2024 California Statewide National Security Economic Impacts Study

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Requested by

Acknowledgements

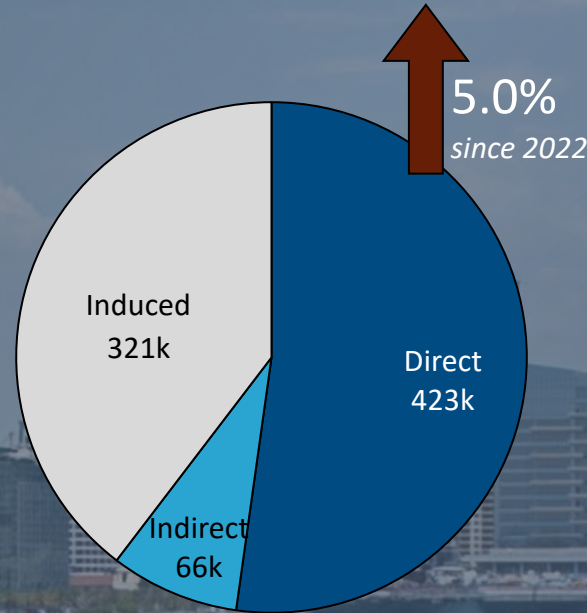# California Statewide National Security Economic Impacts, 2024 Update

6 Key Findings

National security agencies are significant employers in California and a major source of business for numerous industries in the state. This is the seventh annual report the California Research Bureau at the California State Library has prepared at the request of the Governor's Office of Land Use and Climate Innovation and the Governor's Military Council that explores the economic impact of national security activity within California.

This report, using fiscal year 2023 public data from the U.S. Departments of Defense, Homeland Security, and Veterans Affairs finds:

1 National security activity generates 810,000 full-time equivalent jobs for residents of California.

This includes 423,000 full-time equivalent jobs (FTEs) directly employed by the national security agencies and their contractors. The Departments of Defense, Homeland Security, and Veterans Affairs combined to employ approximately 336,000 Californians, including 161,000 active-duty and 53,000 reserve service members, as well as 122,000 civilian employees. In addition, 66,000 FTEs are employed indirectly through the supply chain of direct activities and 321,000 FTEs are employed as a result of economic activity induced by the additional money in the economy.

5.0% *since 2022*

Induced 321k · Direct 423k · Indirect 66k

FTE Employment

2 National security activity produces $196.7 billion in economic impact across California.

The $196.7 billion represents approximately 5.1% of the state's economy.[1] This includes:

- $110.0 billion of direct economic activity by the agencies and their contractors;
- $17.9 billion of indirect economic activity created through the supply chain of direct activities; and
- $68.9 billion of induced economic activity as a result of additional money in the economy.
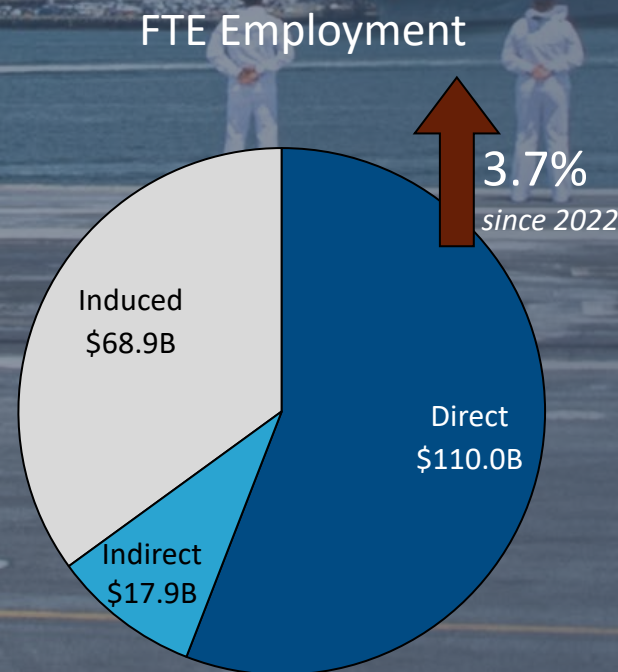
Industries that had the largest impacts from national security activity in the state include manufacturing (aerospace and electronics); professional services (particularly, scientific research and development); real estate; insurance; and healthcare.

3.7% *since 2022*

Induced $68.9B · Direct $110.0B · Indirect $17.9B

Economic Output

[1] May not sum due to rounding.

3 **The economic impacts of national security activity were felt across industries.**

The state's various manufacturing sectors saw over $21.7 billion in total economic output and over 44,200 FTE jobs supported by national security activity. The top manufacturing sectors include aerospace ($6.8 billion in output and 15,100 FTEs) and electronics ($4.0 billion and 6,300 FTEs). Other industrial sectors impacted by national security activity include professional services, with $20.2 billion in output and 85,900 FTEs (especially scientific research and development: $6.6 billion and 19,400 FTEs); real estate ($13.2 billion and 18,900 FTEs); insurance ($9.5 billion and 23,500 FTEs); and healthcare ($7.8 billion and 49,800 FTEs).

4 **California is home to more security-related employment than any other state, third in spending.**

California has 161,000 active-duty service members, more than any other state, ahead of Virginia (127,000), Texas (111,000), and North Carolina (91,000), the next highest states. California's 122,000 civilian employees top Virginia (119,000) and Texas (110,000), as well. California had the third largest share of national security-related contracts in 2023 with $35.0 billion across the three departments, trailing Texas ($66.8 billion) and Virginia ($45.3 billion).

5 **National security activity generates $31.7 billion in tax revenue for federal, state and local governments.**

Federal tax revenue from national security activity in California totals $20.4 billion. State tax revenue totals $8.4 billion, including $3.3 billion in state income tax revenue, $2.4 billion in sales tax, and $2.1 billion in property tax, as well as other smaller taxes and fees.

6 **Including a portion of the Department of Energy's activities would increase total economic activity in California by approximately $5.5 billion.**

The estimated portion of Department of Energy activity related to national security leads to approximately $5.5 billion in total output and 20,800 FTEs, which are mostly concentrated in scientific research and development.

A B-21 Raider undergoes flight testing at Edwards Air Force Base.

Contents

Army soldiers parachute during Aerial Delivery Exercise 24 at a drop zone in Fort Hunter Liggett.

California Statewide National Security Economic Impacts, 2024 Update

Introduction

California is home to the nation's largest concentration of military personnel and other national security activity. Some 161,000 active-duty military personnel and an additional 53,000 reservists and National Guard are stationed at more than 30 military installations across California.[1] About 1.4 million veterans call California home.[2] National security agencies employ an additional 122,000 civilians in California.[3] In fiscal year 2023,[4] military and other national security activity in the state generated an estimated $196.7 billion in economic activity, approximately 5.1% of California's economy.[5]

The California Research Bureau at the California State Library produced this report with support from the California Governor's Office of Business and Economic Development at the request of the Governor's Office of Land Use and Climate Innovation and the Governor's Military Council. The California Research Bureau previously released a report estimating the economic impact of national security spending in California during fiscal years 2016 and 2018 through 2022.[6] The report uses fiscal year 2023 spending and employment data from the Departments of Defense, Homeland Security, and Veterans Affairs to expand existing research to include estimated impacts of national security spending in each of California's 58 counties and 52 congressional districts. The estimates for impacts in California counties and congressional districts will be published in late 2024.

