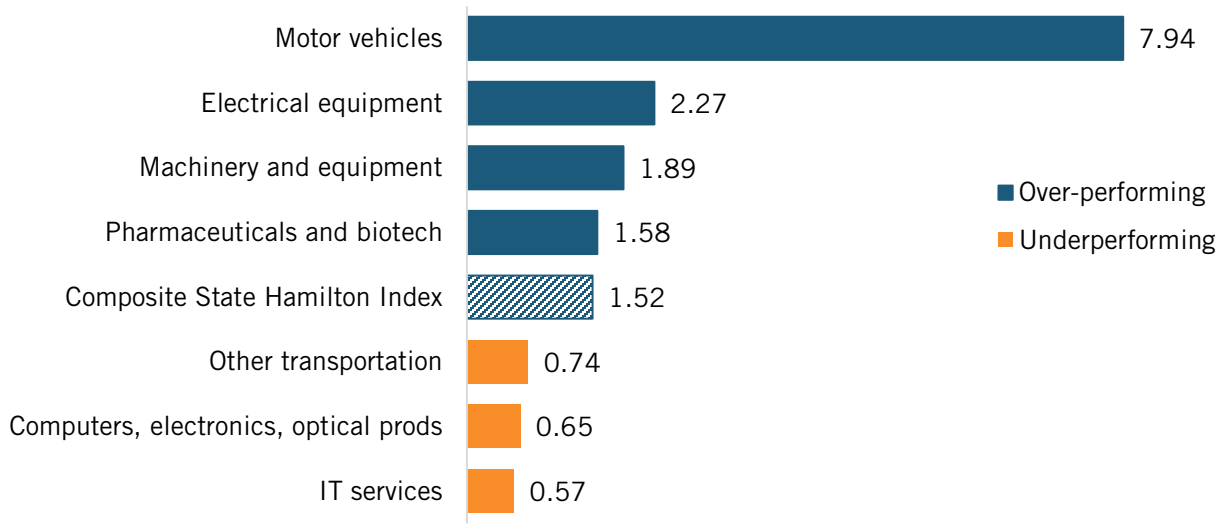


No. 3: Indiana

Indiana, a state well-known for its strong manufacturing base and automotive industry, significantly over-performs in motor vehicles with an LQ of 7.94, making it the state's strongest advanced industry sector. Electrical equipment (2.27), machinery and equipment (1.89), and pharmaceuticals and biotech (1.58) also perform well above the national average, reflecting Indiana's diversified industrial economy and the presence of major players such as Eli Lilly in biotech and Cummins in manufacturing.

In contrast, Indiana underperforms in industries such as transportation (0.74), computers, electronics, and optical products (0.65), and IT services (0.57). These sectors highlight areas where Indiana's advanced industry base is less developed than the national average, underscoring potential opportunities for investment in tech-driven industries and advanced transportation manufacturing.

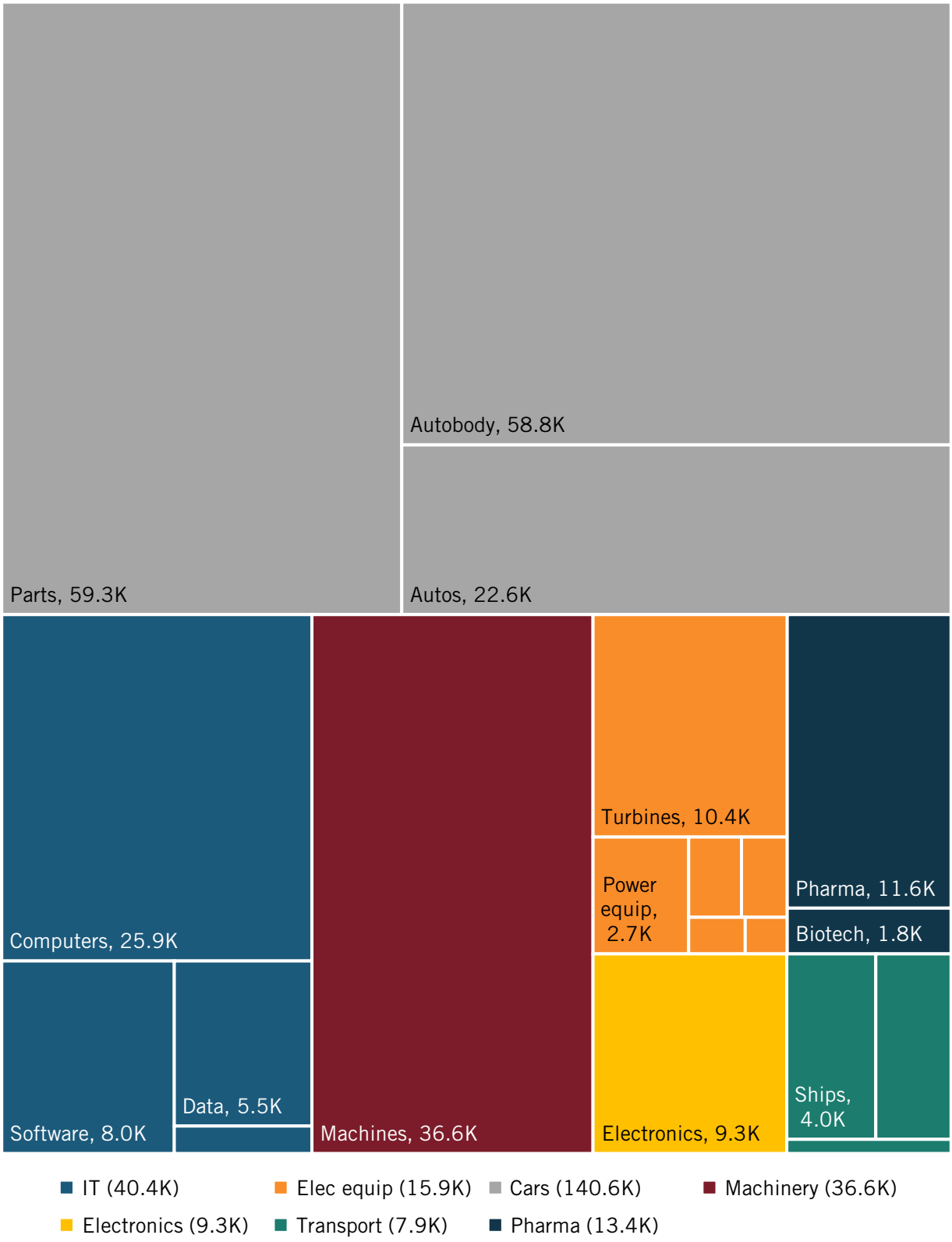
Figure 57: Indiana's relative performance in Hamilton Index industries



The vehicles industry employs the largest number of workers, with 140,600 employees spread across key subindustries such as manufacturing automobile parts (59,257), body and trailers (58,758), and automobiles (22,557). The machinery sector is another significant contributor, employing over 36,000 individuals.

Despite its low LQ, Indiana's IT and information services industry employs 40,400 workers, making it the second largest of the Hamilton industries in absolute terms. Computer systems design is the largest subindustry (25,943), followed by software publishing (8,014) and data processing (5,492). The pharmaceutical and biotechnology sector, which includes pharmaceutical manufacturing (11,618), also plays a notable role in Indiana's economy. The other transportation and computers and electronics manufacturing industries each employ fewer than 10,000 individuals.

Figure 58: Number of employees in Hamilton Index subindustries in Indiana (264,200 workers total)

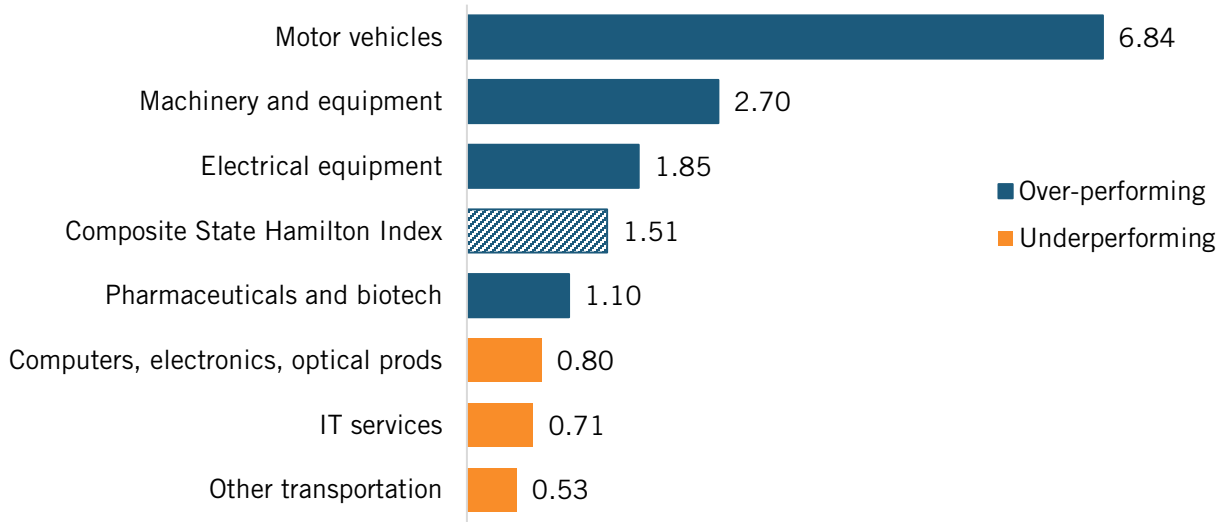


No. 4: Michigan

Michigan, the heart of the American automotive industry and home to companies such as Ford, General Motors, and Stellantis, over-performs in motor vehicles with an LQ of 6.84. This dominance underscores Michigan's reputation as the hub of automotive manufacturing, even as the automotive industry has largely moved overseas. Additionally, the state over-performs in machinery and equipment (2.70), electrical equipment (1.85), and pharmaceuticals and biotech (1.10), reflecting its contributions to manufacturing, technology, and life sciences.

In contrast, Michigan underperforms in industries such as computers, electronics, and optical products (0.80), IT services (0.71), and other transportation (0.53). Developing these underrepresented sectors could further strengthen the state's overall advanced industry competitiveness outside the automotive industry.

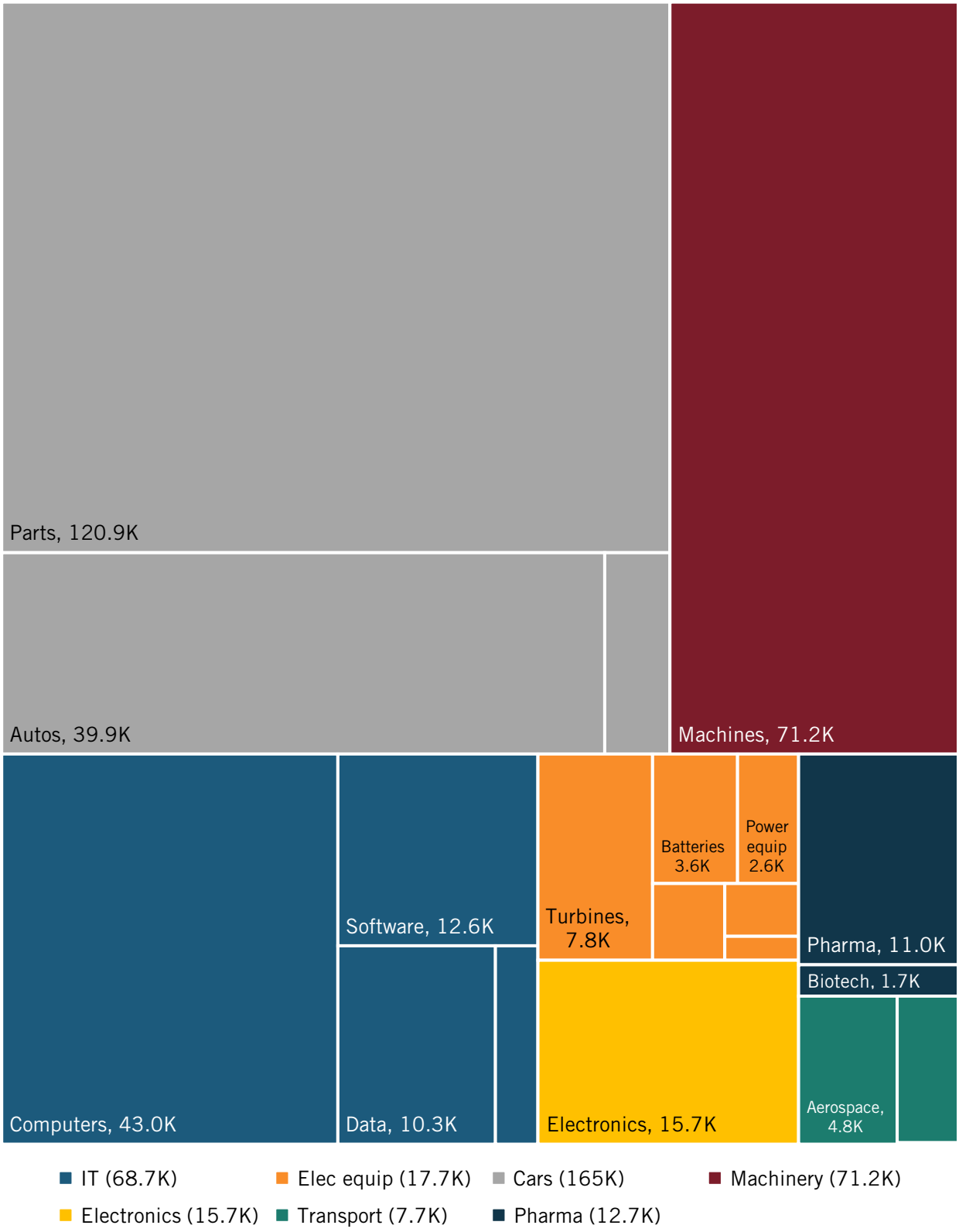
Figure 59: Michigan's relative performance in Hamilton Index industries



Michigan's economy is heavily influenced by its advanced manufacturing sectors, with the automotive industry leading employment at 165,120 workers. Parts manufacturing dominates this sector with 120,866 employees, followed by automobile production with 39,939 workers, and body and trailer manufacturing with 4,315 employees. Machinery is another cornerstone of Michigan's economy, employing 71,247 individuals.

In addition to its manufacturing strengths, Michigan has a significant number of IT and information services workers, employing 68,700 people. The largest IT subindustry is computer systems design, which provides 43,049 jobs. Computers and electronics manufacturing employs about 16,000 individuals, while the pharmaceutical industry employs more than expected (12,691). Despite its manufacturing strengths, the other transportation industry has a minimal presence in Michigan.

Figure 60: Number of employees in Hamilton Index subindustries in Michigan (358,900 workers total)

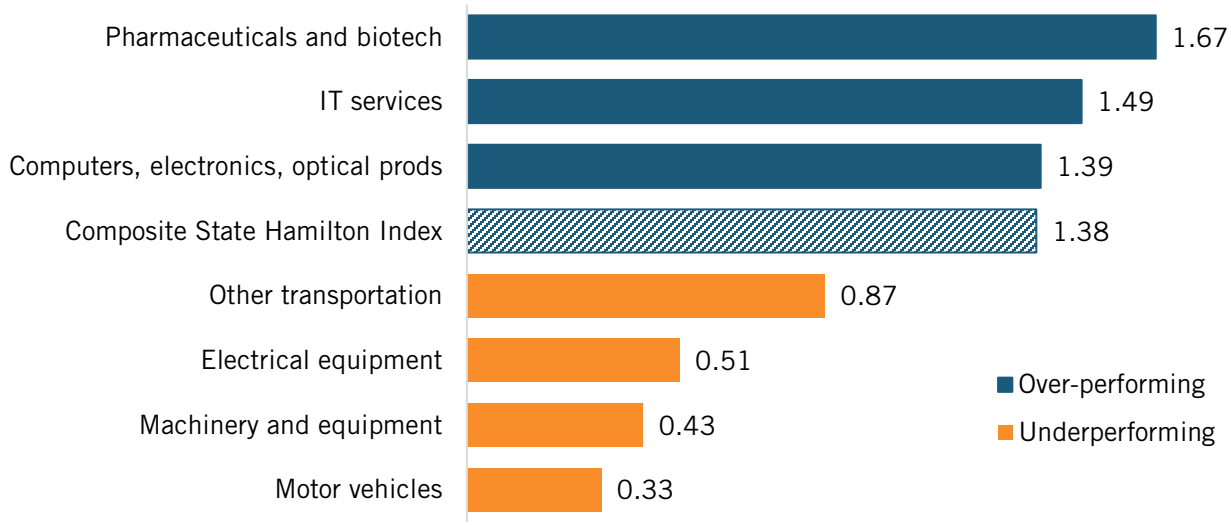


No. 5: California

California, home to globally recognized technology and pharmaceutical firms such as Apple, Google, and Amgen, excels in several advanced industries. The state over-performs significantly in pharmaceuticals and biotech with an LQ of 1.67, followed closely by IT services at 1.49. Additionally, computers, electronics, and optical products rank high, with an LQ of 1.39, reflecting California's role as a hub for innovation, technology, and cutting-edge manufacturing.

However, California underperforms in traditional manufacturing and transportation-related industries. The state's electrical equipment sector has an LQ of 0.51, while machinery and equipment manufacturing (0.43) and the motor vehicles sector (0.33) also underperform. This underscores the focus of California's economy on technology, services, and life sciences rather than heavy manufacturing.

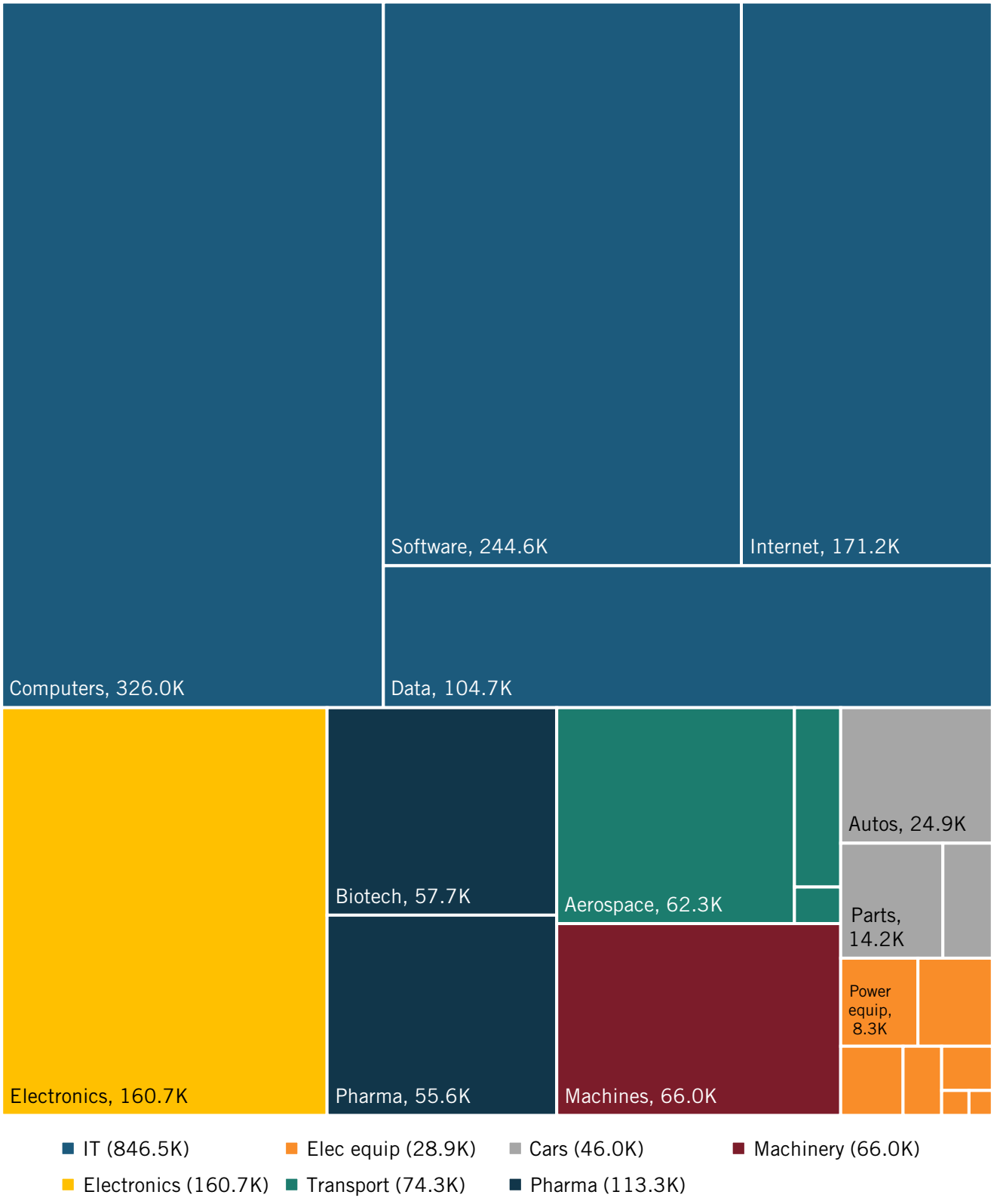
Figure 61: California's relative performance in Hamilton Index industries



IT and information services is the leading Hamilton industry in absolute employment in California, with over 846,000 employees, making it the largest in the country. The largest subindustry within IT is computer systems design, which employs 325,951 individuals, followed by software publishing, which employs 244,641 employees. The Internet publishing and data processing industries employ over 100,000 workers. These figures highlight California's strength in technology and digital innovation, driven by the presence of such global giants as Google, Apple, and Facebook.

Electronics manufacturing is another key sector in California, employing 160,683 workers, reflecting the state's leadership in semiconductor and hardware production. The pharmaceutical and biotech industry employs 113,277 workers, with similar absolute employment levels in medicine manufacturing and biotech research (55,604 and 57,673, respectively). Heavy manufacturing sectors such as other transportation, motor vehicles, and electric equipment manufacturing all show low employment levels relative to other industries.

Figure 62: Number of employees in Hamilton Index subindustries in California (1.3M workers total)

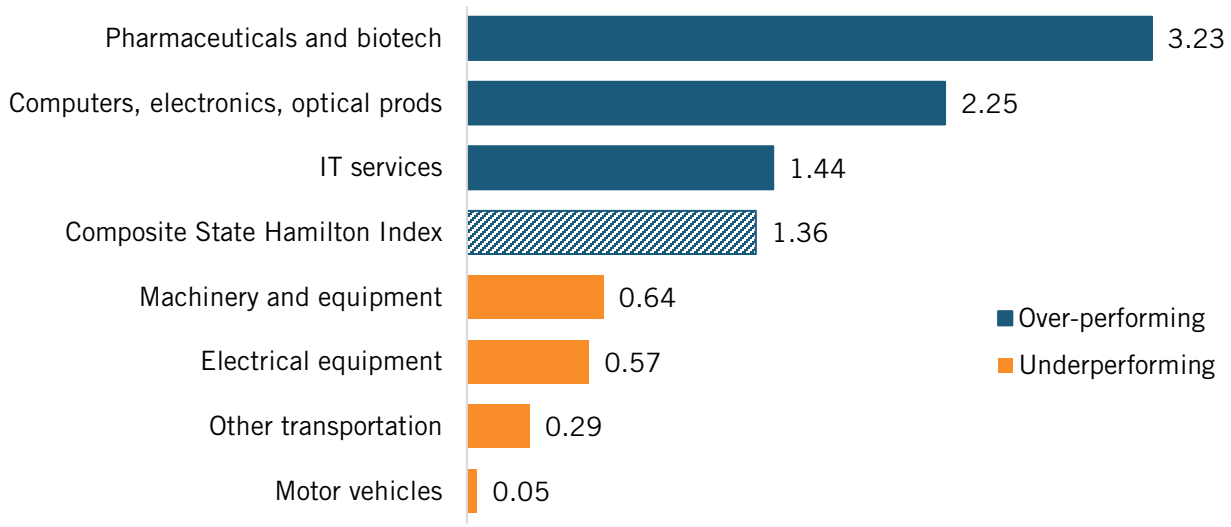


No. 6: Massachusetts

Massachusetts, a hub for biotechnology and innovation, boasts a leading LQ of 3.23 in pharmaceuticals and biotech, driven by the presence of major institutions such as MIT and Harvard and biotech firms such as Moderna and Biogen. The state also excels in computers, electronics, and optical products with an LQ of 2.25, reflecting its advanced manufacturing and research capabilities. IT services have an LQ of 1.44, underscoring Massachusetts' role as a leader in technology and data-driven industries.

In contrast, Massachusetts underperforms in traditional manufacturing sectors. The motor vehicles industry has a minimal presence with an LQ of 0.05, while electrical equipment (0.29) and other transportation (0.29) also fall well below the national average. These figures highlight the state's limited focus on heavy manufacturing, as its economy centers more on research, healthcare, and technology-based industries.

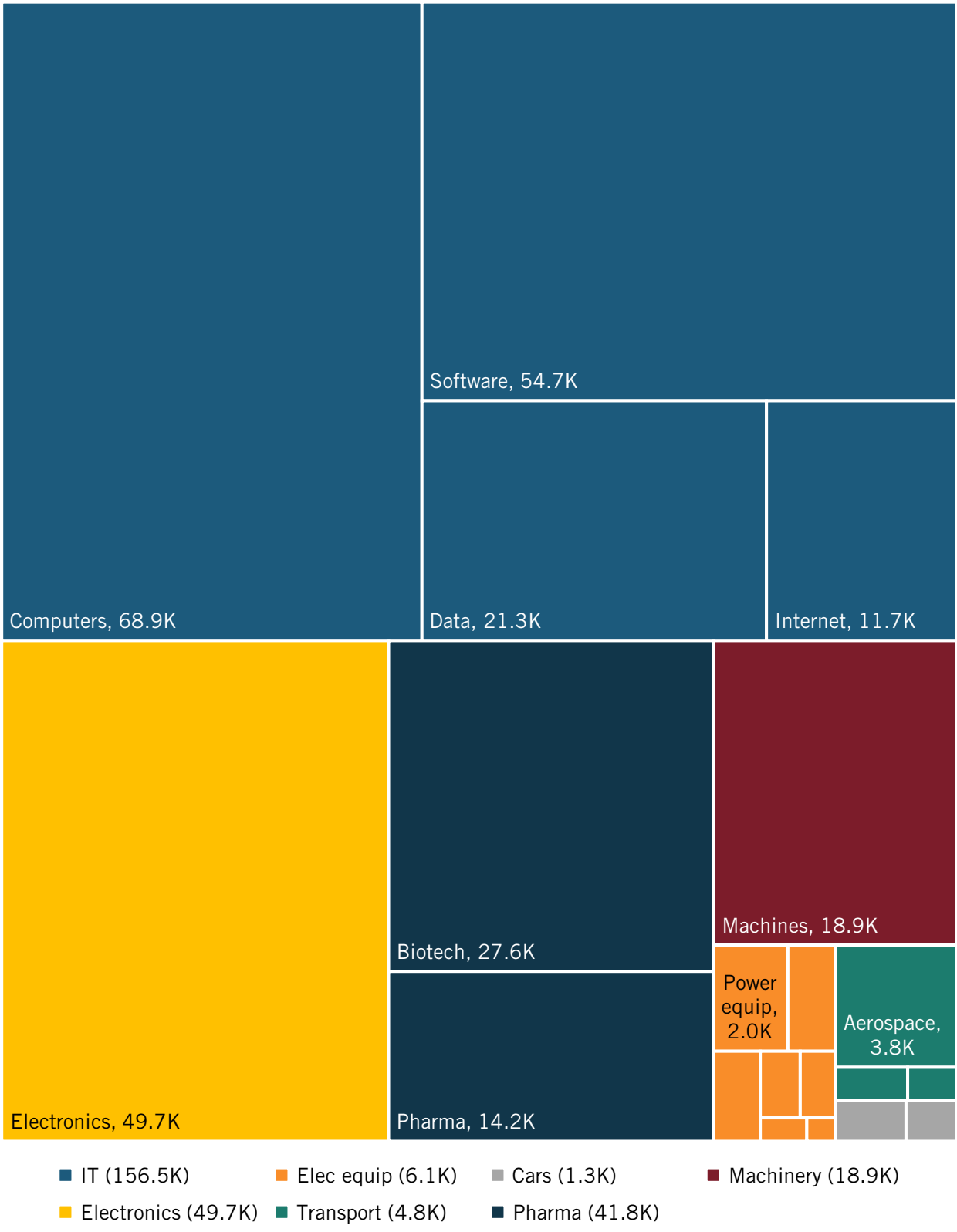
Figure 63: Massachusetts's relative performance in Hamilton Index industries



The IT and information services industry employs the most workers at 156,525. Computer systems design is the largest subindustry within this sector, employing 68,895 individuals. Software publishing follows with 54,682 employees, data processing accounts for 21,260 workers, and Internet publishing employs 11,688. These numbers highlight Massachusetts's role as a technology and digital innovation hub, supported by its strong academic and research institutions.

The pharmaceutical and biotechnology sector is another critical part of Massachusetts's economy, employing 41,810 workers. The biotech R&D subindustry employs 27,617 employees, while pharmaceutical and medicine manufacturing employs 14,193 individuals. Electronics manufacturing is also a notable contributor, employing 49,705 individuals.

Figure 64: Number of employees in Hamilton Index subindustries in Massachusetts (279,200 workers total)

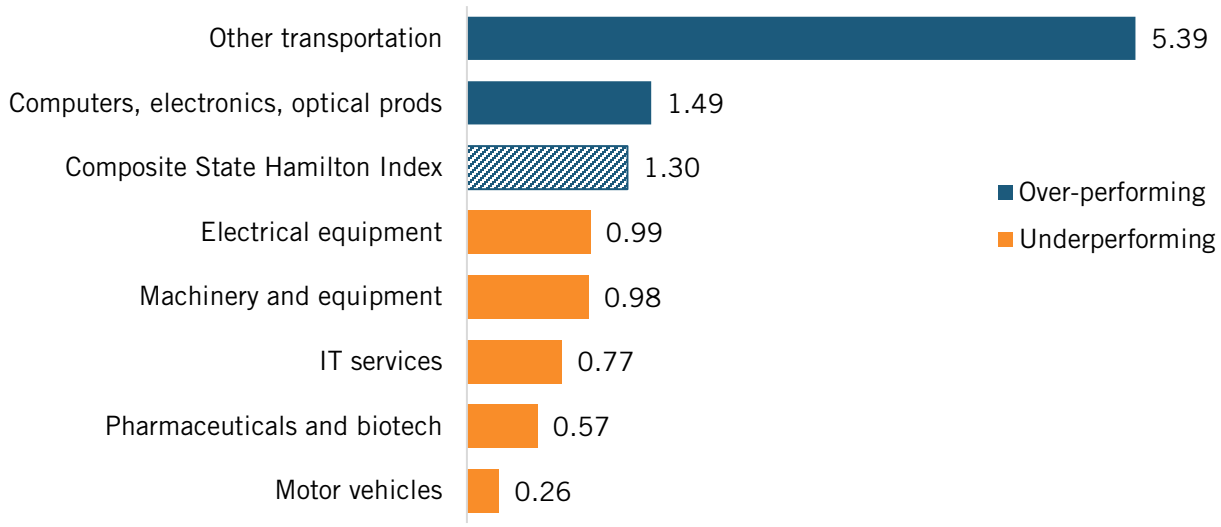


No. 7: Connecticut

Connecticut, home to major aerospace and defense companies such as Pratt & Whitney and Sikorsky, excels in other transportation industries with a high LQ of 5.39. This reflects the state's strong aerospace manufacturing and engineering capabilities. Additionally, computers, electronics, and optical products stand out with an LQ of 1.49, emphasizing Connecticut's advanced manufacturing base and technological innovation.

In contrast, Connecticut underperforms in several key industries. The motor vehicles sector is the weakest with an LQ of 0.26, followed by pharmaceuticals and biotech (0.57), IT services (0.77), machinery and equipment (0.98), and electrical equipment (0.99). These figures suggest that the state's advanced industries are more specialized, particularly in aerospace, while traditional manufacturing and other advanced sectors remain underdeveloped relative to the national average.

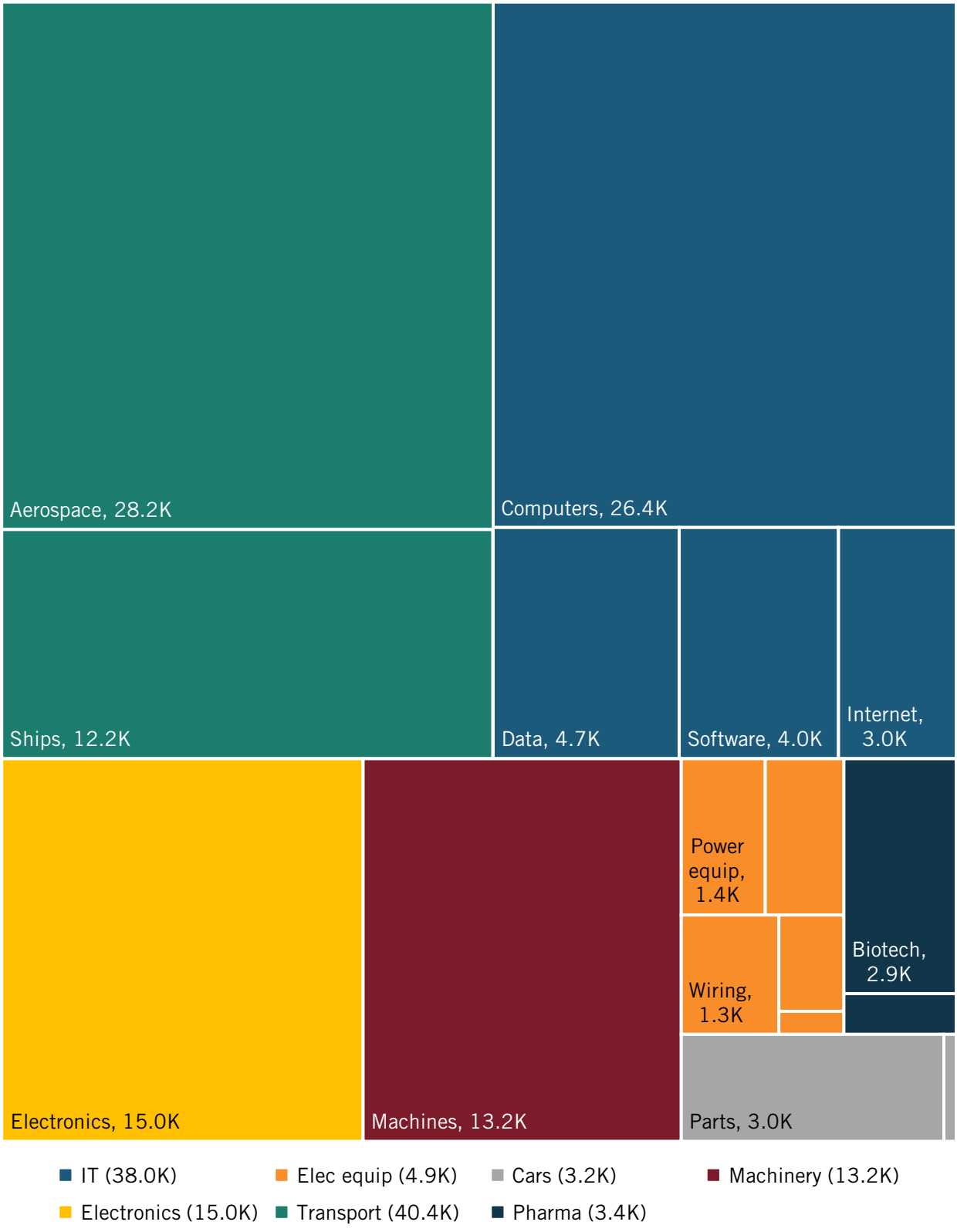
Figure 65: Connecticut's relative performance in Hamilton Index industries



Several subindustries contribute to Connecticut's advanced economy, with the transportation industry employing the most workers at 40,376. Within this sector, aerospace is the largest subindustry, employing 28,151 individuals, followed by shipbuilding with 12,216 workers. These figures emphasize Connecticut's long-standing reputation as a leader in aerospace and maritime manufacturing, supported by major employers such as Pratt & Whitney and Electric Boat.

The IT and information services industry is the second largest Hamilton industry in terms of absolute employment, despite its underperforming LQ, with 38,019 workers. Computer systems design is the largest subindustry, employing 26,401 individuals. Software publishing, data processing, and Internet publishing employ similar numbers of employees in the state (3,000 to 4,700 each). Electronics manufacturing employs 15,007 individuals, while machinery manufacturing accounts for 13,229 workers, underscoring the state's strong presence in high-tech and industrial manufacturing.

Figure 66: Number of employees in Hamilton Index subindustries in Connecticut (118,100 workers total)

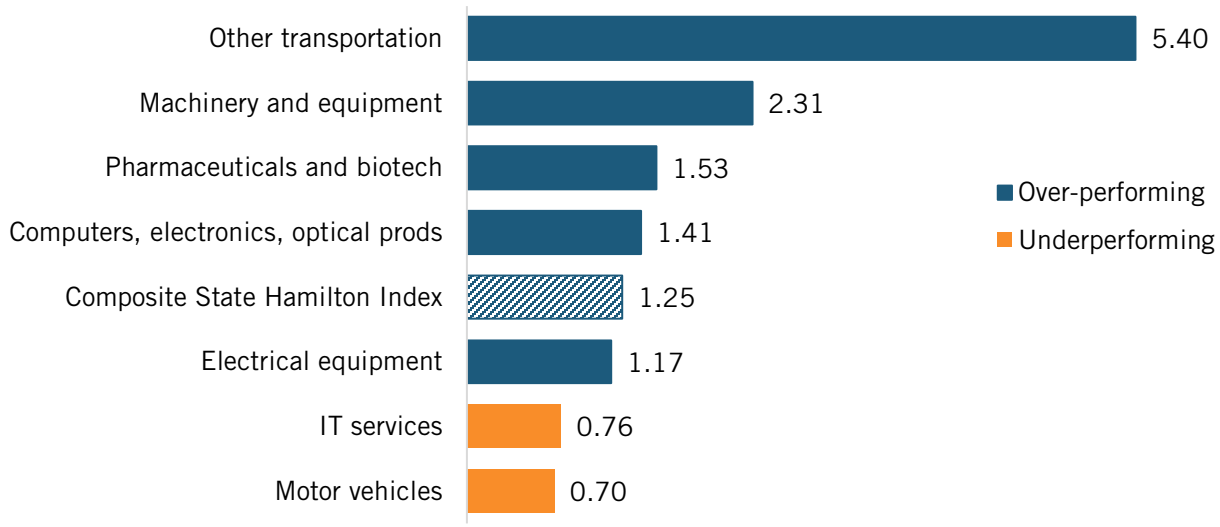


No. 8: Kansas

Kansas stands out as a leader in the aerospace and transportation industries, with an impressive LQ of 5.40 in other transportation, driven by major manufacturers such as Spirit AeroSystems and Textron Aviation. The state also over-performs in machinery and equipment (2.31) and pharmaceuticals and biotech (1.53), highlighting its diversified advanced manufacturing and life sciences capabilities. Additionally, Kansas demonstrates strength in computers, electronics, and optical products, with an LQ of 1.41.

Kansas also underperforms in certain key sectors. IT services, with an LQ of 0.76, and motor vehicle manufacturing, with an LQ of 0.70, reflect areas where the state has less presence compared with the national average. While electrical equipment (1.17) performs slightly above average, there remains potential for Kansas to expand its advanced industry portfolio beyond its current heavy reliance on aerospace and machinery.

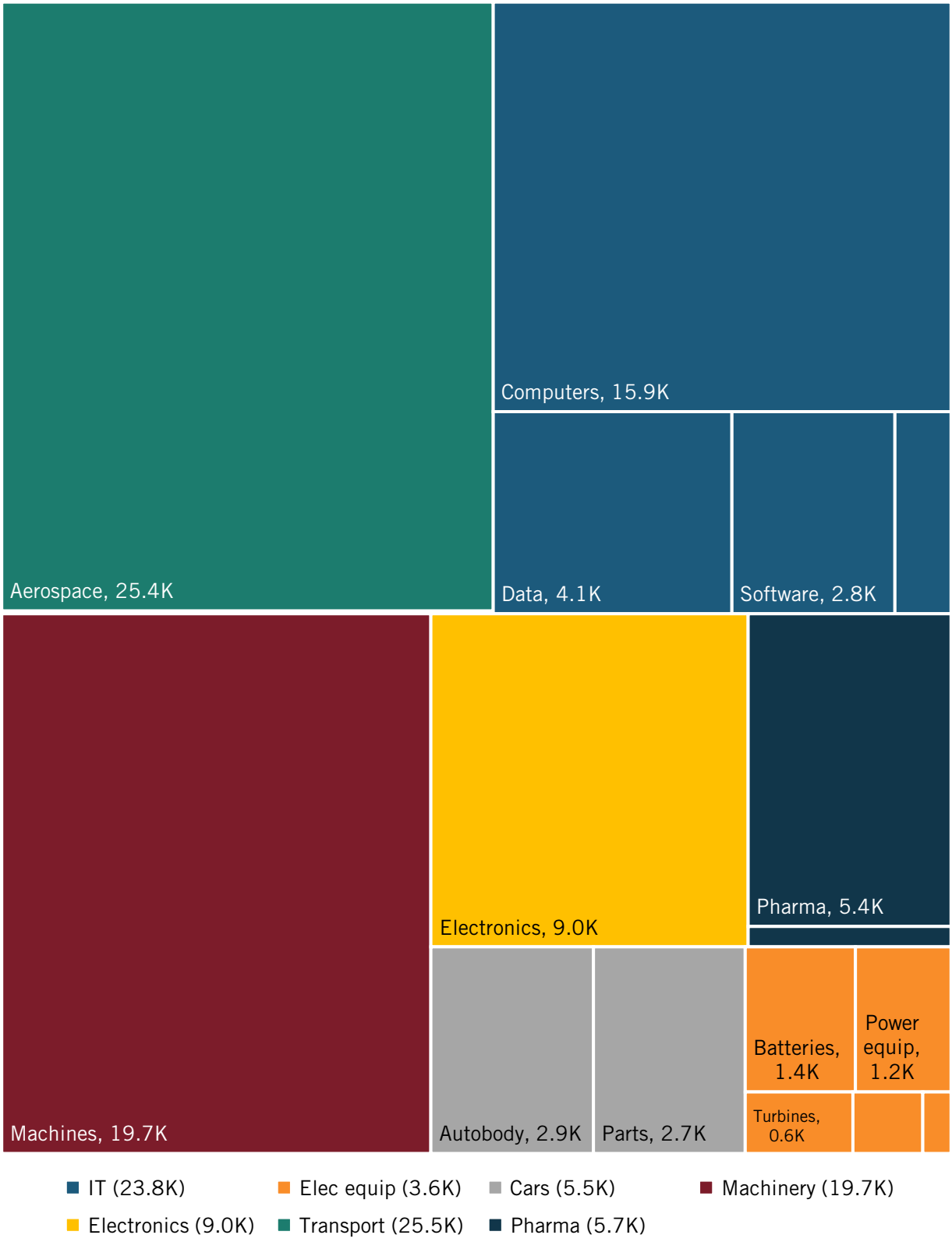
Figure 67: Kansas's relative performance in Hamilton Index industries



Several subindustries contribute to Kansas's advanced economy, with the transportation industry employing the most workers at 25,542, almost all of whom work in the aerospace industry. Railroad manufacturing employs just 129 individuals. The machinery sector is another significant contributor, employing 19,675 workers across various subindustries, showcasing Kansas's robust manufacturing base.

The IT and information services industry, while underperforming according to its LQ, is the third largest Hamilton industry, employing 23,791 workers. Computer systems design is the largest subindustry with almost 16,000 employees. Electronics manufacturing is another important sector, employing 8,982 workers. The pharmaceutical sector, while smaller, employs 5,736 individuals, most of whom work in medicine manufacturing (5,380 workers). Kansas's strength across several industries indicates a diverse economy of manufacturing and advanced technology services sectors.

Figure 68: Number of employees in Hamilton Index subindustries in Kansas (92,800 workers total)

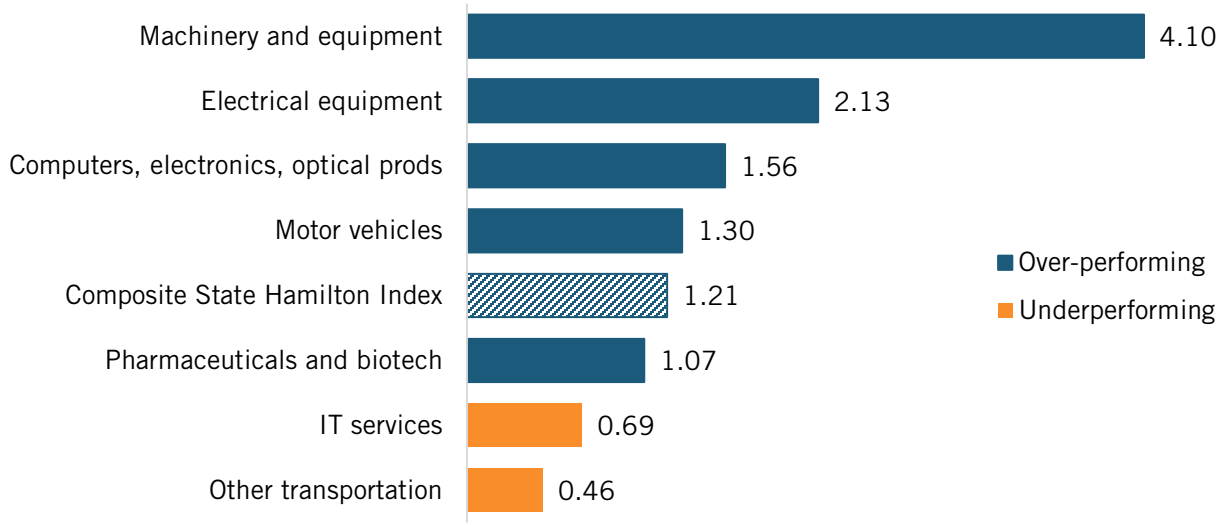


No. 9: Iowa

Iowa, a state known for its agricultural industry and growing advanced manufacturing sector, excels in machinery and equipment with an LQ of 4.10, making it a dominant industry within the state. The electrical equipment industry also performs strongly with an LQ of 2.13, further highlighting Iowa's manufacturing strengths. Additionally, computers, electronics, and optical products (1.56) and motor vehicles (1.30) demonstrate above-average concentration, reflecting Iowa's increasing diversification into technology and transportation-related industries.

However, Iowa underperforms in sectors such as IT services (0.69) and other transportation (0.46), indicating limited presence in digital technology and advanced transportation manufacturing. Pharmaceuticals and biotech (1.07), while slightly above the national average, are not as competitive compared with other states. These figures suggest that Iowa's economy remains heavily focused on traditional manufacturing, with opportunities for growth in high-tech and innovation-driven industries.

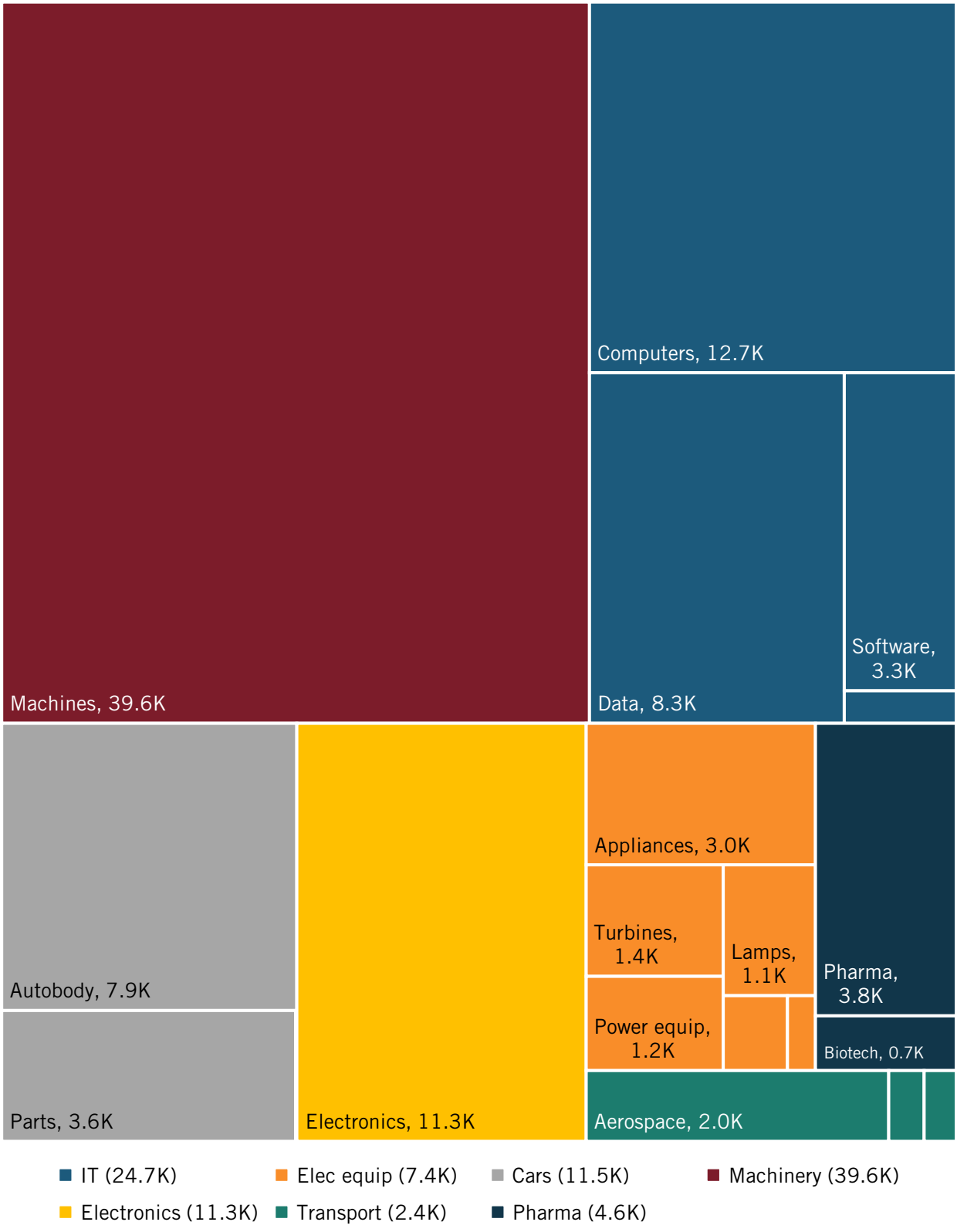
Figure 69: Iowa's relative performance in Hamilton Index industries



In Iowa, most Hamilton industry workers are employed in the machinery sector, which accounts for 3,579 people. The IT and information services industry is also a significant employer, employing 24,677 individuals, with computer systems design leading this category at 12,677 employees, followed by data processing (8,340) and software publishing (3,320).

The electronics sector is also a notable contributor to Iowa's advanced industries, employing 11,290 individuals. This includes significant subindustries such as turbine manufacturing (1,425) and power equipment production (1,208). Other key sectors include transportation, with aerospace manufacturing employing 2,001 workers, and the automotive sector, with 11,521 employees across car manufacturing and autobody and trailer production. The pharmaceutical and biotech industry employs 4,555 individuals, most of whom work in the medicine manufacturing industry (3,837).

Figure 70: Number of employees in Hamilton Index subindustries in Iowa (101,500 workers total)

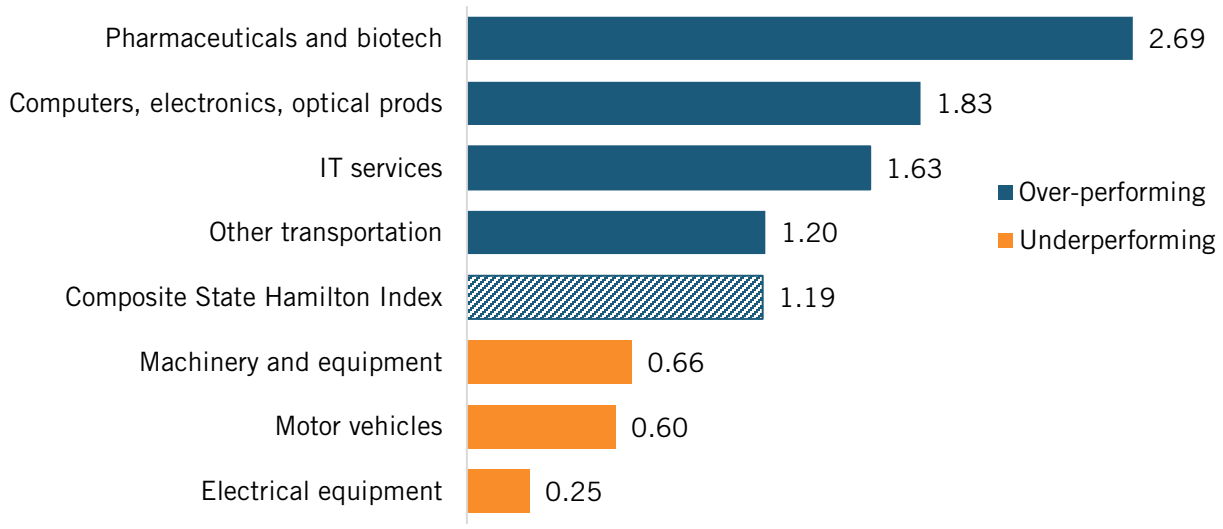


No. 10: Utah

Utah, a growing hub for innovation and technology, excels in pharmaceuticals and biotech with an LQ of 2.69, highlighting the state's strong presence in life sciences and advanced research. Computers, electronics, and optical products also perform well with an LQ of 1.83, reflecting Utah's contributions to advanced manufacturing and tech development. Additionally, IT services show strength with an LQ of 1.63. Other transportation also registers slightly above average with an LQ of 1.20.

However, Utah underperforms in several traditional manufacturing sectors. Electrical equipment has the lowest LQ at 0.25, followed by motor vehicles at 0.60 and machinery and equipment at 0.66. These figures suggest a smaller emphasis on heavy manufacturing compared with the national average, as Utah's economy remains more centered on high-tech industries and life sciences rather than traditional industrial sectors.

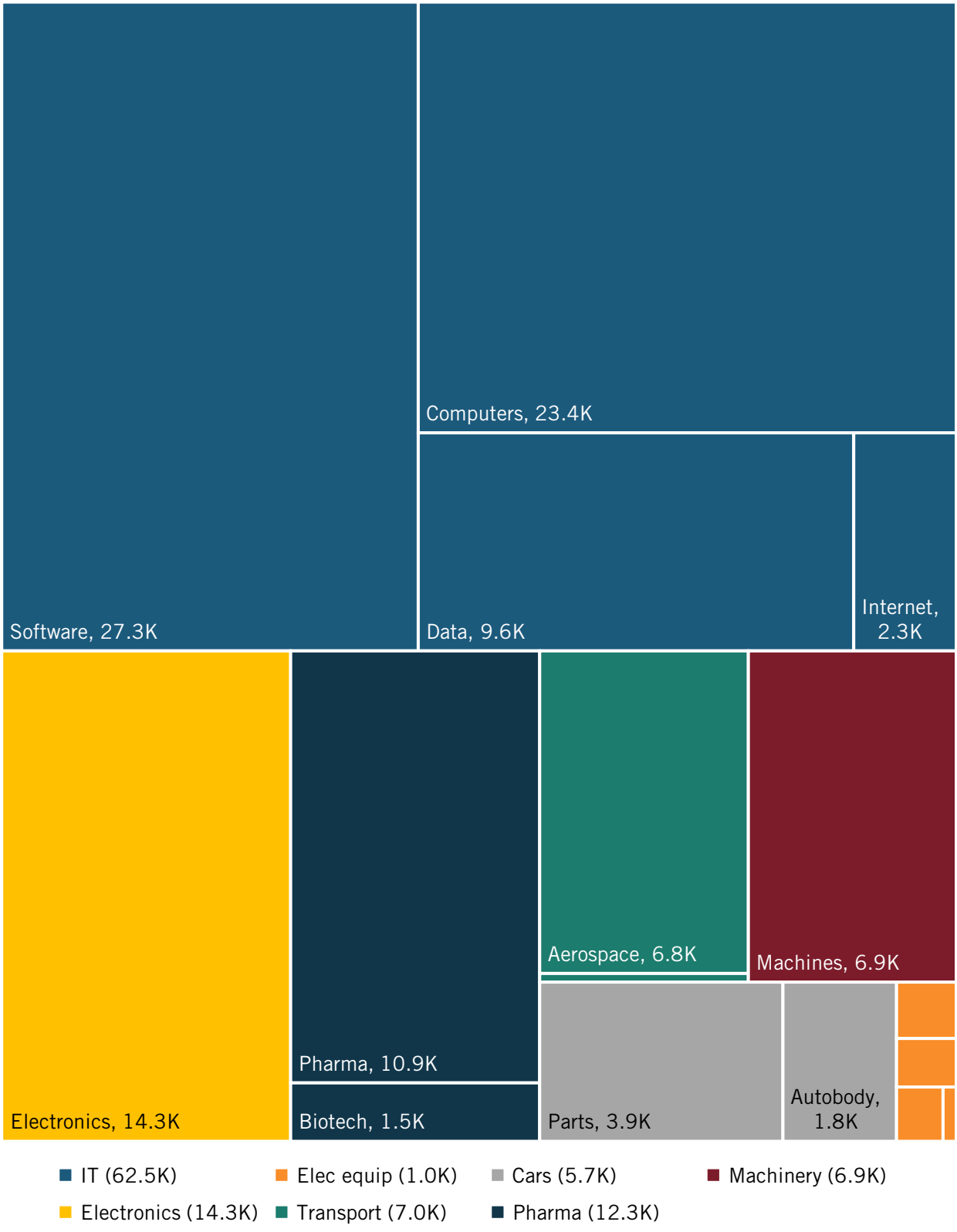
Figure 71: Utah's relative performance in Hamilton Index industries



In Utah, most Hamilton industry employees are employed in the IT and information services industry, with 62,486 workers. This includes the largest subindustry, software publishing, which employs 27,269 individuals, followed by computer systems design with 23,366 workers. Data processing contributes an additional 9,596 employees, while Internet publishing employs 2,255 people. These numbers highlight Utah's strong presence in the technology sector, driven by its growing tech hubs, known as Silicon Slopes, in the Salt Lake City and Provo areas.

The pharmaceutical and biotech industry employs 12,315 workers in Utah, with pharmaceutical manufacturing employing 10,850 people. Electronics manufacturing also plays a significant role, employing 14,287 individuals. There is also a significant aerospace industry with almost 7,000 employees, driven by companies such as Collins Aerospace and Northrup Grumman. Automotive and electrical equipment manufacturing do not have a significant presence in Utah, demonstrating areas for industrial growth.

Figure 72: Number of employees in Hamilton Index subindustries in Utah (109,700 workers total)

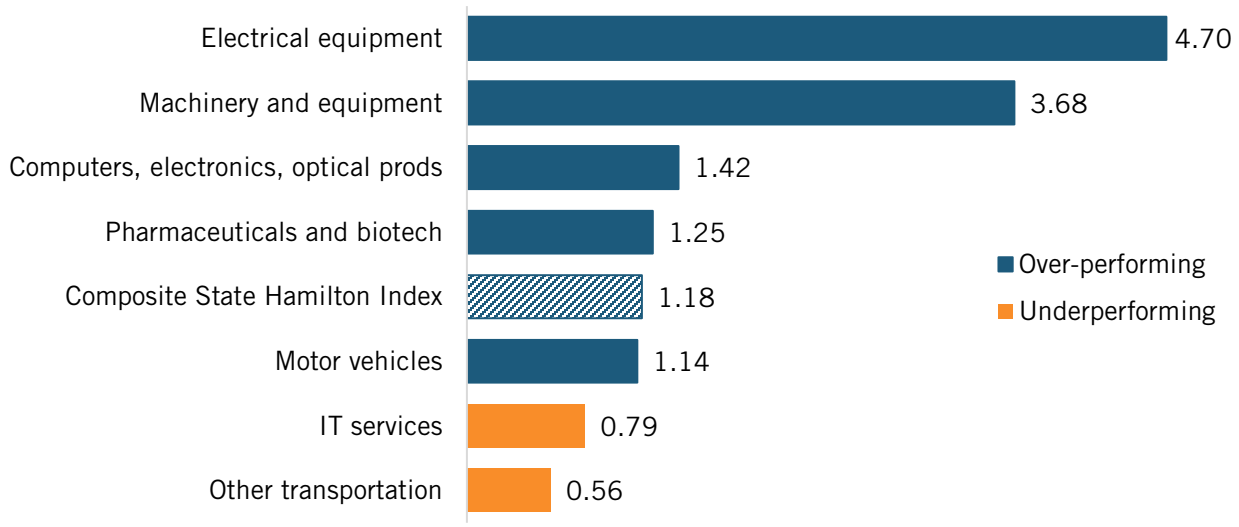


No. 11: Wisconsin

Wisconsin excels in electrical equipment manufacturing with a high LQ of 4.70, driven by major companies such as Rockwell Automation and Regal Rexnord. Machinery and equipment is also a significant industry in the state (3.68), unsurprising given the state's location in the Rust Belt among other manufacturing hubs. The state over-performs in computers, electronics, and optical products (1.42) and pharmaceuticals and biotech (1.25), reflecting its diversified industrial base.

However, Wisconsin underperforms in IT services (0.79) and other transportation industries such as aerospace and shipbuilding (0.56). While the motor vehicle sector has an LQ of 1.14, it is less significant compared with the state's strengths in heavy manufacturing. These trends highlight Wisconsin's reliance on traditional manufacturing and opportunities to grow in advanced technology and transportation sectors.

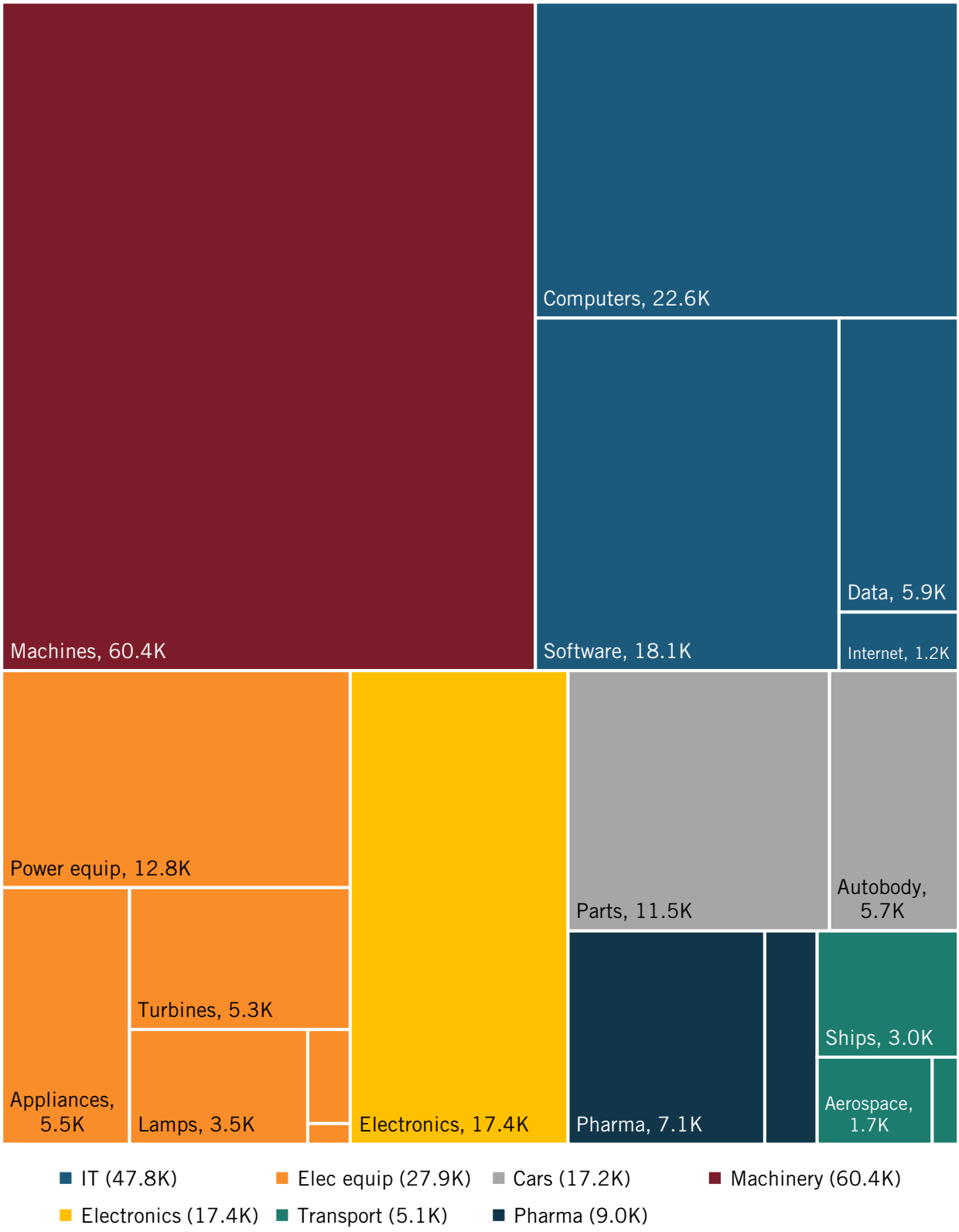
Figure 73: Wisconsin's performance in Hamilton Index industries



Several subindustries are used to calculate a composite score within each of the Hamilton Index industries. In Wisconsin, machinery manufacturing leads the way, employing over 60,400 individuals. This significant presence reflects Wisconsin's legacy as a leader in industrial equipment and heavy machinery production. The IT and information services sector also stands out with over 47,000 workers. Most of these employees are engaged in computer systems design (22,592) and software development (18,130). IT services is the second largest Hamilton industry, despite its low LQ.

The electrical equipment sector employs 27,936 people and includes power equipment (12,806) and household appliances (5,542) as major subindustries. Additionally, electronics manufacturing employs 17,436 individuals, highlighting Wisconsin's position in producing advanced electronic components. Pharmaceutical manufacturing and biotechnology, while smaller, also maintain a strong presence with 7,106 and 1,885 employees, respectively.

Figure 74: Number of employees in Hamilton Index subindustries in Wisconsin (184,800 workers total)

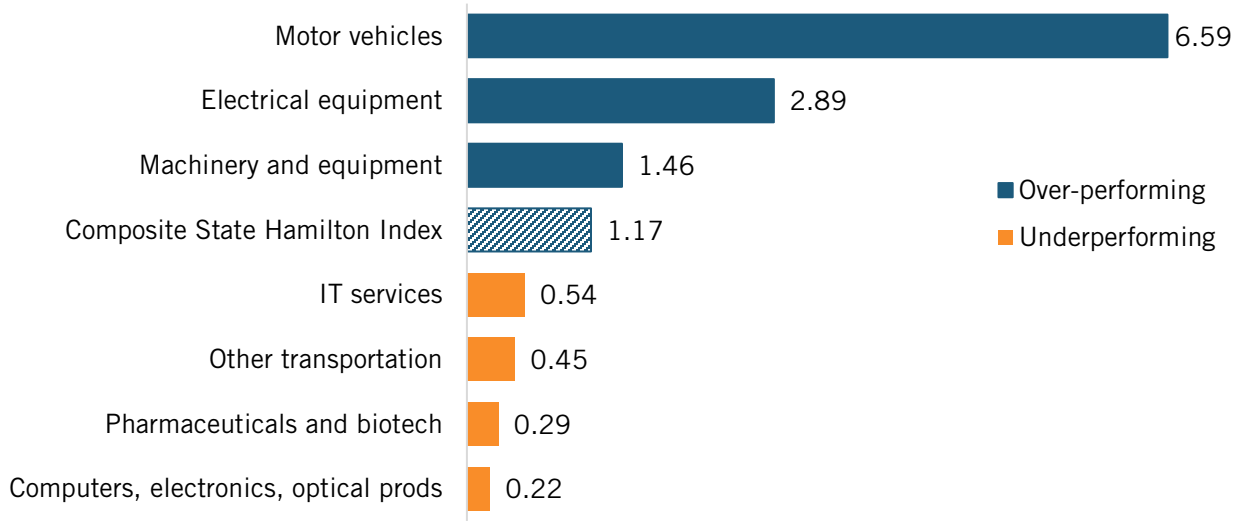


No. 12: Kentucky

Kentucky, home to such major automotive manufacturers as Toyota and Ford Motor Company, has an LQ of 6.59 in motor vehicles, making it the state's strongest industry by far. This highlights Kentucky's significant role in automotive production, particularly in assembling vehicles and manufacturing automotive components. Electrical equipment, with an LQ of 2.89, is another key industry, supported by companies such as GE Appliances, which has a substantial presence in Louisville.

On the other hand, Kentucky underperforms in IT services, with an LQ of 0.54, and in other transportation industries, such as aerospace and shipbuilding, with an LQ of 0.45. The state also shows limited specialization in pharmaceuticals and biotech (0.29) and computers, electronics, and optical products (0.22). These lower scores indicate that Kentucky's economy is more concentrated in traditional manufacturing sectors rather than advanced technology or life sciences, suggesting potential areas for economic diversification.

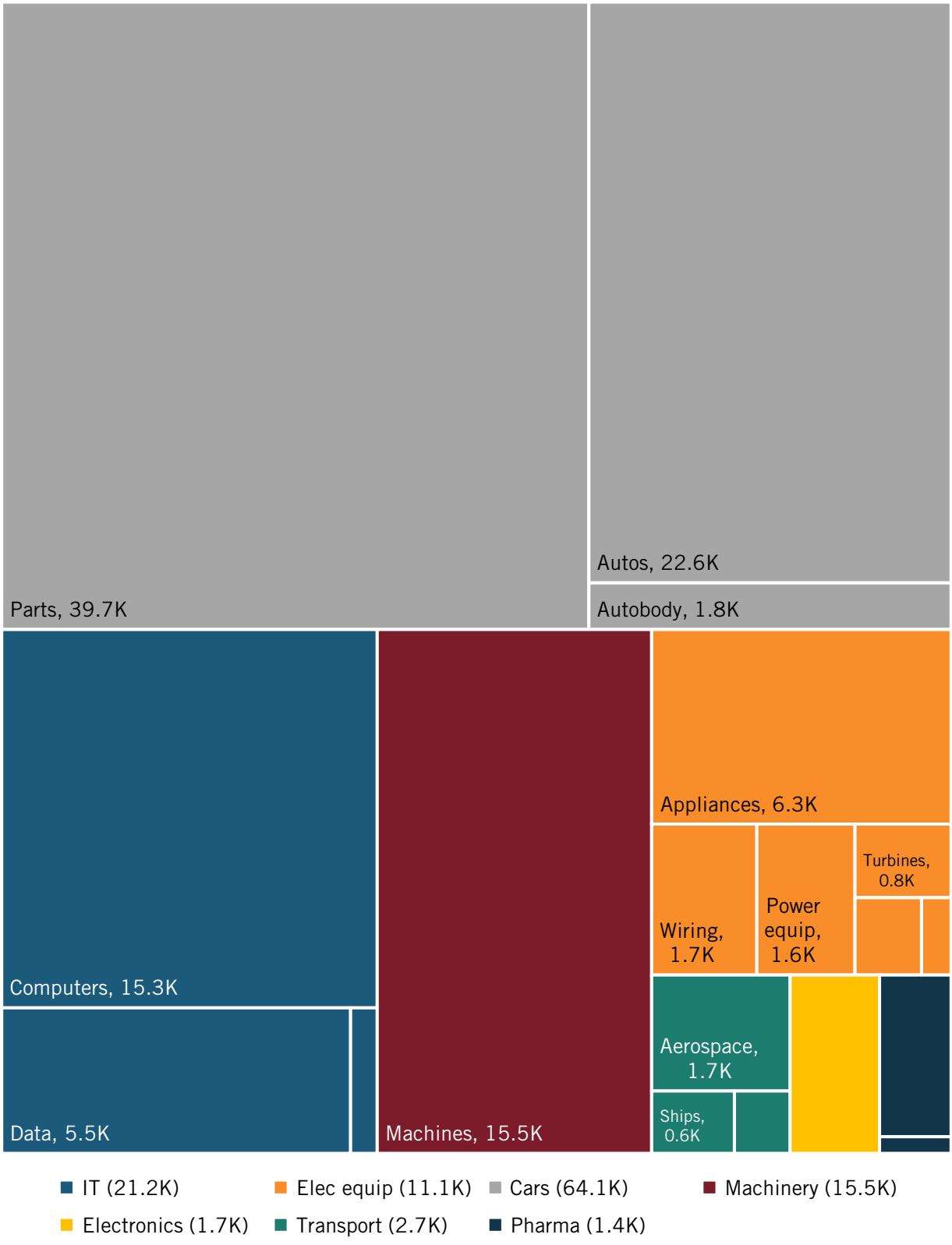
Figure 75: Kentucky's performance in Hamilton Index industries



In Kentucky, most Hamilton industry employees are concentrated in the car manufacturing sector, with over 64,100 workers. The production of automotive parts is the largest subindustry, employing 39,670 individuals, while automobile manufacturing employs 22,637 workers. Additionally, machinery manufacturing (15,505 workers) and electrical equipment manufacturing (11,131 workers) are significant employers, showcasing Kentucky's manufacturing diversity.

In absolute terms, the IT and information services industry is significant in Kentucky, employing 21,200 individuals, with computer systems design being a prominent sub-sector (15,300 workers). The transportation and computers and electronics sector are rather small, employing just 2,659 and 1,711 employees, respectively.

Figure 76: Number of employees in Hamilton Index subindustries in Kentucky (117,700 workers total)

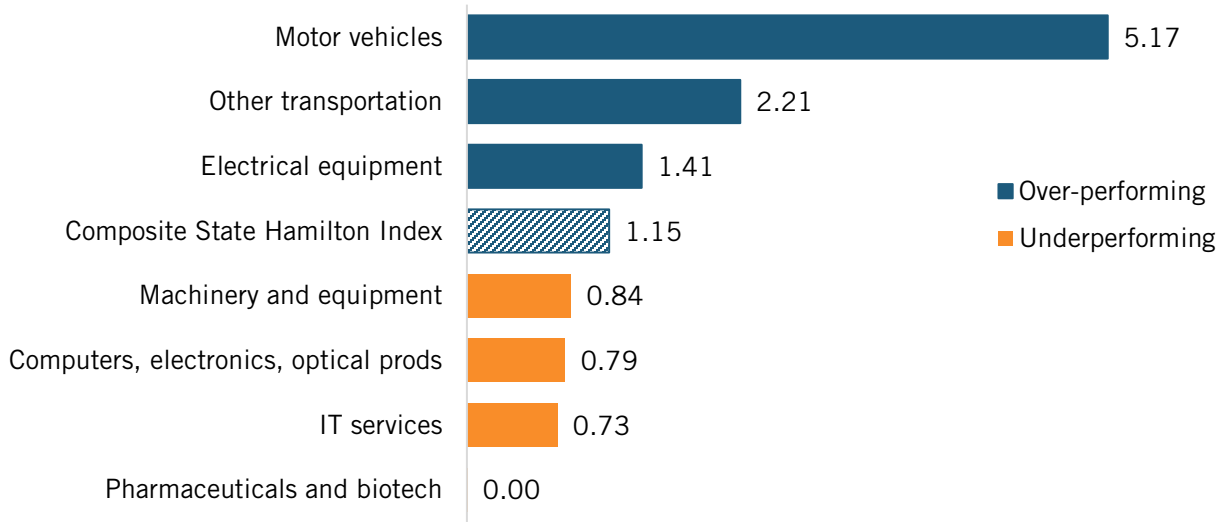


No. 13: Alabama

Alabama is a leader in the motor vehicles industry, boasting a substantial LQ of 5.17 due to the presence of major manufacturers such as Mercedes-Benz, Hyundai, and Honda. The state also performs well in the other transportation sector, with an LQ of 2.21, driven by its aerospace and shipbuilding contributions. Electrical equipment manufacturing (1.41) is another industry in which Alabama over-performs, further reflecting its strength in traditional manufacturing.

However, Alabama's performance lags behind in other areas, such as computers, electronics, and optical products (0.79) and IT services (0.73), showing limited growth in technology-focused industries. The machinery and equipment industry, while larger than advanced technology and services industries, is another area where the state underperforms with an LQ of 0.84. Meanwhile, Alabama has a very small presence in the pharmaceuticals and biotechnology sector.

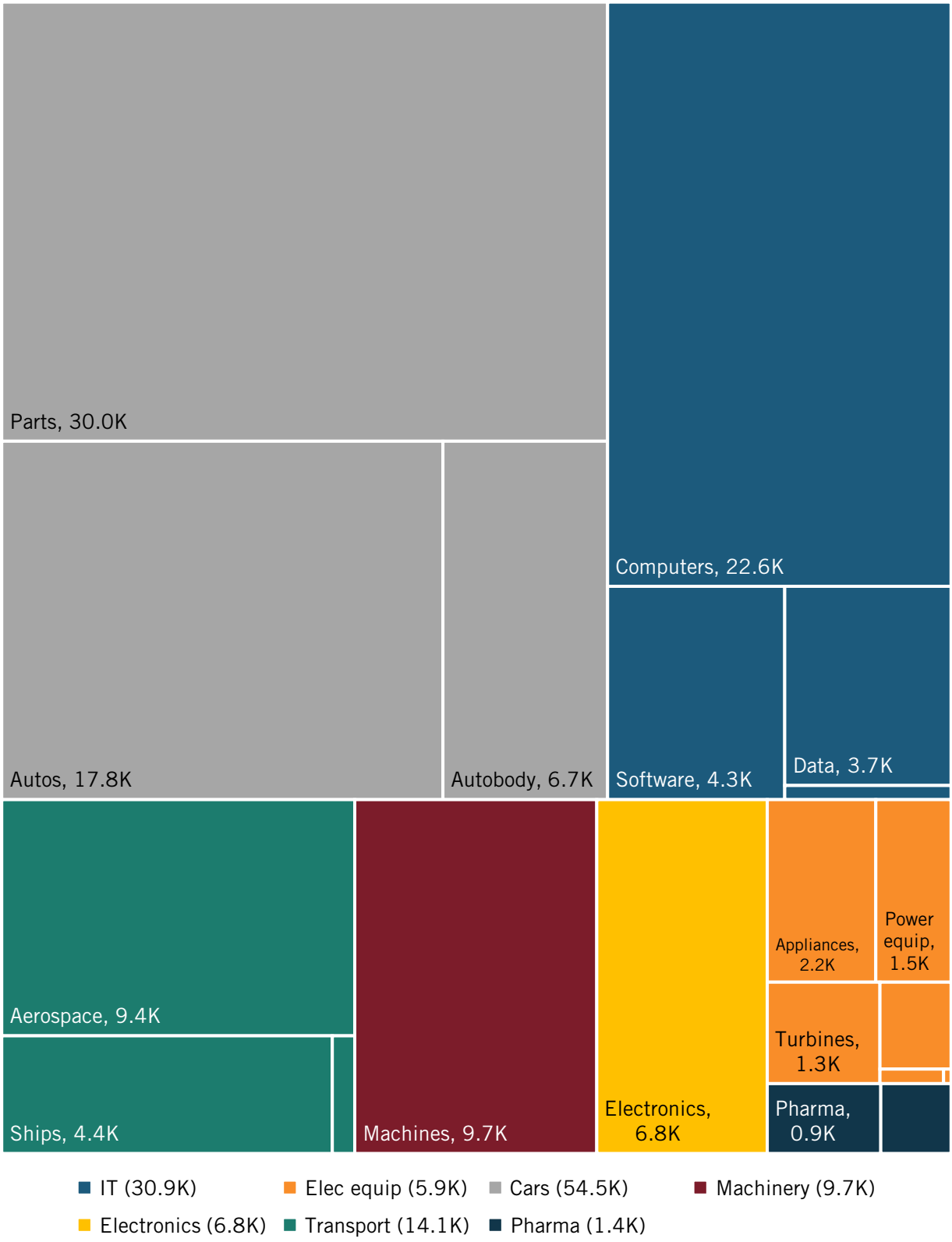
Figure 77: Alabama's performance in Hamilton Index industries



In Alabama, most Hamilton industry workers are employed in the car manufacturing sector, which employs about 54,500 people. This dominance highlights the state's strong foothold in automotive production, including automotive manufacturing and parts manufacturing plants. IT services is the second largest Hamilton industry in absolute terms, employing 30,871 people. Computer systems and design is the largest subindustry, employing 22,613 individuals.

The aerospace industry is another notable sector in Alabama, employing 9,396 people, underscoring the state's role in advanced transportation manufacturing. Machinery manufacturing employs 9,654 individuals, while electronics manufacturing, with 6,815 employees, demonstrates an area for growth for the state. Other high-tech industries, including software publishing, data processing, and the pharmaceuticals and biotechnology industries are small employers in the state.

Figure 78: Number of employees in Hamilton Index subindustries in Alabama (123,200 workers total)

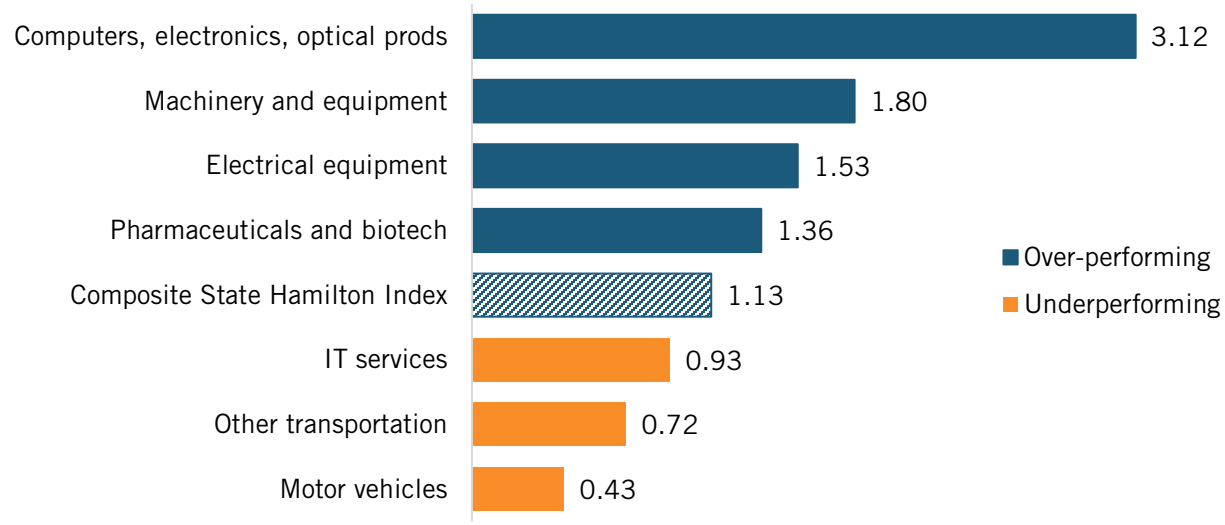


No. 14: New Hampshire

New Hampshire excels in the computers, electronics, and optical products industry, with an LQ of 3.12, highlighting its strong specialization in advanced manufacturing and technology. Companies such as BAE Systems and DEKA Research and Development are key players in these sectors, driving innovation in defense, medical devices, and robotics. The state also performs well in machinery and equipment (1.80) and electrical equipment (1.53) manufacturing. Pharmaceuticals and biotechnology, another advanced technology sector, has an LQ of 1.36, underscoring the state's growing footprint in life sciences.

However, New Hampshire underperforms in other transportation equipment (0.72) and motor vehicles (0.43). IT services also lag behind, with an LQ of 0.93, despite the state's strong technology ecosystem. These gaps reveal opportunities for diversification and investment in sectors where New Hampshire could build additional capacity and competitiveness.

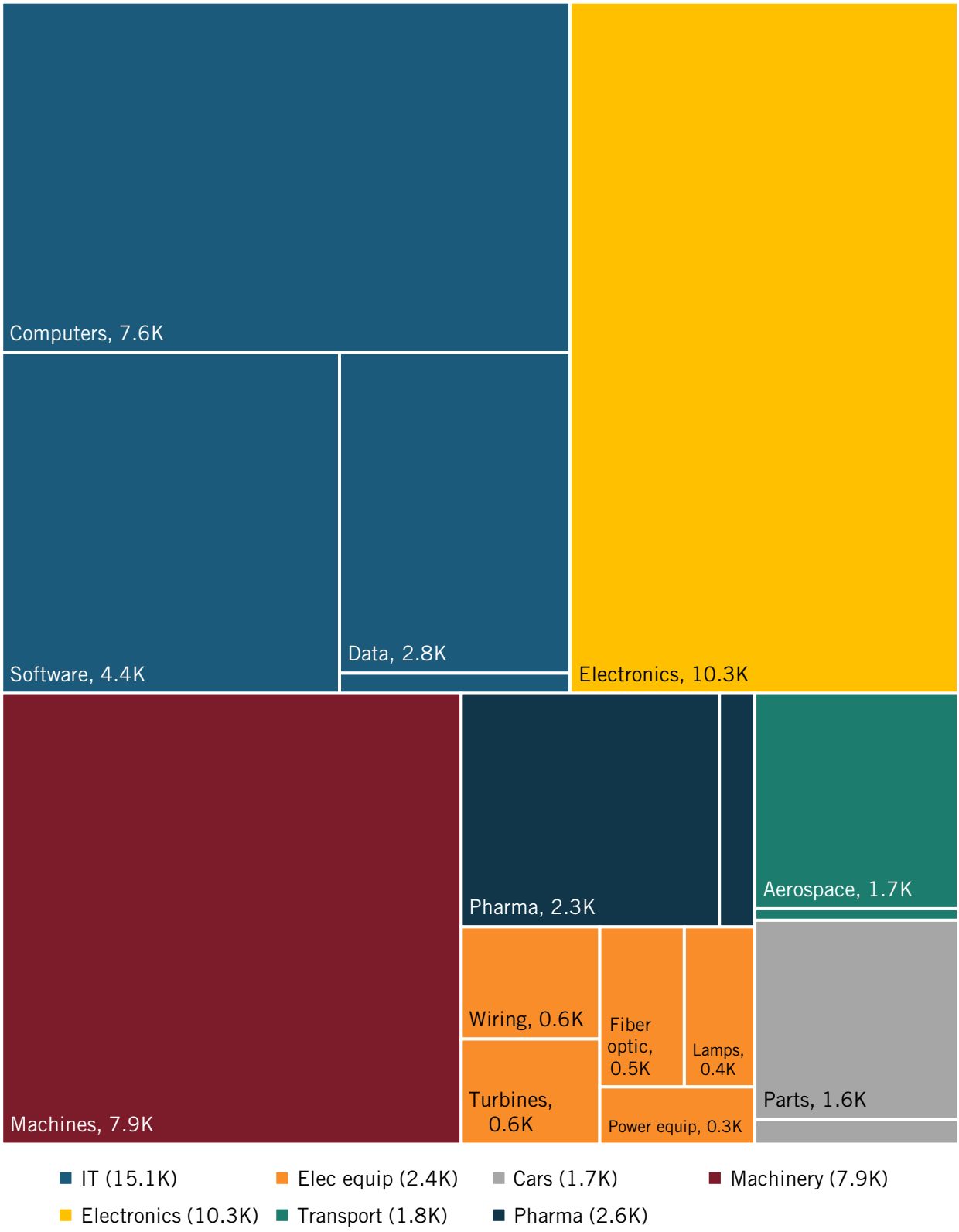
Figure 79: New Hampshire's performance in Hamilton Index industries



In absolute terms, New Hampshire's IT sector leads in employment among advanced industries, with 15,100 workers. This includes 7,633 individuals in computer systems design, followed by 4,414 in software publishing and 2,800 in data processing. This highlights the state's growing emphasis on technology and digital services as significant economic contributors. However, this industry is still smaller than expected based on New Hampshire's population.

Computers and electronics manufacturing is another large sector, employing 10,281 workers, which reflects the state's strong foothold in high-tech production, specifically semiconductors, medical devices, and telecommunications equipment. Meanwhile, machinery manufacturing employs 7,932 individuals. Other notable industries include aerospace with 1,676 employees and pharmaceuticals with 2,311 workers, showcasing the state's diversified advanced manufacturing landscape.

Figure 80: Number of employees in Hamilton Index subindustries in New Hampshire (41,900 workers total)

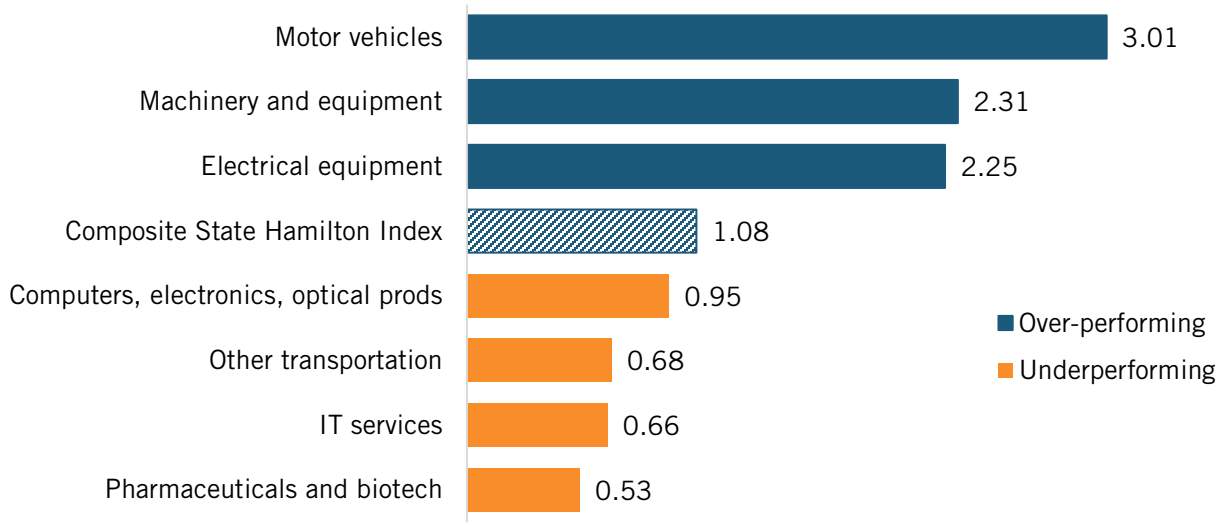


No. 15: Ohio

Ohio, a manufacturing powerhouse, exhibits its strongest performance in the motor vehicles industry with an LQ of 3.01, reflecting its historic role in automobile production. The state is home to major facilities operated by General Motors, Honda, and Ford, which contribute significantly to this sector. Additionally, Ohio excels in machinery and equipment (2.31) and electrical equipment (2.25) manufacturing.

Conversely, Ohio underperforms in several key areas. Other transportation equipment (0.68), IT services (0.68), and pharmaceuticals and biotech (0.53) industries are smaller than expected based on Ohio's size, indicating limited activity and investment in these sectors. Computers, electronics, and optical products (0.95) also fall slightly short, highlighting opportunities for growth and diversification in technology-driven industries.