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[1] Defense Manpower Data Center (Sept. 2023). Department of Defense Personnel, Workforce Reports & Publications.

[2] California Association of Veteran Service Agencies (2023). The California Veterans Community Report.

[3] Department of Defense, Department of Homeland Security and Department of Veterans Affairs.

[4] Fiscal year, as mentioned throughout this report, refers to the federal fiscal year.

[5] CRB calculation based on the California Department of Finance's estimate of California state Gross Domestic Product (GDP) of $3,862,171,400,000 for 2023.

[6] All prior reports can be found on the California Governor's Military Council website.

Prior to this study, all studies on the impacts of national security spending in California have been limited in geography and/or scope. The Department of Defense provides annual reports on direct spending and employment without conducting economic impact studies.[7] The San Diego Military Advisory Council has produced an economic analysis annually since 2008.[8] It provides similar analysis to this report but is limited to San Diego County. In addition, while a number of other analyses have been completed over the years, they are generally limited to the relative impact of a specific base on its local or regional community.

This report focuses on estimated impacts from the U.S. Departments of Defense, Homeland Security, and Veterans Affairs. In addition, U.S. Department of Energy impacts are provided as a supplement and are not included in the overall estimate. Intelligence spending such as the Defense Advanced Research Projects Agency, which is responsible for the development of emerging technologies for national defense, is included if the source of funding is included under the agencies specified above. Other agencies with national security responsibilities either have limited data availability due to security concerns, and/or do not have the data available to disambiguate security and non-security activities within the agency.

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[7] U.S. Department of Defense Office of Local Defense Community Cooperation. Defense Spending by State.
[8] San Diego Military Advisory Council. Military Economic Impact Report.

Direct Activity

The three federal agencies identified – Defense, Homeland Security, and Veterans Affairs[9] – collectively spent $53.5 billion in California and directly employed approximately 336,000 civilians and military personnel (including reservists and National Guard) in the state during fiscal year 2023. The largest share of direct spending comes from Department of Defense contracting, totaling $32.0 billion. Veterans Affairs direct payments totaling $13.4 billion represented the bulk of the remaining direct spending and Veterans Affairs contracts added an additional $2.3 billion to the total in direct spending. Homeland Security contracts add about $737 million. In addition, the federal government's charge card program, SmartPay,[10] totals $1.2 billion and grants total $3.8 billion across the three agencies, primarily Homeland Security ($2.6 billion). Figure 1 depicts this distribution.

Direct Employment

Direct employment is also concentrated in the Department of Defense, which employed 60,000 civilians, 161,000 active-duty personnel and 53,000 reserve and National Guard personnel in fiscal year 2023.[11] The Departments of Veterans Affairs and Homeland Security combined to employ an additional 62,000 civilians. Homeland Security also employed an additional 5,000 active-duty and 1,000 reserve Coast Guard personnel that round out the totals in Figure 2.[12]

Figure 1: Direct Spending
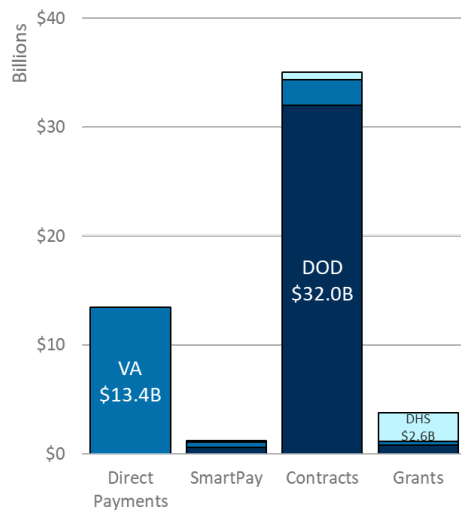
Figure 2: Direct Employment

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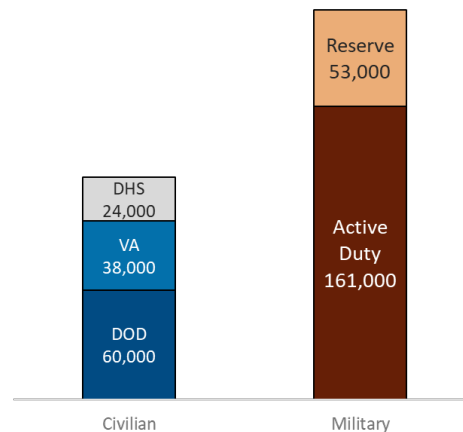
[9] These agencies were selected in the original report based on having clear national security missions with readily available data. U.S. Department of Energy national security activities are considered in a separate section.
[10] Government purchase cards used for very small purchases.
[11] Department of Defense total does not include Coast Guard personnel employed by the Department of Homeland Security.
[12] Defense Manpower Data Center (Sept. 2023). Military and Civilian Personnel by Service/Agency by State/Country (Updated Quarterly).

After dipping modestly due to budget sequestration,[13] civilian employment grew steadily until the COVID-19 pandemic, with an average 2.0% annual increase from 2015 to 2020. After a slight drop in 2021 and 2022, civilian employment in 2023 rose 2.5% from 2022, but remains 0.9% below pre-pandemic highs, as shown in Figure 3.

Military employment had recovered from budget sequestration and reached new highs by 2020. Overall military employment has reversed course and decreased modestly, but consistently over the past three years, including a 1.3% decline from 2022 to 2023. The number of active-duty personnel in California in fiscal year 2023 dropped to 161,000 – a 1.4% decrease from 2022. Reserves, which steadily remained around 57,000 since 2020, dropped just below 53,000 in 2023 – a 1.0% decrease from 2022. Both are represented in Figure 4.

Figure 3: Civilian Employment by Year
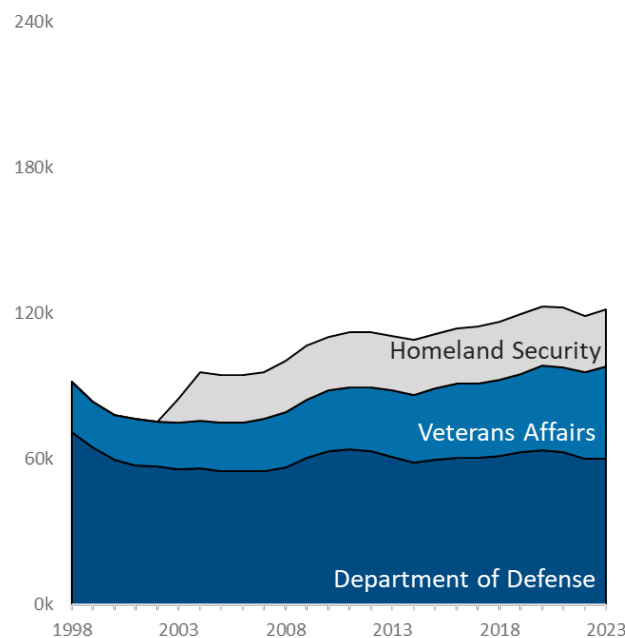
Figure 4: Military Employment by Year

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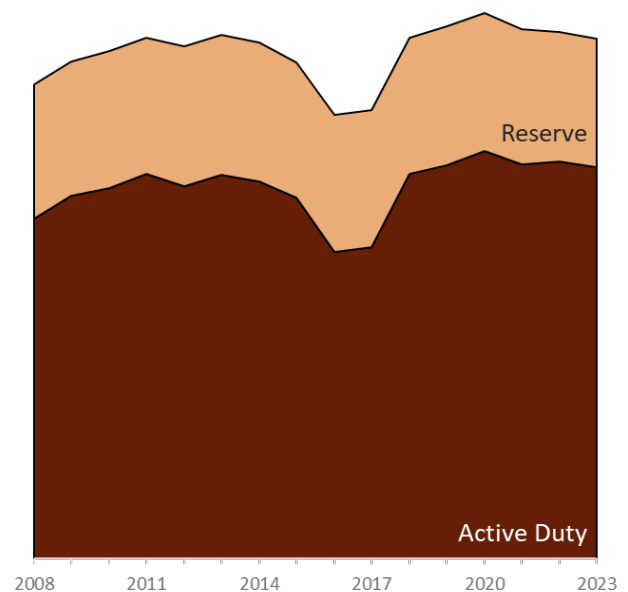
[13] The Budget Control Act of 2011 implemented significant across the board cuts to federal spending, including large cuts to national security agencies, going into effect in 2013.

Direct Spending

Direct spending increased to $53.5 billion in 2023 from $51.4 billion in 2022 (a 4.2% nominal increase), as shown in Figure 5. In real terms, this drops to a 2.0% decrease due to high inflation during this period.[14] California performed slightly better than the national trend – direct spending in the United States had a nominal increase of 4.0%, and a real decrease of 2.2%, from 2022 to 2023.

The bulk of the increase comes from Veterans Affairs direct payments (generally pension payments, which are adjusted for cost-of-living annually), growing by nearly $1.4 billion – an 11.5% increase. The $13.4 billion in Veterans Affairs direct payments for fiscal year 2023 brings this spending total to its highest nominal point since 2011. After accounting for inflation, the $13.4 billion total for 2023 remains more than double its 2011 level.

Overall contract spending grew by 1.4%, a gain of nearly $500 million. All three agencies saw an increase in contract spending. The Department of Defense saw an increase of $300 million (a 0.9% increase), followed by Veterans Affairs ($174.6 million, an 8.2% increase) and Homeland Security ($23.2 million, a 3.3% increase). The Department of Defense awarded the 22 largest national security-related contracts in 2023 – among these, seven were for managed care support services for the TRICARE health care program, and five were awarded to aerospace defense companies (three to Lockheed Martin, two to Northrop Gunman). The biggest Veterans Affairs contracts provided additional funding for medical disability examinations in relation to the Veterans Benefits Improvement Act of 1996.

Overall grant spending had a slight increase of $47.5 million in 2023, a 1.3% increase from 2022, with declines from Homeland Security ($168.8 million, a 6.0% decrease) offset by gains from the Department of Defense ($129.5 million, an 18.8% increase) and Veterans Affairs ($86.9 million, a 34.1% increase). Defense increased the allotment for the Army National Guard Facilities Program, and Veterans Affairs increased grants for the Supportive Services for Veteran Families (SSVF) Program. Homeland Security decreases are due to the reduction in COVID-19 related grants by the Federal Emergency Management Agency (FEMA) as pandemic response and disaster relief winds down. FEMA awarded one such grant that was over $135 million in 2023, down from four in 2022 and nine in 2021.

SmartPay had a 20.2% nominal increase from 2022, rising to its highest level since 2011. Increased SmartPay spending fell in line with overall increases in national SmartPay spending across the three agencies.

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[14] Contracts, grants, and direct payment data from the Departments of Defense, Homeland Security, and Veterans Affairs for fiscal year 2023 was retrieved from USAspending.gov on August 14, 2024.

Figure 5: Direct Spending by Year
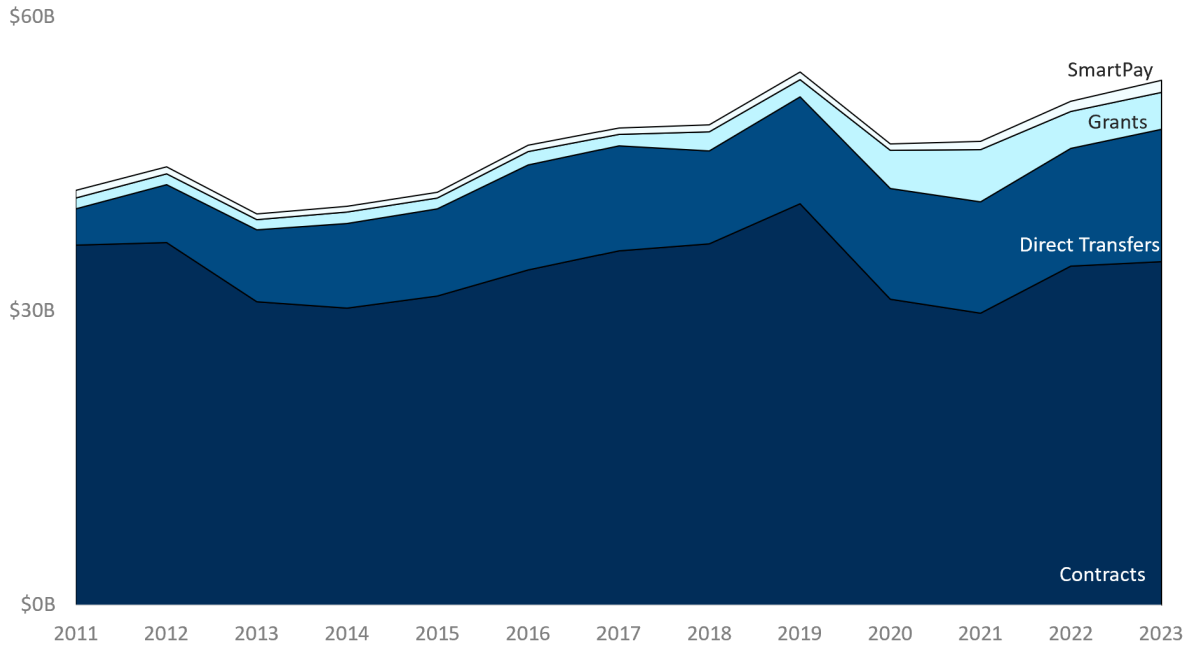
U.S. Marines scale a cliff during Mountain Exercise 5-24 at Marine Corps Mountain Warfare Training Center, Bridgeport.