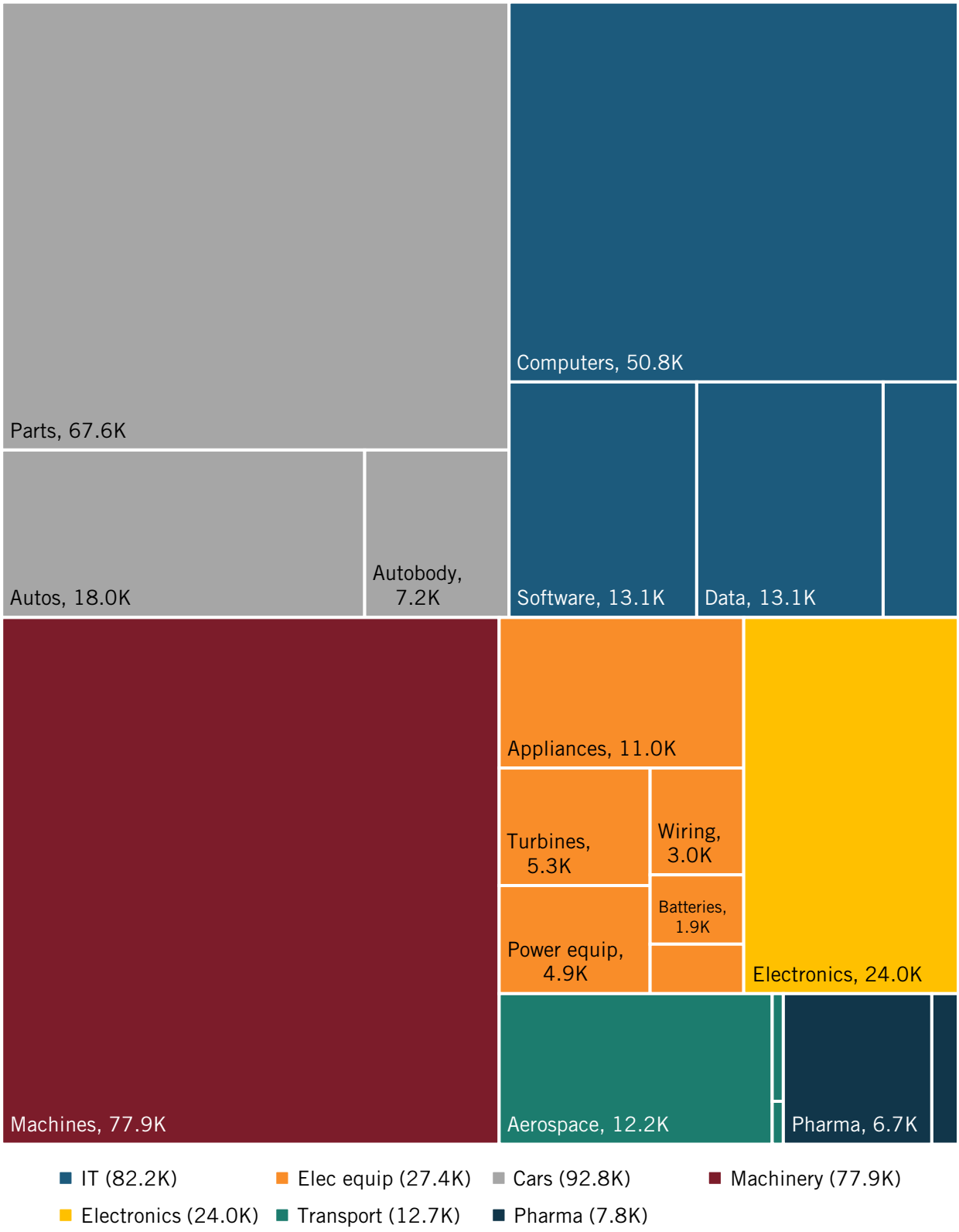
Figure 81: Ohio's performance in Hamilton Index industries



Ohio's automotive sector leads among Hamilton industries, employing over 92,806 individuals, most of whom (67,592) are employed in the automotive parts manufacturing sector. IT and information services also employs significant numbers of Ohioans, with 82,212 individuals in the industry, more than half of whom work in computer systems design (50,764). Software publishing and data processing each employ about 13,100 workers. Despite significant employment in this sector, great investment could help Ohio to over-perform in this industry.

Machinery manufacturing employs about 78,000 individuals, making it one of the largest industries in the state. Electrical equipment manufacturing is also a significant employer, with large levels of employment in the household appliance industry (10,998 workers), engine and turbine industry (5,277 workers), and the power equipment industry (4,852 workers).

Figure 82: Number of employees in Hamilton Index subindustries in Ohio (324,900 workers total)

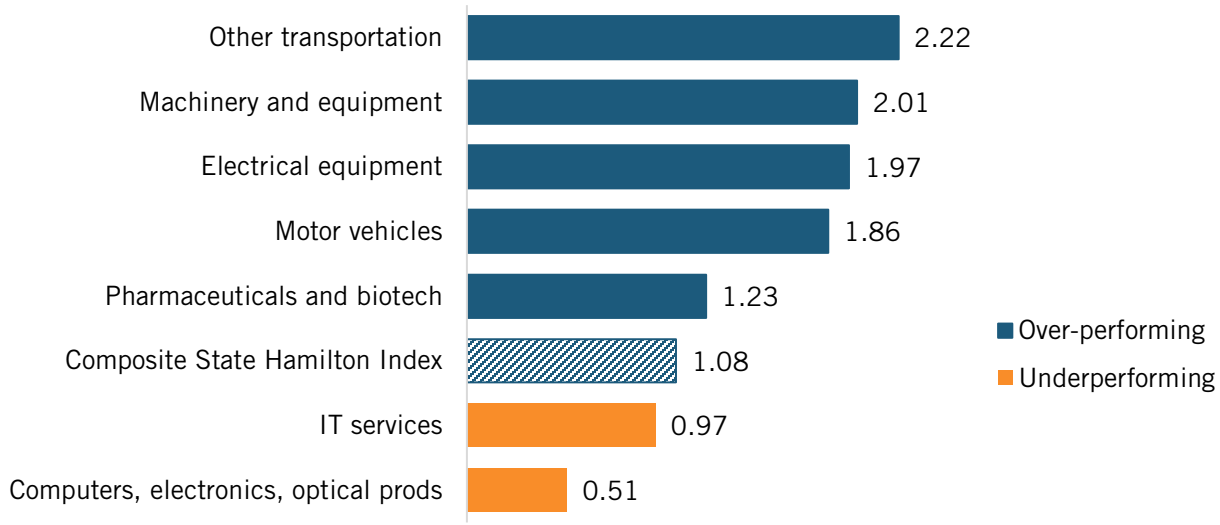


No. 16: Missouri

Missouri demonstrates strong performance in advanced industries, particularly in other transportation equipment, with an LQ of 2.22, showcasing its robust manufacturing capabilities in sectors such as aerospace and defense. The state is home to a Boeing plant in St. Louis, a key driver of its over-performance in this industry. Machinery and equipment (2.01) and electrical equipment (1.97) are also significant industries in Missouri.

Conversely, Missouri underperforms in IT services (0.97) and computers, electronics, and optical products (0.51), indicating lower relative activity in technology and innovation-driven sectors. Pharmaceuticals and biotechnology (1.23) is a relatively strong industry in Missouri, but still presents opportunities for growth.

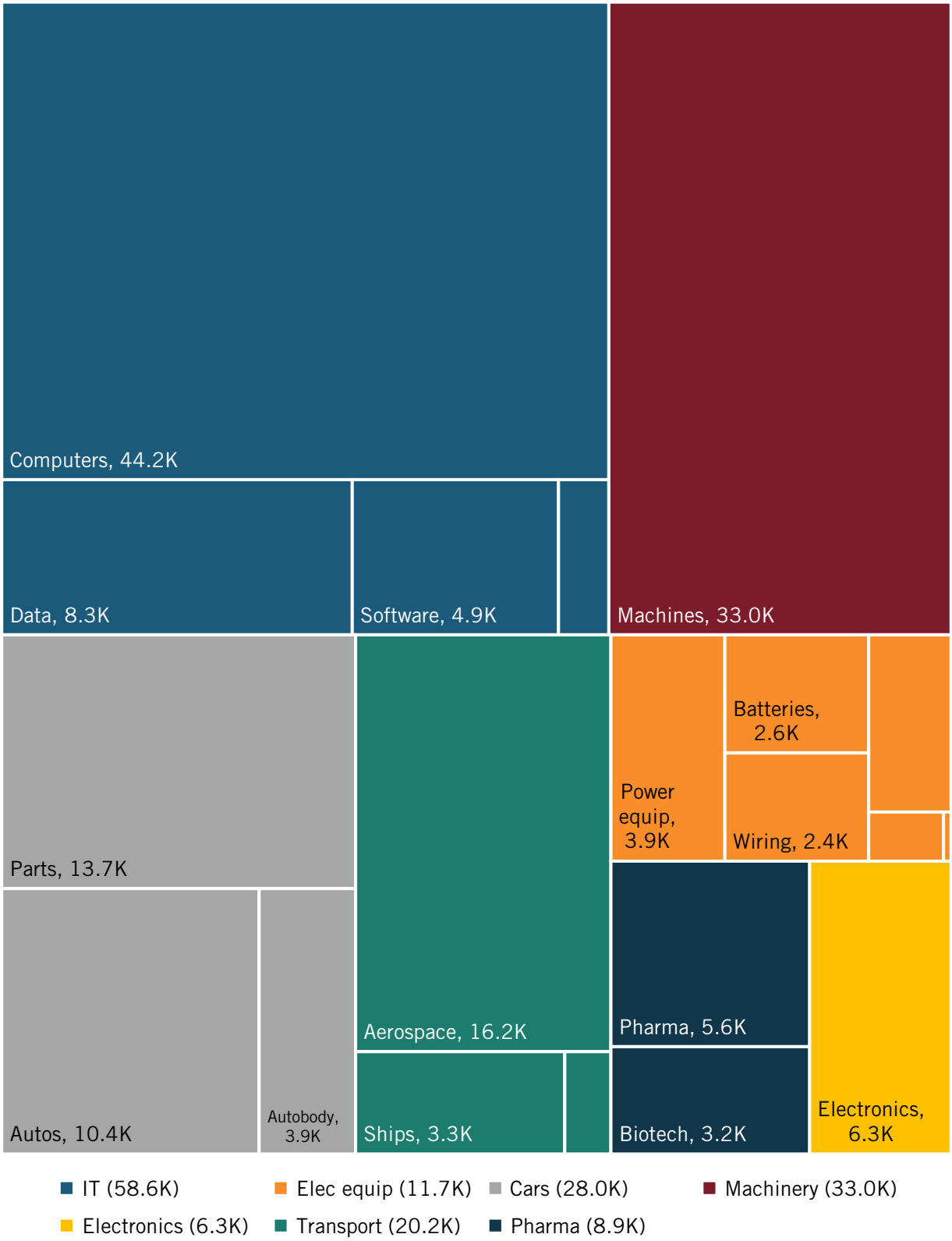
Figure 83: Missouri's performance in Hamilton Index industries



In absolute terms, most Hamilton industry workers are employed in the IT and information services industry, with 58,559 employees. Most of these workers are in the computer systems design subindustry (44,168), followed by data processing and hosting (8,307) and software publishing (4,896). Machinery manufacturing is another key industry, employing 33,005 individuals, showcasing Missouri's strengths in advanced manufacturing.

In the transportation industry, aerospace employs the most individuals (16,241), making it a vital sector in Missouri. The automotive sector also has a strong presence, with about 28,000 employees working in car manufacturing and about 13,700 in parts production. Electronics and pharmaceutical sectors, employing 6,305 and 8,875 workers, respectively, are the smallest of the Hamilton industries in Missouri.

Figure 84: Number of employees in Hamilton Index subindustries in Missouri (166,700 workers total)

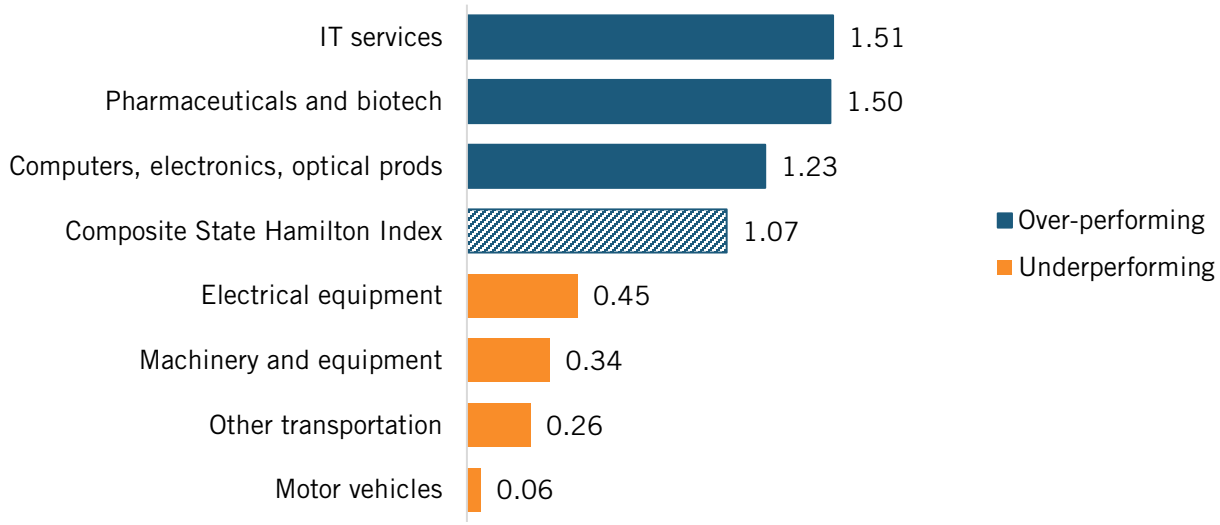


No. 17: Maryland

Maryland, a hub for IT and biotechnology, exhibits strong performance in IT services, with an LQ of 1.51, reflecting its prominence in cybersecurity and software development industries. The state is home to major players such as Northrop Grumman and Lockheed Martin, which contribute to its IT and defense sectors. Pharmaceuticals and biotech also thrive, with an LQ of 1.50, supported by companies such as Emergent BioSolutions and the proximity to federal agencies such as the National Institutes of Health.

Conversely, Maryland struggles in industries such as machinery and equipment (0.34) and motor vehicles (0.06), where its activity remains far below the national average. Electrical equipment (0.45) and other transportation (0.26) also underperform, highlighting limited industrial presence in these areas.

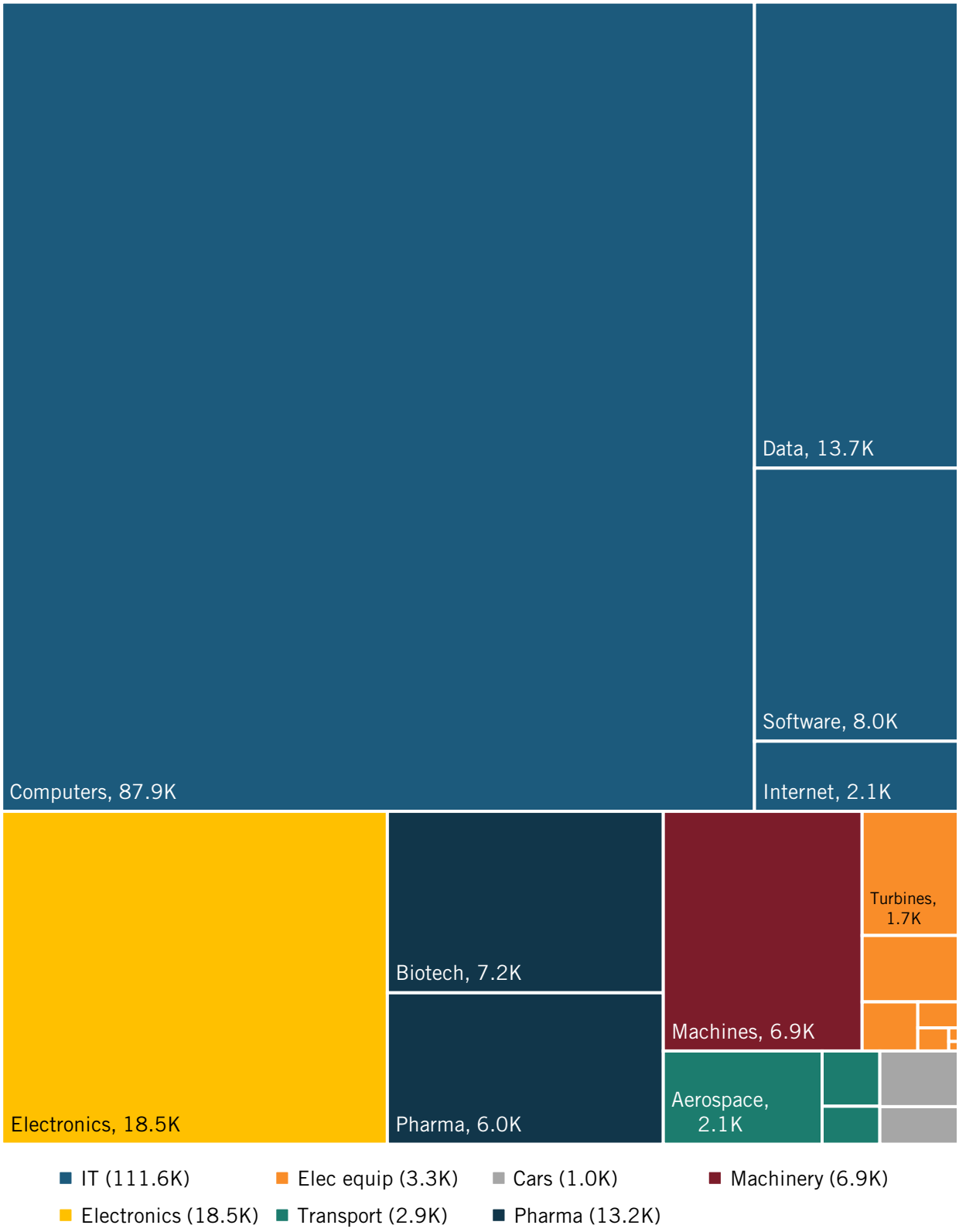
Figure 85: Maryland's performance in Hamilton Index industries



Maryland's economy is heavily anchored by its IT sector, which employs 111,627 individuals. This includes a significant number of workers in computer systems design (87,871) and data processing services (13,684). The pharmaceutical manufacturing and biotechnology sectors are also notable, employing about 6,000 and 7,200 workers, respectively, emphasizing Maryland's role in medical R&D.

The computers and electronics industry contributes 18,499 jobs to the economy, while machinery manufacturing and aerospace industries are smaller, with 6,865 and 2,135 employees, respectively. These subindustries represent steady contributors to the state's advanced manufacturing landscape. Other heavy manufacturing industries, such as motor vehicle and electric equipment manufacturing, are smaller employers, with 1,049 and 3,318 employees, respectively.

Figure 86: Number of employees in Hamilton Index subindustries in Maryland (157,500 workers total)

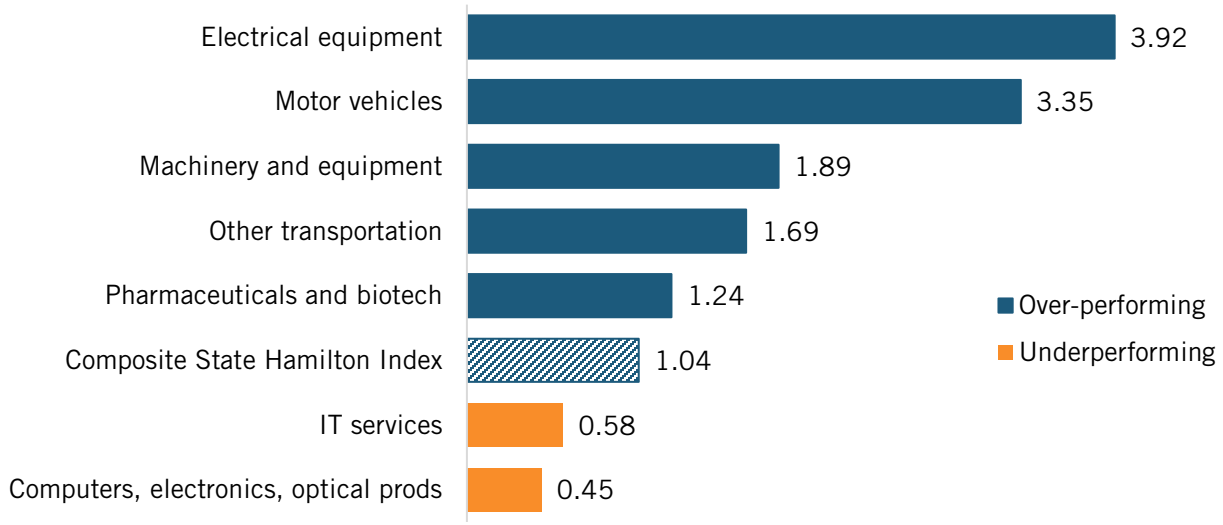


No. 18: South Carolina

South Carolina demonstrates significant strengths in electrical equipment and motor vehicles, with LQs of 3.92 and 3.35, respectively. The state hosts major manufacturers such as BMW, which operates its largest global production facility in Spartanburg, and Michelin, which is a key player in tire manufacturing. Additionally, machinery and equipment (1.89) and other transportation (1.69) also show above-average performance, further highlighting the state's focus on manufacturing and transportation-related sectors.

In contrast, South Carolina underperforms in IT services (0.58) and computers, electronics, and optical products (0.45). Pharmaceuticals and biotech, while showing some strength with an LQ of 1.24, still lag behind the top-performing sectors, indicating room for expansion in life sciences and related research industries.

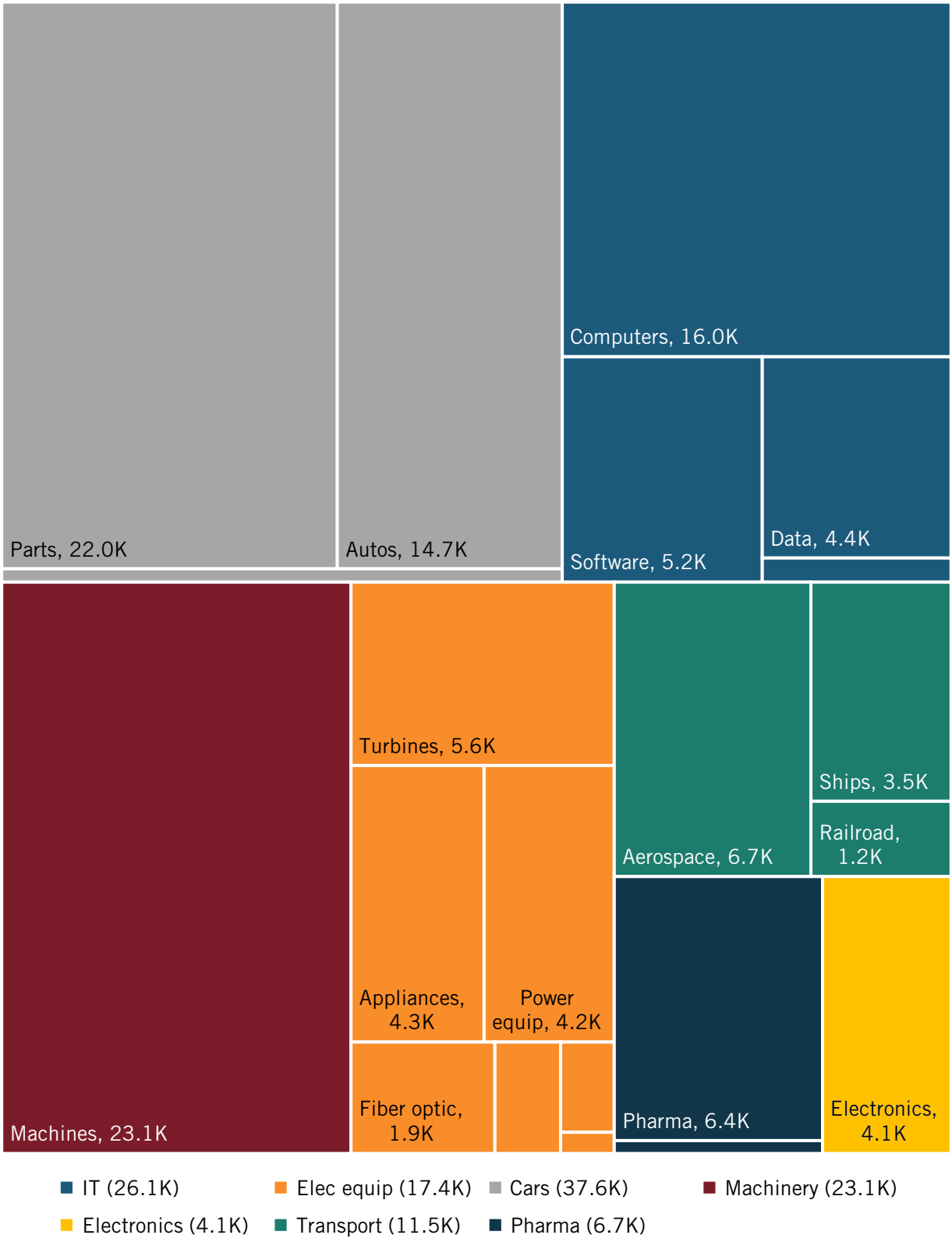
Figure 87: South Carolina's performance in Hamilton Index industries



Several subindustries contribute to South Carolina's economic profile within Hamilton Index industries. The automotive sector is particularly dominant, employing 37,604 individuals, 22,014 of whom work in parts manufacturing, while 14,737 work in automotive manufacturing. The machinery industry also plays a significant role, with 23,098 employees, highlighting the state's general manufacturing capabilities.

The second largest Hamilton industry by employment is the IT and information services industry, with over 26,098 employees. Most of these workers are employed in the computer systems design subindustry (15,952), followed by software publishing (5,223), and data processing (4,402). Despite the large number of IT services employees, South Carolina still underperforms in this industry.

Figure 88: Number of employees in Hamilton Index subindustries in South Carolina (126,500 workers total)

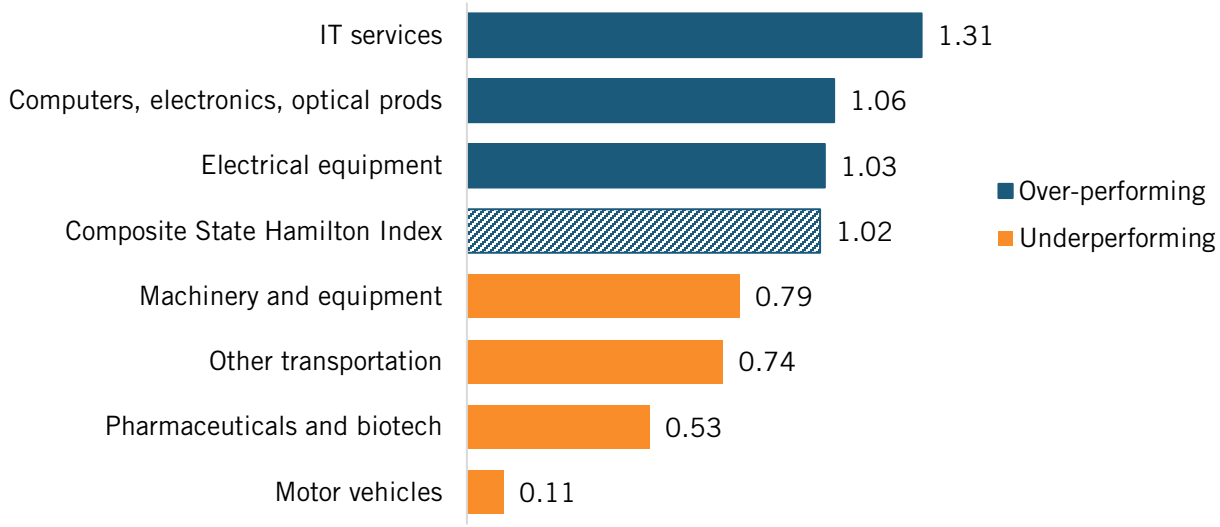


No. 19: Colorado

Colorado exhibits strength in IT services, with an LQ of 1.31, indicating a workforce share in this sector higher than the national average. Companies such as Arrow Electronics, based in Centennial, play a pivotal role in this industry. The state also over-performs in computers, electronics, and optical products (1.06) and electrical equipment (1.03), which align with its reputation as a hub for tech innovation and advanced manufacturing in major cities such as Boulder and Denver.

Conversely, Colorado's share of employment in pharmaceuticals and biotechnology and motor vehicles is far below average, with LQs below 0.50. Machinery and equipment manufacturing (0.79) and other transportation (0.74) are also industries in which Colorado should aim to grow, as both show underperformance.

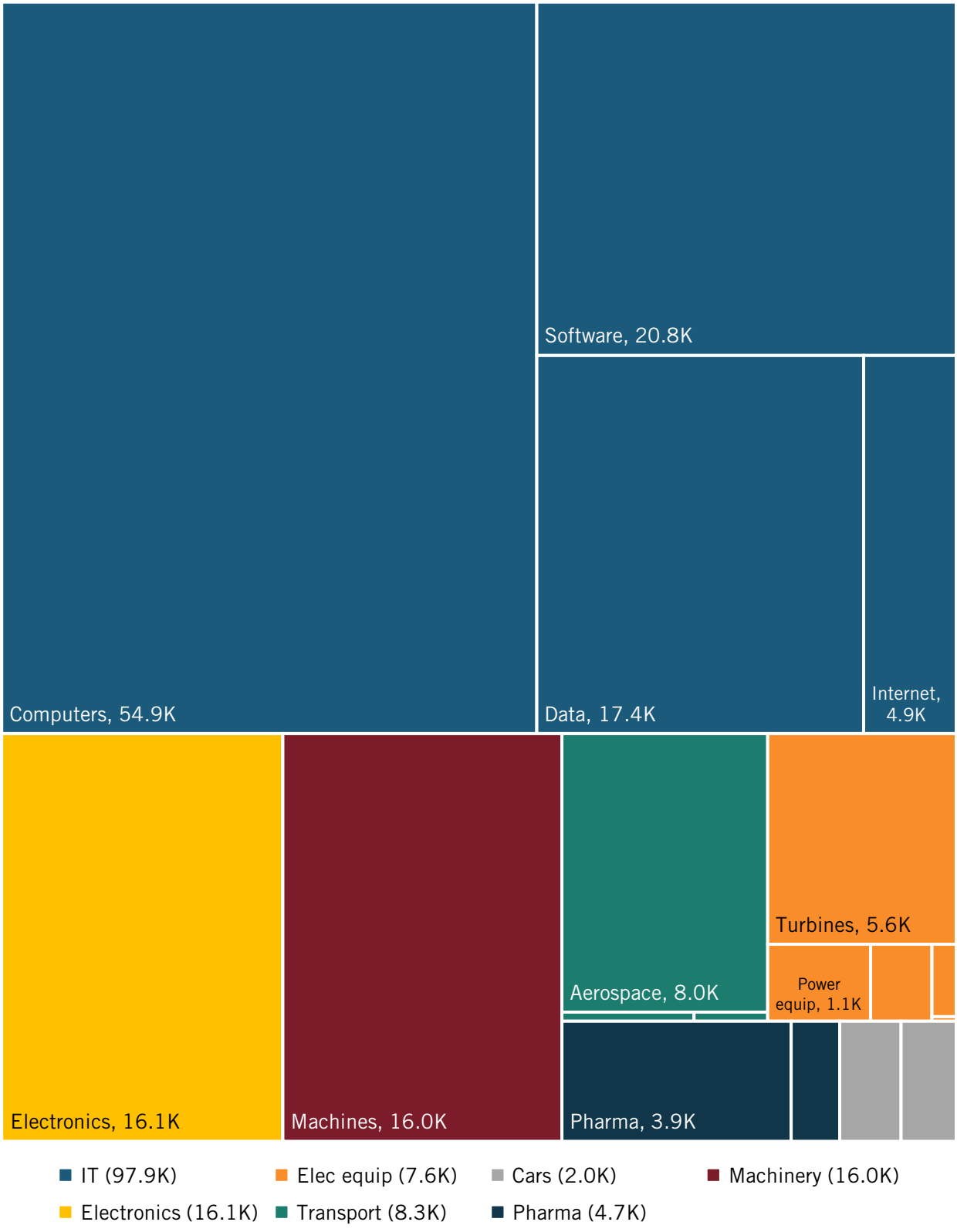
Figure 89: Colorado's performance in Hamilton Index industries



Several subindustries contribute to Colorado's economic strength, particularly in the IT and information services sector, which employs nearly 98,000 individuals. Within this industry, the computer systems design and related services subindustry employs the most workers (54,860), followed by software publishing (20,765) and data processing services (17,350). These figures highlight Colorado's role as a growing hub for technology and innovation, with big-tech companies such as Oracle having a significant presence in the state.

Colorado also demonstrates considerable strength in the machinery and electronics manufacturing sectors. Each employs about 16,000 individuals. The transportation industry employs 8,298 individuals, almost all of whom work in the aerospace industry (8,044). Fewer than 1,000 individuals work in the shipbuilding or railroad industries each.

Figure 90: Number of employees in Hamilton Index subindustries in Colorado (152,400 workers total)

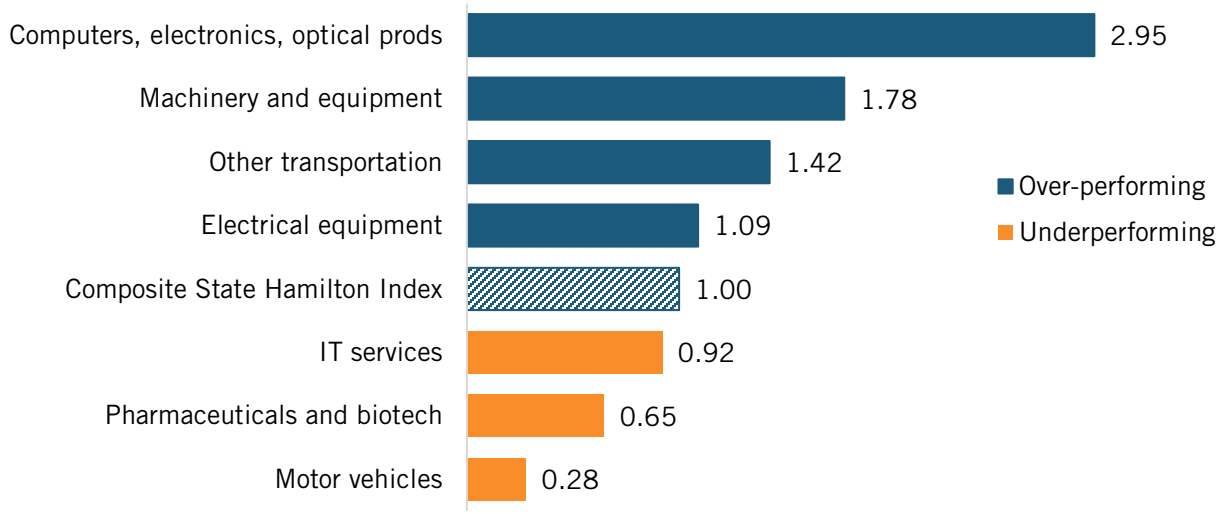


No. 20: Vermont

Vermont, known for its growing tech presence, has a significant strength in computers, electronics, and optical products, with an LQ of 2.95, nearly three times the national average. This indicates a robust advanced manufacturing and tech sector. Companies such as GlobalFoundries, which operates a semiconductor plant in Essex Junction, play a pivotal role in driving this industry forward. Machinery and equipment (1.78) and other transportation (1.42) also show strong performances.

In contrast, Vermont underperforms in several key areas. Motor vehicles have an LQ of 0.28, indicating a minimal presence in this sector. The advanced industries of IT services (0.92) and pharmaceuticals and biotech (0.65) are also underrepresented. While Vermont's overall advanced industry composite index aligns with the national average (1.00), further diversification could help enhance its competitive edge in the broader advanced manufacturing and tech landscape.

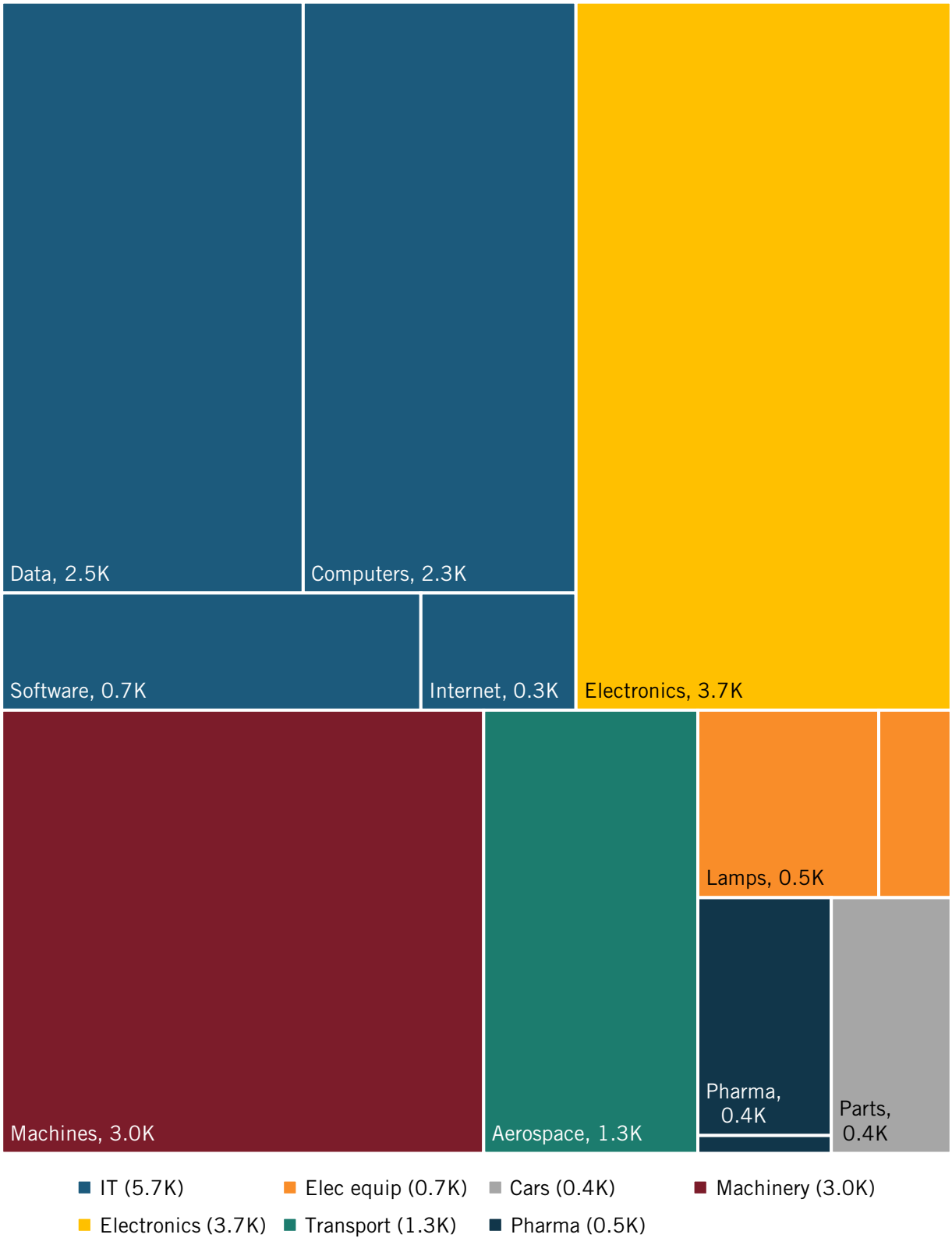
Figure 91: Vermont's performance in Hamilton Index industries



In absolute terms, the largest Hamilton industry in Vermont is the IT and information sector (5,710 workers). The majority of IT workers are employed in data processing and computer systems design, with 2,503 and 2,263 individuals, respectively. There are fewer than 1,000 employees in software publishing or Internet publishing and broadcasting.

The second largest Hamilton industry, in absolute terms, is the computer, electronics, and optical products industry, which employs over 3,700 workers. These include employees working in the production of semiconductors, consumer electronics, and telecommunication devices. Machinery and equipment manufacturing is also a significant industry, employing over 3,000 employees.

Figure 92: Number of employees in Hamilton Index subindustries in Vermont (15,400 workers total)

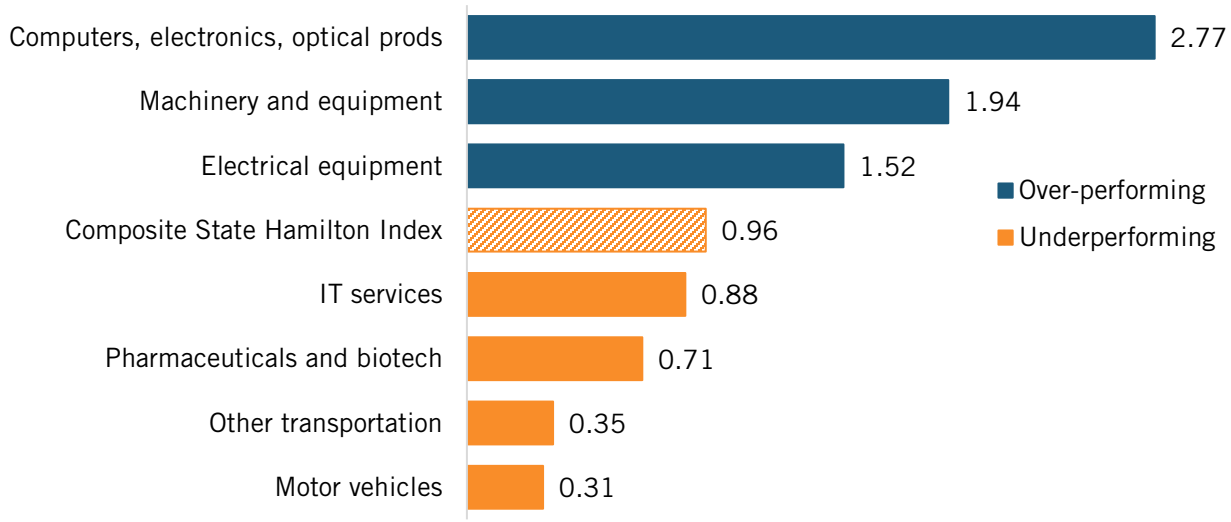


No. 21: Minnesota

Minnesota excels in computers, electronics, and optical products with an LQ of 2.77, driven by companies such as Seagate Technology and Honeywell. The machinery and equipment sector also stands out (1.94), supported by firms such as Polaris. Minnesota's over-performance in electrical equipment, with an LQ of 1.52, highlights the state's strength in producing essential components such as circuit boards and electric motors.

In contrast, the state underperforms in IT services (0.88) and pharmaceuticals/biotech (0.71). Other transportation and motor vehicles have even lower LQs of 0.35 and 0.31, indicating limited activity in these sectors. With an overall LQ below 1.00, Minnesota is performing below the national average when it comes to the size of key Hamilton industries in the state.

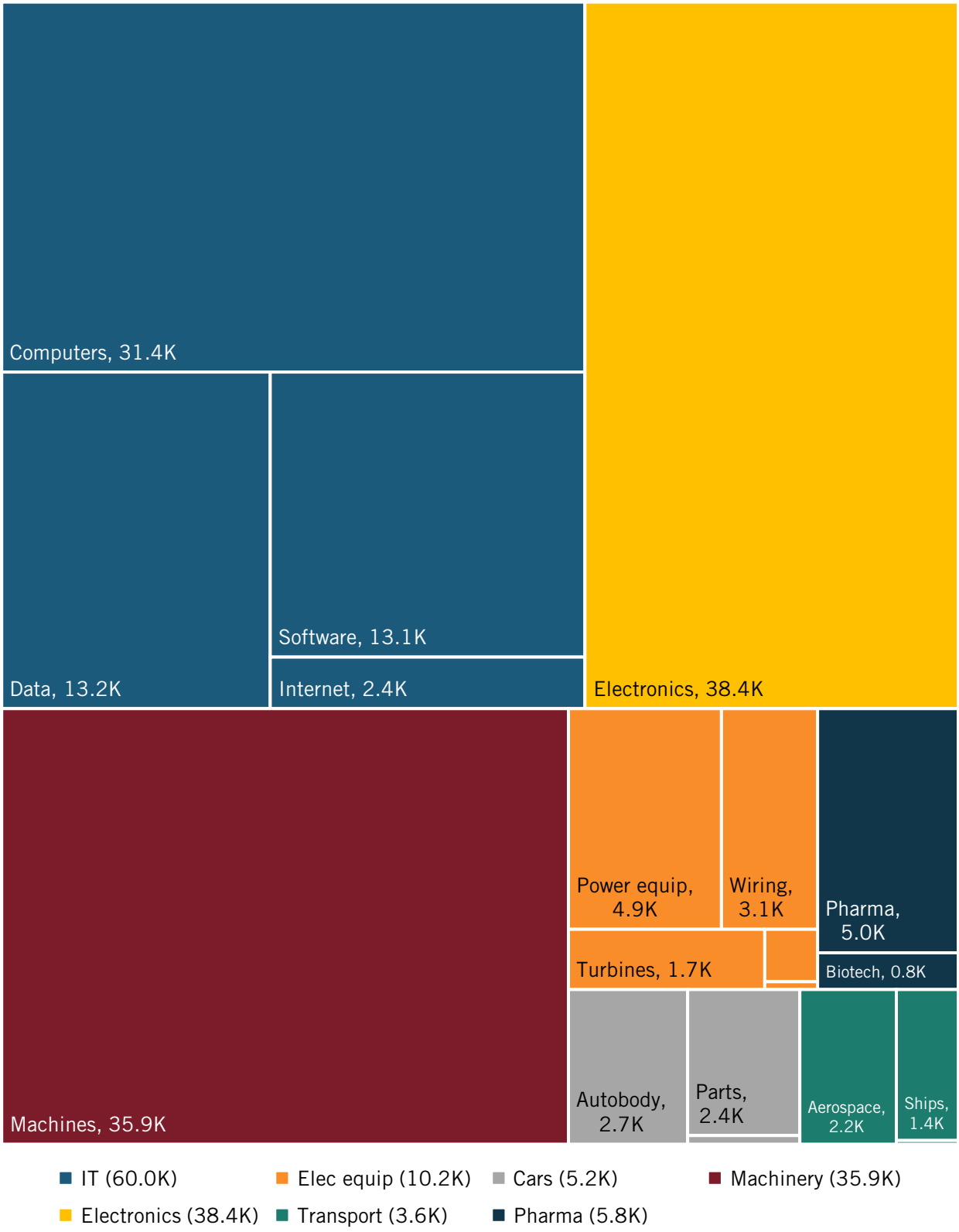
Figure 93: Minnesota's relative performance in Hamilton Index industries



Several subindustries are used to calculate a composite score within each Hamilton Index industry. In Minnesota, most Hamilton industry employees are employed in the IT and electronics sectors, with the IT industry accounting for almost 60,000 workers and the electronics industry employing 38,394 workers. Key areas in IT include computer systems and design (31,420 employees), data processing (13,154), and software development (13,053). Electronics manufacturing, which includes medical devices and semiconductors, is also prominent, supported by companies such as 3M and Medtronic, both headquartered in the state.