Economic Impacts

Total Output

The spending and employment included in this estimate generated $196.7 billion in total economic activity output in California during fiscal year 2023.[15] This total output includes:

- $110.0 billion of direct economic activity by the agencies and their contractors;
- $17.9 billion of indirect economic activity created through the supply chain of direct activities; and
- $68.9 billion of induced economic activity created as a result of additional money in the economy.

This total represents a 3.7% nominal increase since 2022. Accounting for inflation, total output had a real decrease of 2.4%.

Figure 6: Total Output

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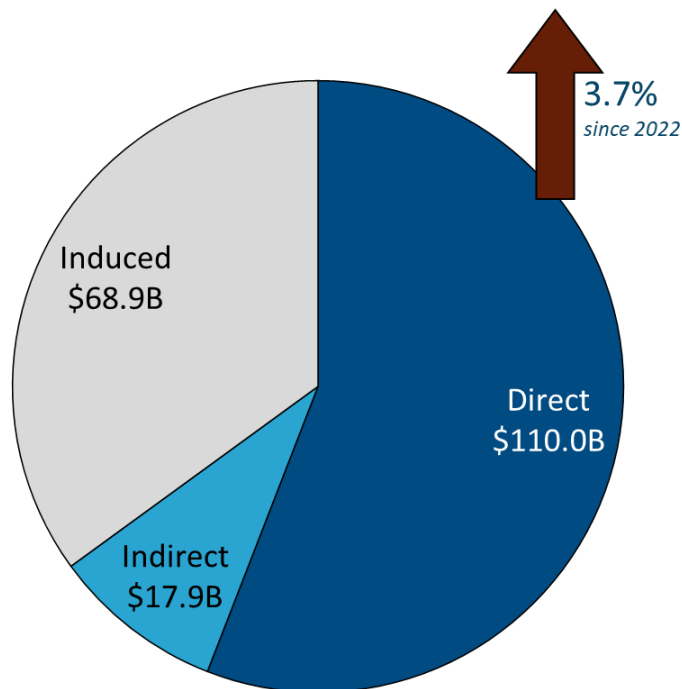
[15] May not sum due to rounding.

Total Employment

The spending and employment included in this estimate generated 810,000 full-time-equivalent (FTE) jobs in California. This total includes:

- 423,000 FTEs directly employed by the agencies and their contractors;[16]
- 66,000 FTEs employed indirectly through the supply chain of direct activities; and
- 321,000 FTEs employed because of economic activity induced by the additional money in the economy.

This total represents a 5.0% nominal increase since 2022.

Figure 7: Total Employment

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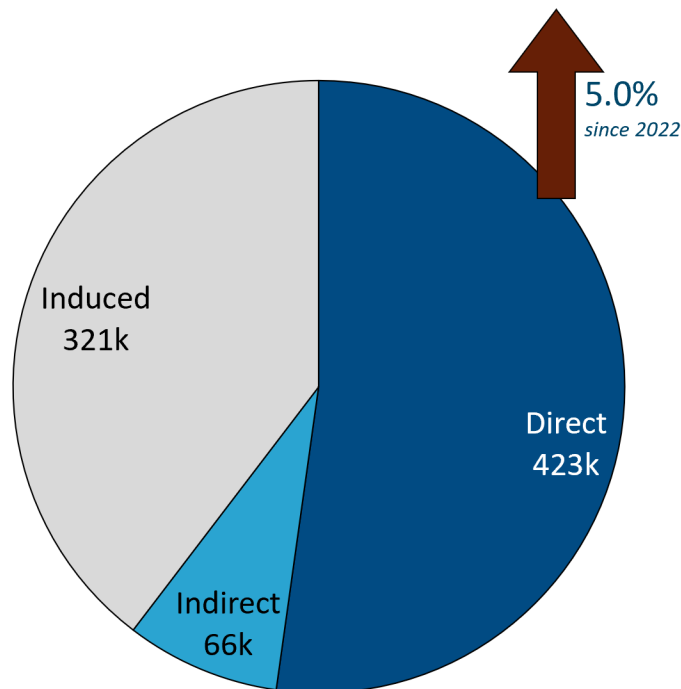
[16] Direct employment includes federal employees as well as the employment of federal contractors and vendors generated by direct government spending.

Government Revenue

Economic activity generates additional tax revenue for governments at all levels, especially through payroll and income taxes generated by hundreds of thousands of FTE employment. The economic software used for this report, described in the Methodology & Data section below, estimates that the federal government received a total of $20.4 billion in revenue, with approximately $9.2 billion in personal income tax and $8.5 billion in payroll tax as a result of the spending and employment modeled.[17]

At the state and local level, combined impacts include $3.3 billion in income tax, $2.4 billion in sales tax, $2.1 billion in property tax, and $3.5 billion in other smaller taxes and fees that make up the remainder of the $11.3 billion total.

Industries Impacted

Spending and employment modeled in this report impact a wide variety of industries. These generally fall into four broad categories. The first two categories include broad types of direct spending:[18]

- **Core Mission**: A large portion of spending and resulting economic activity occur in industries that are central to the work of the three federal agencies involved, including defense contractors (primarily aerospace and research and development) and pharmaceutical manufacturers that supply Veterans Affairs' healthcare facilities.

- **Large Employer**: Some industries benefit because they are related to employment and are similar for any large employer. This includes insurance, driven by the Department of Defense's TRICARE health care program, among the top industries.

The next two categories include indirect and induced spending:

- **Subcontractors**: This category includes the contractors and suppliers of industries in the categories above, including supply chain industries such as manufacturers, transportation, and wholesalers, as well as general business-supporting industries such as janitorial and professional services.

- **Population-focused**: The remaining industries, such as restaurants, real estate, and education, primarily serve the local population and benefit when any spending occurs because it results in increased local employment and earnings.

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[17] May not sum due to rounding.

[18] Overlap does exist between these groups. For example, healthcare could be considered to be part of every category. The health industry is a major contractor for the Veterans Affairs, as part of its central mission to provide healthcare to veterans. The healthcare industry also serves the Department of Defense, as an employer providing insurance for its workforce and the insurance industry, as a major subcontractor. It is also an industry that serves the local population.