The machinery and equipment sector employs 35,946 individuals, making it another significant industry in Minnesota. Other notable contributions to Minnesota's employment come from the electrical equipment industry, with about 10,200 employees. Industries such as power equipment manufacturing (4,927 workers) and wiring device manufacturing (3,086) have large workforces.

Figure 94: Number of employees in Hamilton Index subindustries in Minnesota (159,000 workers total)

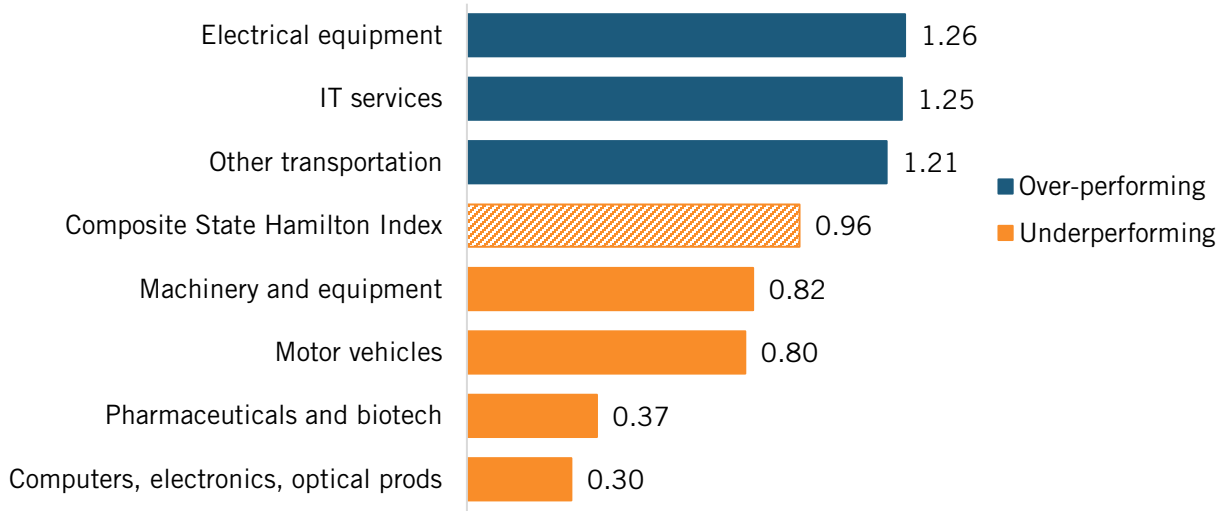


No. 22: Georgia

Georgia performs strongly in electrical equipment manufacturing with an LQ of 1.26, IT services (1.25), and other transportation (1.21). These industries are driven by the state's focus on advanced technology and transportation infrastructure, with Atlanta serving as a hub for IT and logistics.

However, Georgia underperforms in pharmaceuticals and biotech (0.37) and computers, electronics, and optical products (0.30), indicating limited activity in these fields. Machinery and equipment (0.82) and motor vehicles (0.80) also lag slightly below the national average, reflecting a broader focus on service-oriented sectors rather than manufacturing-heavy industries.

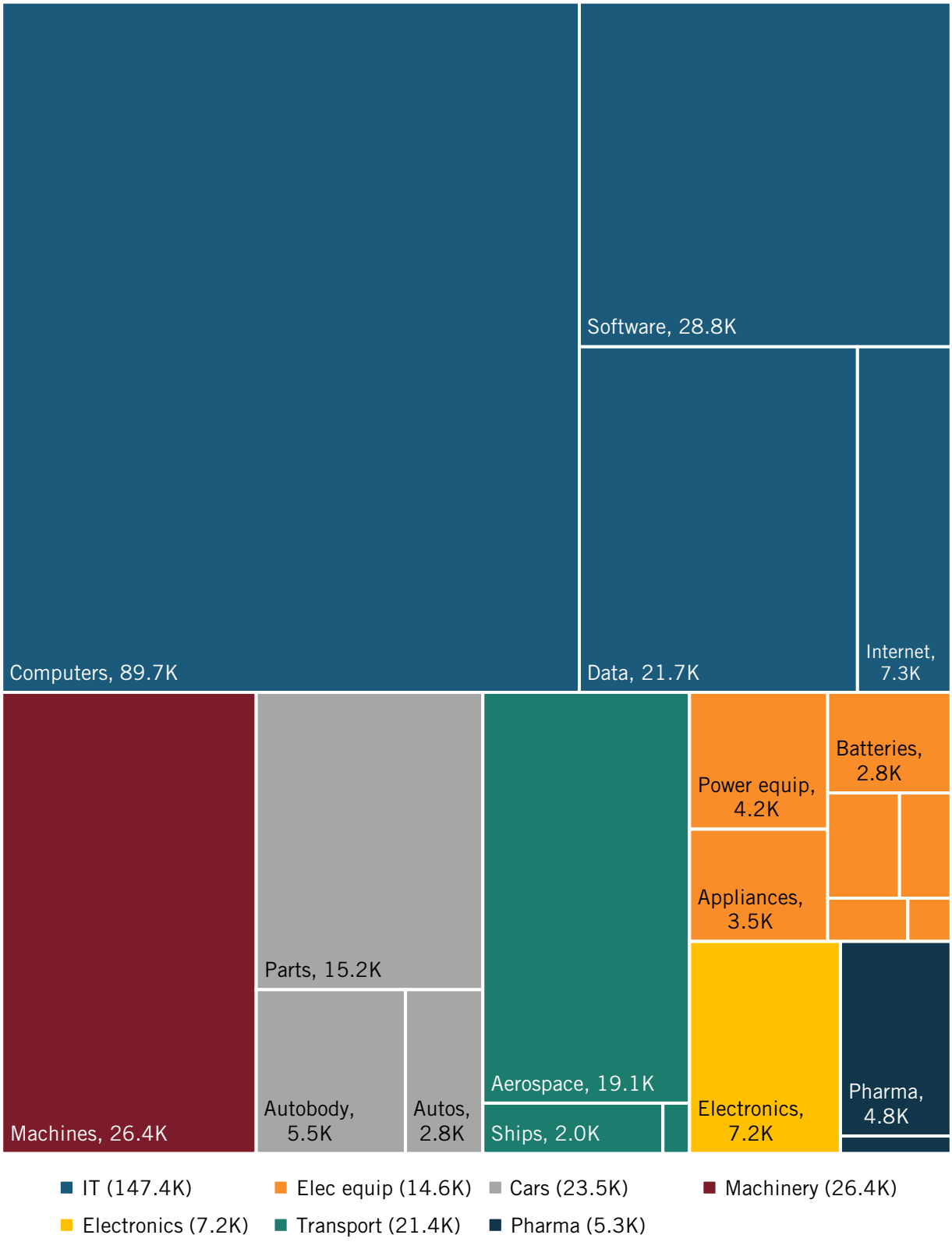
Figure 95: Georgia's relative performance in Hamilton Index industries



In Georgia, most Hamilton industry employees are in the IT sector, with over 147,400 workers. This includes 89,654 in computer systems design, 28,814 in software publishing, and 21,679 in data processing. Georgia's thriving IT sector is bolstered by companies such as NCR Corporation and Cisco Systems, both of which maintain a strong presence in the state.

The machinery sector employs 26,385 individuals, making it the second largest Hamilton industry in the state. Additionally, the other transportation industry employs 21,440 workers, with the aerospace industry as the largest subindustry with about 19,100 workers. Companies such as Lockheed Martin and Gulfstream Aerospace contribute to this sector, emphasizing aircraft manufacturing and maintenance.

Figure 96: Number of employees in Hamilton Index subindustries in Georgia (245,800 workers total)

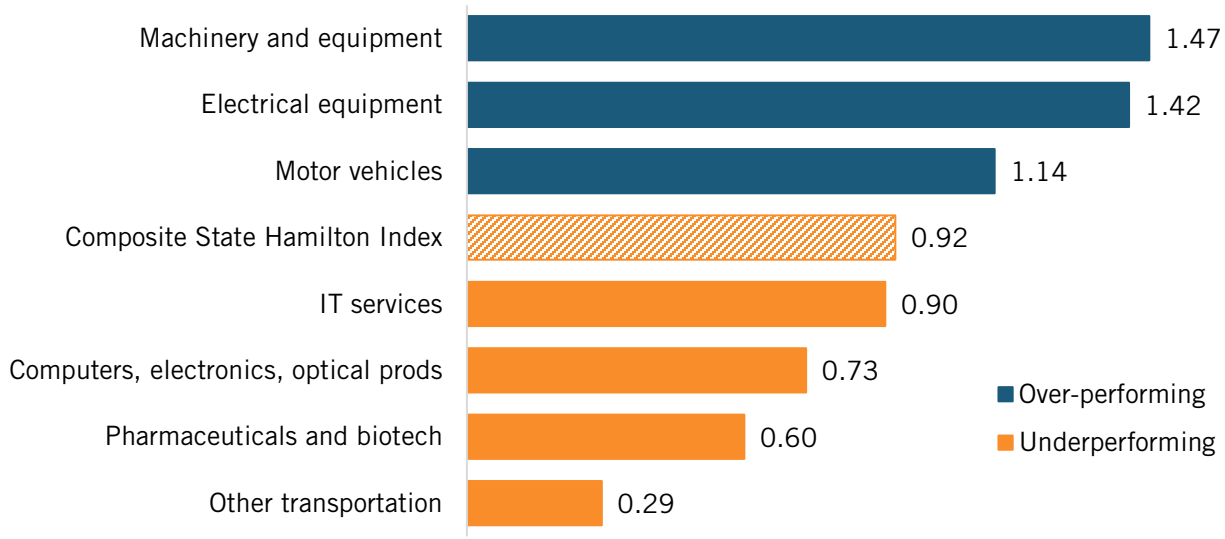


No. 23: Illinois

Illinois, home to major firms such as Caterpillar and John Deere, excels in machinery and equipment (LQ of 1.47) and electrical equipment (1.42), reflecting its strong industrial base. The motor vehicles sector (1.14) also performs well, driven by innovative companies such as Rivian and Navistar.

In contrast, Illinois underperforms in industries such as pharmaceuticals and biotechnology (0.60) and other transportation (0.29), signaling limited activity in these areas. IT services (0.90) and computers, electronics, and optical products (0.73), while more significant than other industries, also fall below the national average despite advanced technology firms such as Siemens and Cisco and nationally ranking universities located in the state.

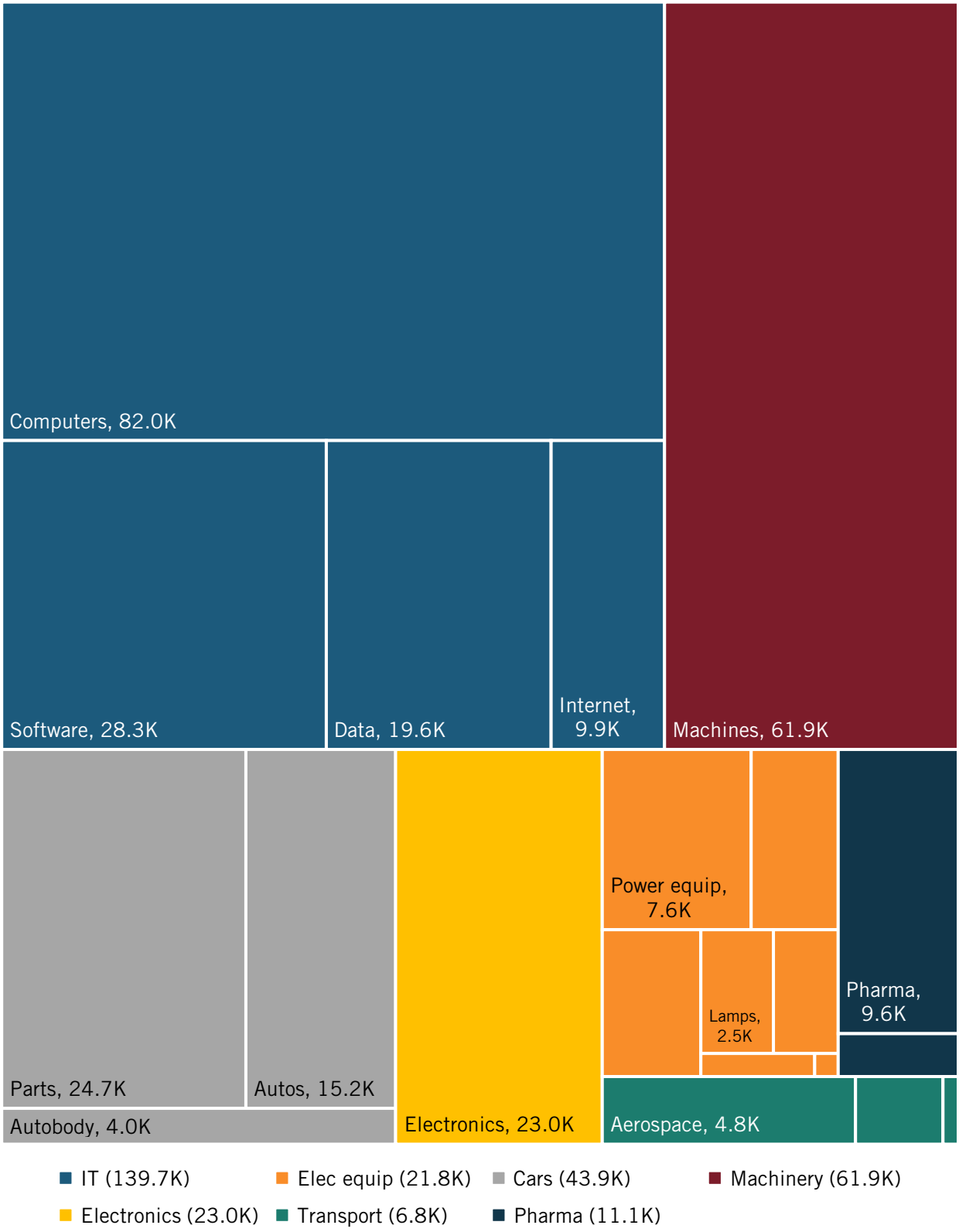
Figure 97: Illinois's relative performance in Hamilton Index industries



In Illinois, the IT sector is the largest employer, with 139,688 workers. This includes 81,968 in computer systems design, 28,253 in software publishing, and 19,602 in data processing. Companies such as Motorola Solutions and CDW, headquartered in Illinois, contribute significantly to the state's IT landscape. The machinery industry is also prominent, employing 61,929 workers.

The automotive sector is another key industry, employing 43,870 individuals, supported by major manufacturers such as Stellantis and Rivian. The majority of employees in this industry work in automotive parts manufacturing (24,729), followed by automotive assembly (15,190). Autobody and trailer manufacturing is a smaller industry, employing just under 4,000 workers.

Figure 98: Number of employees in Hamilton Index subindustries in Illinois (308,100 workers total)

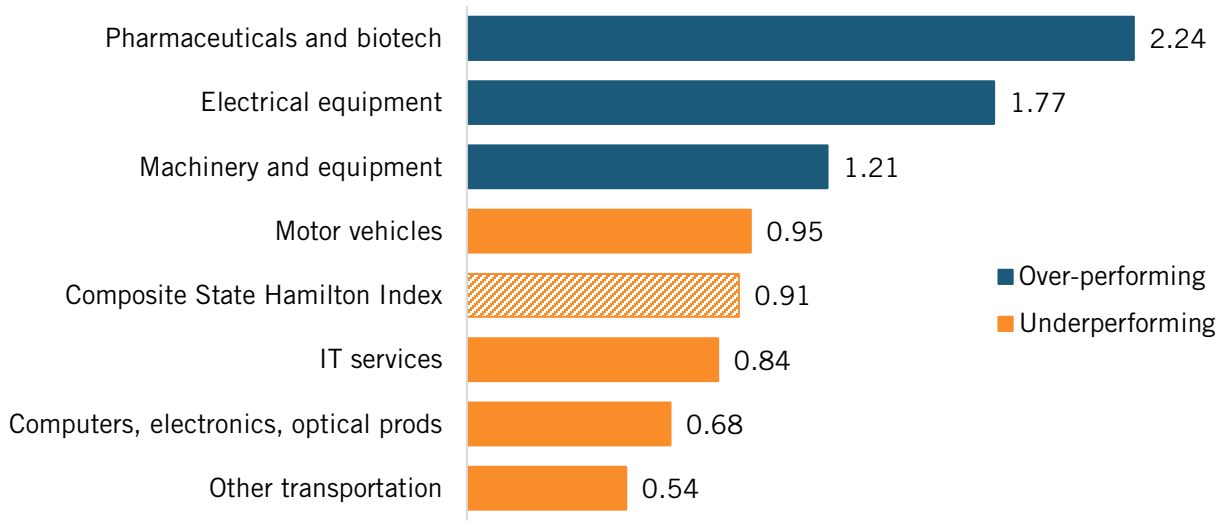


No. 24: North Carolina

North Carolina, a hub for pharmaceutical giants such as GlaxoSmithKline and Novartis, leads with a high LQ of 2.24 in the pharmaceuticals and biotechnology industry. This sector underscores the state's strength in life sciences, supported by its Research Triangle Park. Electrical equipment (1.77) and machinery and equipment (1.21) are also notable, reflecting the state's robust industrial base.

Conversely, North Carolina underperforms in both manufacturing industries and advanced technology. Motor vehicles (0.95) and other transportation (0.54) are manufacturing industries in which North Carolina underperforms, whereas IT services and computers, electronics, and optical products are industries focused on advanced technology where North Carolina performs below the national average. Overall, North Carolina is underperforming in key industries, reducing its competitive edge.

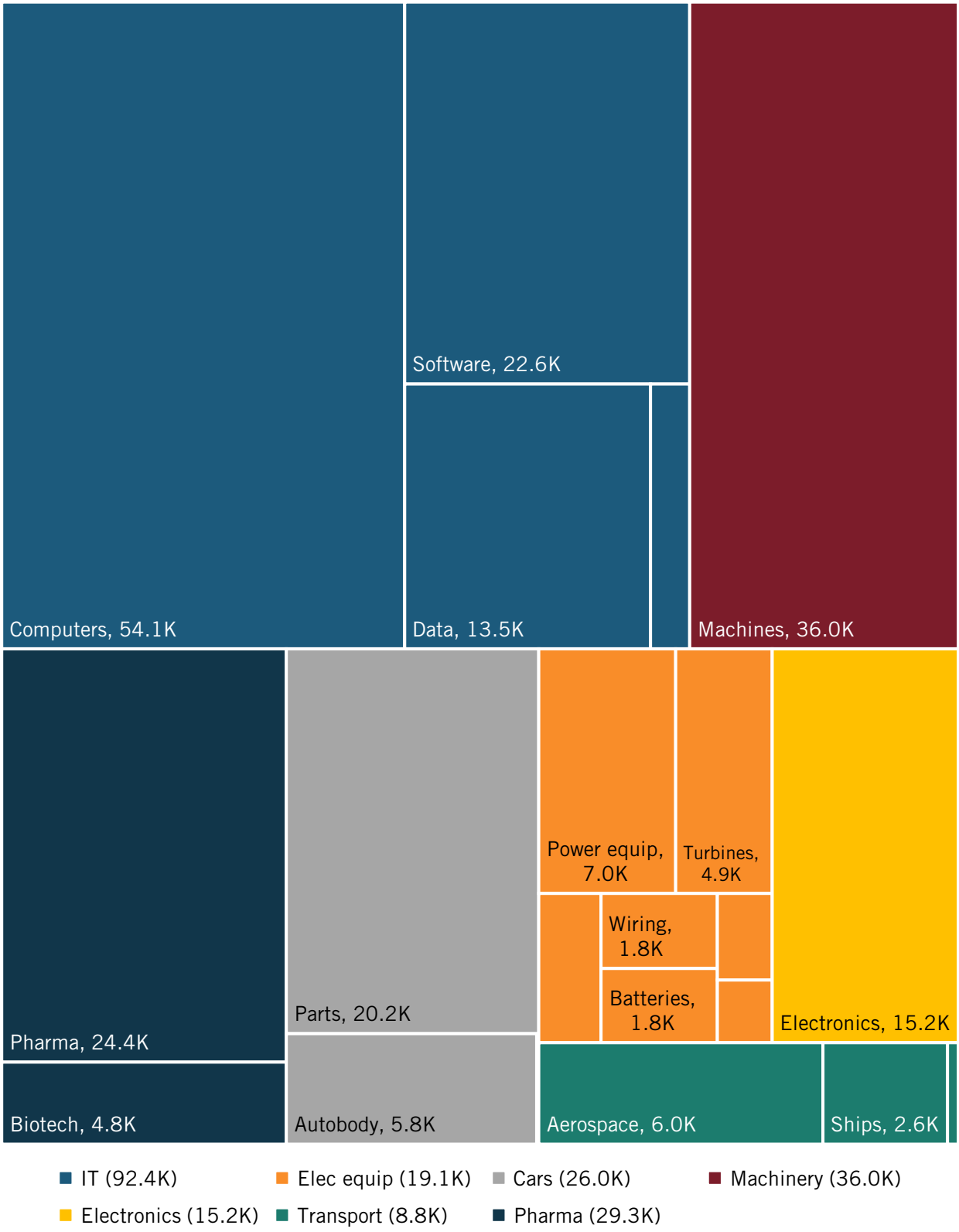
Figure 99: North Carolina's relative performance in Hamilton Index industries



In North Carolina, the IT sector is the largest employer, with 92,381 workers. This includes 54,085 in computer systems design, 22,607 in software publishing, and 13,524 in data processing. Companies such as Red Hat and SAS Institute, headquartered in North Carolina, are major contributors to the state's IT industry. The machinery sector follows, employing 36,048 individuals and highlighting the state's strength in manufacturing.

The pharmaceutical industry is another significant employer, with 29,270 workers, reflecting the state's reputation as a medicine and biotechnology hub. Over 24,000 employees work in pharmaceutical manufacturing, while about 5,000 work in biotechnology research. North Carolina's pharmaceutical industry benefits from private-public research collaboration between top-tier universities, such as the University of North Carolina and Duke, and innovative biotechnology firms, creating a powerful innovation ecosystem. Other industries, such as other transportation (8,826 employees), have much smaller workforces.

Figure 100: Number of employees in Hamilton Index subindustries in North Carolina (226,800 workers total)

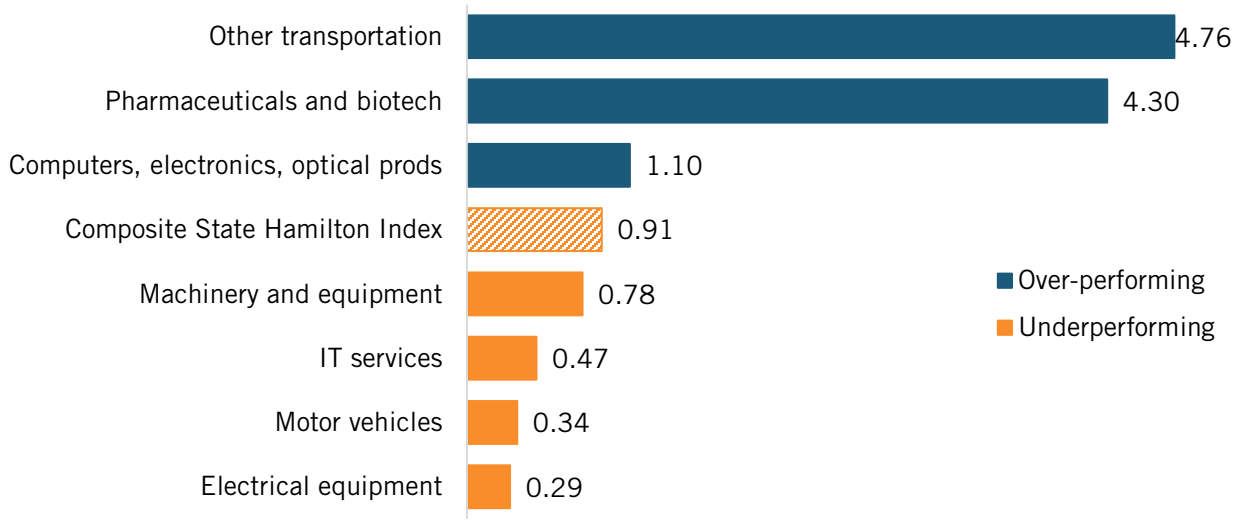


No. 25: Maine

Maine stands out as an over-performer in the other transportation industry, with a high LQ of 4.76. This strength is driven by the state's significant shipbuilding sectors, with Bath Iron Works, a division of General Dynamics, serving as a key employer in ship production. Additionally, the relative size of the pharmaceuticals and biotech sector in Maine is four times the national average (4.30).

Conversely, Maine underperforms in several industries, including IT services and electrical equipment, both of which have an LQ below 0.50. The state's machinery and equipment industry also falls below the national average, with an LQ of 0.78. These trends suggest that while Maine excels in specific niches such as transportation and biotechnology, it has opportunities to further diversify and strengthen its industrial base in other sectors.

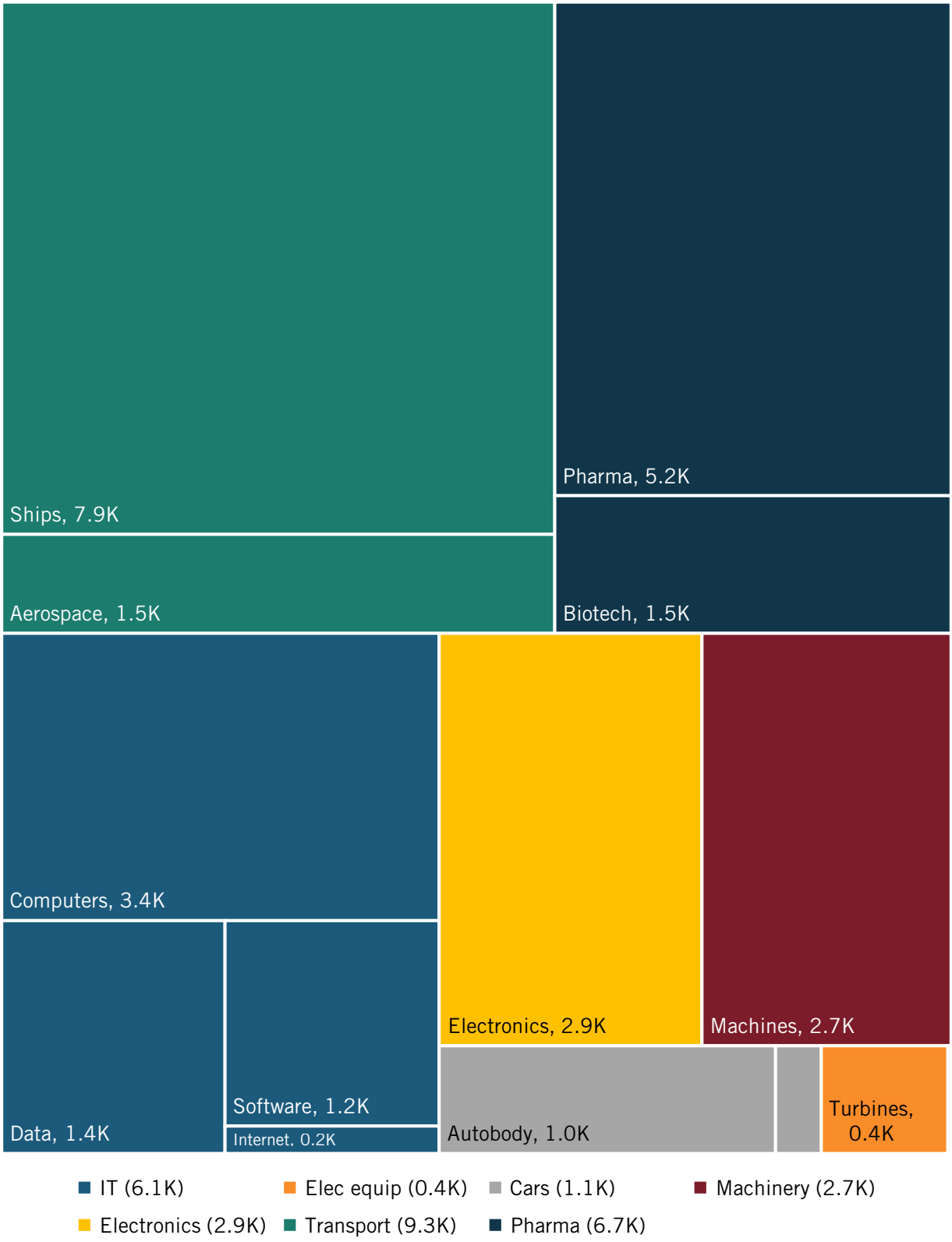
Figure 101: Maine's relative performance in Hamilton Index industries



In Maine, the other transportation sector employs the most individuals, with about 9,300 workers, driven largely by the shipbuilding industry, which accounts for 7,859 jobs. The aerospace industry also has a small presence in the state, employing just under 1,500 individuals. The pharmaceutical and biotech industry also plays a significant role in Maine's economy, with 6,683 employees.

The IT sector employs 6,082 workers, with computer systems design and data processing being the primary subindustries, accounting for 3,359 and 1,388 employees, respectively. Additionally, the electronics and machinery industries contribute significantly to Maine's economy, employing 2,897 and 2,748 workers, respectively. The electrical equipment manufacturing industry in Maine is very small, with only 372 employees, most of which are in the turbine and engine manufacturing industry.

Figure 102: Number of employees in Hamilton Index subindustries in Maine (29,200 workers total)

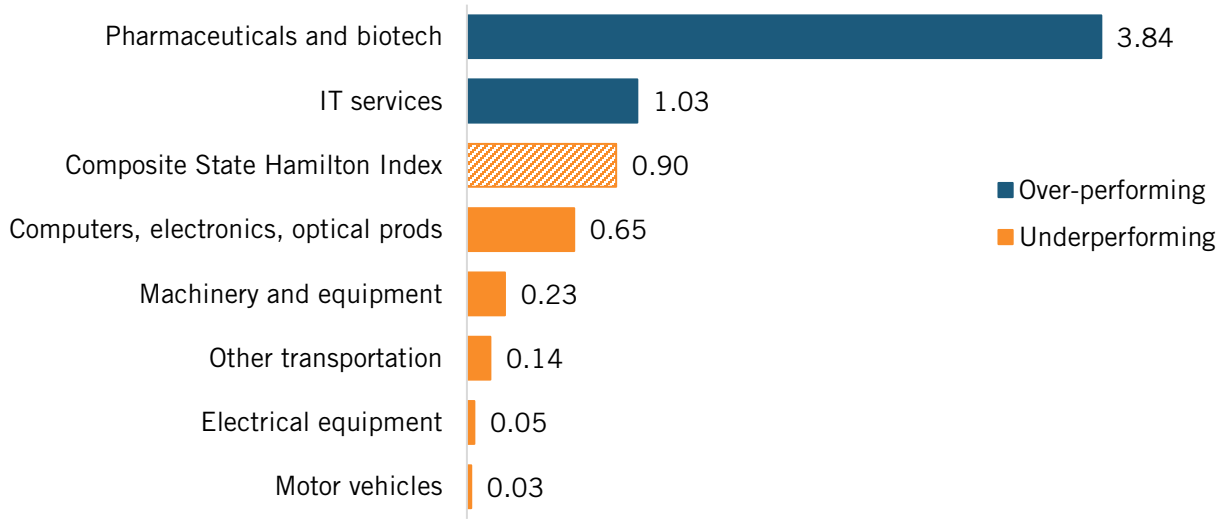


No. 26: Delaware

Delaware, home to global pharmaceutical and biotech companies such as AstraZeneca and Incyte, excels in this sector with an LQ of 3.84. Additionally, Delaware shows slight over-performance in IT services (1.03), reflecting its growing focus on information technology and financial services, supported by major corporations operating in the state.

However, Delaware underperforms in several advanced industries, including computers, electronics, and optical products (0.65), machinery and equipment (0.23), electrical equipment (0.05), and motor vehicles (0.03). The state's minimal activity in heavy manufacturing demonstrates its reliance on advanced technology and service sectors. Delaware's overall LQ of 0.90 shows that the number of workers employed in advanced industries relative to the state's size is below the national average.

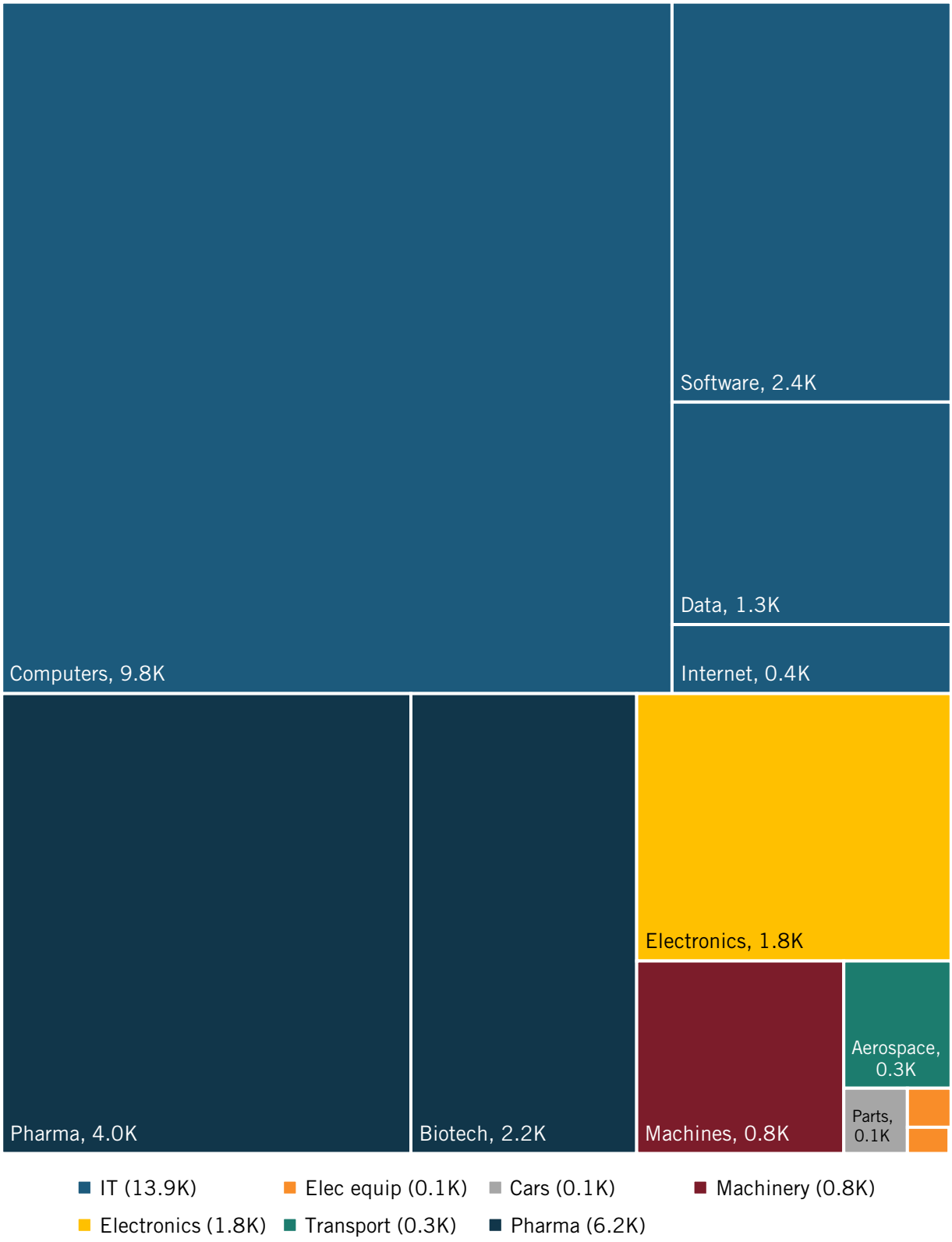
Figure 103: Delaware's relative performance in Hamilton Index industries



In Delaware, most Hamilton industry employees work in the IT sector, with 13,901 individuals employed across subindustries such as computer systems design (9,819) and software development (2,362). The state's focus on technology is complemented by its strong presence in the pharmaceutical industry, which employs about 6,200 people. The pharmaceutical and biotech industry is the second largest in terms of absolute employment. About 4,000 individuals work in pharmaceutical manufacturing, while 2,200 work in biotechnology research.

The computer and electronics manufacturing industry employs about 1,800 individuals, making it one of the larger industries in the state despite its relative underperformance. Other transportation, motor vehicle manufacturing, and electric equipment manufacturing have small presences in the state, employing less than 1,000 individuals each.

Figure 104: Number of employees in Hamilton Index subindustries in Delaware (23,200 workers total)

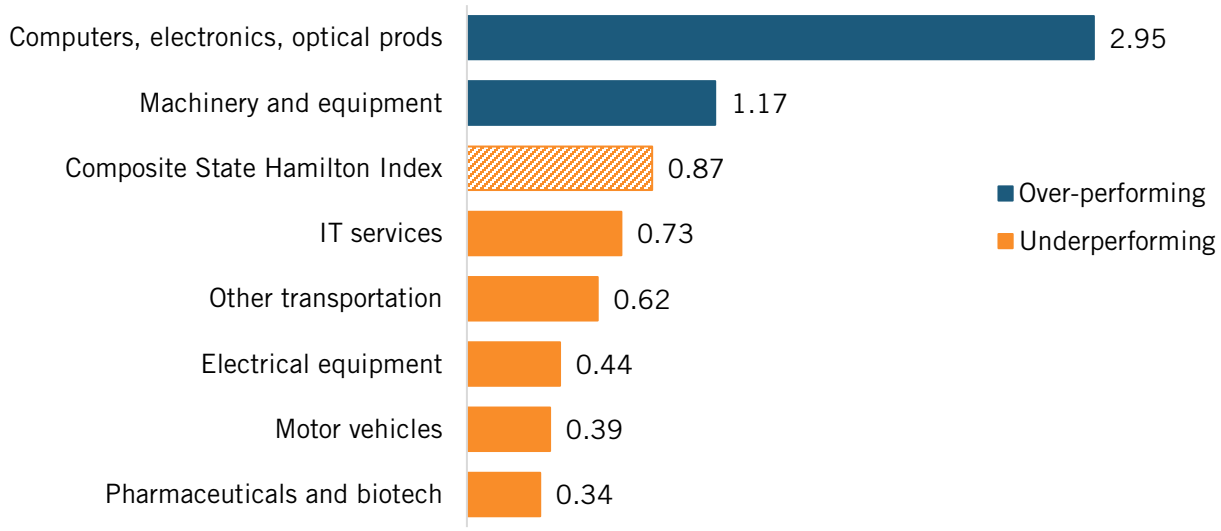


No. 27: Oregon

Oregon, home to globally recognized technology companies such as Intel and Tektronix, has a notable concentration in the computers, electronics, and optical products industry, with an LQ of 2.95. This indicates that the state's share of employment in this sector is significantly higher than the national average. Machinery and equipment also stands out with an LQ of 1.17.

However, Oregon underperforms in several advanced manufacturing industries, including electrical equipment (0.44), motor vehicles (0.39) and pharmaceuticals and biotech (0.34). The state's reliance on the technology sector contrasts with its limited presence in traditional manufacturing sectors such as motor vehicles and electrical equipment. The relative size of the state's IT and information services is also below the national average (0.73).

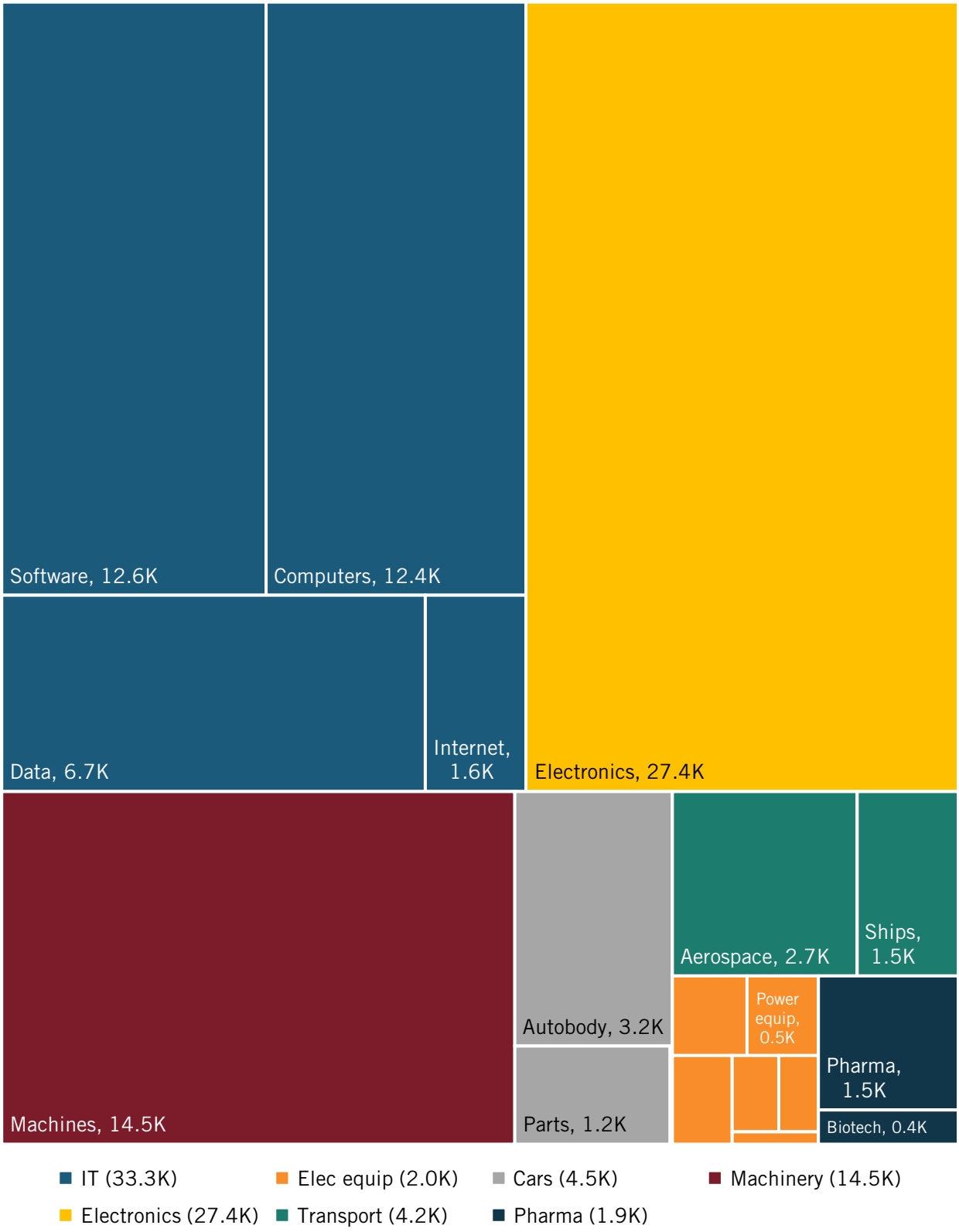
Figure 105: Oregon's relative performance in Hamilton Index industries



In Oregon, the computers and electronics industry employs the most workers, with 27,431 individuals contributing to sectors such as semiconductors and other advanced manufacturing. IT follows closely, with 33,255 employees spread across software publishing (12,592), computer systems design (12,396), and data hosting and processing services (6,682), highlighting the state's growing tech sector. Companies such as Intel, which has a significant presence in Oregon, play a critical role in the state's electronics and IT industries.

The machinery sector also stands out, employing about 14,500 individuals and supporting Oregon's diverse manufacturing base. The transportation industry, though smaller, employs over 4,200 workers, including 2,742 in aerospace and 1,500 in ship building. The pharmaceutical and biotech sectors are modest in size (1,500 and 384 employees, respectively).

Figure 106: Number of employees in Hamilton Index subindustries in Oregon (87,800 workers total)

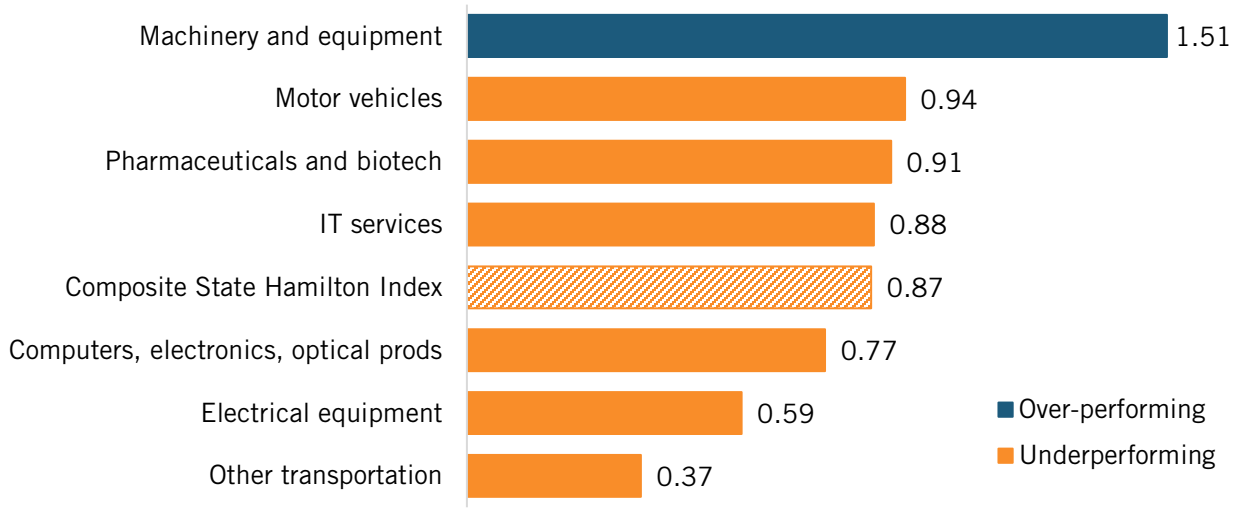


No. 28: Nebraska

Nebraska, known for its agricultural equipment manufacturing and food processing, over-performs only in the machinery and equipment industry, with an LQ of 1.51. Companies such as Lindsay Corporation, which produces irrigation systems, drive Nebraska's strength in machinery manufacturing. Motor vehicles (0.94) and pharmaceuticals and biotech (0.91) are close to the national average, though still underperform, reflecting moderate activity in these sectors.

Nebraska underperforms in several industries, including computers, electronics, and optical products (0.77), electrical equipment (0.59), and other transportation (0.37). The state also lags behind in IT services, with an LQ of 0.88. These figures suggest that while Nebraska excels in machinery and agricultural-related manufacturing, it focuses less on high-tech and diversified industrial sectors compared with other states. Its overall LQ is 0.87.

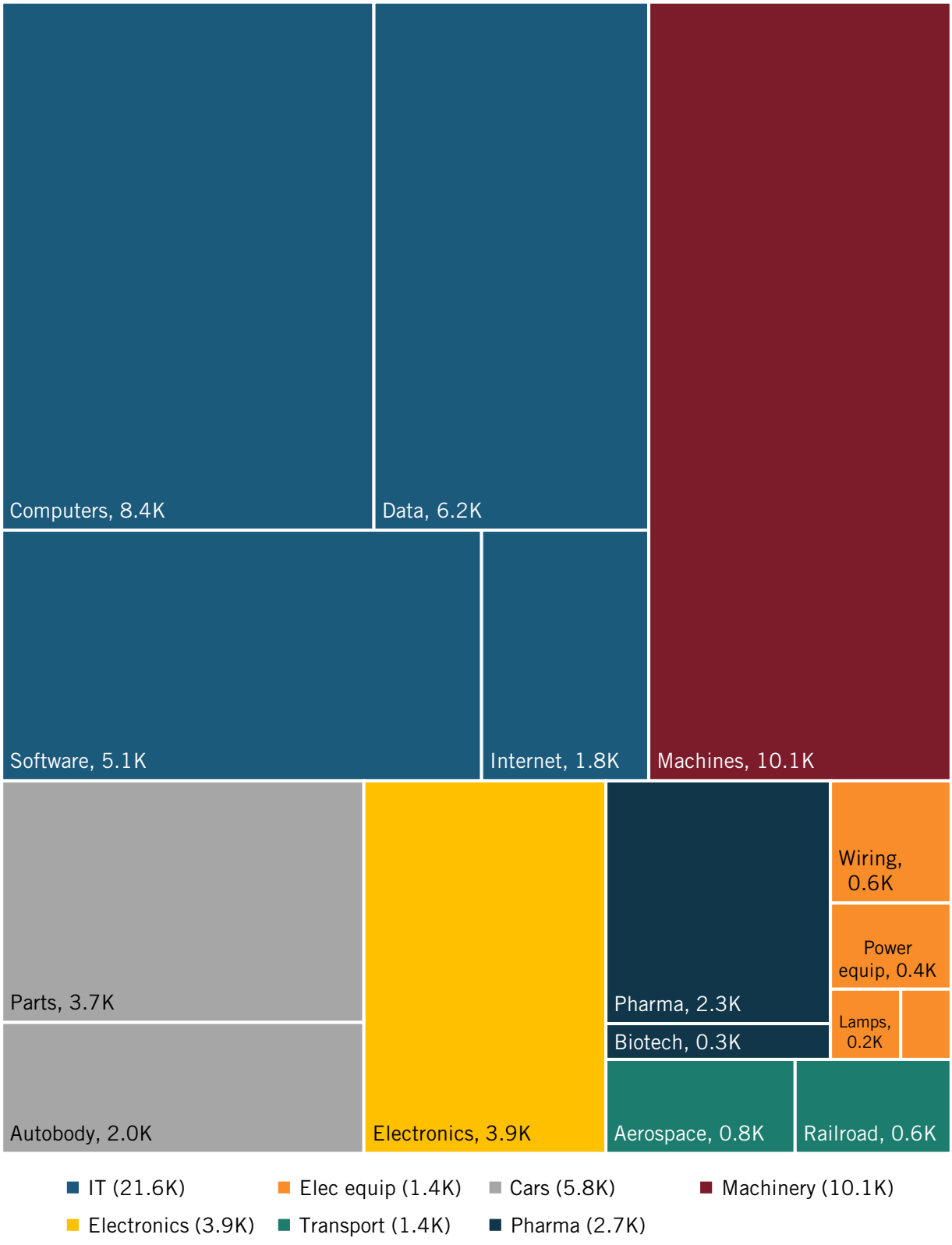
Figure 107: Nebraska's relative performance in Hamilton Index industries



In Nebraska, the IT sector employs the most workers, with 21,553 individuals spread across computer systems design (8,411), data processing (6,207), software development (5,145), and Internet publishing and broadcasting (1,790). The machinery industry follows, with over 10,000 employees. Strength in Nebraska's IT industry is driven largely by the state's success as a hub for data centers.

The automotive industry in Nebraska is the third largest Hamilton industry in the state, employing just under 6,000 individuals. Over half of these workers are employed in the automotive parts industry (3,744), while 2,030 individuals work in the autobody and trailer manufacturing industry. Advanced technology industries, such as pharmaceuticals and biotechnology and computers and electronic manufacturing, are less significant, employing just 2,600 and 4,000 employees, respectively.

Figure 108: Number of employees in Hamilton Index subindustries in Nebraska (46,800 workers total)

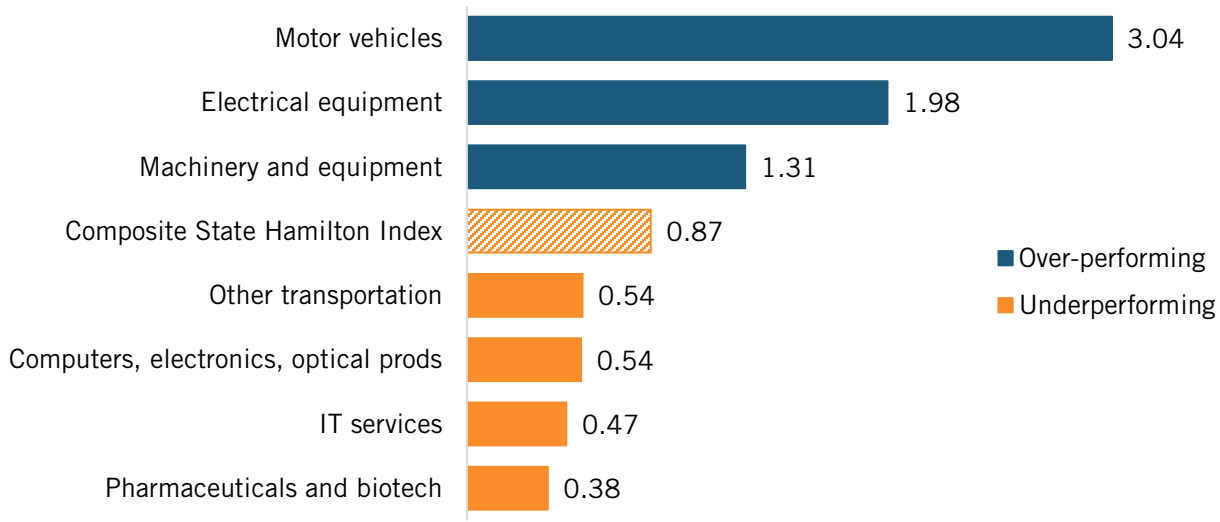


No. 29: Tennessee

Tennessee, with its strong automotive sector, has an LQ in the motor vehicles industry of 3.04, a concentration over three times the national average. This dominance reflects the presence of major automotive manufacturing plants such as Nissan in Smyrna, General Motors in Spring Hill, and Volkswagen in Chattanooga. Electrical equipment (1.98) and machinery and equipment (1.31) also stand out as over-performing industries in the state, supported by companies such as Schneider Electric and Emerson Electric.

In contrast, Tennessee underperforms in several advanced technology industries, including computers, electronics, and optical products (0.54), IT services (0.47), and pharmaceuticals and biotech (0.38). Despite the state's robust manufacturing base, its lack of concentration in high-tech industries leaves Tennessee with several industries to grow in order to improve its competitiveness in advanced industries.

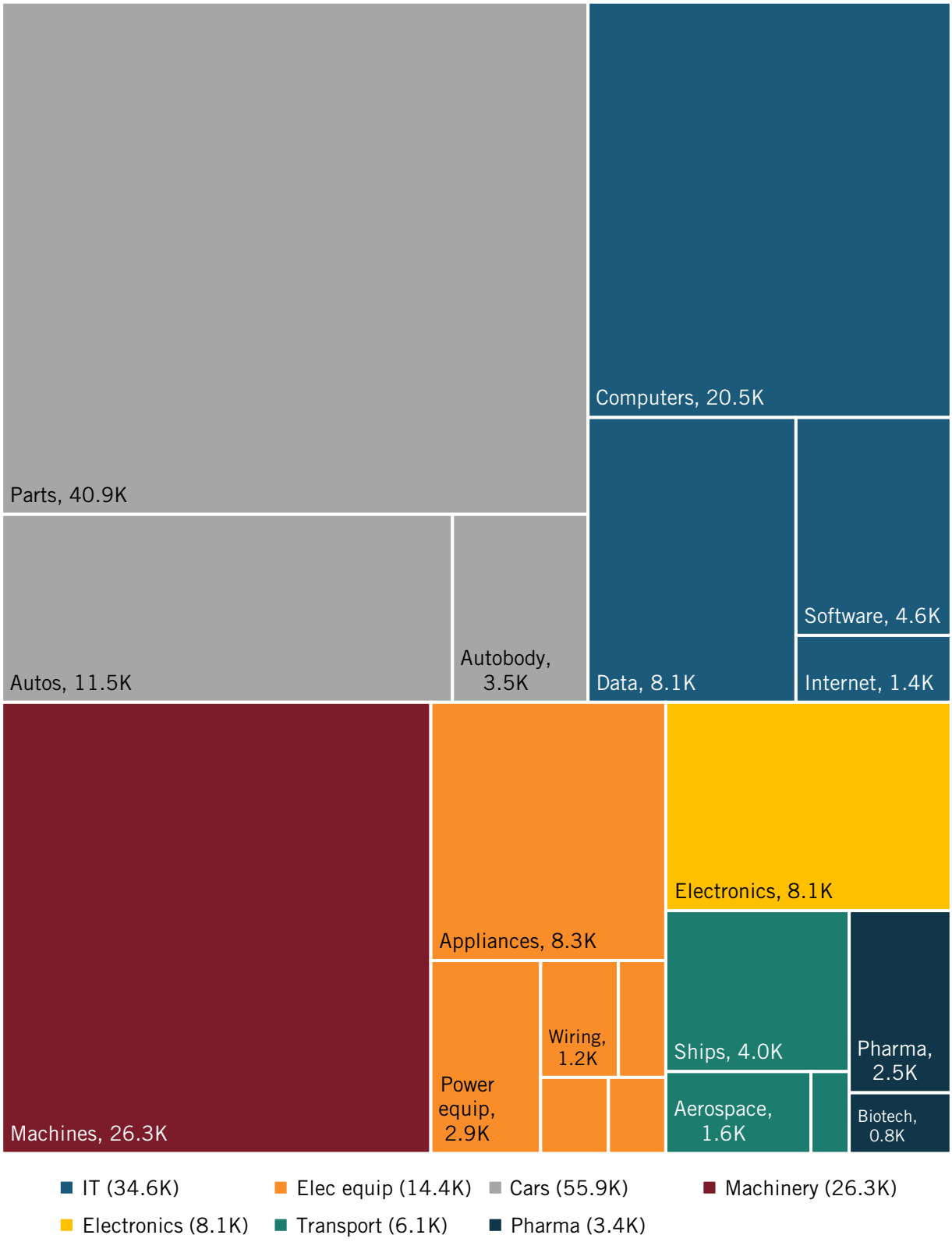
Figure 109: Tennessee's relative performance in Hamilton Index industries



In Tennessee, the automotive industry stands out as the largest employer, with 55,925 individuals working in car manufacturing and related sectors. The auto parts manufacturing subindustry is the largest in this industry, employing 40,908 workers. The car manufacturing sector employs 11,549 individuals and the autobody and trailer subindustry employs 3,468 workers. Notable companies such as Nissan and General Motors operate major facilities in the state, underscoring its automotive prominence.

The machinery and IT industries are also key contributors to Tennessee's economy. Machinery manufacturing employs 26,349 workers, while IT sectors, including computer systems design (20,529), data processing (8,085), and software publishing (4,598), employ a combined 34,628 individuals. Tennessee also employs thousands of workers in the electrical equipment manufacturing industry, with household appliances and power equipment employing 8,270 and 2,886 employees, respectively.

Figure 110: Number of employees in Hamilton Index subindustries in Tennessee (148,900 workers total)

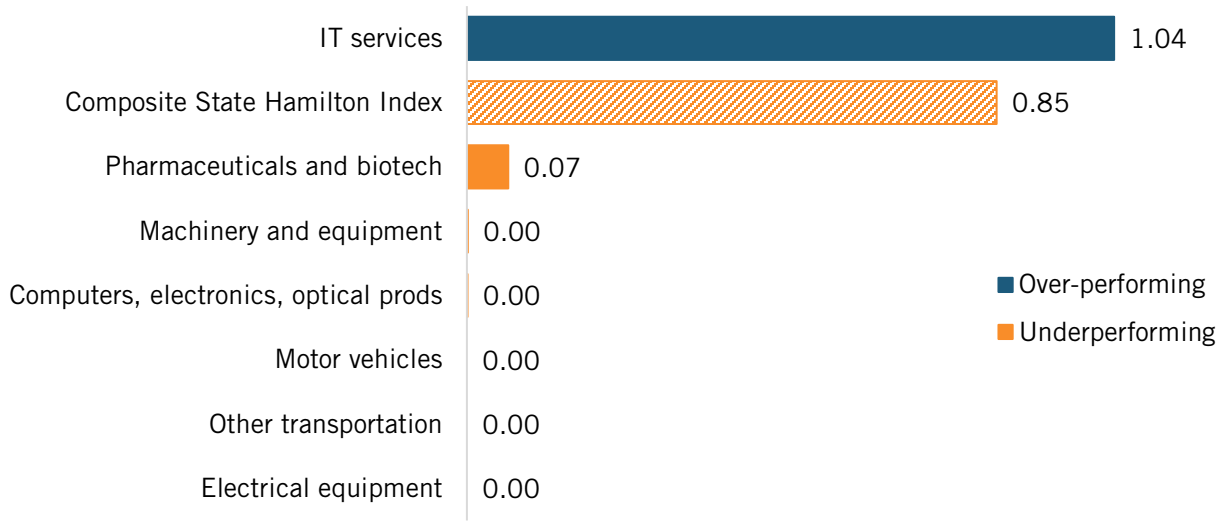


No. 30: District of Columbia

Washington, D.C., exhibits a unique industrial profile dominated by the IT services industry. With an LQ of 1.04, it marginally outperforms the national average. This strength reflects the region's role as a hub for government-related IT services, consulting, and cybersecurity. Major firms such as Booz Allen Hamilton and Insperity and numerous smaller contractors support federal agencies in this domain.

In contrast, D.C. significantly underperforms in most advanced industries, with LQs of 0.00 each in machinery and equipment, motor vehicles, and electrical equipment. Pharmaceuticals and biotech (0.07) also show minimal presence, highlighting the city's focus on services over manufacturing. This pattern aligns with D.C.'s economic landscape, which is heavily oriented toward government operations, professional services, and policy work rather than industrial production.

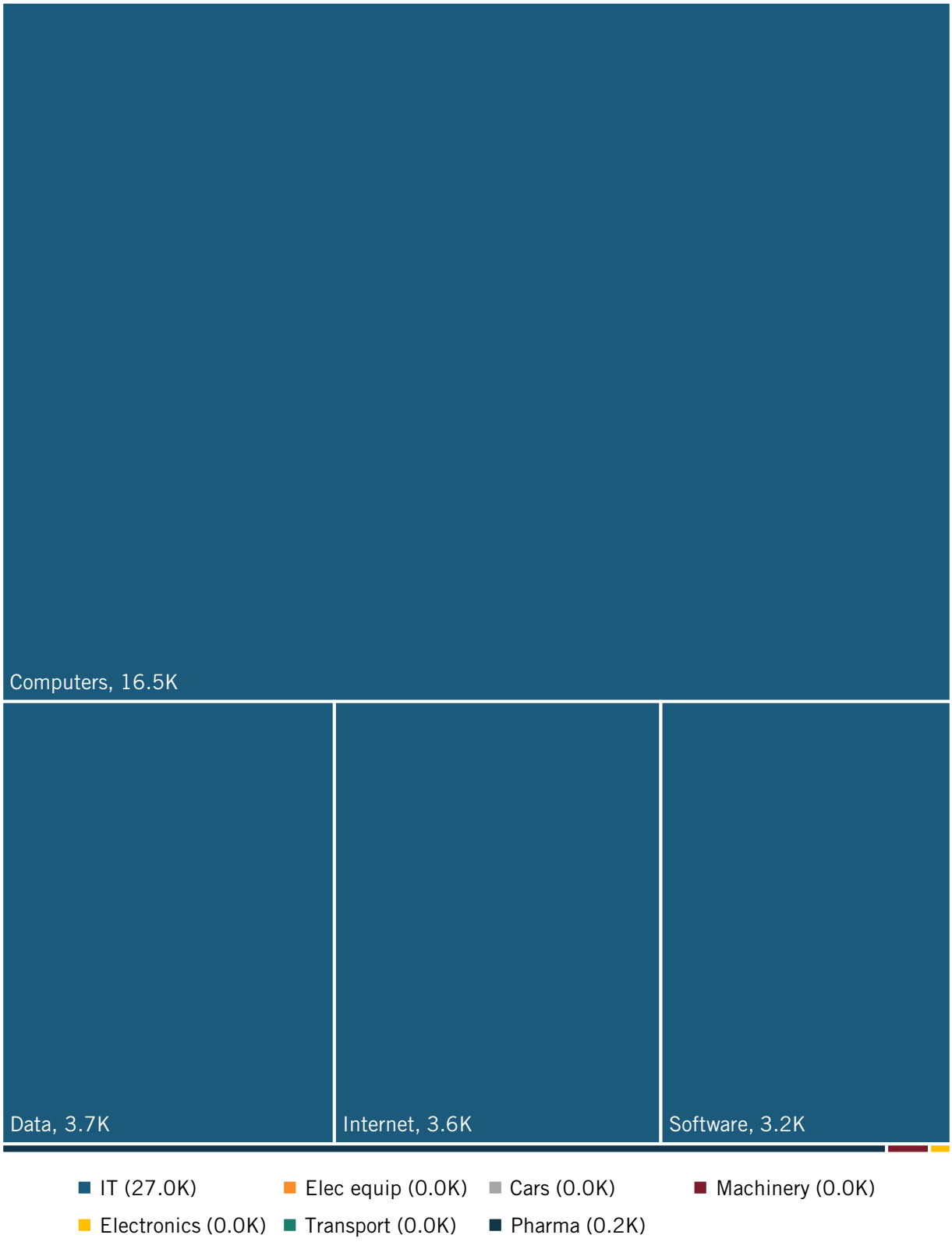
Figure 111: District of Columbia's relative performance in Hamilton Index industries



In Washington, D.C., the IT industry dominates employment, with about 27,000 workers engaged across sectors such as data processing (3,665), Internet publishing (3,602), and software publishing (3,200). The computer systems design sub-sector employs the largest share, with 16,542 individuals, reflecting the city's role as a hub for information technology and digital infrastructure. Tech companies such as Google and Accenture have a strong regional presence, supporting government operations and private sector innovations.

Other industries in D.C. have significantly smaller employment shares, with minimal contributions from traditional manufacturing sectors such as machinery and transportation. The pharmaceutical and biotech industry employs just 206 workers, highlighting the limited presence of advanced manufacturing compared with the city's IT and service-based economy.

Figure 112: Number of employees in Hamilton Index subindustries in the District of Columbia (27,200 workers)

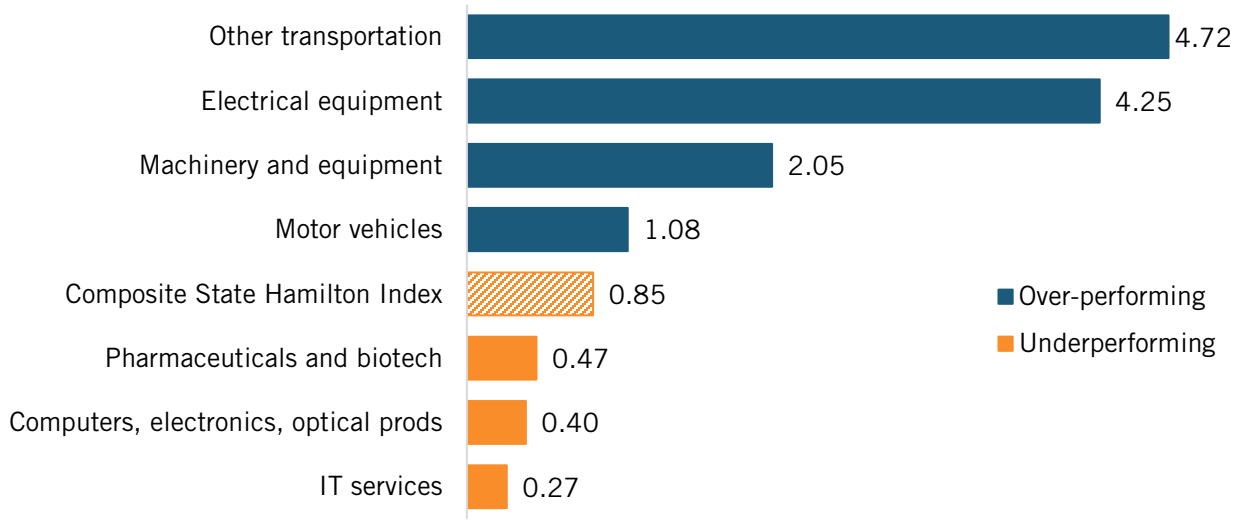


No. 31: Mississippi

Mississippi exhibits strong over-performance in the other transportation industry, with an LQ of 4.72. This highlights the state's specialization in the production of transportation equipment, such as ships, driven by companies such as Huntington Ingalls Industries, which operates one of the largest shipyards in the nation. Electrical equipment manufacturing is another key strength, with an LQ of 4.25, reflecting a robust presence of companies producing electrical components and systems.

In contrast, Mississippi underperforms in advanced industries such as pharmaceuticals and biotech (0.47), computers, electronics, and optical products (0.40), and IT services (0.27). The state's economy remains heavily anchored in traditional manufacturing sectors, with less diversification into modern advanced industries.

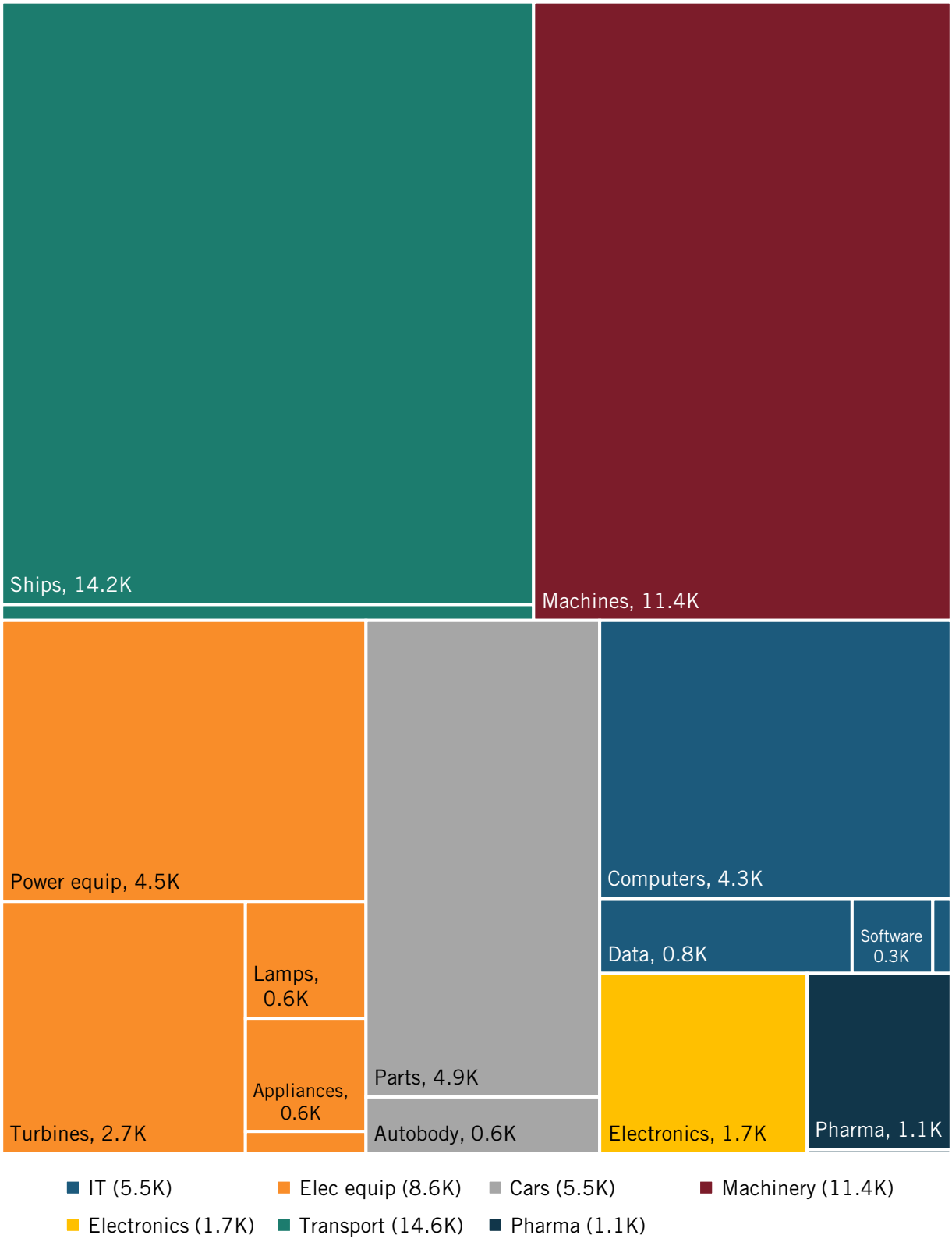
Figure 113: Mississippi's relative performance in Hamilton Index industries



Mississippi's largest industry is the other transportation industry, with 14,562 employees. Most of these employees work in shipbuilding (14,189 workers), driven by large military shipbuilding firms operating in Pascagoula. Mississippi also has a small aerospace industry composed of just 400 individuals and no railroad industry. A significant number of employees work in machinery manufacturing in the state (11,400).

The electrical equipment industry employs about 8,600 individuals, with notable subindustries including power equipment manufacturing (4,534 employees) and engine and turbine manufacturing (2,714 employees). The IT services industry employs 5,495 individuals, with a focus on computer systems and design (4,325 workers). Additionally, automobile parts manufacturing, employing 4,931 people, is another heavy machinery industry with a significant presence in Mississippi.

Figure 114: Number of employees in Hamilton Index subindustries in Mississippi (48,400 workers total)

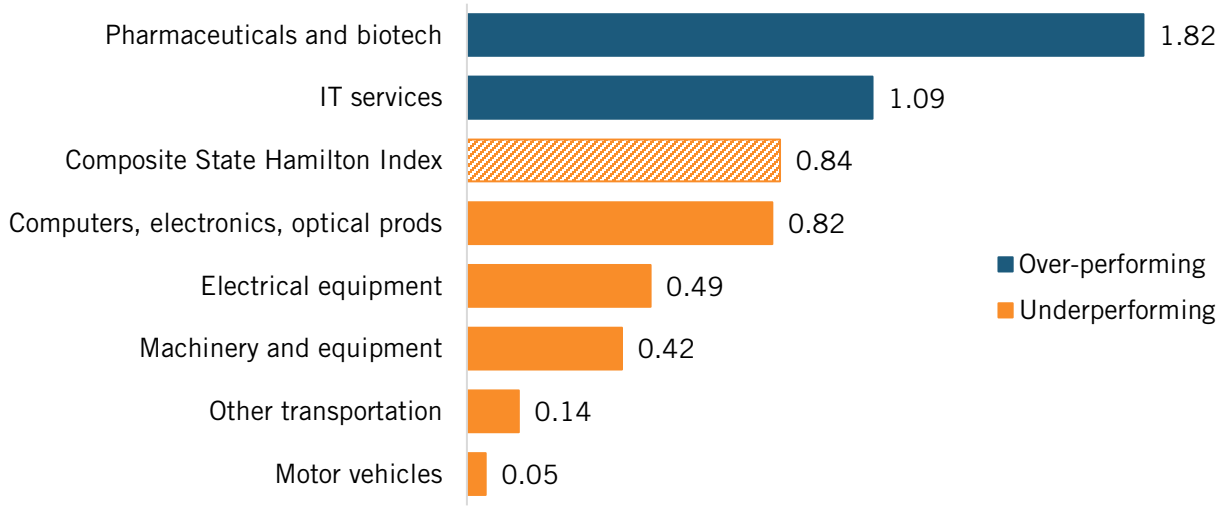


No. 32: New Jersey

New Jersey stands out with an over-performance in the pharmaceuticals and biotech industry, with an LQ of 1.82. As the headquarters for major pharmaceutical companies such as Johnson & Johnson and Merck, New Jersey continues to lead in pharmaceutical product R&D and manufacturing. IT services also shows a modest over-performance, with an LQ of 1.09.

In contrast, New Jersey underperforms in several advanced manufacturing sectors, including electrical equipment (0.49), machinery and equipment (0.42), and other transportation (0.14). Computers, electronics, and optical products also register below-average employment with an LQ of 0.82, highlighting a relatively lower emphasis on technology-driven manufacturing industries.

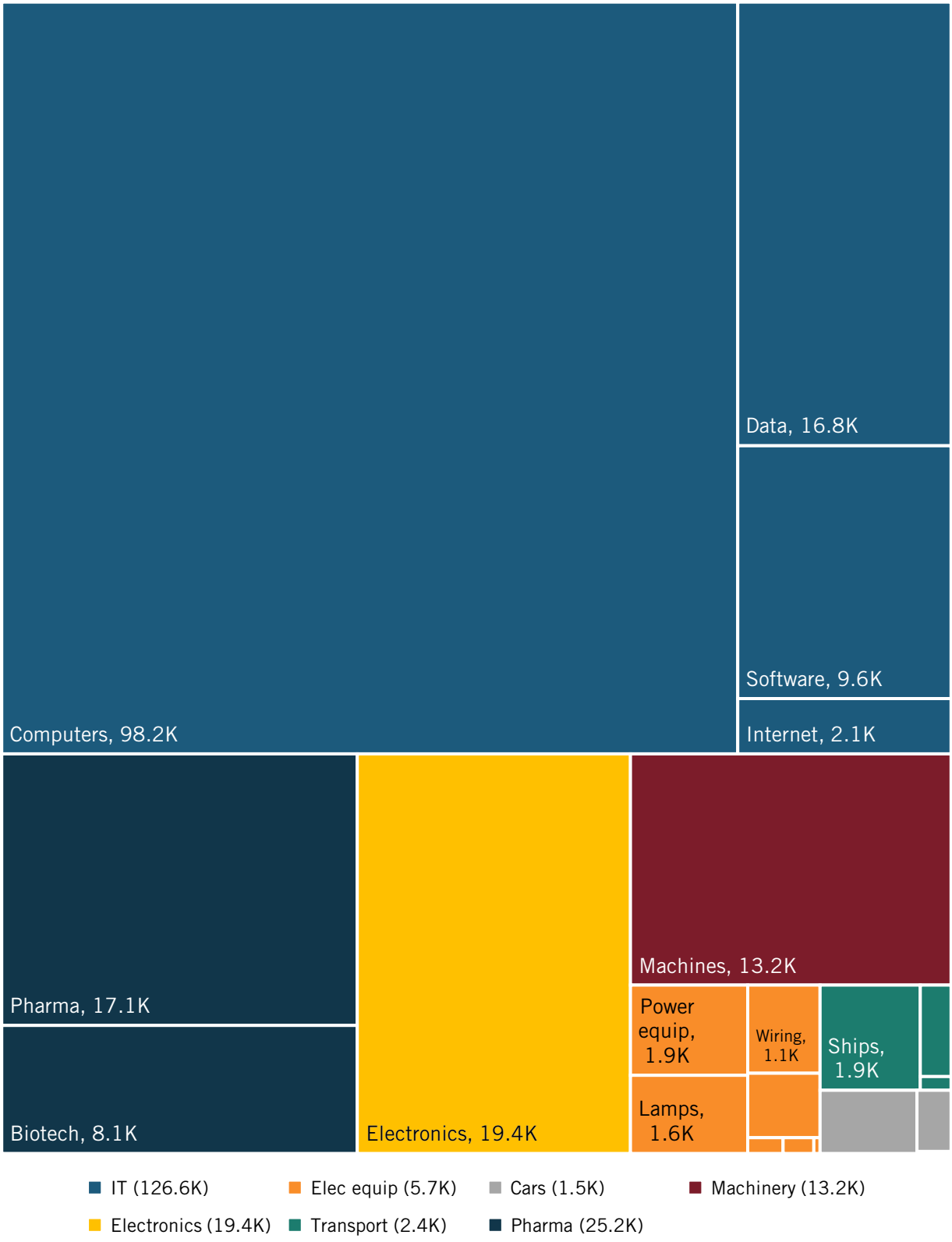
Figure 115: New Jersey's relative performance in Hamilton Index industries



Most Hamilton industry employees in New Jersey are in the IT and information services sector, with 126,648 individuals. Within this sector, computer systems design employs the largest share, totaling 98,218 individuals. The data processing and software publishing subindustries also have a significant presence in the state, employing 16,773 and 9,576 workers, respectively.

The pharmaceutical and biotechnology industry employs over 25,200 people, with about 17,100 individuals employed in pharmaceutical manufacturing and 8,100 in biotechnology research. Computers and electronics manufacturing employs 19,395 individuals. Heavy manufacturing industries, such as electrical equipment, other transportation, and motor vehicle manufacturing have much smaller industrial bases in the state, employing fewer than 6,000 workers each.

Figure 116: Number of employees in Hamilton Index subindustries in New Jersey (194,000 workers total)

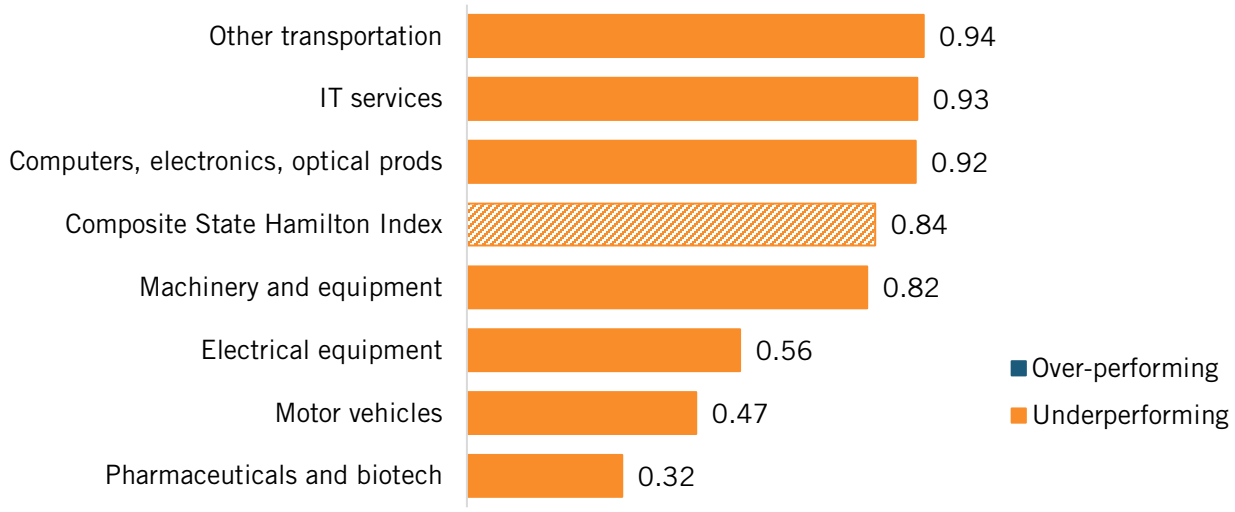


No. 33: Texas

Texas, a hub for diverse industrial activities, shows a relatively balanced performance across most advanced industries but lacks over-performance in any particular sector. The state's strongest industries include other transportation (0.94), IT services (0.93), and computers, electronics, and optical products (0.92). These sectors align with Texas's reputation as a growing technology hub, with cities such as Austin and Dallas housing such major tech firms as Dell, Oracle, and Texas Instruments.

In contrast, Texas severely underperforms in pharmaceuticals and biotech with an LQ of 0.32, electrical equipment (0.56), and motor vehicles (0.47). Texas's overall LQ of 0.84 reflects its underperformance in key advanced industries compared with the national average, showing significant areas for growth and investment as the state continues to grow as a technology hub.

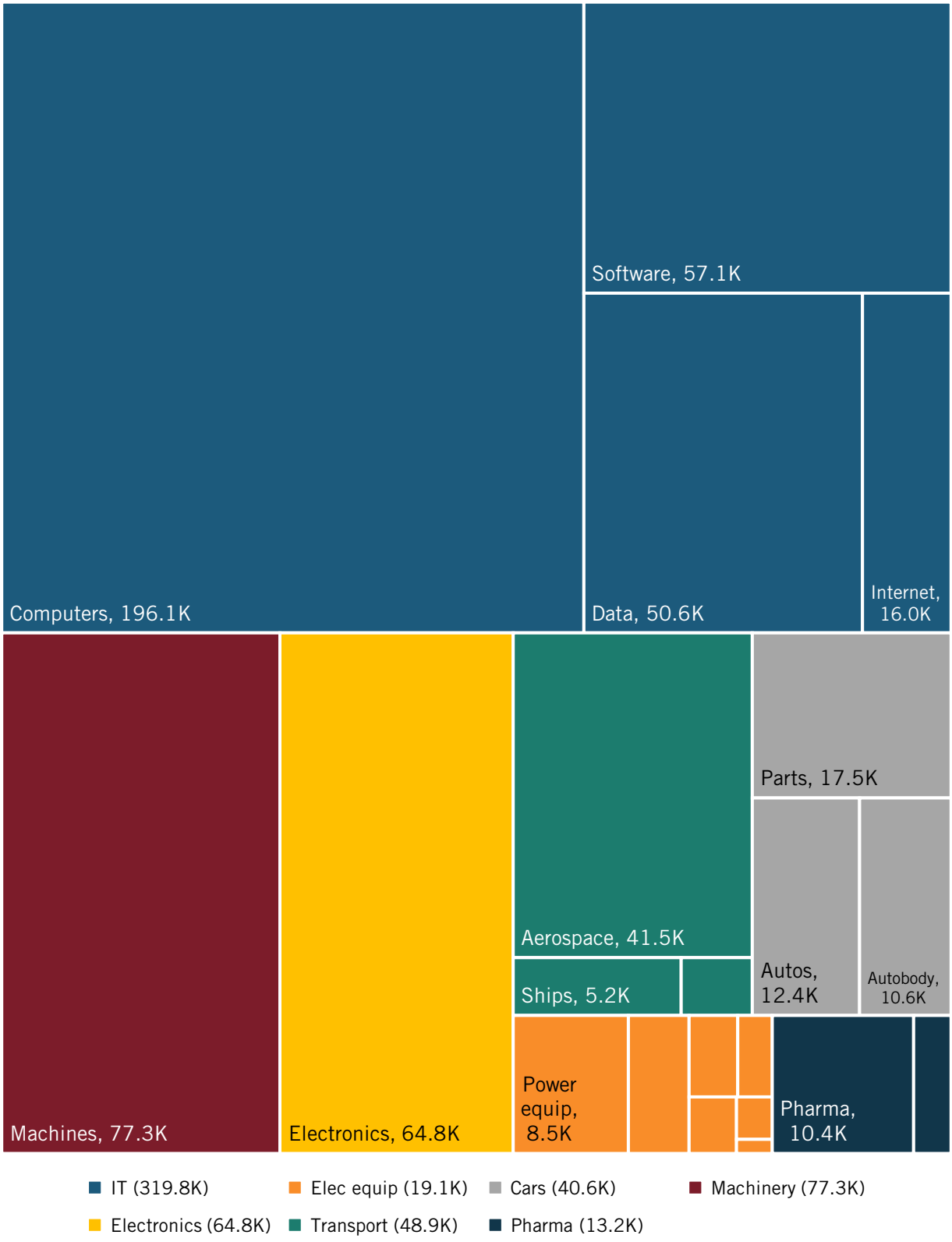
Figure 117: Texas's relative performance in Hamilton Index industries



In Texas, most Hamilton industry employees are concentrated in the IT and information services sector, with over 319,800 workers. Within this sector, computer systems design jobs dominate, employing 196,110 individuals, followed by software publishing (57,084) and data processing roles (50,614). Internet publishing is the smallest subindustry, employing 16,032 individuals.

About 77,300 individuals are employed in the machinery industry, reflecting the state's strong manufacturing base. Electronics manufacturing, which includes products such as semiconductors and consumer electronics, also contributes significantly, employing 64,813 workers, with companies such as Texas Instruments leading in semiconductor production. The transportation industry, which includes aerospace (41,535) and shipbuilding (5,160), highlights Texas's strategic importance in advanced manufacturing and logistics. Notable aerospace firms such as Lockheed Martin and Boeing are integral to the state's economy.

Figure 118: Number of employees in Hamilton Index subindustries in Texas (583,700 workers total)

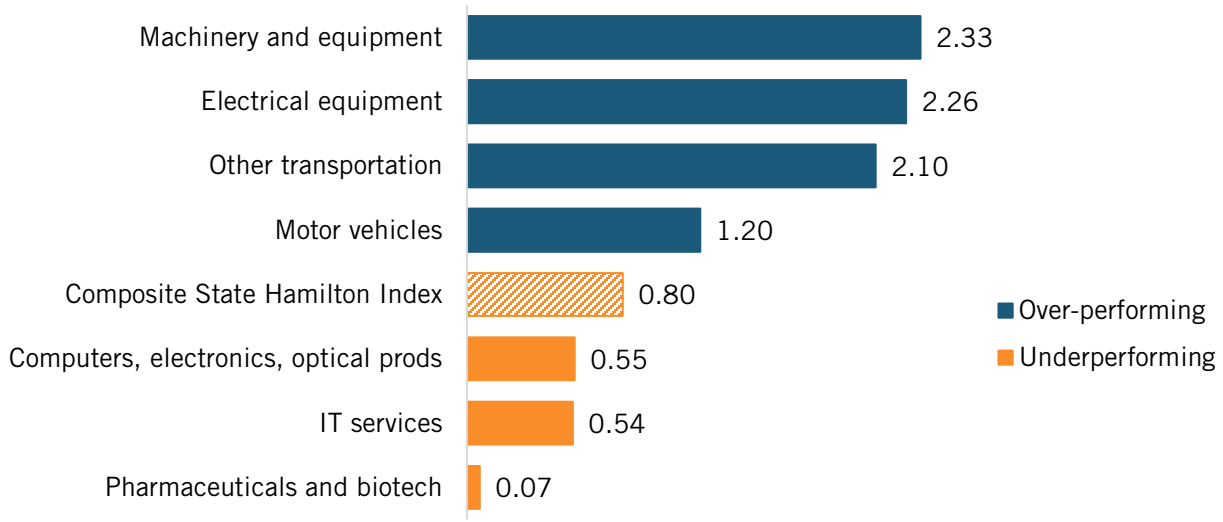


No. 34: Arkansas

Arkansas demonstrates significant strengths in machinery and equipment (2.33), electrical equipment (2.26), and other transportation (2.10), highlighting its industrial capabilities. The strong performance in machinery and equipment is supported by companies such as Caterpillar, which has manufacturing facilities in the state. In the other transportation industry, companies such as Dassault Falcon Jet in Little Rock underpin the state's competitive position.

Conversely, Arkansas underperforms in industries such as computers, electronics, and optical products (0.55), IT services (0.54), and pharmaceuticals and biotech (0.07). These sectors reflect limited development compared to national averages, with fewer companies or specialized resources driving growth in these fields.