Nearly every industry in the state benefits from national security spending. The largest economic impacts are in manufacturing, with the various manufacturing sectors (including aerospace and electronics) combining for $21.7 billion in total output, and professional services with nearly 86,000 in FTE employment. The top manufacturing sectors include aerospace ($6.8 billion in output and 15,100 FTEs) and electronics ($4.0 billion and 6,300 FTEs). Other top sectors in total output include professional services, with $20.2 billion in output and 85,900 FTEs (especially scientific research and development: $6.6 billion and 19,400 FTEs); real estate ($13.2 billion and 18,900 FTEs); insurance ($9.5 billion and 23,500 FTEs); and healthcare ($7.8 billion and 47,000 FTEs).

In addition, the retail ($6.9 billion and 45,200 FTEs); restaurant ($4.6 billion and 43,600 FTEs); and transportation & warehousing ($5.2 billion and 28,700 FTEs) industries saw at least 20,000 jobs generated because of national security spending in California.

Figures 8 and 9 show the industries with the largest total economic output and employment, respectively, resulting from national security spending and employment.

Policymakers may wish to consider other characteristics of the impacted industries that are beyond the scope of this report. These include: 1) economic considerations such as industries that support the generation of exports or innovation that may lead to future economic growth; 2) cultural considerations such as the importance of a particular profession or industry to the state or a local community's identity; and 3) externalities related to the industry such as environmental, health, or educational impacts.

Figure 8: Industry Impacts – Output

Industry	Output
Professional Services	$20.2B
Real Estate	$13.2B
Insurance	$9.5B
Healthcare	$7.8B
Retail	$6.9B
Manufacturing - Aerospace	$6.8B
Wholesale	$5.7B
Publishing - Electronic	$5.5B
Financial	$5.3B
Transportation & Warehousing	$5.2B
Restaurants	$4.6B
Manufacturing - Electronic	$4.0B

Legend: ■ Direct ■ Indirect + Induced

Figure 9: Industry Impacts – Employment

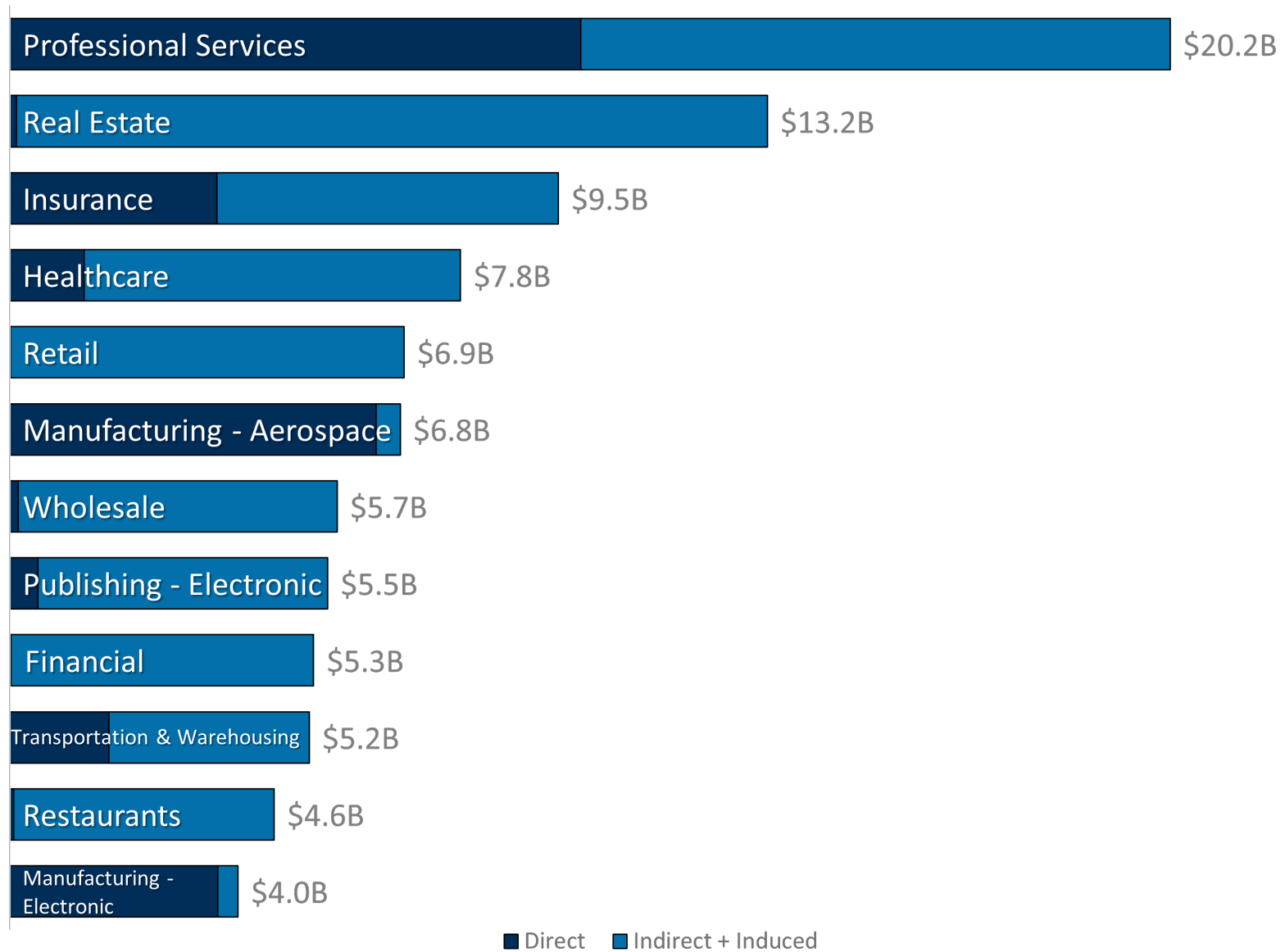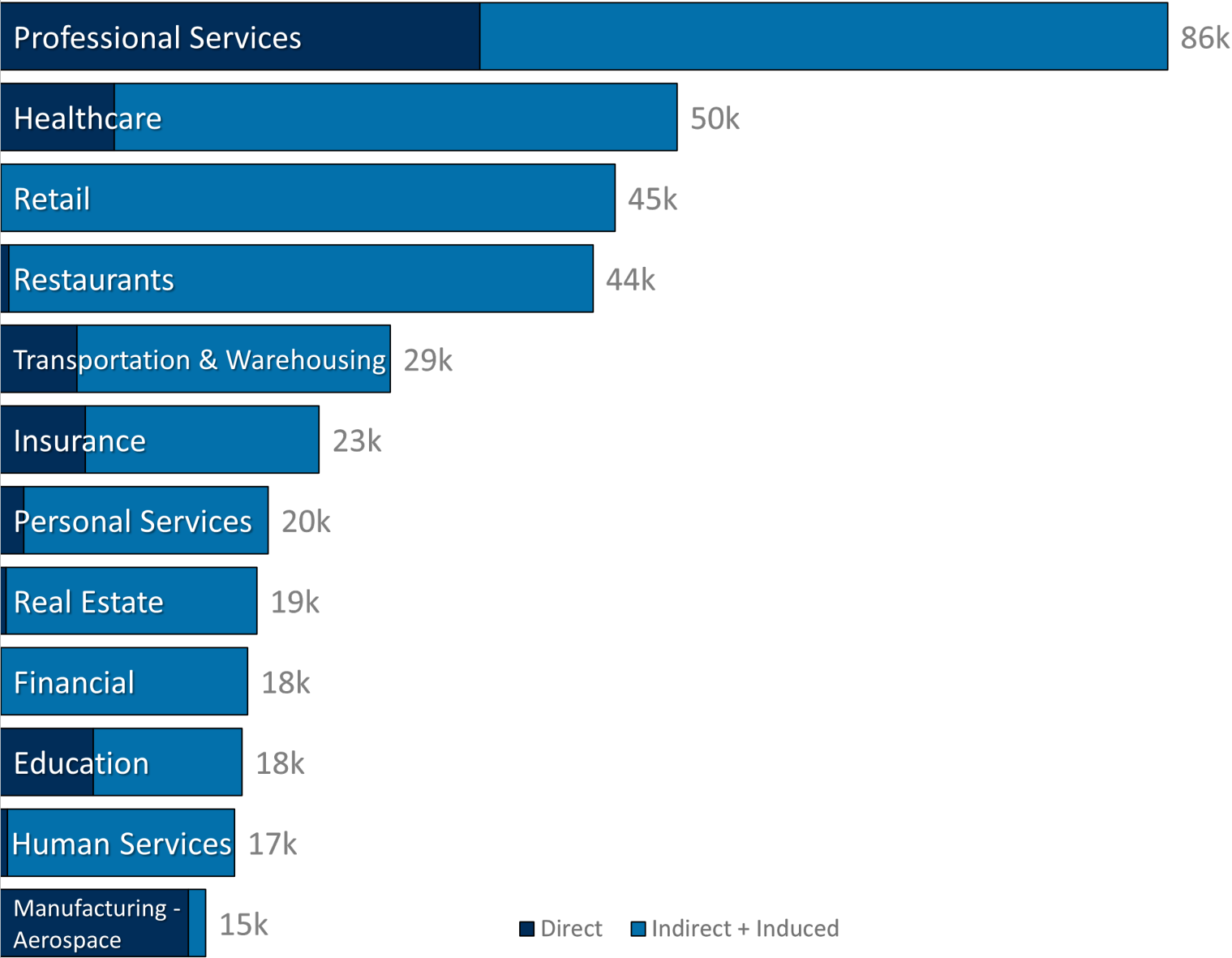| Industry	Value
Professional Services	86k
Healthcare	50k
Retail	45k
Restaurants	44k
Transportation & Warehousing	29k
Insurance	23k
Personal Services	20k
Real Estate	19k
Financial	18k
Education	18k
Human Services	17k
Manufacturing - Aerospace	15k

■ Direct ■ Indirect + Induced

Select State Comparisons

Employment

In 2023, the U.S. Departments of Defense, Homeland Security, and Veterans Affairs collectively employed 1.4 million civilians and stationed an additional 1.1 million active-duty military members in domestic locations. Of these 2.5 million jobs, about 750,000 are concentrated in just three states: California (283,000), Virginia (246,000) and Texas (221,000). Figure 10 displays the breakdown of civilian employment by state.

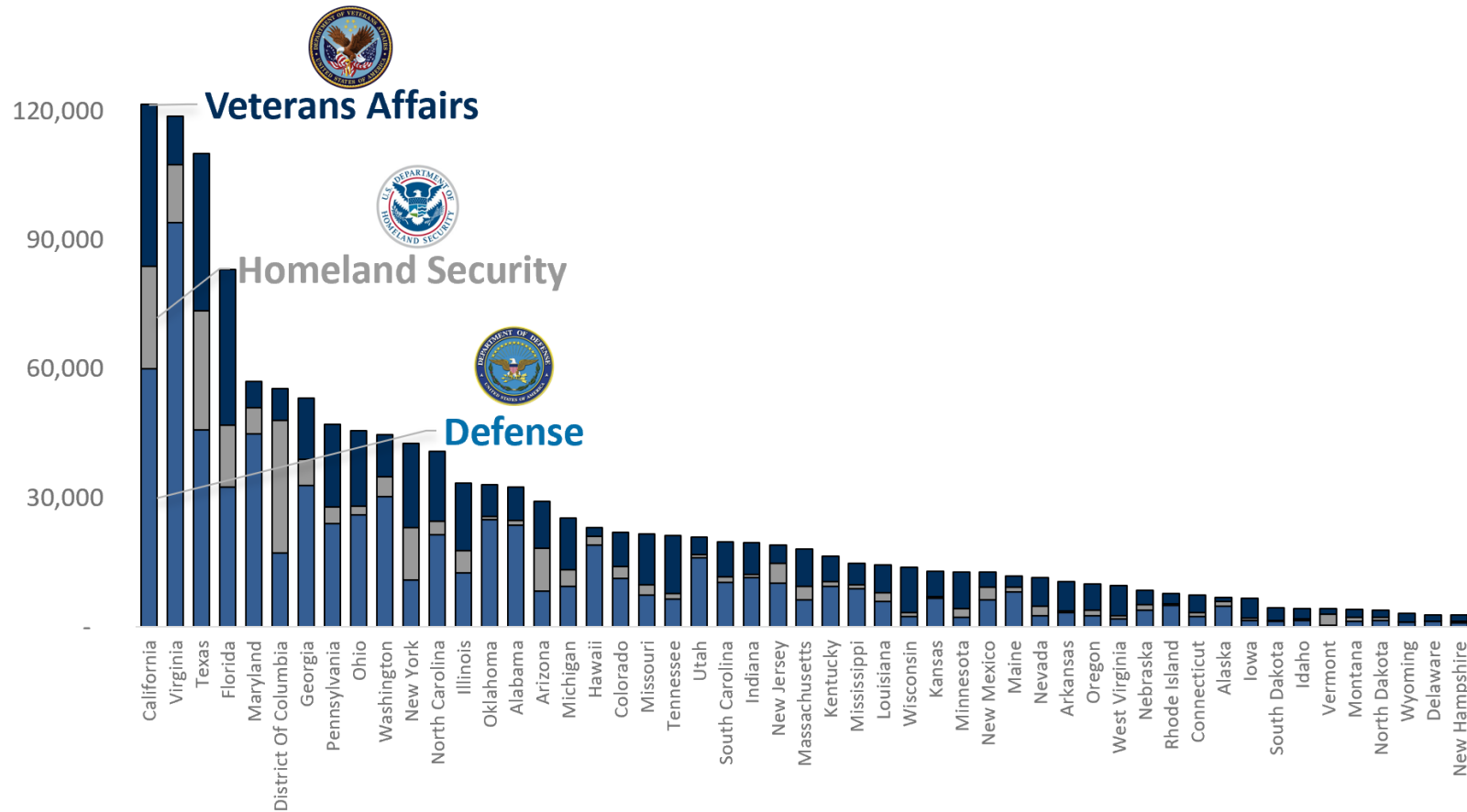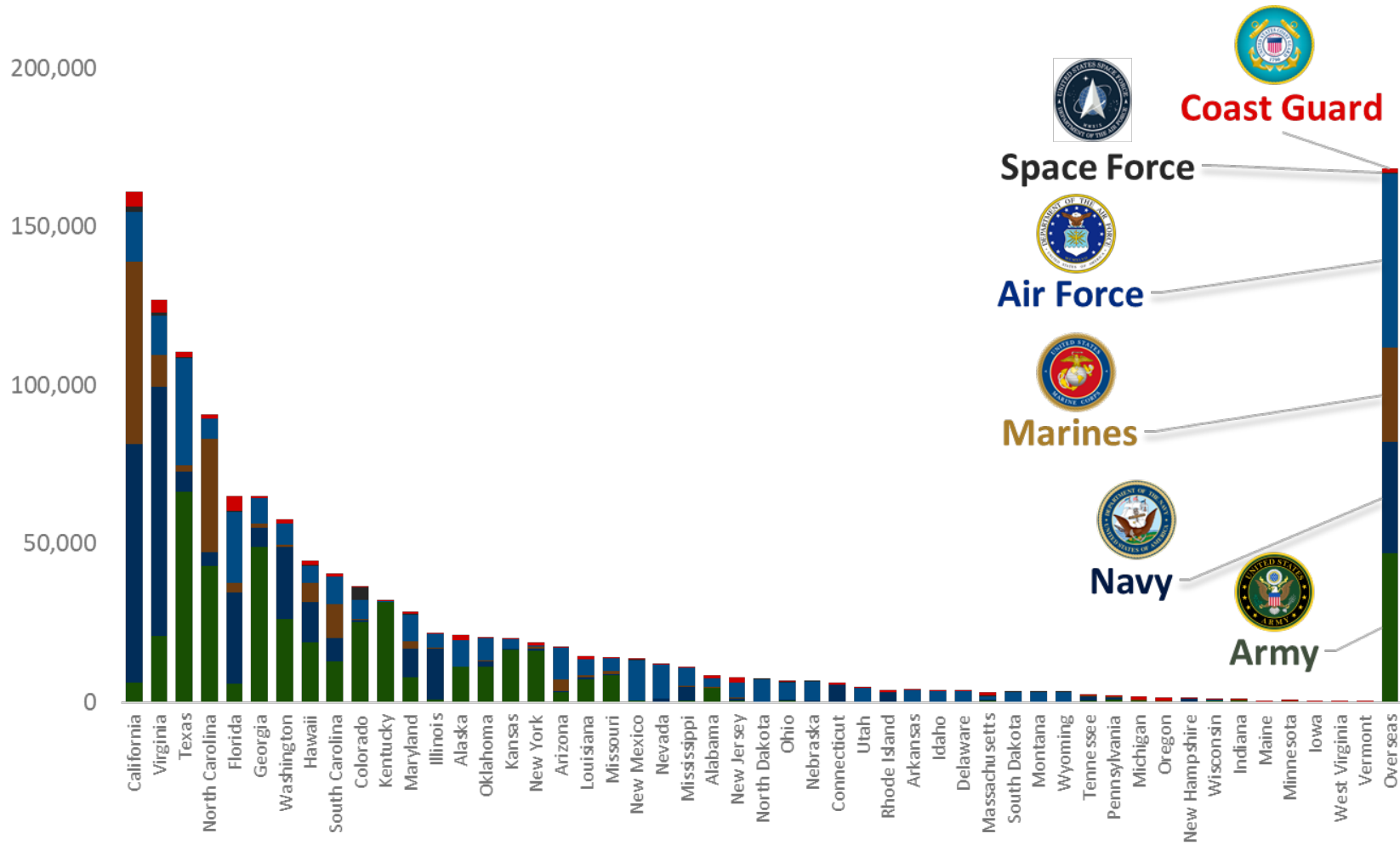**Figure 10: Civilian Employment by State**

Figure 11 displays active-duty military employment by state, broken out by branch. In addition to having the largest concentration of active-duty military overall, California has the largest Marine Corps concentration, the second largest among the Navy, Coast Guard, and Space Force, and the third largest among the Air Force.

Figure 11: Active-Duty Military Employment by State

Historical Comparisons

This section details a comparison of the three states with the largest share of national security-related employment (California, Texas, and Virginia). Civilian employment data by state is currently available since 1998, while military employment data is available since 2008.

Through 2012, the three states appeared to follow similar trends. California and Virginia had a similar number of national security employees in their states, while Texas fell 20,000 to 30,000 FTE jobs behind. Gains or falls in each year happened at about the same rate, but the three states hit a peak of civilian employment, prior to budget sequestration, in 2012.