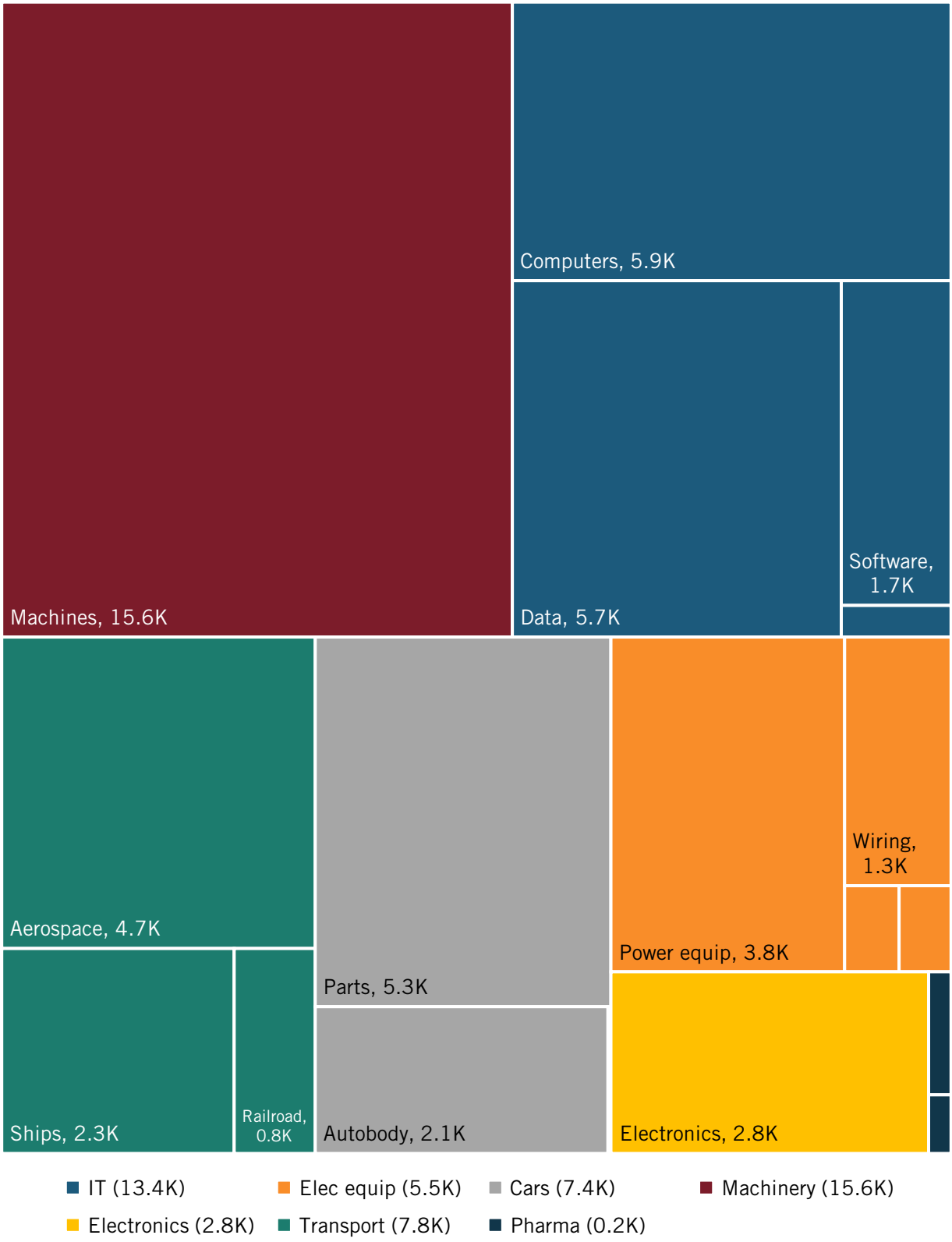
Figure 119: Arkansas's relative performance in Hamilton Index industries



In Arkansas, the machinery industry employs the largest number of workers, 15,634. This is followed by the IT sector, which employs 13,439 individuals, primarily in the computer systems design (5,897) and data processing subindustries (5,657). Other high-tech industries, such as pharmaceuticals and biotechnology, have a minimal presence, employing fewer than 1,000 individuals.

The transportation industry also plays a critical role in Arkansas, employing 7,809 workers across various subindustries, including aerospace and shipbuilding. Additionally, the computer, electronics, and optical products manufacturing industry employs 2,779 workers, making it one of the smaller Hamilton industries in the state. Notably, the state's electrical equipment industry employs almost 5,500 individuals, with more than half engaged in the manufacturing of power equipment (3,776).

Figure 120: Number of employees in Hamilton Index subindustries in Arkansas (52,700 workers total)

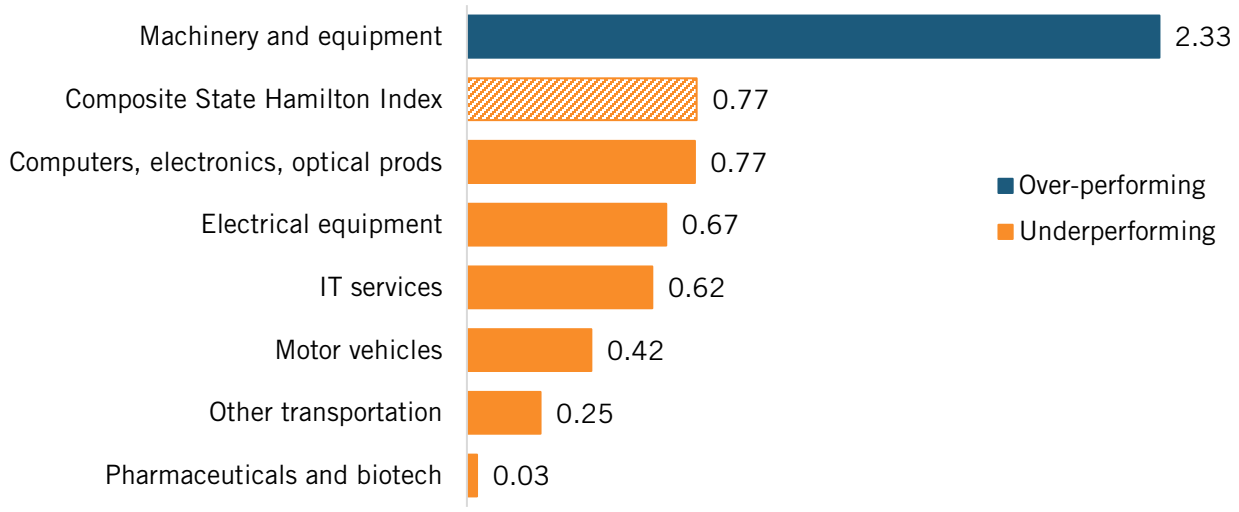


No. 35: North Dakota

North Dakota's highest-performing industry is machinery and equipment, with an LQ of 2.33, showcasing a strong specialization in this sector. This reflects the state's focus on manufacturing and industrial machinery for agricultural and construction applications, which are critical to its economy. Companies such as Bobcat Company, headquartered in West Fargo, contribute significantly to this strength by producing construction and agricultural equipment.

In contrast, North Dakota underperforms in all other Hamilton industries, with motor vehicle manufacturing, other transportation, and pharmaceuticals and biotech all having LQs below 0.50. The state underperforms in both high-tech industries and manufacturing-based sectors, demonstrating a lack of competitive industrial strategy in North Dakota.

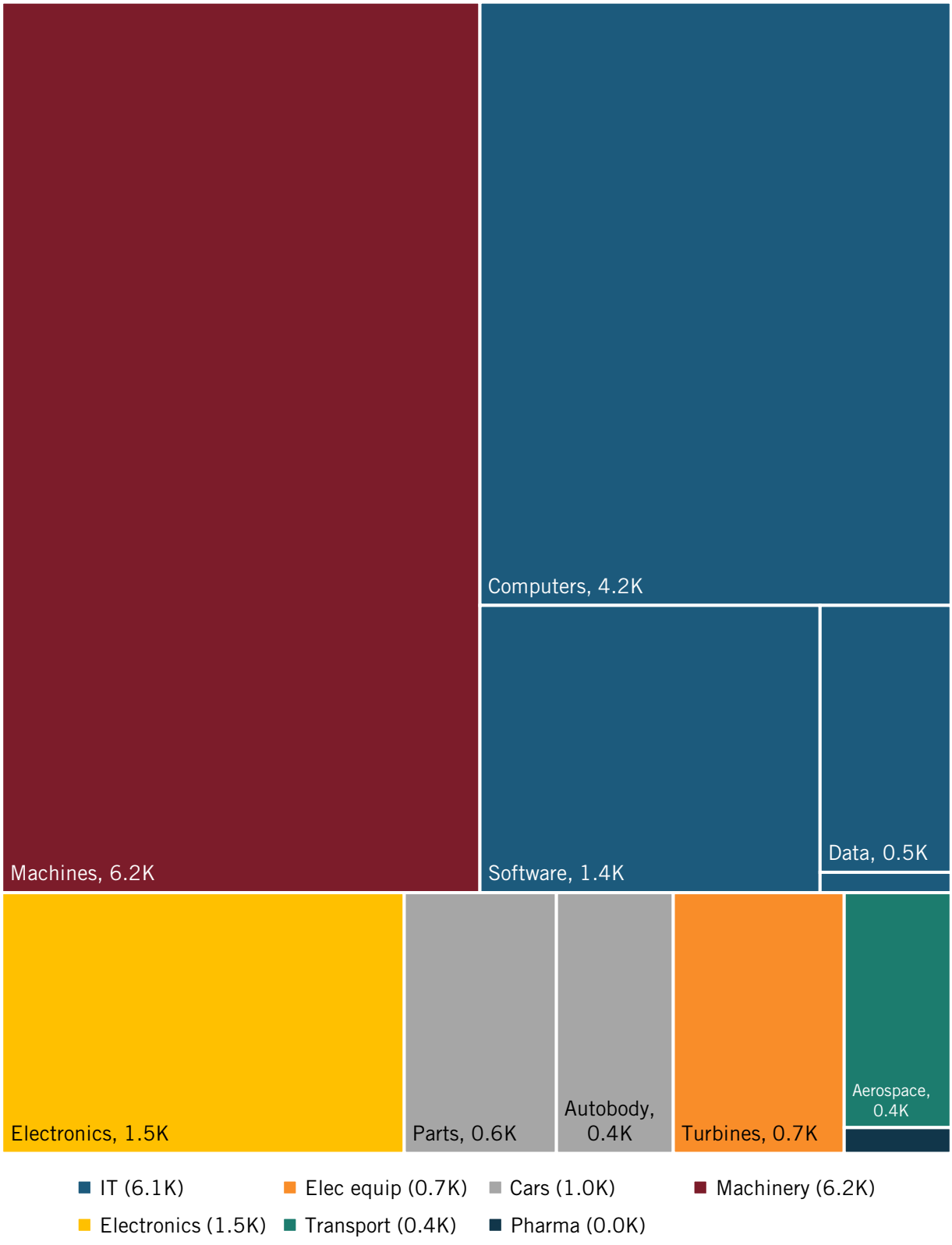
Figure 121: North Dakota's relative performance in Hamilton Index industries



Unsurprisingly, the machinery industry employs the most individuals out of the Hamilton industries, with 6,226 workers. The IT sector, while relatively small when measuring LQ, is the second-largest employer in absolute terms, with 6,133 employees. Most are employed in the computer systems design subindustry (4,155), followed by software publishing (1,428) and data processing (511).

Heavy manufacturing industries, such as motor vehicle production, electrical equipment, and other transportation, have a minimal presence in the state, employing no more than 1,000 individuals each. The motor vehicle and computer and electronic manufacturing industries are slightly larger, employing 1,025 and 1,532 individuals, respectively. Because North Dakota's economy is primarily based on energy and agriculture, Hamilton Index industries employ very few individuals in absolute terms

Figure 122: Number of employees in Hamilton Index subindustries in North Dakota (16,000 workers total)

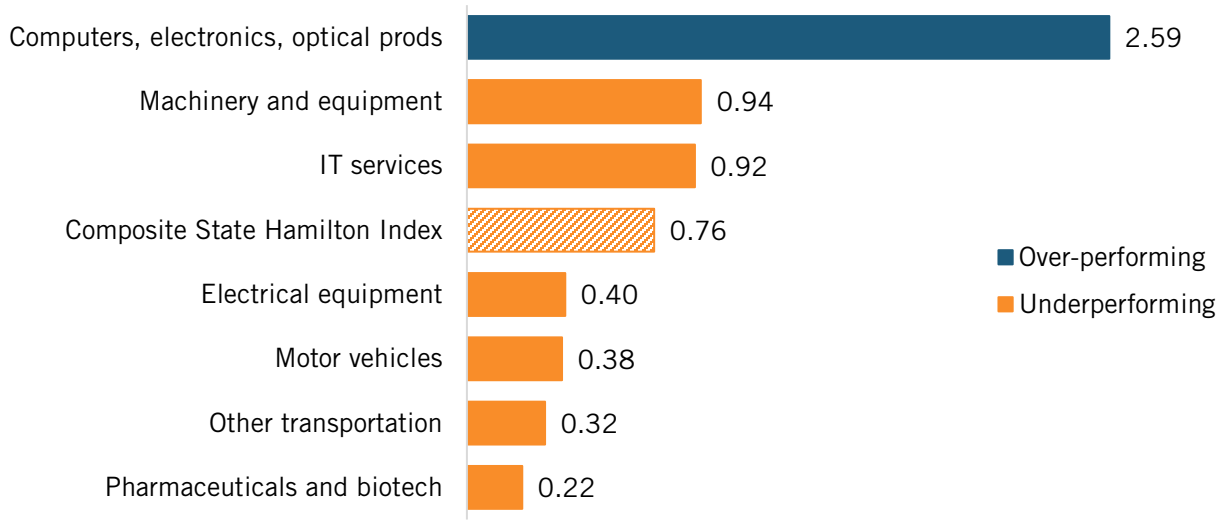


No. 36: Idaho

Idaho stands out for its strength in the computers, electronics, and optical products industry. An LQ of 2.59 indicates significant specialization compared with the national average. Companies such as Micron Technology, based in Boise, are major contributors to this sector, particularly in semiconductor manufacturing. This industry's performance underscores Idaho's role as a key player in technology and advanced manufacturing.

However, Idaho underperforms in several industries, including motor vehicles (0.38), other transportation (0.32), and pharmaceuticals and biotech (0.22). Despite its robust electronics manufacturing industry, the state shows limited activity in these sectors, reflecting a lack of diversification in advanced industries.

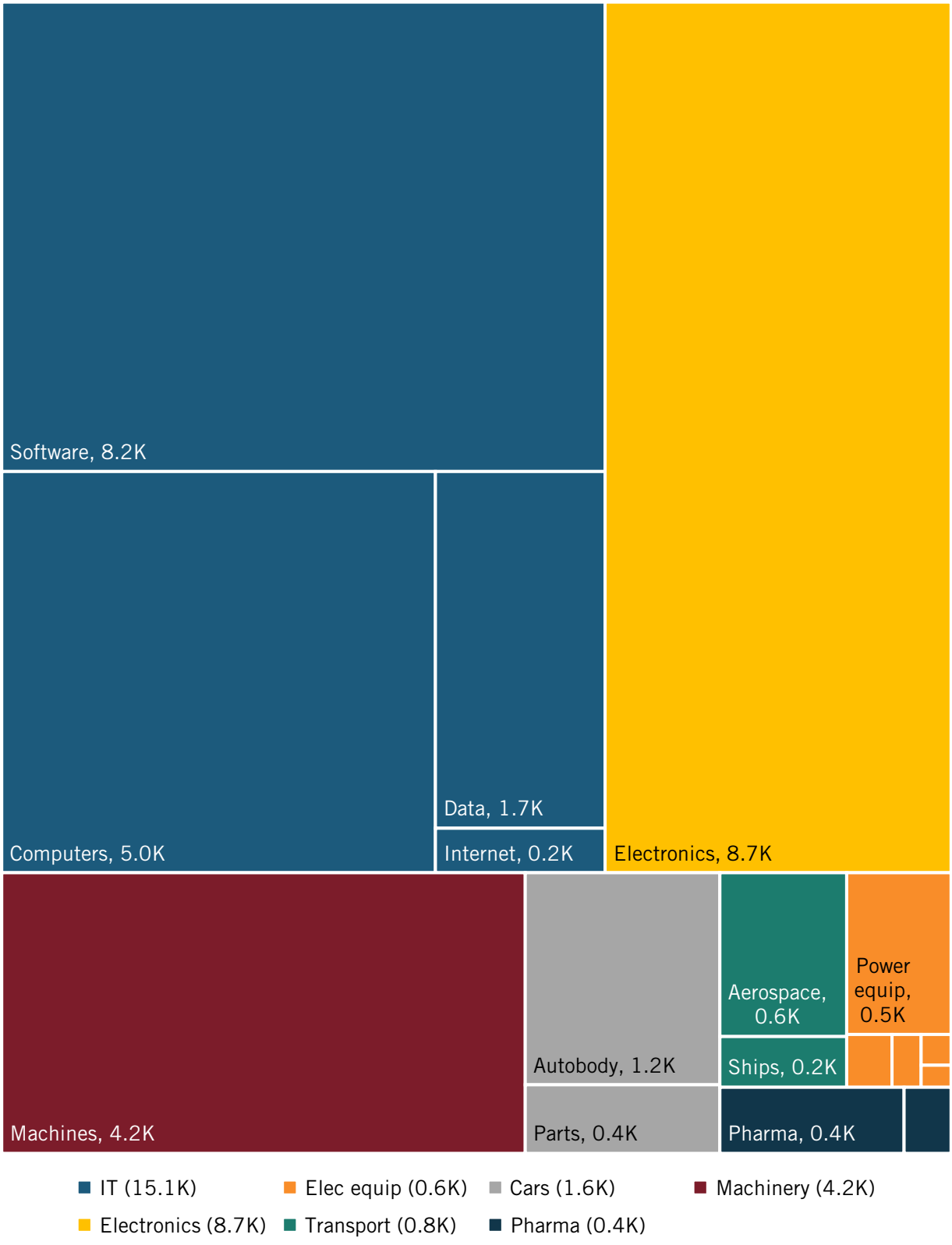
Figure 123: Idaho's relative performance in Hamilton Index industries



In Idaho, the IT sector employs the most individuals, with 15,130 employees, primarily in software publishing (8,157) and computer systems design (5,012). Fewer employees work in data processing (1,742) and Internet publishing (219). The electronics industry is another significant employer in the state, with 8,673 employees focused on producing specialized components and devices, likely reflecting Idaho's growing tech manufacturing capabilities.

The machinery industry employs 4,226 individuals, making it another notable sector in Idaho. Other transportation-related sectors, such as aerospace and shipbuilding, employ smaller workforces, about 600 and 200 individuals, respectively. Idaho's economy is largely focused on a few advanced industries driven by a small number of innovative firms, such as Micron and the Idaho National Laboratory.

Figure 124: Number of employees in Hamilton Index subindustries in Idaho (31,500 workers total)

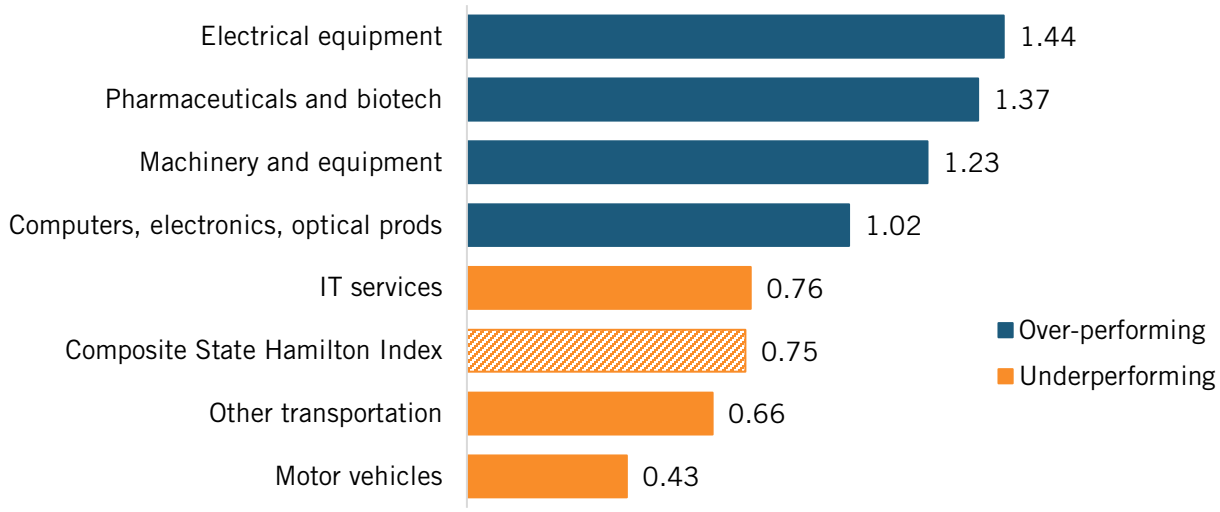


No. 37: Pennsylvania

Pennsylvania excels in the electrical equipment industry with an LQ of 1.44, indicating a significant concentration of this sector compared with the national average. The state also performs strongly in pharmaceuticals and biotech (1.37) and machinery and equipment industries (1.23). Companies such as Merck and Co., with its U.S. Human Health Division headquarters located in Pennsylvania, are leaders in the pharmaceutical industry.

On the other hand, Pennsylvania underperforms in industries such as IT services (0.76), other transportation (0.66), and motor vehicles (0.43). While its computers, electronics, and optical products sector achieves a near-parity LQ of 1.02, the state's overall Hamilton Index LQ (0.75) reveals room for growth in overall industrial strategy.

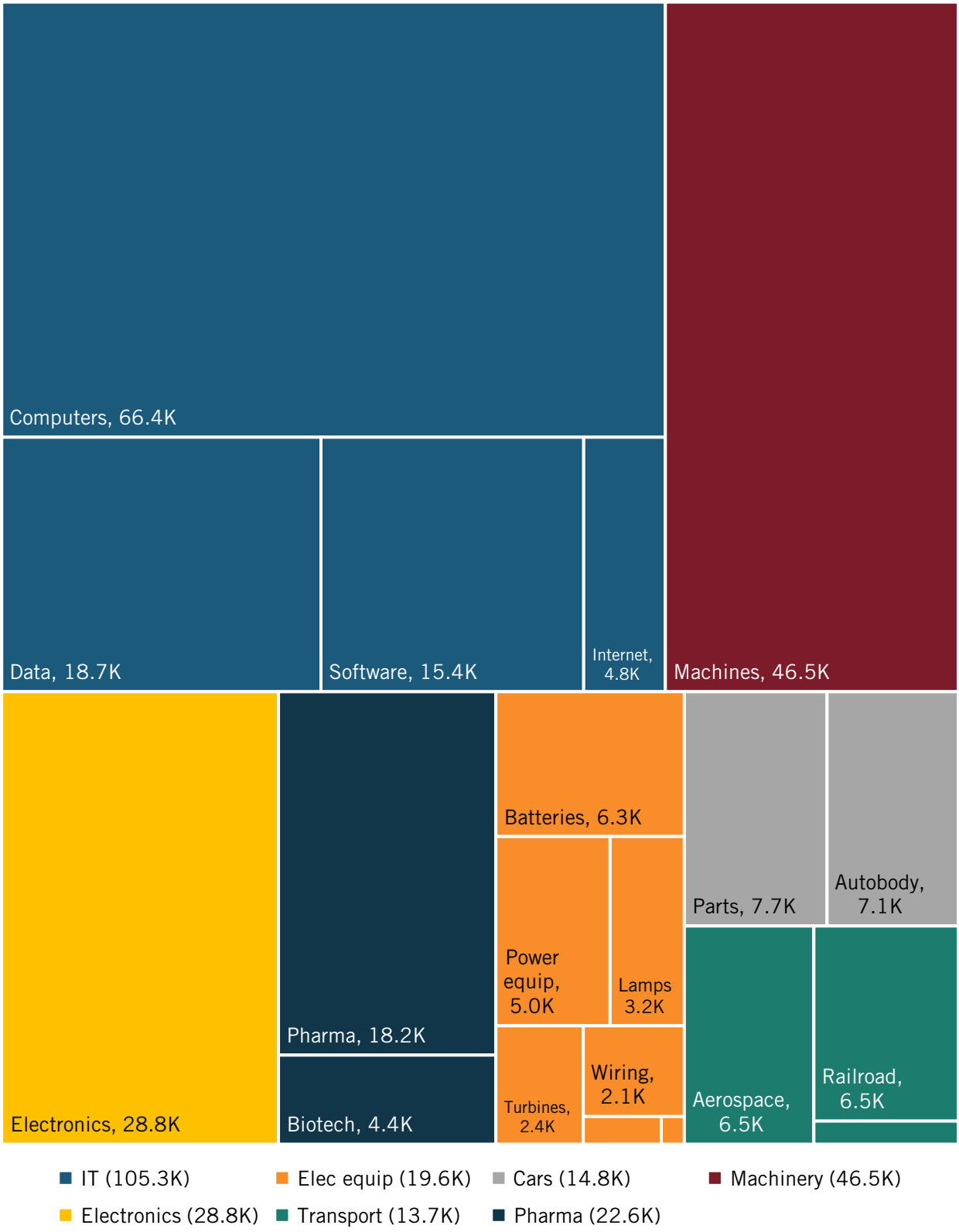
Figure 125: Pennsylvania's relative performance in Hamilton Index industries



In Pennsylvania, most Hamilton industry workers are employed in the IT sector, with over 105,300 employees, primarily in the subindustries of computer systems design (66,431), data processing (18,701), and software publishing (15,383). The state's robust IT workforce reflects its growing prominence in technology-driven industries, with notable hubs in cities such as Pittsburgh and Philadelphia, home to companies such as Comcast and innovative tech start-ups.

Pennsylvania employs many individuals in advanced, heavy manufacturing industries, including machinery and electrical equipment manufacturing. The machinery industry employs 46,462 individuals, and the electrical equipment industry employs 19,630. Electronics manufacturing, which includes the production of consumer electronics, telecommunications technologies, and semiconductors, employs close to 30,000 workers in Pennsylvania.

Figure 126: Number of employees in Hamilton Index subindustries in Pennsylvania (251,400 workers total)

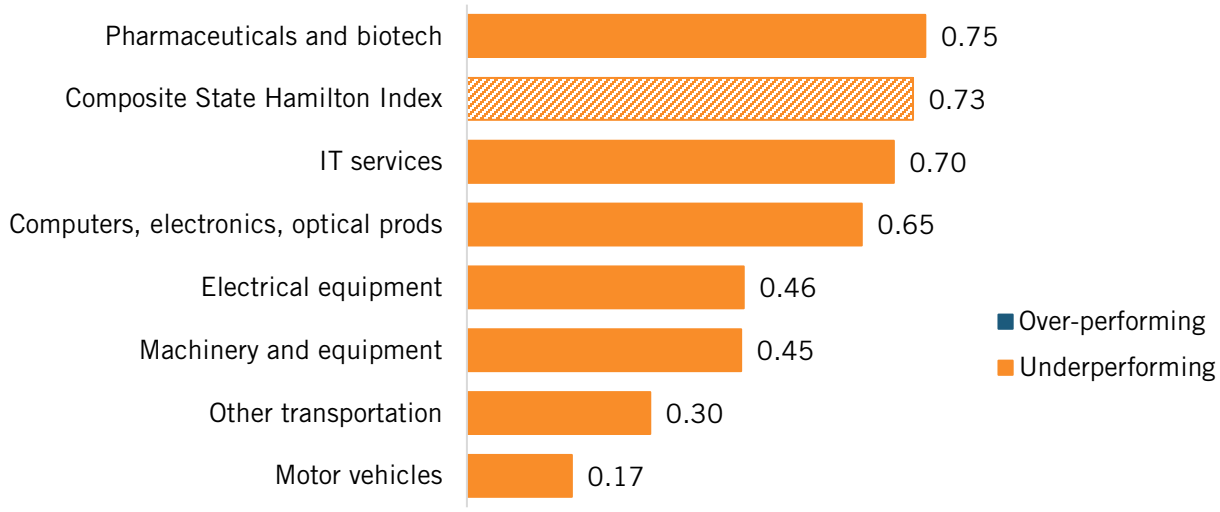


No. 38: New York

New York underperforms in all Hamilton industries. Pharmaceuticals and biotech show the highest relative concentration with an LQ of 0.75, but this still indicates an underperformance compared with other states. Despite being a financial hub, New York's IT services industry also scores below average, with an LQ of 0.70. Key players such as IBM and Google's New York office contribute to the state's tech ecosystem but haven't pushed its IT concentration above the national average.

Other advanced industries, such as computers, electronics, and optical products (0.65) and electrical equipment (0.46), also demonstrate relatively low employment concentrations. Machinery and equipment (0.45) and other transportation (0.30) perform similarly, while motor vehicles exhibit the lowest LQ at 0.17.

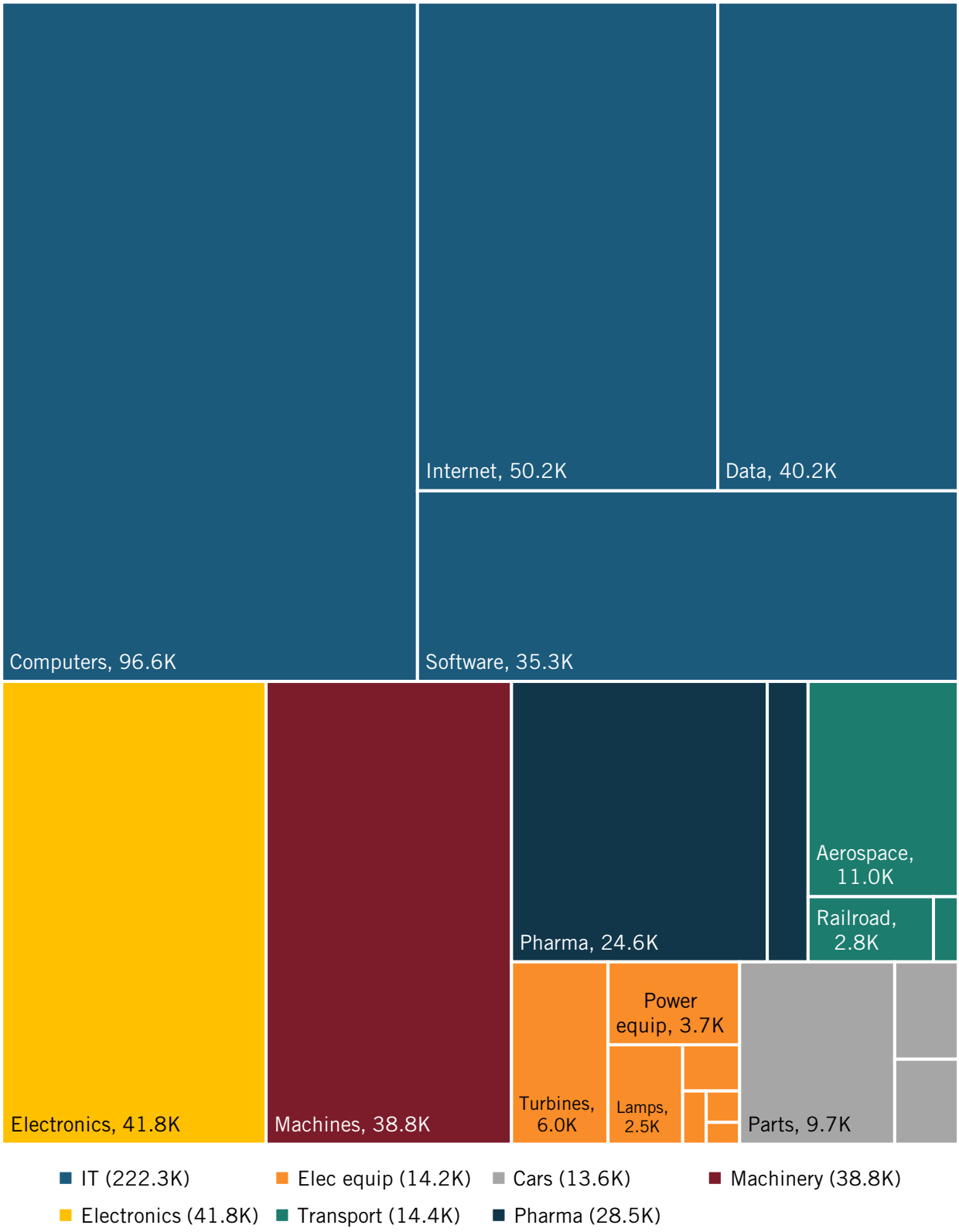
Figure 127: New York's relative performance in Hamilton Index industries



In New York, the IT and information services industry employs the most individuals, with 222,338 workers across various subindustries. Computer systems design leads with 96,609 employees, followed by Internet publishing and broadcasting (50,201), data processing (40,219), and software publishing (35,309). The IT and information services industry is four times larger than the next largest Hamilton industry.

The machinery and electronics industries also play an important role in New York's advanced industrial workforce. Machinery manufacturing employs 38,800 individuals, while the electronics sector employs 41,800 employees. Pharmaceuticals and biotechnology, with 28,500 employees, is another significant industry, supported by companies such as Pfizer, which has its global headquarters in New York City. Pharmaceutical manufacturing alone employs over 24,000 individuals, while almost 4,000 workers are employed in biotech R&D.

Figure 128: Number of employees in Hamilton Index subindustries in New York (373,800 workers total)

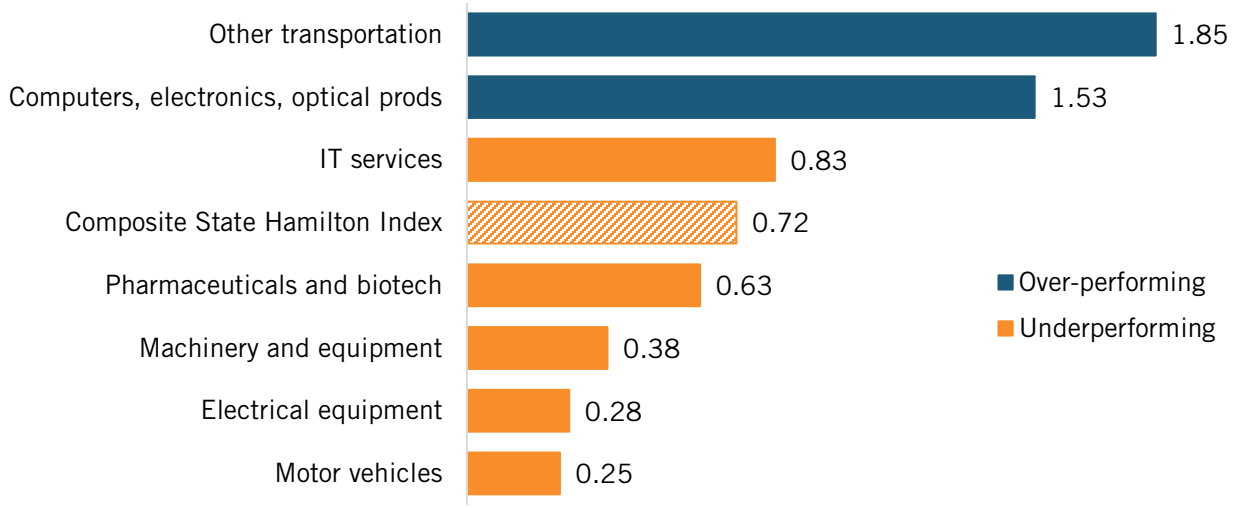


No. 39: Arizona

Arizona stands out with its strong performance in the other transportation industry, achieving an LQ of 1.85, reflecting a specialization above the national average. This can be attributed to the state's robust aerospace sector, with notable companies such as Honeywell Aerospace and Raytheon Technologies playing key roles in employment and innovation. The computers, electronics, and optical products industry also over-performs with an LQ of 1.53, reflecting Arizona's contributions to semiconductor manufacturing, led by companies such as Intel and TSMC. With the investments in semiconductor manufacturing being made under the CHIPS Act, Arizona's LQ is likely to increase in this sector.

Despite these strengths, Arizona underperforms in several other advanced industries. IT services, with an LQ of 0.83, falls short of the national average. Similarly, pharmaceuticals and biotech (0.63), machinery and equipment (0.38), and electrical equipment (0.28) lag behind, indicating a less diversified industrial base. The motor vehicles industry shows the lowest relative concentration with an LQ of 0.25, indicating a minimal presence in this sector.

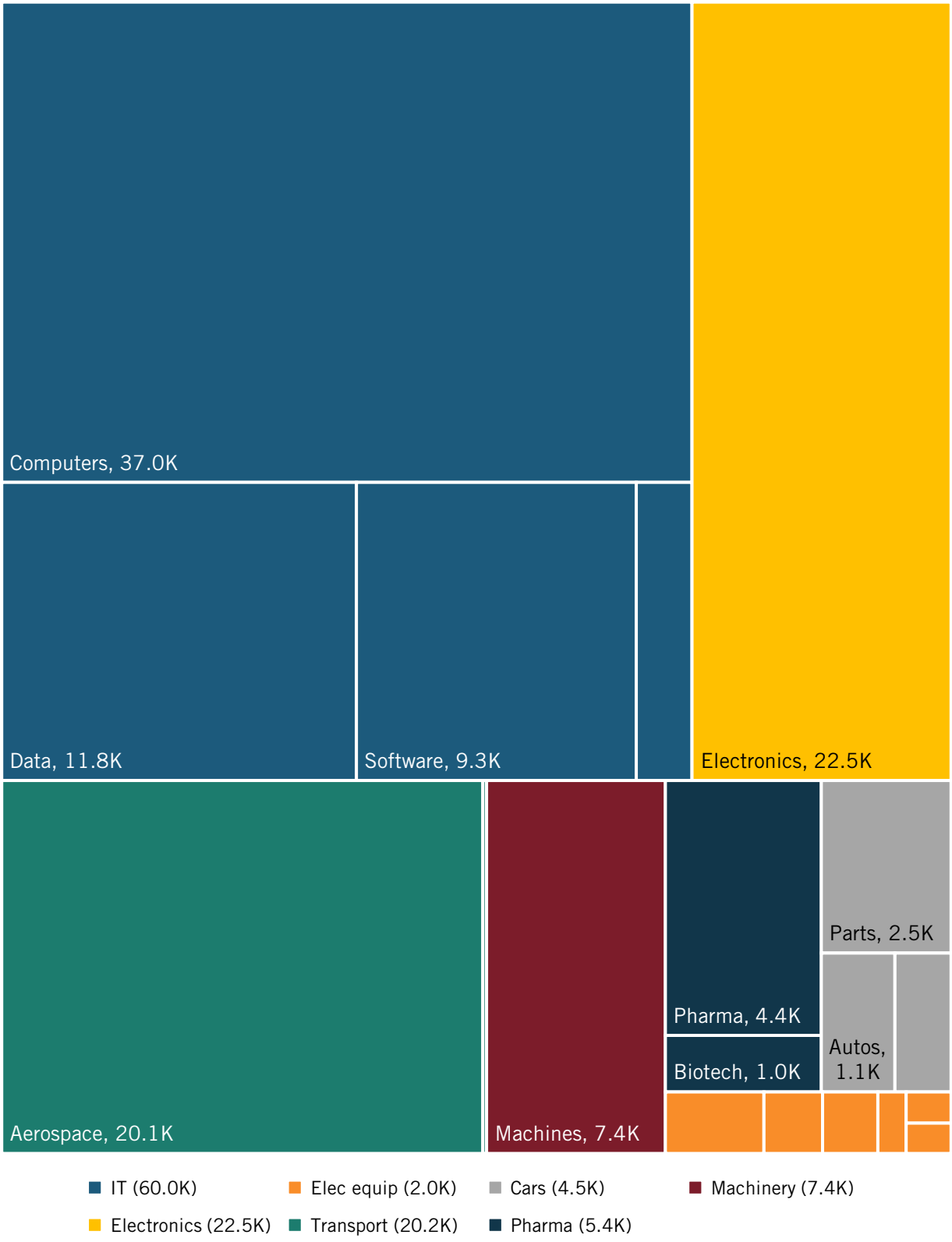
Figure 129: Arizona's relative performance in Hamilton Index industries



In Arizona, most Hamilton industry workers are employed in the IT and information services industry, with 60,016 people. The largest subindustry is computer systems design, which employs 37,035 individuals, followed by data processing (11,804) and software publishing (9,314). Arizona's IT sector benefits from companies such as Intel, which operates facilities in the state, and tech start-ups centered in the Phoenix metropolitan area.

The electronics manufacturing industry also plays a significant role in Arizona's advanced industrial workforce, which employs about 22,500 individuals, many of whom work in semiconductor manufacturing. This number is set to increase as well as semiconductor fabs continue to be built in Arizona using funding from the CHIPS Act. The other transportation sector is also large in absolute terms, with 20,300 workers, almost all of whom work in the aerospace subindustry (20,055).

Figure 130: Number of employees in Hamilton Index subindustries in Arizona (122,100 workers total)

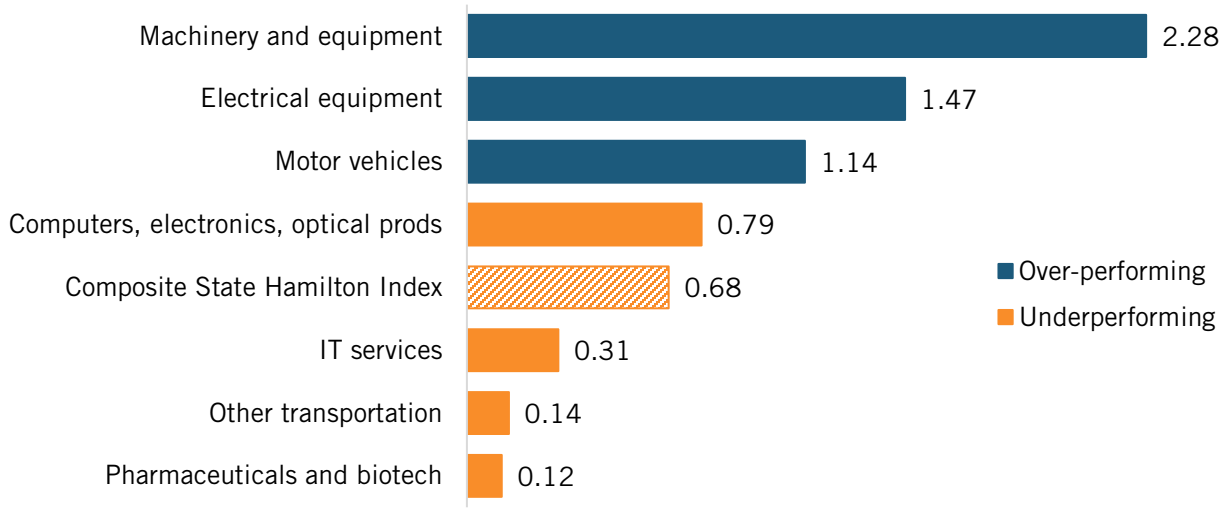


No. 40: South Dakota

South Dakota excels in the machinery and equipment industry with an LQ of 2.28, indicating a significant concentration compared with the national average. This reflects the state's strong manufacturing base, with firms such as Raven Industries, known for its agricultural technology solutions, contributing to the industry's prominence. Similarly, the electrical equipment sector performs well with an LQ of 1.47, showcasing the state's capabilities in manufacturing electrical components and systems.

In contrast, South Dakota underperforms in several advanced industries. With an LQ of 0.31, the IT services industry remains a smaller component of the state's economy. Additionally, South Dakota underperforms in industries such as other transportation (0.14) and pharmaceuticals and biotech (0.12), largely due to its reliance on agriculture as the predominant industry in the state.

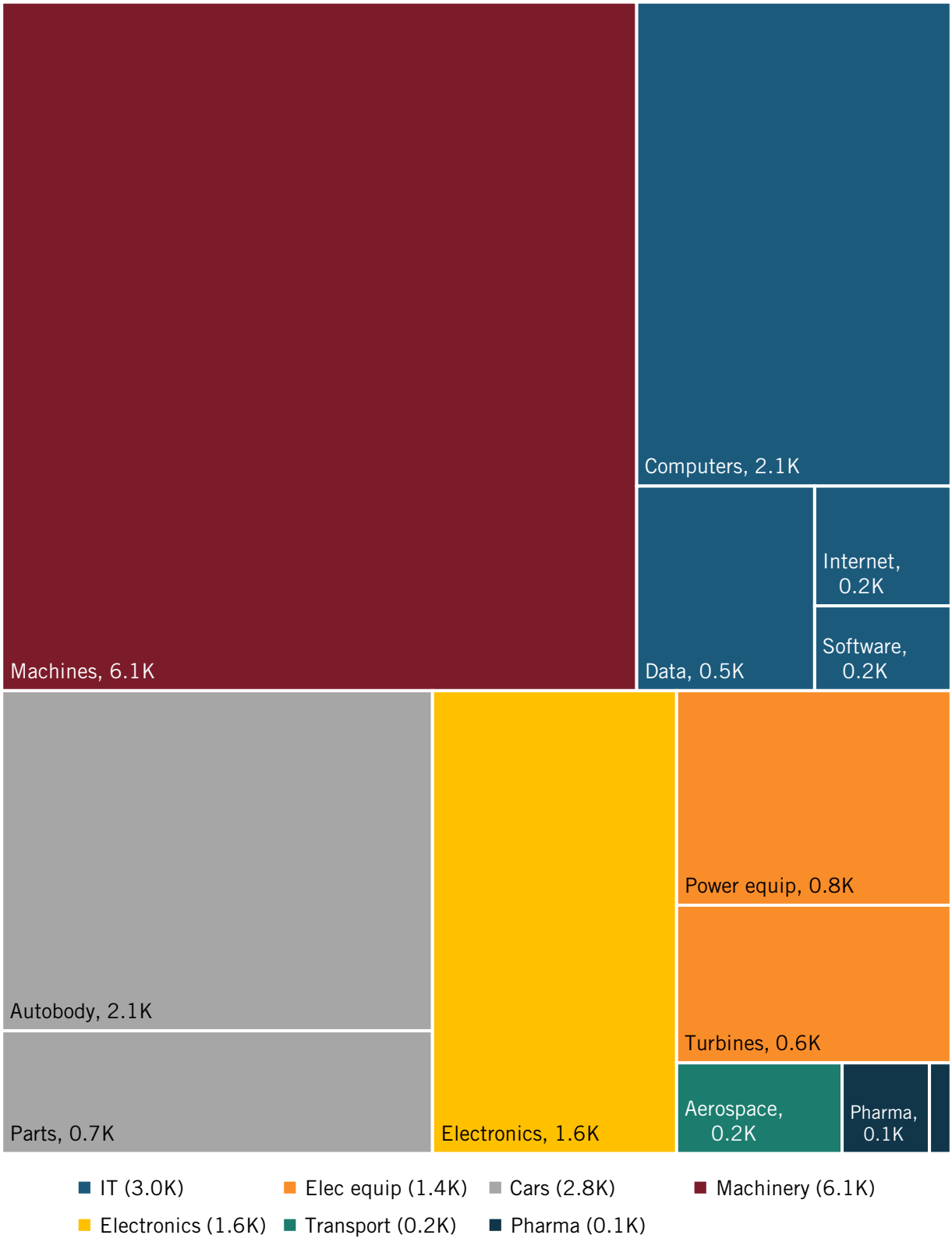
Figure 131: South Dakota's relative performance in Hamilton Index industries



The machinery industry is the largest Hamilton industry in absolute terms in South Dakota, employing over 6,000 individuals. The industry's role is critical in supporting the state's agricultural economy, one of the largest industries in the state, which relies heavily on equipment manufacturing.