The three states had somewhat different experiences in the early years of the budget sequestration. California's civilian employment declined by 3% before bottoming out in 2014. Texas declined by 4% and Virginia by 7%. Since then, California's civilian employment has grown modestly faster, surpassing its pre-sequestration peak in 2016. Texas surpassed its 2012 level in 2017, while Virginia remained below its 2012 level until 2020.

In 2023, all three states grew from 2022 levels – California by 2.5%, Texas by 4.2%, and Virginia by 2.6%. Compared to the pre-sequestration peak in 2012, California had an 8.6% increase in civilian employment in 2023, while Texas and Virginia had 10.1% and 3.2% more, respectively. Texas and Virginia reached their all-time high in national security-related civilian employment, surpassing their levels from 2021.

Figure 12: Civilian Employment by Year
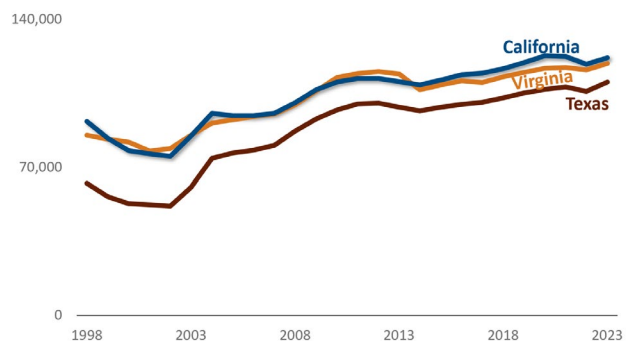
**Figure 13: Indexed Civilian Employment**
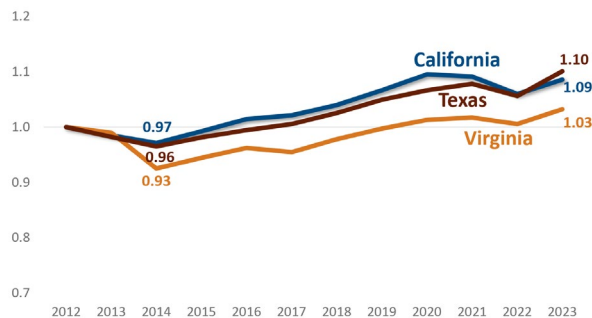
While civilian trends, with the exception of the depth of loss from budget sequestration, were largely similar, active-duty employment trends have been more varied. California has consistently been the top state in military employment, while Texas and Virginia exchanged second and third place four times over 12 years. Since 2018, Virginia has held second place.