While smaller, the IT sector still employs 3,034 workers, 2,132 of whom work in computer systems design. Electronics manufacturing supports an additional 1,583 employees, emphasizing the state's involvement in producing electronic components for various applications. Other notable industries include motor vehicle manufacturing, with 2,792 workers. About 2,000 employees work in the autobody and trailer subindustry and about 700 work in parts manufacturing.

Figure 132: Number of employees in Hamilton Index subindustries in South Dakota (15,300 workers total)

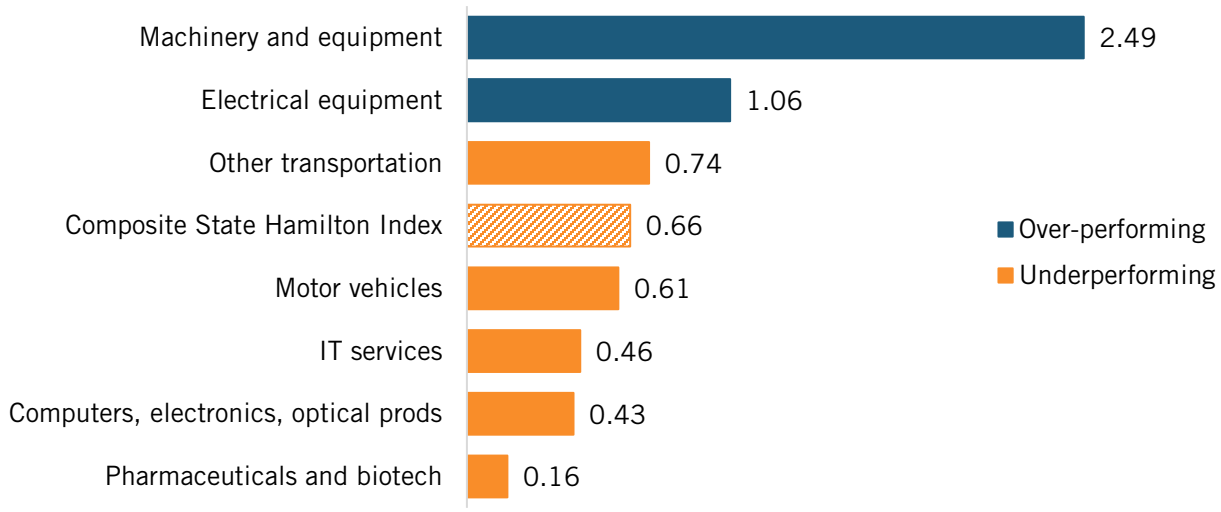


No. 41: Oklahoma

Oklahoma's strongest industry is machinery and equipment, with an LQ of 2.49, demonstrating the state's robust manufacturing base. The state's energy production industry relies on this sector to provide heavy equipment for oil drilling and refinement. The only other industry that over-performs in Oklahoma is the electrical equipment manufacturing industry, with an LQ of 1.06.

In contrast, Oklahoma's advanced industries, particularly high-tech industries, face many challenges. The pharmaceuticals and biotechnology industry has an LQ of only 0.16, highlighting limited activity in this field. Similarly, IT services (0.46) and computers, electronics, and optical products (0.43) fall below the national average, suggesting an underdeveloped technology sector. While the other transportation industry performs slightly better with an LQ of 0.74, it still lags behind the national benchmarks, presenting opportunities for growth and diversification.

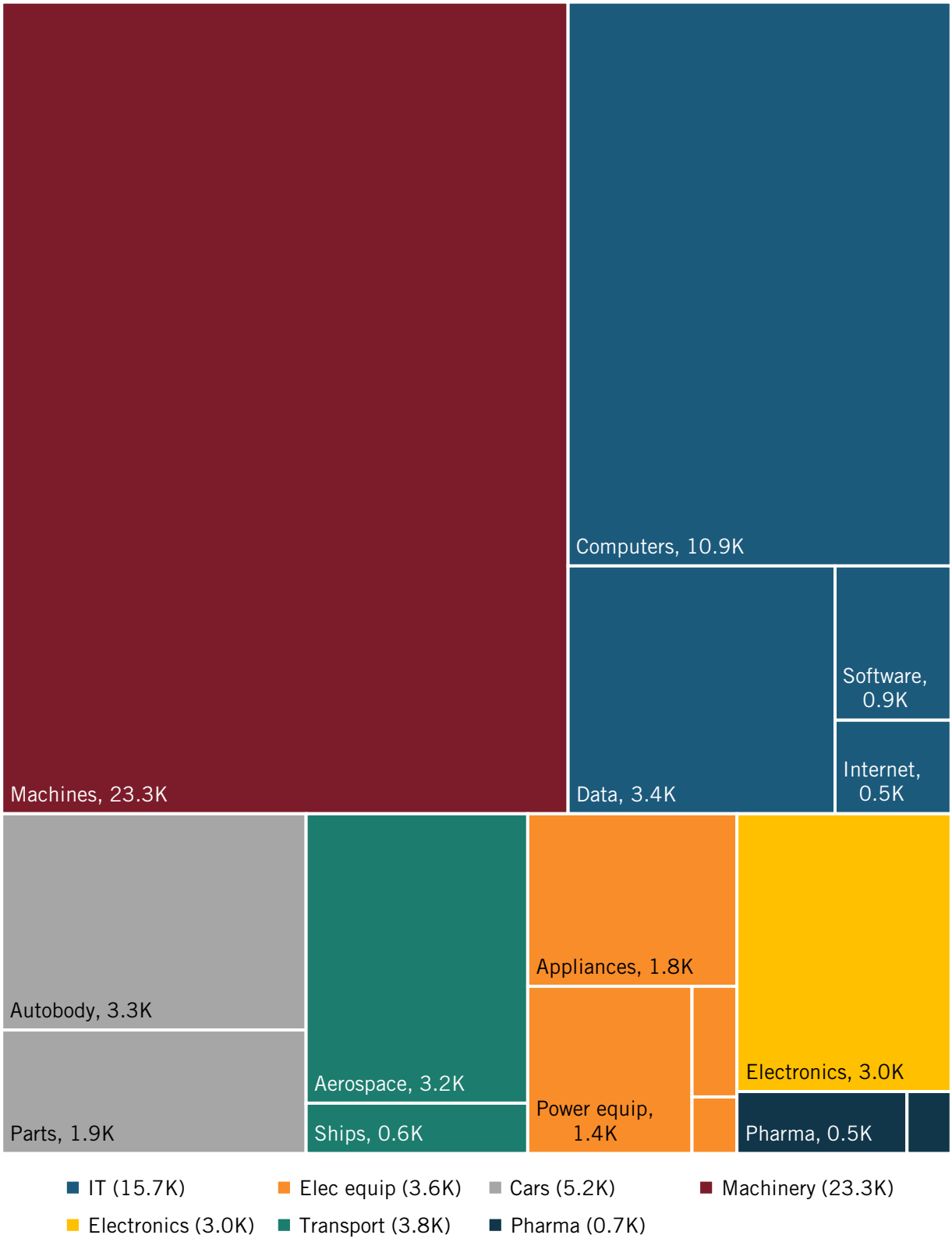
Figure 133: Oklahoma's relative performance in Hamilton Index industries



The machinery industry employs the largest number of workers in Oklahoma, with 23,272. This sector includes the production of heavy equipment and machinery used in energy and agriculture, both significant industries in Oklahoma. The IT industry is another significant employer, with 15,729 workers, including 10,923 in computer systems design and 3,351 in data processing.

Other heavy manufacturing industries, such as motor vehicles, electrical equipment, and other transportation, are smaller employers in the state. Of the 5,233 workers in the motor vehicle industry, 3,308 work in autobody and trailer manufacturing, followed by 1,900 in parts manufacturing. Electrical equipment manufacturing employs 3,600 individuals, half of whom work in home appliances.

Figure 134: Number of employees in Hamilton Index subindustries in Oklahoma (55,300 workers total)

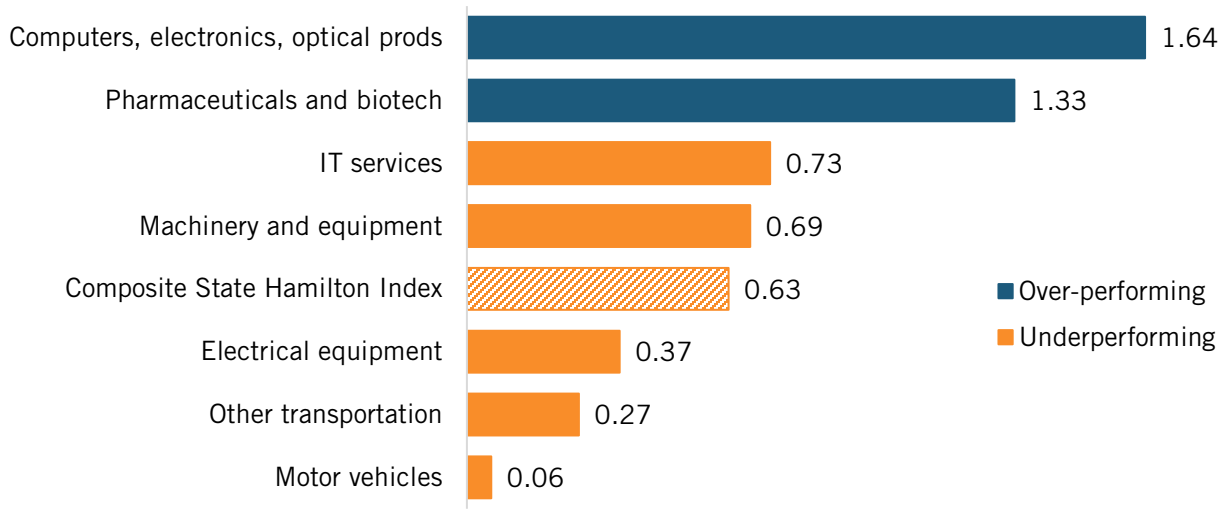


No. 42: Rhode Island

Rhode Island demonstrates strength in the computers, electronics, and optical products industry, with an LQ of 1.64. This over-performance reflects the state's focus on precision manufacturing. The pharmaceuticals and biotech sector also over-performs, with an LQ of 1.33, showcasing a robust presence of research institutions and companies such as Amgen, which operates a major biomanufacturing facility in the state.

However, most industries in Rhode Island lag behind national averages. IT services, with an LQ of 0.73, and machinery and equipment, with an LQ of 0.69, indicate areas for potential growth. The state notably underperforms in manufacturing sectors such as electrical equipment (0.37) and other transportation (0.27), suggesting limited specialization in these fields. With an LQ of 0.06, motor vehicles remain the weakest sector, highlighting a minimal role in automotive manufacturing within Rhode Island's economy.

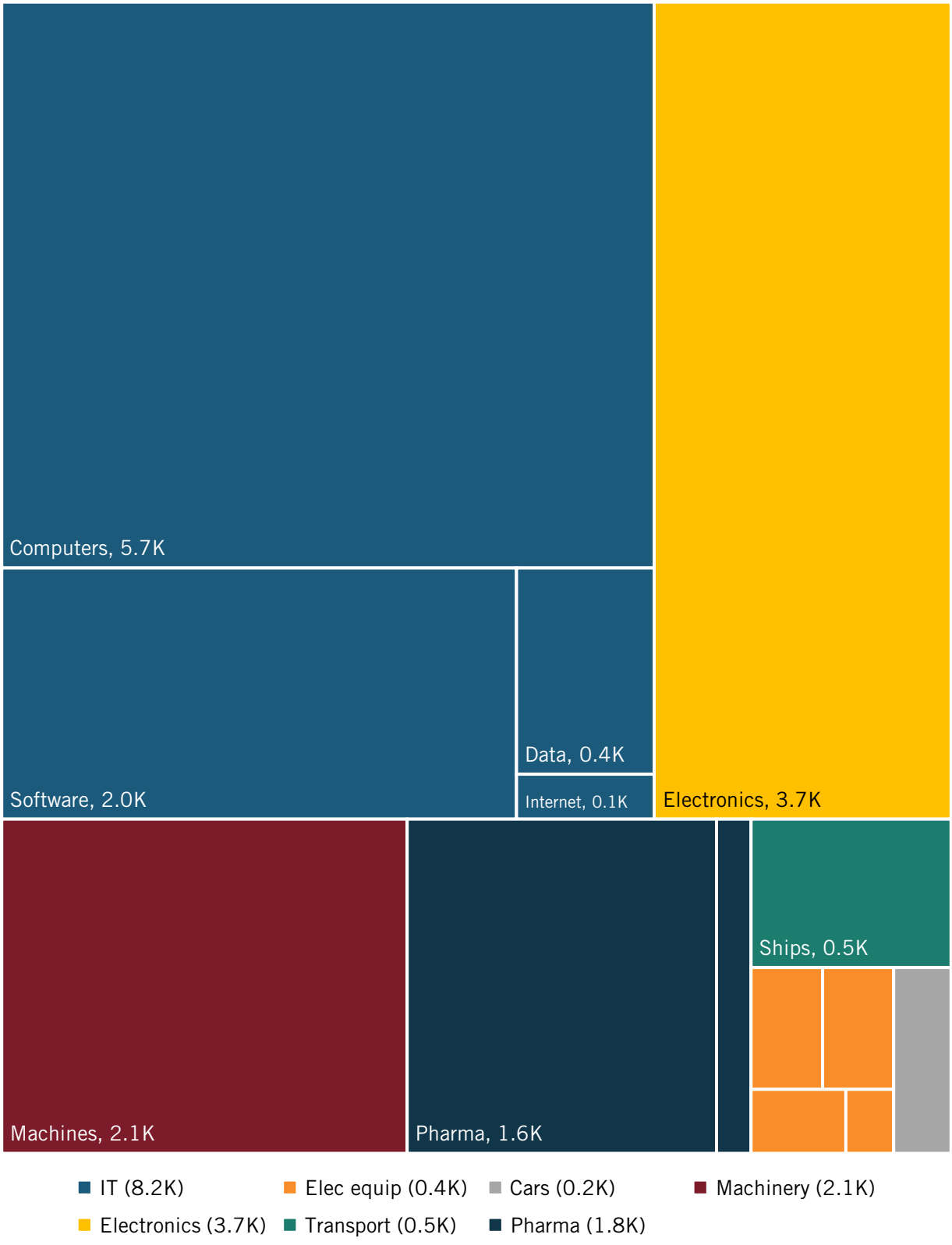
Figure 135: Rhode Island's relative performance in Hamilton Index industries



In Rhode Island, the IT industry employs the most individuals, with 8,193 employees. This sector includes 5,674 workers in the computer systems design subindustry and 1,988 in software publishing. Electronics manufacturing is another significant contributor to the workforce, employing 3,728 individuals. It is one of the largest subindustries in Rhode Island and highlights the state's niche in this industry.

The pharmaceutical and biotechnology industry employs 1,767 workers, demonstrating its importance to Rhode Island's economy. Most of these workers are employed in pharmaceutical manufacturing (1,589), while biotechnology research has a small presence in the state (178). The machinery sector, with 2,082 employees, remains a steady contributor to industrial employment in a state where a significant population works in the high-tech and services industry.

Figure 136: Number of employees in Hamilton Index subindustries in Rhode Island (16,800 workers total)

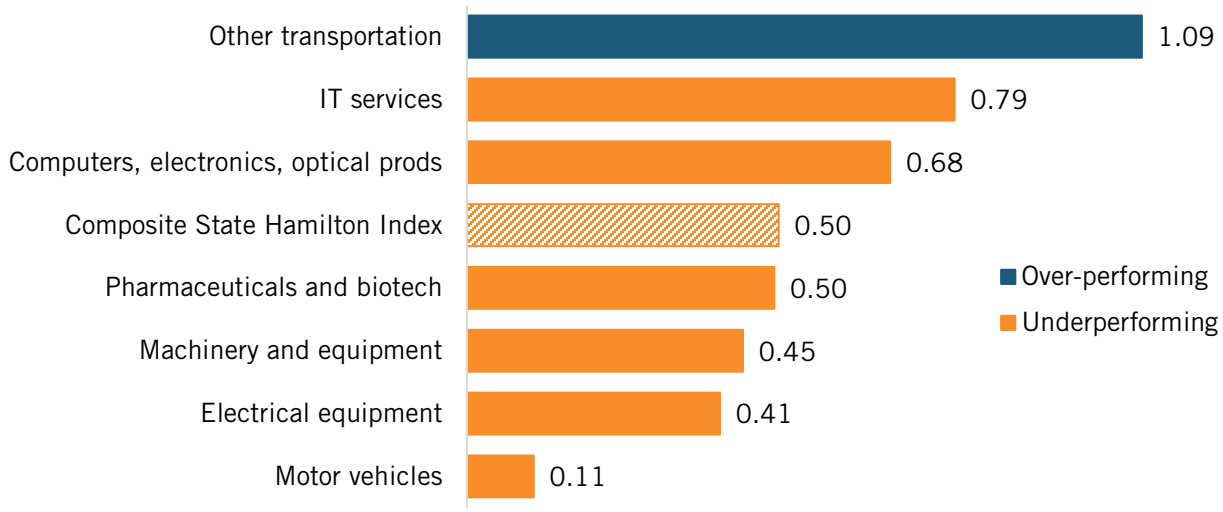


No. 43: Florida

Florida's strongest industry in the Hamilton Index is the other transportation sector, which has an LQ of 1.09. This indicates a slightly above-average concentration in aerospace and shipbuilding, likely driven by companies such as Lockheed Martin and NASA's significant presence at the Kennedy Space Center. Florida's IT services sector also shows promise, with an LQ of 0.79, highlighting the state's growing technology hubs in cities such as Miami and Orlando.

Despite its strengths, Florida underperforms in almost all Hamilton industries, leading to a low composite LQ of 0.50. Computers, electronics, and optical products have an LQ of 0.68, while pharmaceuticals and biotech (0.50), machinery and equipment (0.45), electrical equipment (0.41), and motor vehicle manufacturing (0.11) each register an LQ of 0.50 or below.

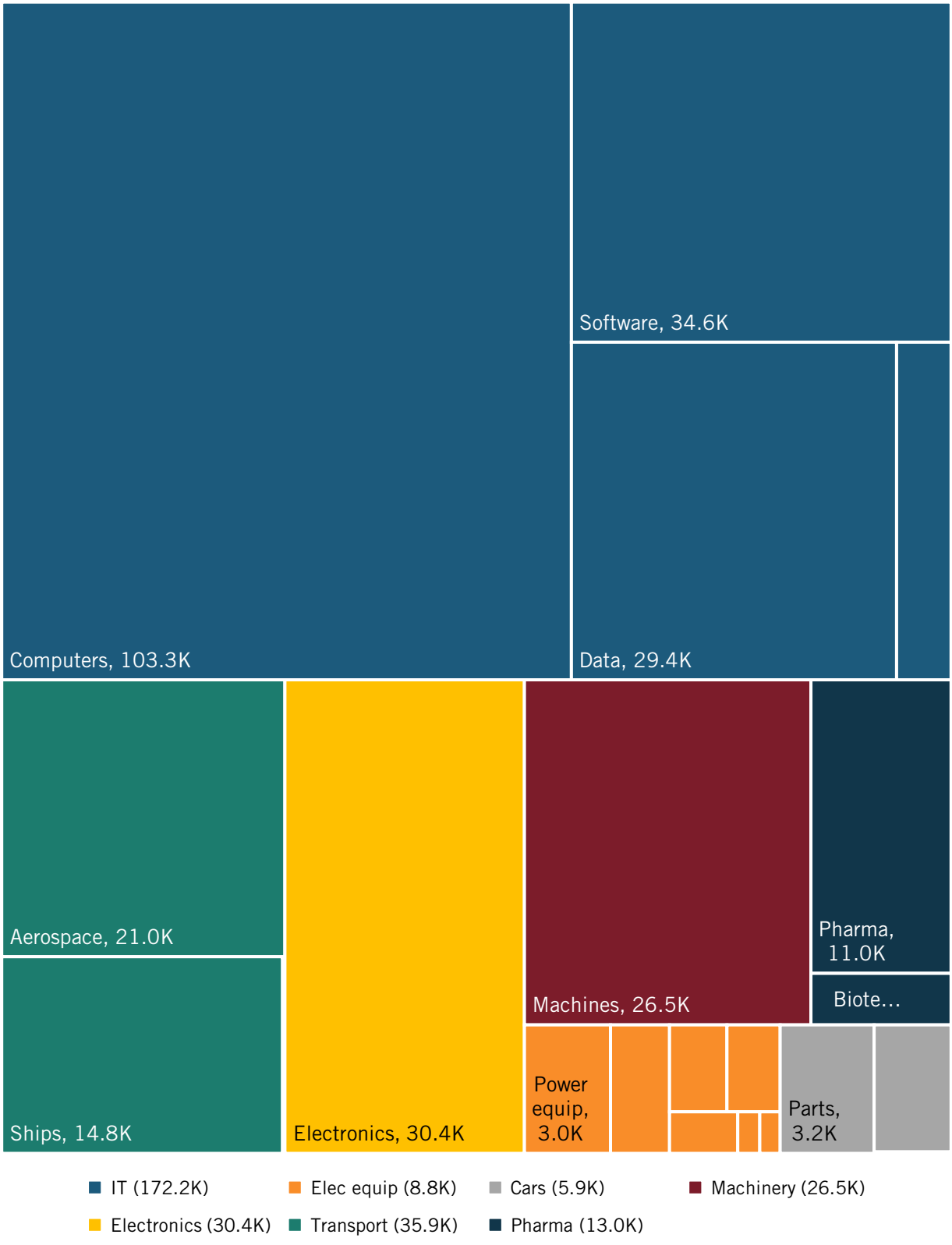
Figure 137: Florida's relative performance in Hamilton Index industries



In Florida, most Hamilton industry employees are in the IT and information services industry, with over 172,000 employees. This sector includes computer systems design (103,333), software publishing (34,593), data processing and hosting (29,405), and Internet publishing and broadcasting (4,899). Florida's growing reputation as a tech hub contributes to the sector's prominence, with notable companies such as Citrix Systems and Magic Leap driving innovation.

The transportation and electronics industries are also significant in Florida, employing about 35,900 and 30,400 individuals, respectively. The aerospace industry, a key part of the transportation sector, employs 21,011 people and highlights Florida's role in space exploration, anchored by companies such as SpaceX and Blue Origin at Cape Canaveral, among others. Florida also employs 14,768 employees in the shipbuilding subindustry.

Figure 138: Number of employees in Hamilton Index subindustries in Florida (292,700 workers total)

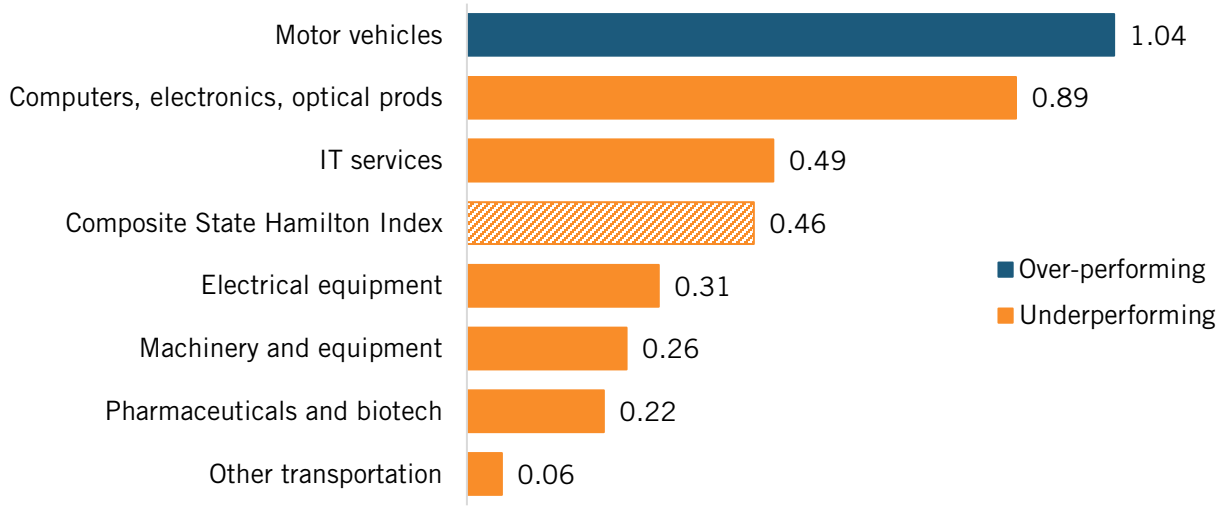


No. 44: Nevada

With its emphasis on gaming and tourism, Nevada performs poorly in advanced industries. It does slightly over-perform in the motor vehicles industry with an LQ of 1.04, reflecting the state's growing interest in electric vehicles and automotive technologies. This is partly driven by Tesla's Gigafactory near Reno, a facility for electric vehicle battery production and innovation. However, this marginal over-performance is not accompanied by strong indicators in other advanced industries.

Nevada, which relies on a service economy, underperforms in several key sectors. Computers, electronics, and optical products have an LQ of 0.89, suggesting a lower activity concentration relative to the national average. IT services, machinery and equipment, and pharmaceuticals and biotech all register LQs below 0.50, indicating limited representation in these areas. The state's weakest sector is other transportation, with an LQ of just 0.06, reflecting minimal activity in subindustries such as aerospace and shipbuilding.

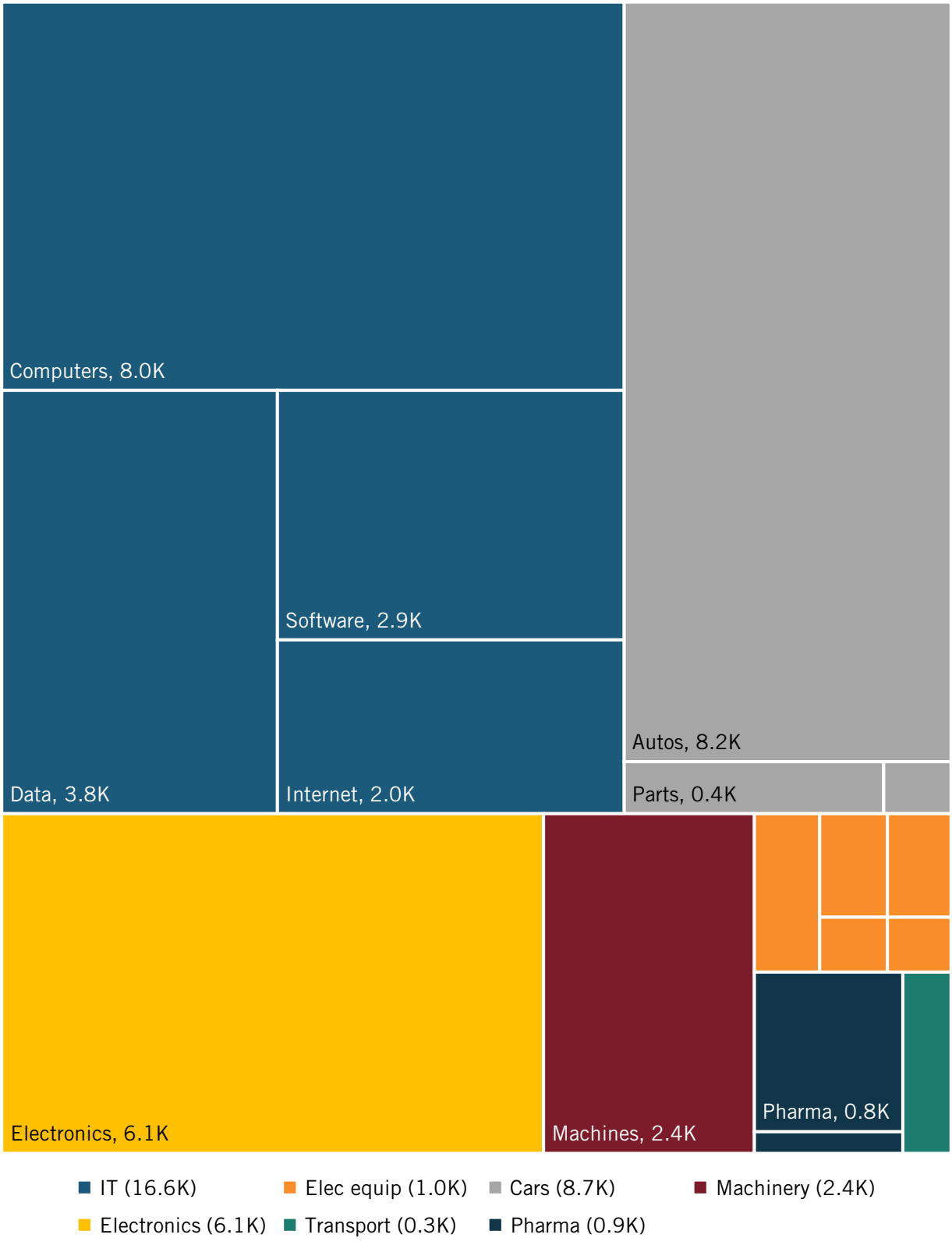
Figure 139: Nevada's relative performance in Hamilton Index industries



In Nevada, the IT and information services industry employs the most individuals, with 16,635 workers spread across areas such as computer systems design (7,956), data processing (3,843), software publishing (2,851), and Internet publishing and broadcasting (1,985). Nevada's growing IT presence reflects its strategic push toward diversifying its economy beyond hospitality and gaming, with companies such as Switch and Google establishing large data centers in the state.

Electronics manufacturing is another notable sector in Nevada, comprising the manufacturing of key electronic goods and components. This industry employs 6,058 workers in Nevada. The automotive industry is also significant, with 8,739 employees, primarily in motor vehicle manufacturing and assembly (8,179), with a small number of employees in parts manufacturing (445). The state's machinery sector employs 2,355 individuals, supporting industries such as renewable energy and mining.

Figure 140: Number of employees in Hamilton Index subindustries in Nevada (36,000 workers total)

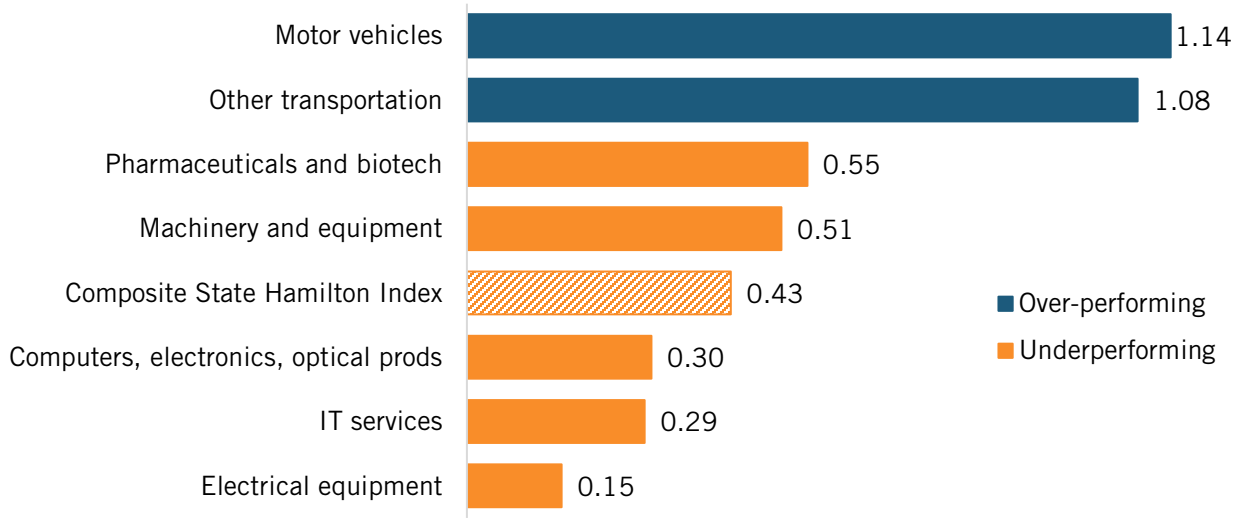


No. 45: West Virginia

West Virginia shows slight over-performance in motor vehicles and other transportation industries, with LQs of 1.14 and 1.08, respectively. The state's motor vehicle sector benefits from facilities such as Toyota's engine and transmission plant in Buffalo, which plays a pivotal role in regional automotive manufacturing.

Conversely, West Virginia significantly underperforms in several advanced industries. In high-tech industries such as pharmaceuticals and biotechnology (0.55) and IT services (0.29) and manufacturing industries, such as machinery and equipment (0.51) and electrical equipment (0.15), West Virginia severely underperforms relative to what is expected given the state's size.

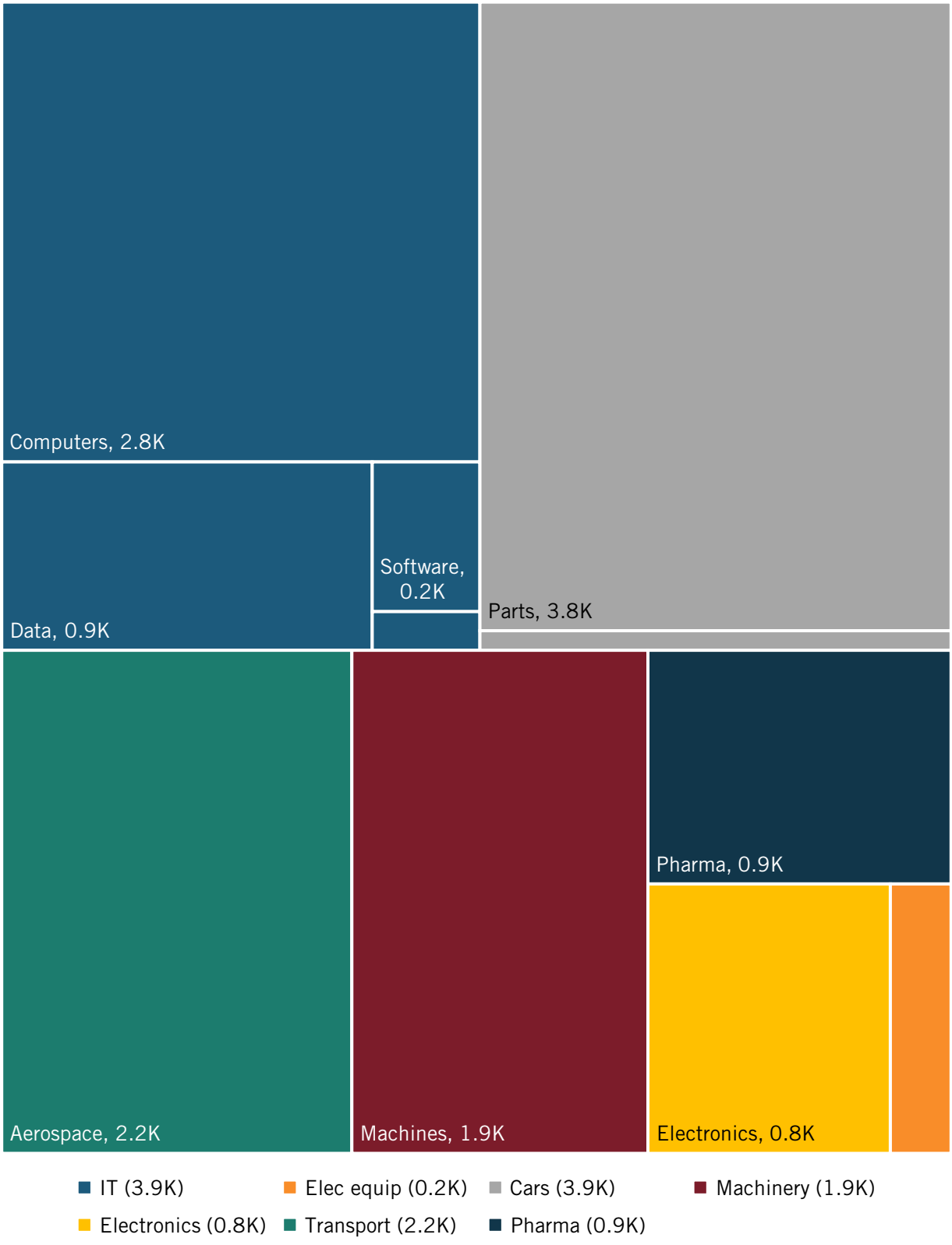
Figure 141: West Virginia's relative performance in Hamilton Index industries



The automotive and IT services industries in West Virginia employ the most individuals, with about 3,900 workers each. In automotive manufacturing, almost all employees work in parts manufacturing, with just over 100 workers in autobody and trailer manufacturing. In IT services, 2,795 workers are employed in computer systems design, followed by data processing and hosting (888), and software publishing (205).

West Virginia has a diversified manufacturing employment landscape, with aerospace products and machinery manufacturing employing about 2,000 employees each. West Virginia also employs 832 employees in computers and electronics manufacturing. Electrical equipment manufacturing is the smallest Hamilton industry in West Virginia in absolute terms, employing just 207 workers.

Figure 142: Number of employees in Hamilton Index subindustries in West Virginia (13,900 workers total)

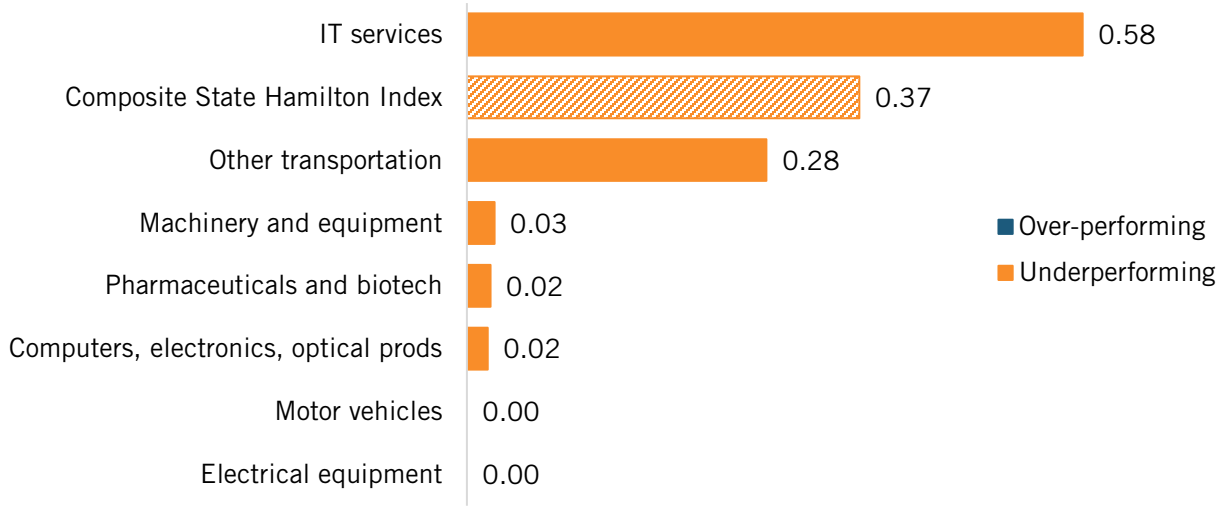


No. 46: Alaska

With its vast natural resources, Alaska does not perform strongly in advanced industries, reflected in its overall Hamilton Index score of 0.37. While underperforming nationally, IT services is the highest-ranked industry in the state with an LQ of 0.58, driven by the growing demand for digital infrastructure to support its remote and dispersed communities. The state also has a relatively modest presence in other transportation industries with an LQ of 0.28, underscoring the importance of other modes of transportation in keeping Alaska's remote areas connected with the rest of the country.

In contrast, Alaska significantly underperforms in machinery and equipment (0.03), pharmaceuticals and biotech (0.02), and computers, electronics, and optical products (0.02). Notably, motor vehicles and electrical equipment are virtually absent in the state's economy, registering LQs of 0.00. This lack of diversification highlights Alaska's reliance on traditional industries such as oil and gas, fishing, and tourism, with minimal integration into the advanced manufacturing and technology sectors.

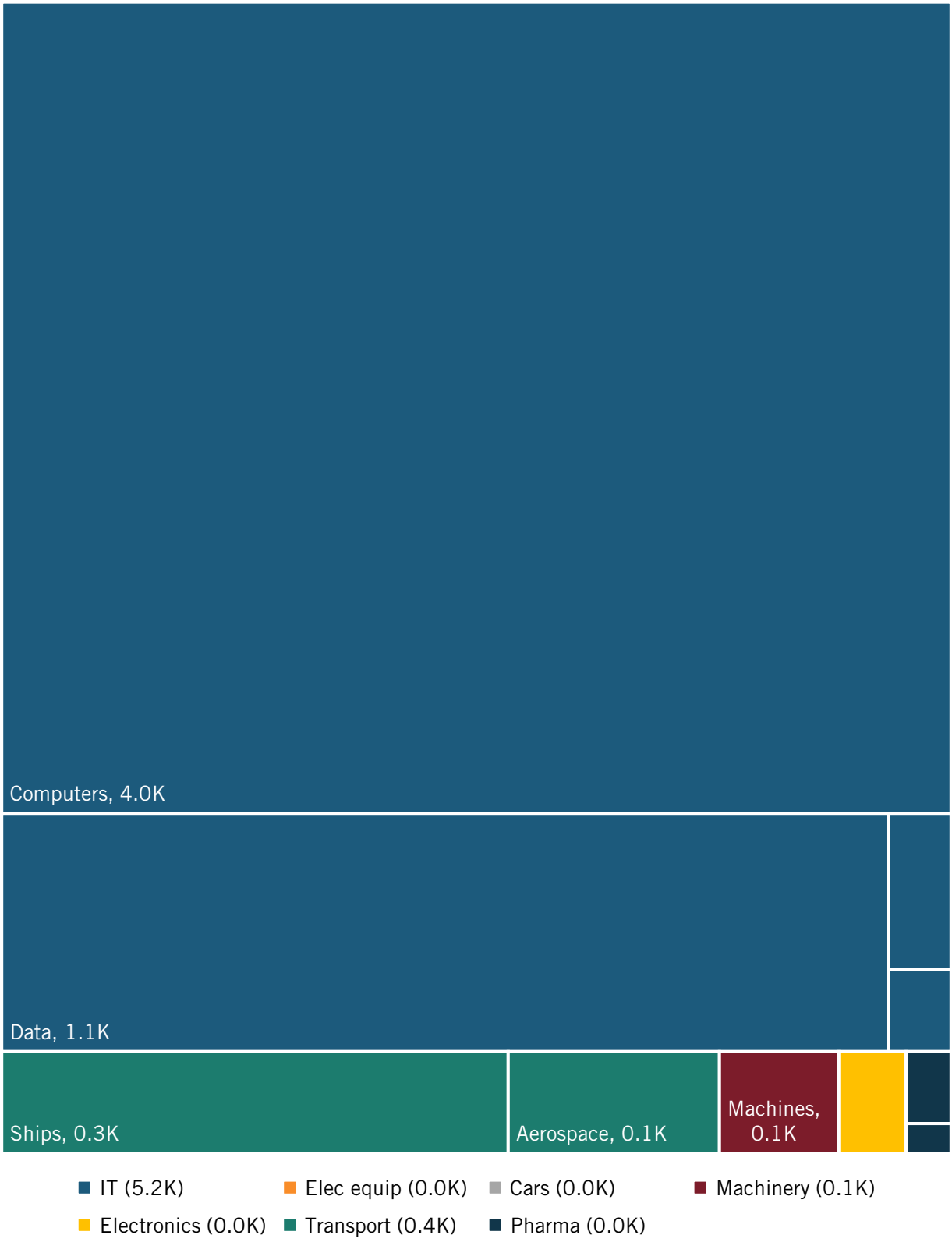
Figure 143: Alaska's relative performance in Hamilton Index industries



Just 5,745 Alaskans work in Hamilton industries, with most employed in the IT and information services sector (5,237). This includes 4,048 working in computer systems design and 1,111 in data processing. The software publishing and Internet publishing industries each employ fewer than 100 workers in the state.

Though far less prominent than the IT industry, the transportation industry is the second largest Hamilton industry in Alaska. Shipping employs 271 individuals, reflecting Alaska's reliance on maritime logistics due to its geography. Aerospace and machinery manufacturing each employ about 100 individuals. Alaska's focus on the energy and fishing industries leaves its economy undiversified, with little emphasis on advanced or high-tech sectors.

Figure 144: Number of employees in Hamilton Index subindustries in Alaska (5,700 workers total)

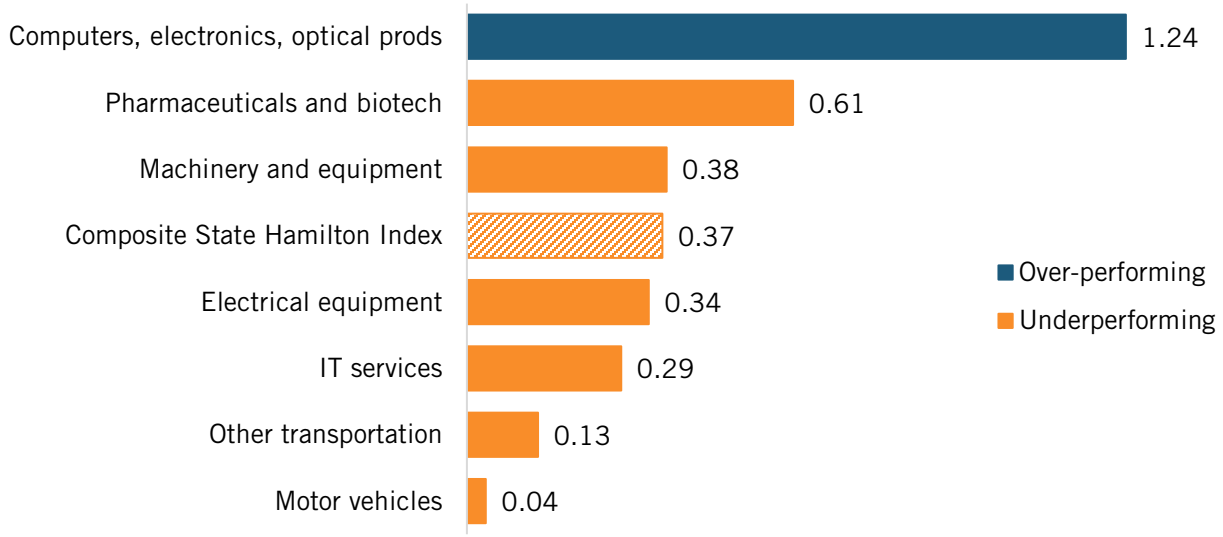


No. 47: New Mexico

New Mexico, home to prominent institutions such as Sandia National Laboratories and Los Alamos National Laboratory, demonstrates its strength in the computers, electronics, and optical products sector with an LQ of 1.24. This reflects the state's focus on advanced scientific research and technology development, supported by its significant federal and academic partnerships. Though underperforming, the pharmaceuticals and biotech industry (0.61) has grown due to the state's emerging biotech initiatives and collaboration with national research entities.

However, New Mexico underperforms across most advanced industries, with notable weaknesses in machinery and equipment (0.38), electrical equipment manufacturing (0.34), and IT services (0.29). Other transportation (0.13) and motor vehicles (0.04) have minimal presence in the state's industrial portfolio. This disparity highlights New Mexico's reliance on niche technology and research-focused sectors while struggling to establish a broader industrial base.

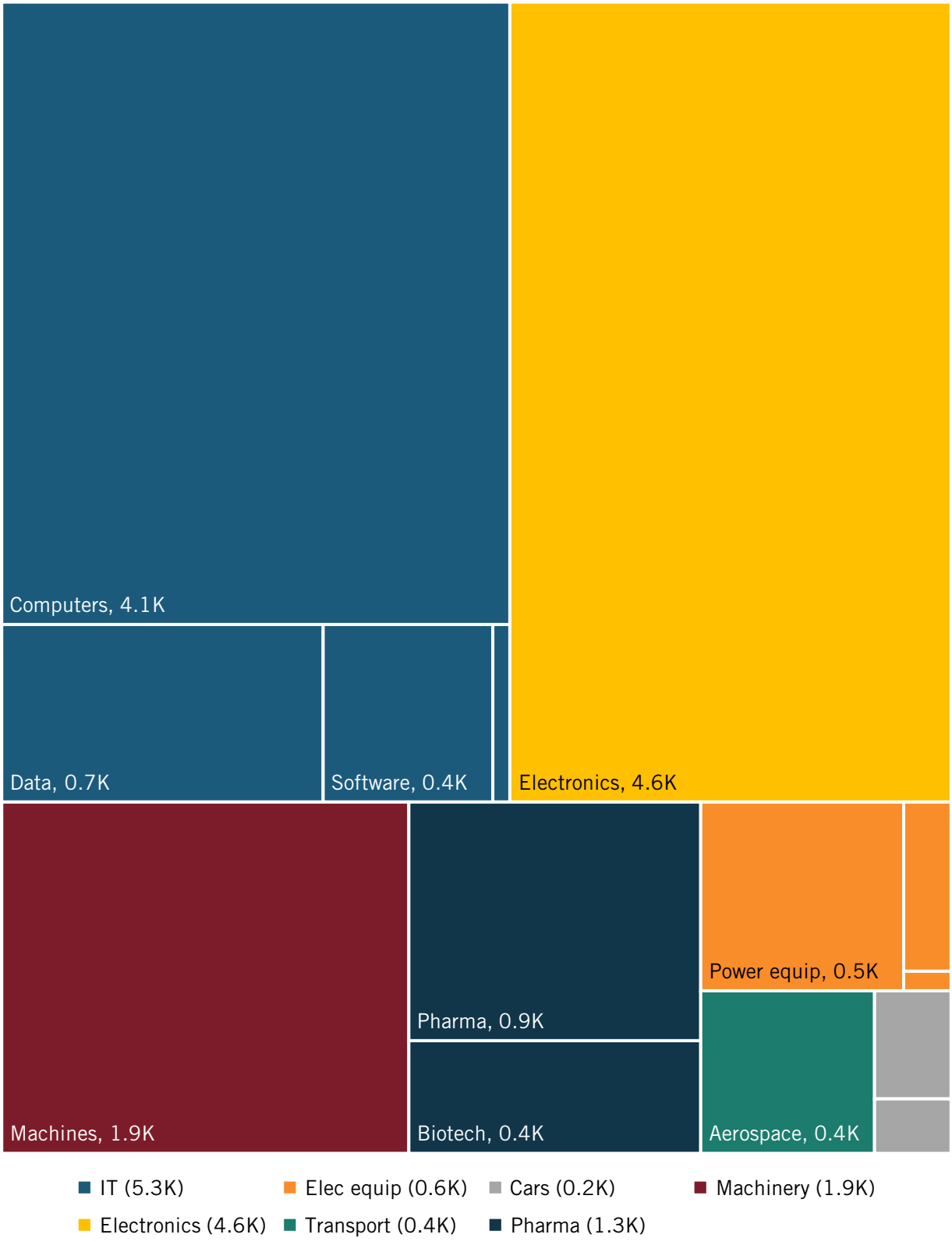
Figure 145: New Mexico's relative performance in Hamilton Index industries



In New Mexico, most Hamilton industry employees are engaged in the IT and information services industry, with 5,286 employees, predominantly working in computer systems design (4,112). The electronics industry also stands out, employing 4,588 individuals, which reflects the state's focus on advanced electronics manufacturing and its role in supporting technological innovation.

The machinery industry employs 1,858 workers, making it another notable sector in New Mexico. Additionally, the pharmaceutical and biotech sector employs 1,334 individuals, about 900 of whom work in pharmaceutical manufacturing and about 400 of whom work in biotechnology research. Research partnerships between industries and the two national laboratories in New Mexico have helped to increase the presence of advanced industries in New Mexico, particularly in research and engineering around nuclear science.

Figure 146: Number of employees in Hamilton Index subindustries in New Mexico (14,200 workers total)

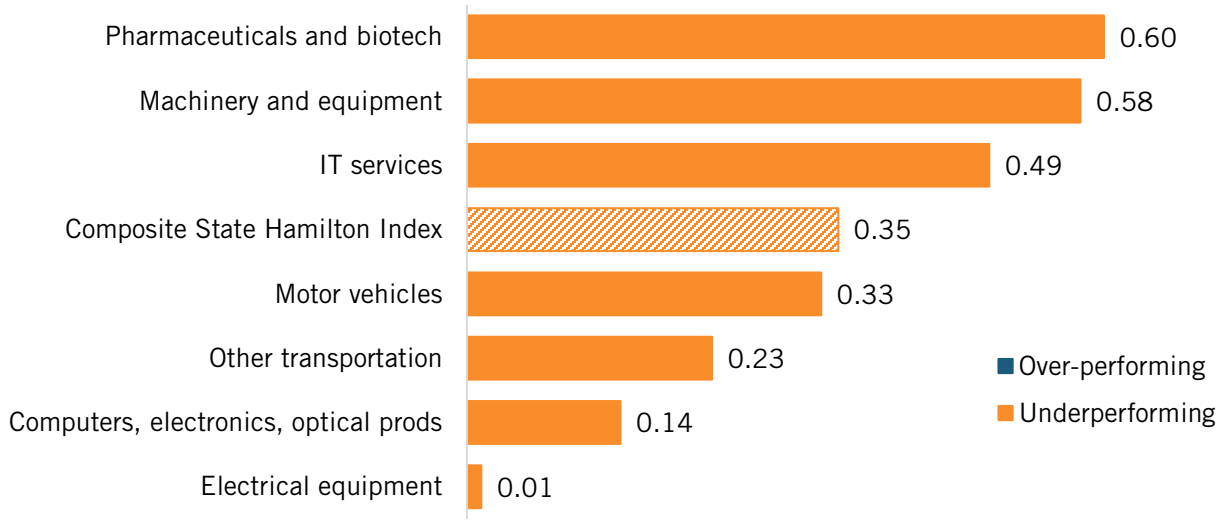


No. 48: Montana

Montana, known for its natural resources and agricultural focus, has a relatively low standing in advanced industries, with an overall LQ of 0.35. While underperforming nationally, the state's pharmaceutical and biotech sector has the highest LQ of 0.60, likely driven by regional healthcare initiatives and niche biotechnological applications. Machinery and equipment follow closely with an LQ of 0.58, reflecting the state's emphasis on agriculture and resource extraction equipment.

Montana's reliance on resource-based industries rather than high-tech or manufacturing sectors results in little to no Hamilton industries in the state. Montana underperforms in IT services, motor vehicles, other transportation, computers, electronics, and optical products, and electrical equipment, all of which have LQs below 0.50.

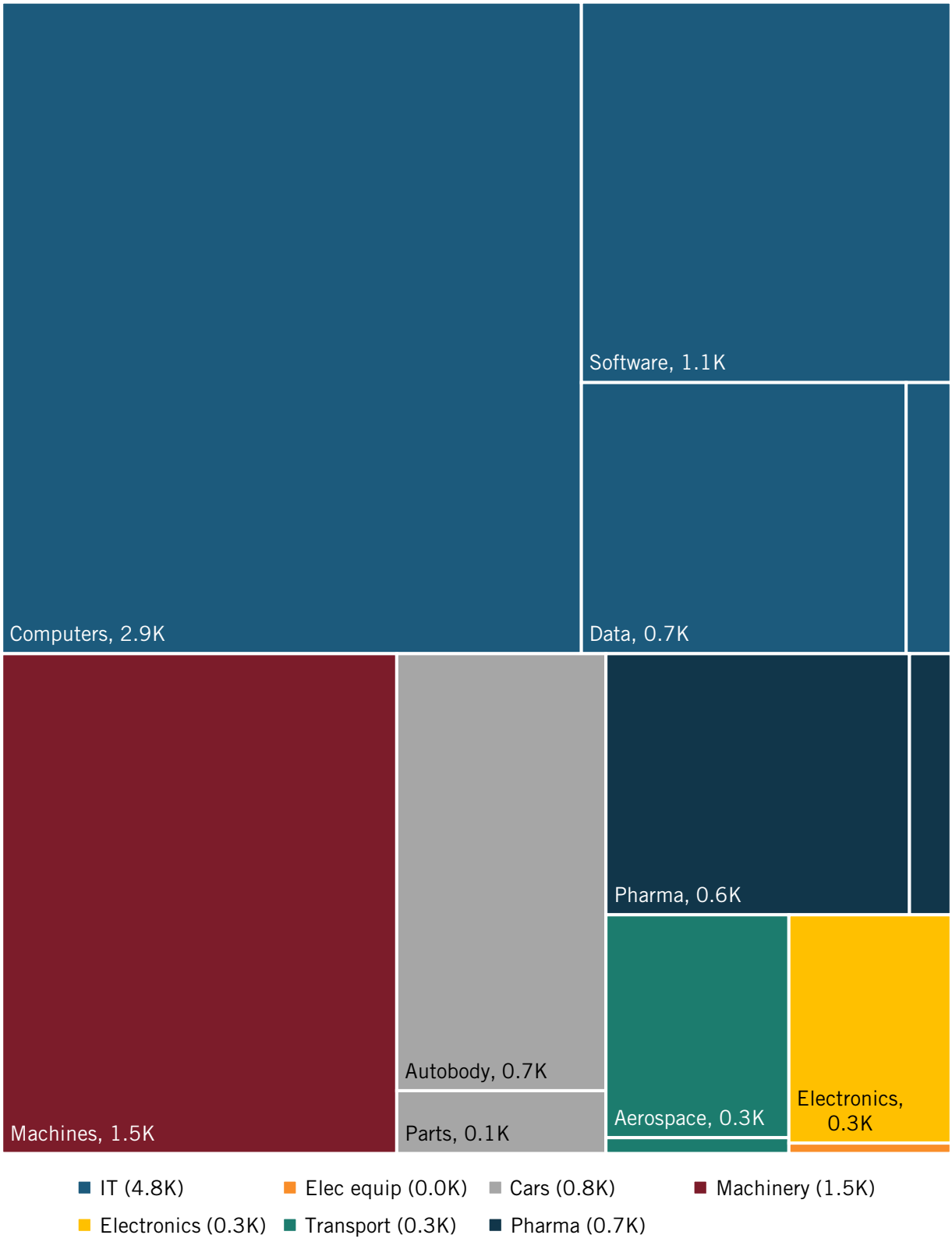
Figure 147: Montana's relative performance in Hamilton Index industries



In a state with just 8,423 Hamilton industry employees, over half are employed in the IT and information services industry. About 4,800 employees work in this sector, with 2,910 employed in computer systems design, 1,084 employed in software publishing, and 679 employed in data processing.

In addition to IT, the machinery industry employs 1,522 workers, making it a notable contributor to Montana's industrial workforce. The pharmaceutical and biotech industry employs 694 individuals, with almost all employed in pharmaceutical manufacturing (611). The growth of this industry is driven by pharmaceutical and biotech firms in Bozeman, Montana. Employment in aerospace, electronic manufacturing, and electrical equipment is very small, while other industries have no presence in the state.

Figure 148: Number of employees in Hamilton Index subindustries in Montana (8,400 workers total)

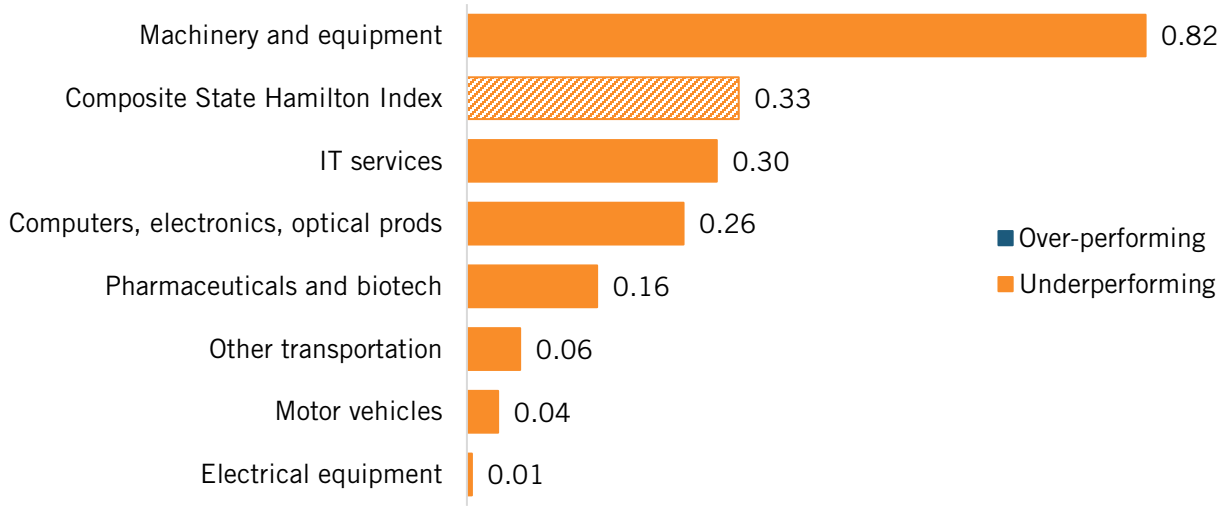


No. 49: Wyoming

Wyoming, known for its energy sector and open landscapes, struggles to achieve parity in advanced industries, as reflected by its low composite Hamilton Index of 0.33. Machinery and equipment is the state's most prominent industry, with an LQ of 0.82, supporting the state's prominent energy and agricultural industries.

In contrast, Wyoming significantly underperforms in most advanced industries. Other transportation (0.06), motor vehicles (0.04), and electrical equipment (0.01) are particularly weak areas, reflecting a lack of infrastructure and investment in these sectors. Similarly, pharmaceuticals and biotech (0.16) and computers, electronics, and optical products (0.26) remain underdeveloped. IT services, while slightly stronger with an LQ of 0.30, still lags behind the national average, emphasizing the state's overall reliance on resource-based industries rather than diversification into advanced manufacturing or technology-driven fields.

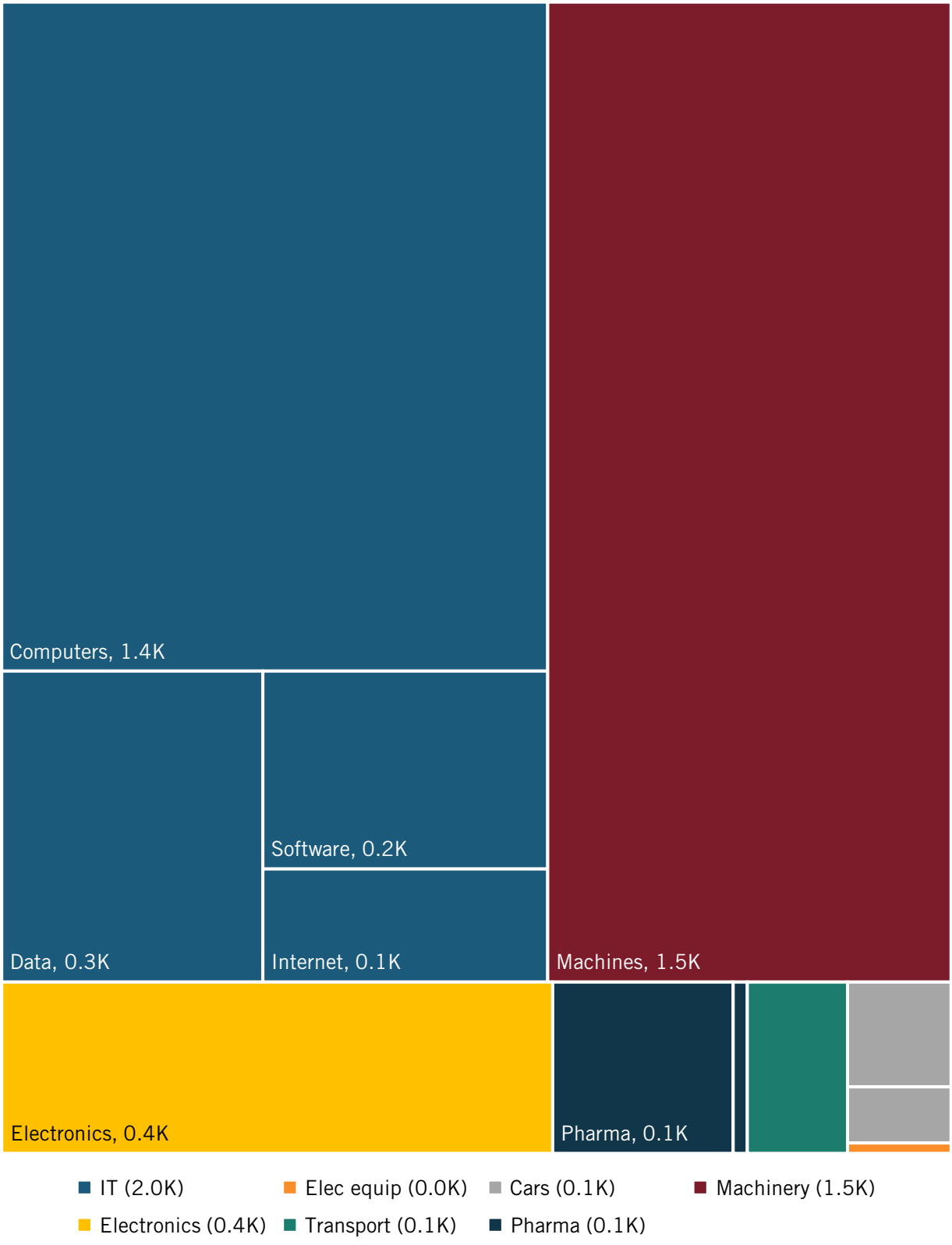
Figure 149: Wyoming's relative performance in Hamilton Index industries



In Wyoming, the largest share of advanced industry employees is found in the IT and information services industry, with 2,024 workers. Among these, 1,382 individuals are engaged in computer systems design, while smaller numbers work in data processing and hosting (307), software publishing (213), and Internet publishing and broadcasting (122).

The machinery industry is another notable contributor, employing almost 1,500 individuals, making it the second largest of Wyoming's Hamilton industries in absolute terms. The electronics manufacturing industry employs 357 people, well below what is expected in relative terms, yet it is also one of the largest advanced industries in the state in absolute employment. Industries such as pharmaceuticals, aerospace, and transportation have limited representation in the state, suggesting that a concerted effort is necessary to bring more firms in advanced industries to Wyoming.

Figure 150: Number of employees in Hamilton Index subindustries in Wyoming (4,100 workers total)

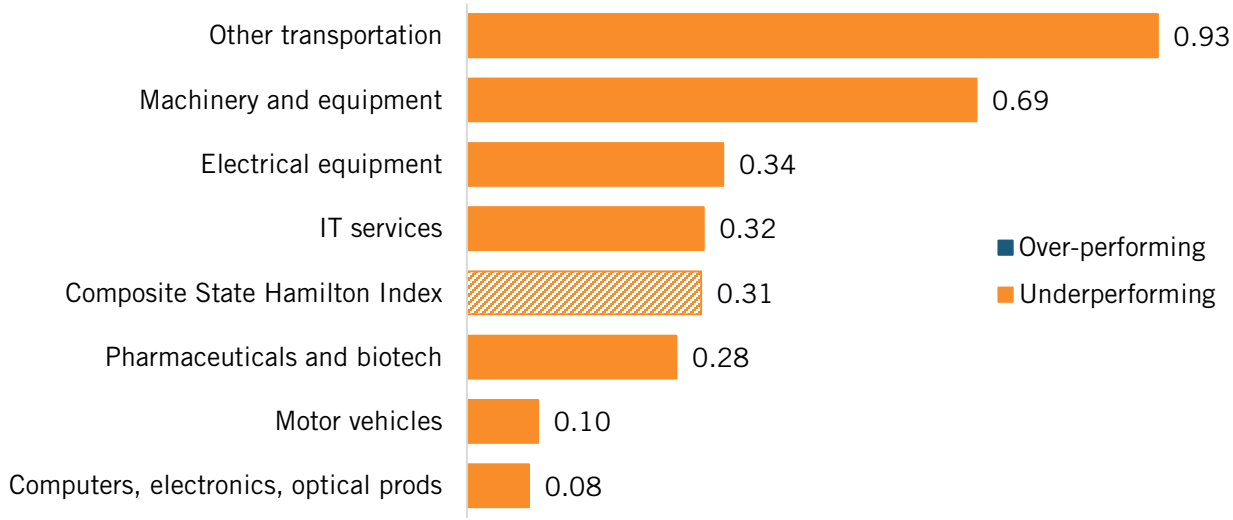


No. 50: Louisiana

A state known for its petrochemical and transportation industries, Louisiana has a composite Hamilton Index of 0.31, highlighting its challenges in advanced industries. Other transportation equipment is the strongest-performing sector in Louisiana, with an LQ of 0.93, reflecting the presence of port-related industries and shipbuilding. Companies such as Bollinger Shipyards and Edison Chouest Offshore contribute to the relative strength of this sector. Machinery and equipment manufacturing follows with an LQ of 0.69, driven by demand from the oil and gas industries.

In contrast, Louisiana underperforms significantly in sectors such as motor vehicles (0.10) and computers, electronics, and optical products (0.08). Electrical equipment (0.34) and IT services (0.32) also struggle to gain traction in the state. This lack of diversification underscores Louisiana's dependence on its traditional industries and the need for initiatives to foster innovation and growth in advanced manufacturing and technology sectors.

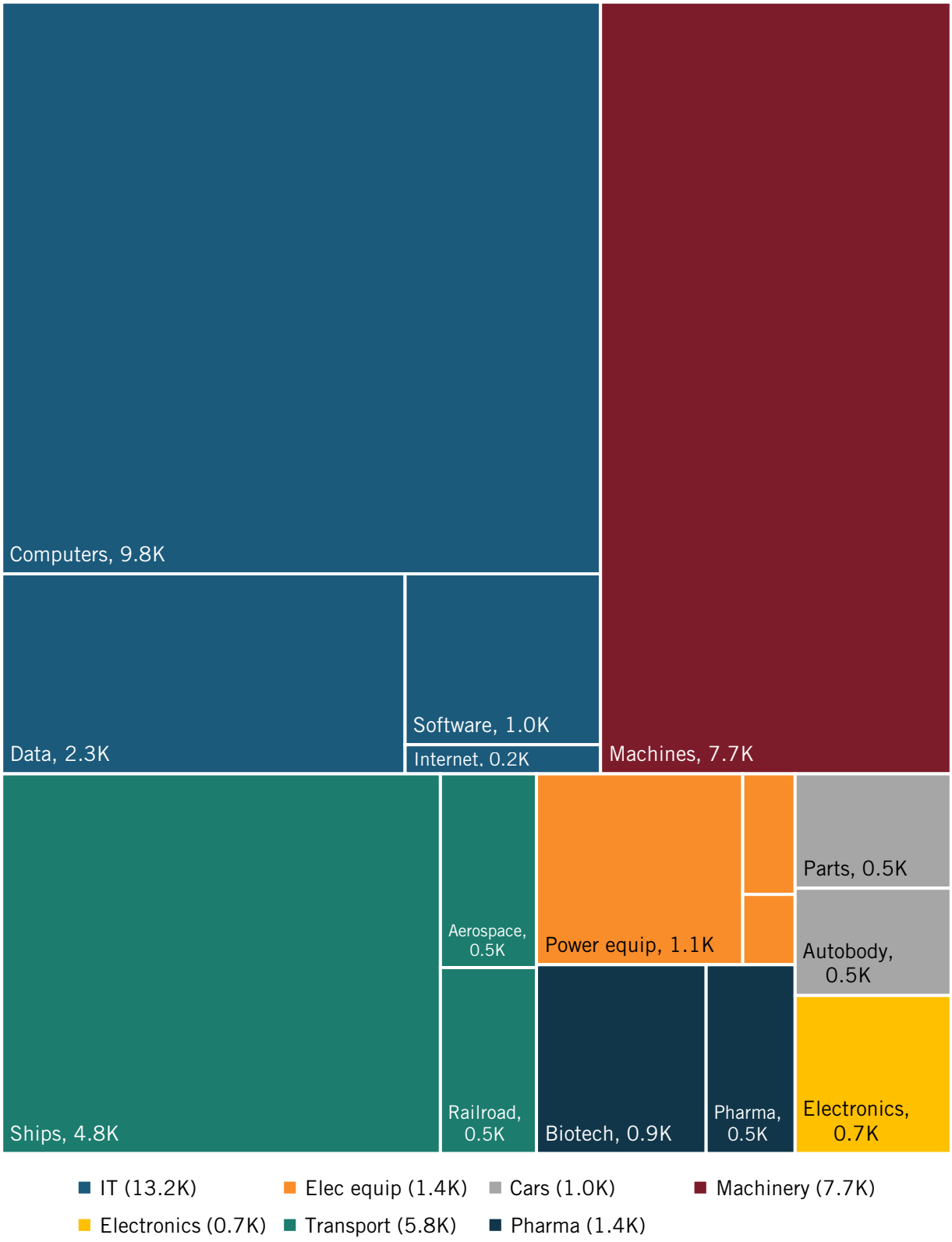
Figure 151: Louisiana's relative performance in Hamilton Index industries



In Louisiana, the IT and information services industry employs the most workers, with 13,224 employees, including 9,796 in computer systems design. The data processing and software publishing subindustries also play a significant role, employing 2,308 and 958 workers, respectively, while the Internet publishing and broadcasting industry employs under 200 employees.

The machinery industry is another significant employer, with 7,737 workers. Additionally, the transportation industry, particularly shipbuilding, stands out with 4,765 employees, reflecting Louisiana's strategic position along the Gulf Coast. Other subindustries within other transportation, such as aerospace and rail, are much smaller, employing about 500 employees each. There are a few other prominent advanced industries in Louisiana, with low employment in both heavy manufacturing industries and pharmaceuticals and biotech.

Figure 152: Number of employees in Hamilton Index subindustries in Louisiana (31,300 workers total)

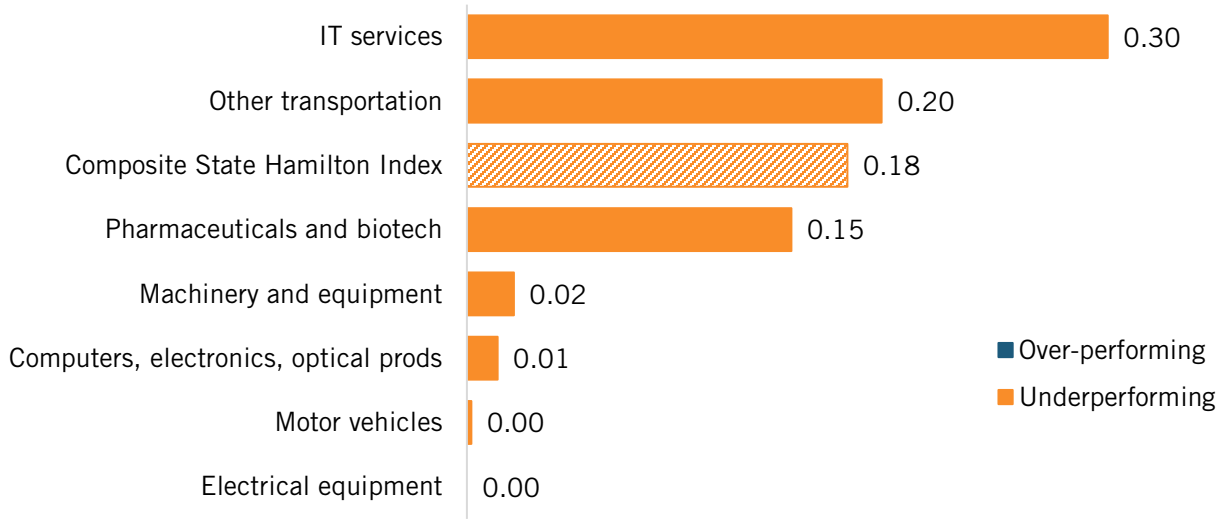


No. 51: Hawaii

Given its tourism-driven economy, it is unsurprising that Hawaii underperforms in the Hamilton Index. The state has a Composite Hamilton Index of 0.18. IT services, the state's strongest sector, has an LQ of 0.30, showcasing potential for growth in digital infrastructure and technology-related businesses. However, this figure still falls far below the national benchmark, indicating a limited presence of technology companies compared with other states.

With its location far from the contiguous United States, it's also unsurprising that manufacturing industries such as other transportation (0.20), machinery and equipment (0.02), and motor vehicles (0.01) have little to no presence in the state. If Hawaii wishes to better its competitiveness in advanced industries, it would be better served to focus on growing service and high-tech industries, such as pharmaceuticals and biotech, which has an LQ of 0.15.

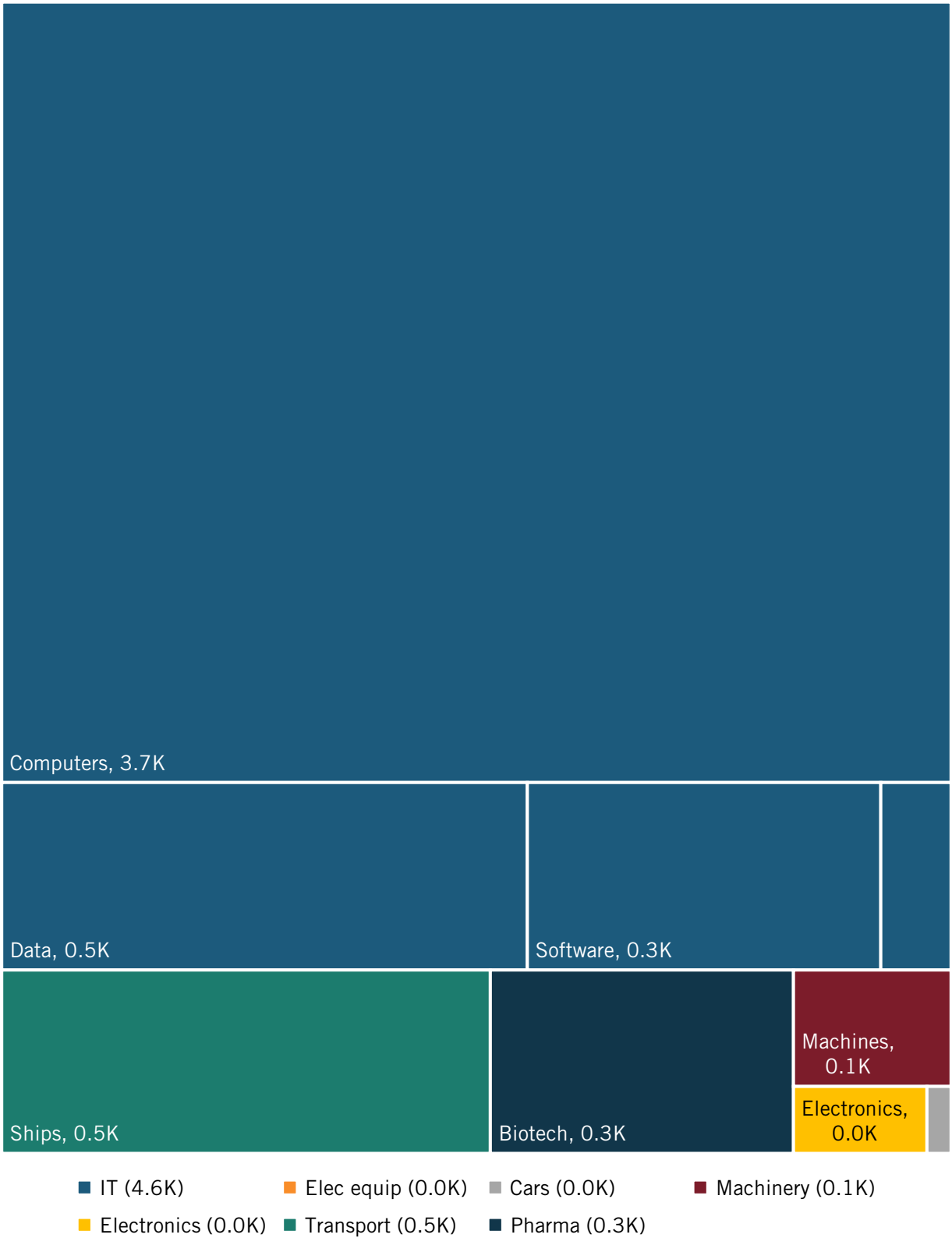
Figure 153: Hawaii's relative performance in Hamilton Index industries



In Hawaii, most Hamilton industry employees are concentrated in the IT and information services industry, employing 4,615 individuals. Within this sector, computer systems design is the largest subindustry, with 3,721 employees, followed by data processing, employing 495 individuals. Software publishing and Internet publishing and broadcasting subindustries account for smaller segments, with about 300 and 100 employees, respectively.

The transportation industry also has a notable presence, with 500 employees in the shipbuilding subindustry, reflecting Hawaii's reliance on maritime activities due to its geographic location. Biotech R&D employs approximately 300 individuals, while machinery manufacturing and electronics and computer manufacturing each employ fewer than 100 employees.

Figure 154: Number of employees in Hamilton Index subindustries in Hawaii (5,500 workers total)



POLICY RECOMMENDATIONS

Most states have economic development programs emphasizing growth in advanced technology sectors. While these sectors succeed in providing job growth and, in some cases, attract new and innovative industries, state policies remain fragmented, with little coordination from the federal government. While it's critical for states to continue pushing forward in their own economic development efforts, it is equally critical for the federal government to partner with state governments to coordinate a national development strategy in advanced industries. To do this, Congress and state governments must prioritize four things:

Stop Using Taxpayer Dollars to Attract Chinese Companies to the United States

State governments have long taken up the strategy that "all jobs are good jobs," supporting whatever strategy is necessary to increase job growth and decrease unemployment for their constituents. This has included subsidizing Chinese foreign direct investment (FDI) in the form of greenfield (building a new facility on American soil) or acquisition (buying an American firm). While this strategy may be lucrative for lawmakers and U.S. citizens locally, it harms American businesses, giving a leg up to firms from China, a country where industrial subsidization has reached record highs.

If the United States wants to advance its competitiveness, state and local governments must stop providing taxpayer dollars to its greatest competitors. The federal government should ban this practice while still encouraging incentives to attract American firms and friendly FDI. Congress can start by prohibiting federal aid, such as grants, loans, and tax breaks, from being awarded to Chinese firms or firms connected to Chinese interests. Additionally, Congress can make economic development aid to states conditional on following the same practices and not providing incentives to Chinese firms.[11]

Establish Grant Programs for States to Attract FDI and Domestic Advanced Technology Production Similar to the CHIPS Act

The CHIPS Act successfully incentivized domestic and international semiconductor firms to grow operations in the United States, using $52.7 billion in funding. Most of these firms settled in semiconductor manufacturing hubs, such as Arizona and Texas; however, others set up operations in states with strong economic development plans, such as New York with its Green CHIPS Act, which provides $10 billion in tax credit to firms opening semiconductor fabs.[12]

To attract greenfield FDI in key industries, Congress should promote state economic development initiatives such as New York's Green CHIPS Act for other technology areas. A new program under the Department of Commerce should allocate up to $5 billion annually in matching funds for state-led initiatives targeting biotechnology, machinery manufacturing, and other advanced industries. States can choose the industries they specialize in to play to their own economic strengths, though the industries must be in a traded sector and improve U.S. global competitiveness.

Retool the Regional Technology Hub Programs

ITIF has advocated for regional growth centers, or technology hubs (in 2019), arguing that targeted federal investment through the Department of Commerce for promising metro areas could transform small industries into self-sustaining innovation centers such as Silicon Valley or Cambridge, Massachusetts.[13] These hubs would attract top talent, foster entrepreneurship, and

accelerate industrial innovation. Congress appropriated funds for these hubs, authorizing $10 billion to the Tech Hub Program under the Economic Development Administration (EDA). However, other agencies—including the National Science Foundation (NSF), the Defense Department (DOD), and the Small Business Administration (SBA)—have since launched their own competing initiatives.

Together, these programs have allocated tech hub funding to 48 states, leading to fragmentation rather than specialization. Multiple cities have been awarded funding to develop a hub for the same technology area. For example, 22 regions have been awarded funding for biotechnology.[14]

This strategy has been unsuccessful, and taxpayer dollars are being used for an incoherent and inefficient industrial strategy. Instead of continuing down this path, Congress should narrow and concentrate funding from these programs toward only NSF and EDA, allowing the two agencies to allocate just 15 technology hubs. Any future technology generation awards from DOD and SBA can be directed to one of these 15 hubs. If Congress wishes to maintain its current strategy, the "hub" title should be retracted, and funding should be awarded as part of a regional technology grant program. Regardless of how Congress reshapes the program, grants should only be allocated to regions focusing on key technology areas, such as those in the Hamilton Index.

Host an Annual National Economic Development Summit

Each state has its own Department of Commerce with competitiveness and development strategies independent of the federal government. It should be the job of the federal Commerce Department and, namely, the secretary of the Treasury to coordinate these strategies in an annual conference between himself, other top federal economic development officials, and the economic development leaders of each state. This short conference would allow state officials to coordinate with federal economic strategy, discussing problems, opportunities, and possible solutions in rules and regulations. This forum would also serve as an opportunity to develop and rework grant and assistance programs between federal and state governments and discuss potential interstate cooperation.[15]

CONCLUSION

China's industrial and innovative capabilities, at least in terms of LQ, significantly exceed the United States'. In this position, the United States has placed itself at risk in economic and national security, making itself vulnerable to weakened supply chains, trade manipulation, and economic instability. The results of the *State Hamilton Index* reveal that 19 states over-perform in advanced industries when compared with the national average, only 4 over-perform globally, and just 1 outperforms China.

Across-the-board tariffs on most countries and industries are not likely to do much to change this, in large part because most advanced industries rely on foreign markets for a considerable portion of sales, and aggressive U.S. trade protection will lead to an equal response from foreign nations, reducing many of these firms' foreign sales. As such, to reclaim leadership in advanced industries, the United States must adopt a comprehensive, coordinated industrial strategy that aligns federal and state policies toward a common goal: strengthening domestic production in key sectors. This requires states to end counterproductive incentives for Chinese firms, target investments in strategic industries, and reimagine regional economic development. A more focused and coordinated effort will be critical to reversing America's industrial decline.

The time for a piecemeal approach to industrial strategy has passed. Without decisive action, the United States risks falling further behind. By leveraging comparative advantages at the state level, fostering innovation clusters, and committing to sustained investment in advanced industries, the United States can rebuild its industrial foundation and reassert itself as a dominant force in the global economy.

Acknowledgments

The author would like to thank Robert Atkinson for his advice and guidance with this report. Any errors or omissions are the author's sole responsibility.

About the Author

Meghan Ostertag is a research assistant at ITIF. She was previously an intern with the Federal Deposit Insurance Corporation. She earned her bachelor's degree in economics from American University.

About ITIF

The Information Technology and Innovation Foundation (ITIF) is an independent 501(c)(3) nonprofit, nonpartisan research and educational institute that has been recognized repeatedly as the world's leading think tank for science and technology policy. Its mission is to formulate, evaluate, and promote policy solutions that accelerate innovation and boost productivity to spur growth, opportunity, and progress. For more information, visit itif.org/about.

ENDNOTES

1. Robert D. Atkinson, "Computer Chips vs. Potato Chips: The Case for a U.S. Strategic-Industry Policy" (ITIF, January 2022), https://itif.org/publications/2022/01/03/computer-chips-vs-potato-chips-case-us-strategic-industry-policy/.
2. Cameron Davis et al., "Building Innovation Ecosystems: Accelerating Tech Hub Growth" (McKinsey & Company, February 2023), https://www.mckinsey.com/industries/public-sector/our-insights/building-innovation-ecosystems-accelerating-tech-hub-growth.
3. Karyn Morrissey, "A Location Quotient Approach to Producing Regional Production Multipliers for the Irish Economy," *Papers in Regional Science,* vol. 95, no. 3 (2016): 491–507, https://doi.org/10.1111/pirs.12143.
4. United States Census Bureau (County Business Patterns: 2022), accessed October 2024, https://www.census.gov/data/datasets/2022/econ/cbp/2022-cbp.html.
5. The 2023 Hamilton Index analyzes 10 advanced industries rather than 7. This report does not analyze output in basic metals, chemicals, or fabricated metals.
6. Mariya Pominova et al., "The Stability of Location Quotients," *The Review of Regional Studies*, no. 52, (2022): 296–320, http://dx.doi.org/10.52324/001c.66197.
7. Ibid.
8. Organization for Economic Cooperation and Development (OECD), Trade in Value Added (TiVA), 2022 ed. Principal Indicators (accessed September 5, 2023), https://stats.oecd.org/Index.aspx?DataSetCode=TIVA_2022_C1.

9. The output of states is measured using employment data from 2022, while the global output is measured using value-added data from 2020. These differences are due to the constraints of the available data.
10. Robert D. Atkinson, "China is Rapidly Becoming a Leading Innovator in Advanced Industries" (ITIF, September 2024), https://itif.org/publications/2024/09/16/china-is-rapidly-becoming-a-leading-innovator-in-advanced-industries/.
11. Robert D. Atkinson, "State and Local Government Need to Stop Subsidizing Chinese Companies," *The Hill,* April 21, 2022, https://thehill.com/opinion/finance/3275383-state-and-local-governments-need-to-stop-subsidizing-chinese-companies/.
12. Fran Hagarty, "Key US States Emerge in Domestic Reshoring of Semiconductor Manufacturing," *S&P Global,* October 26, 2023, https://www.spglobal.com/market-intelligence/en/news-insights/research/us-states-win-domestic-reshoring-semiconductor-manufacturing.
13. Robert D. Atkinson et al., "The Case for Growth Centers: How to Spread Tech Innovation Across America" (ITIF and Brookings, December 2019), https://www2.itif.org/2019-growth-centers.pdf.
14. Robert D. Atkinson and Trelysa Long, "Tech Hubs or Tech Dispersion?" (ITIF, January 6, 2025), https://itif.org/publications/2025/01/06/tech-hubs-or-tech-dispersion/.
15. Robert D. Atkinson, "Secretary Raimondo Should Host a National Economic Development Summit with Her State Counterparts" (ITIF, May 2023), https://itif.org/publications/2023/05/30/secretary-raimondo-should-host-a-national-economic-development-summit/.