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The states' experiences with budget sequestration varied as well. Virginia initially saw an increase in active-duty employment lasting through 2015 before falling the furthest of the three states in 2016 and 2017, dropping 20% from 2012 and 28% from its 2015 peak. California was initially relatively stable, increasing slightly in 2013 before declining slowly through 2015 and falling rapidly in 2016. This totaled an 18% drop from 2012 and 20% decline from its 2013 peak. Texas, on the other hand, saw a rapid decline in 2013 and then continued to decline slowly through 2017, but yielded the smallest overall decline of the three states at only 13%.

In 2023, all three states fell from 2022 levels – California by 1.4%, Virginia by 1.9%, and Texas by 3.2%. Compared to 2012 levels, Virginia (13.4%) and California (4.9%) continue to show growth, overall. In contrast, Texas fell to a recent low, with a 13.0% decline since 2012.

Figure 14: Active-Duty Employment by Year
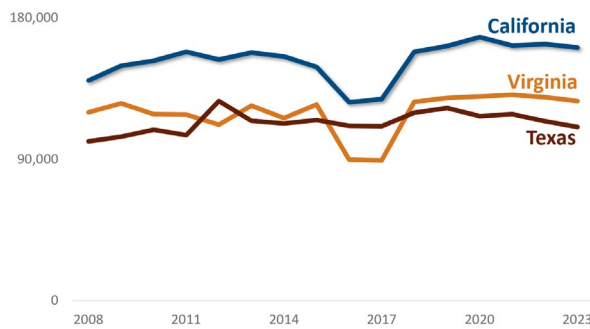
Figure 15: Indexed Active-Duty Employment
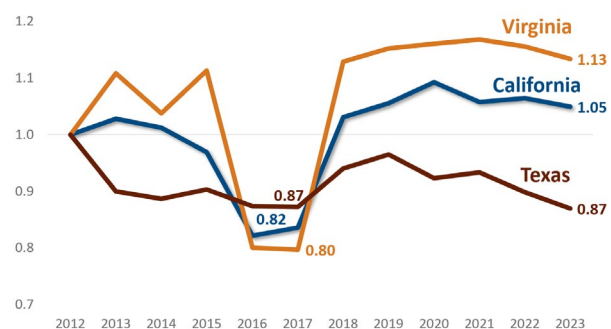
Direct Spending

2023 Comparisons

California received $35.0 billion in security-related contracts across the three national security agencies in fiscal year 2023, a roughly 1.4% nominal increase from the $34.6 billion the state received in 2022. Overall, California received the third-most in national security-related contracts among all states, trailing Texas ($66.8 billion) and Virginia ($45.3 billion). Connecticut ($25.3 billion); Florida ($17.2 billion); Arizona ($15.6 billion); Pennsylvania ($14.8 billion); Massachusetts ($14.5 billion); Missouri ($11.4 billion); and Maryland ($11.1 billion) round out the Top 10 states.

Historical Comparisons

This section details a comparison of the three states with the largest share of national security-related spending. USAspending data by state is currently available since federal fiscal year 2008. The states have followed different spending trends since that time.

Texas' national security spending has been the most volatile among the Top 3 states. From 2008 to 2009, Texas' national security spending dropped by over 60%. After its 2009 low, Texas began to see gradual increases until slipping again in 2014. Texas saw big spikes in 2017, 2020, 2022, and 2023, which can largely be attributed to big contracts with Department of Defense contractors such as Lockheed Martin. Texas' national security spending in 2023 was 127% more than the amount of national security spending it had in 2012.

Virginia showed steady growth from 2008 to 2011, before declining from 2012 to 2014 during budget sequestration. Beginning in 2015, Virginia once again saw steady growth, before a small dip in 2021. As of 2023, Virginia's national security spending was 39% more than its 2012 level.

California has followed a similar path to Virginia, with steady growth prior to sequestration, followed by a dip during the early years of sequestration and steady growth for the next several years. California reached a record high in 2019, with nearly $40.7 billion in national security spending. In 2020 and 2021, California's spending appeared to decrease by about 19% since its 2012 level. This is due to McKesson moving its headquarters from California to Texas. As a result, its large Veterans Affairs contract is counted by USAspending.gov in Texas instead of California. It is likely that a significant portion of the economic activity remains in California, but it is missed by our current accounting approach. California's national security spending has since rebounded, and its 2023 total is now 5% above its 2012 level.

Figure 16: Direct Spending by Year (in billions)
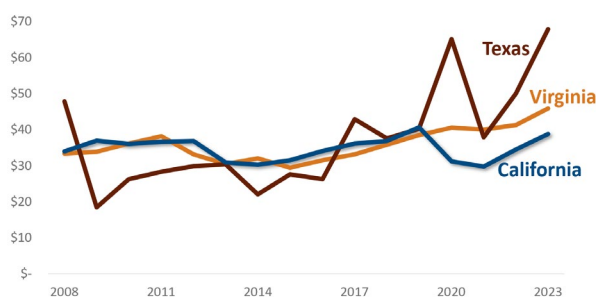
Figure 17: Indexed Direct Spending
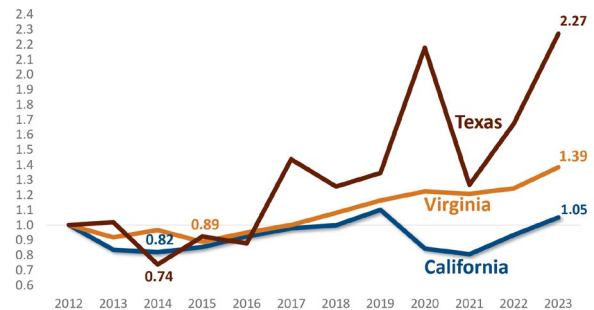
Figure 18: 2023 Contract Spending by State (in billions)

TX
DOD
$55.4 B

TX
VA
$10.9 B

CT
DOD
$25.1 B

FL
DOD
$15.9 B

Others
DOD: $99.2 B

VA
DOD
$36.7 B

VA
DHS
$4.9 B

AZ
DOD
$15.3 B

PA
DOD
$14.2 B

VA
VA
$3.7 B

MA
DOD
$14.1 B

MD
DOD
$10.0 B

CA
DOD
$32.0 B

CA
VA

MO
DOD
$11.2 B

NY
DOD
$9.8 B

CA

Others
VA: $8.0 B

Others
DHS:
$1.8 B
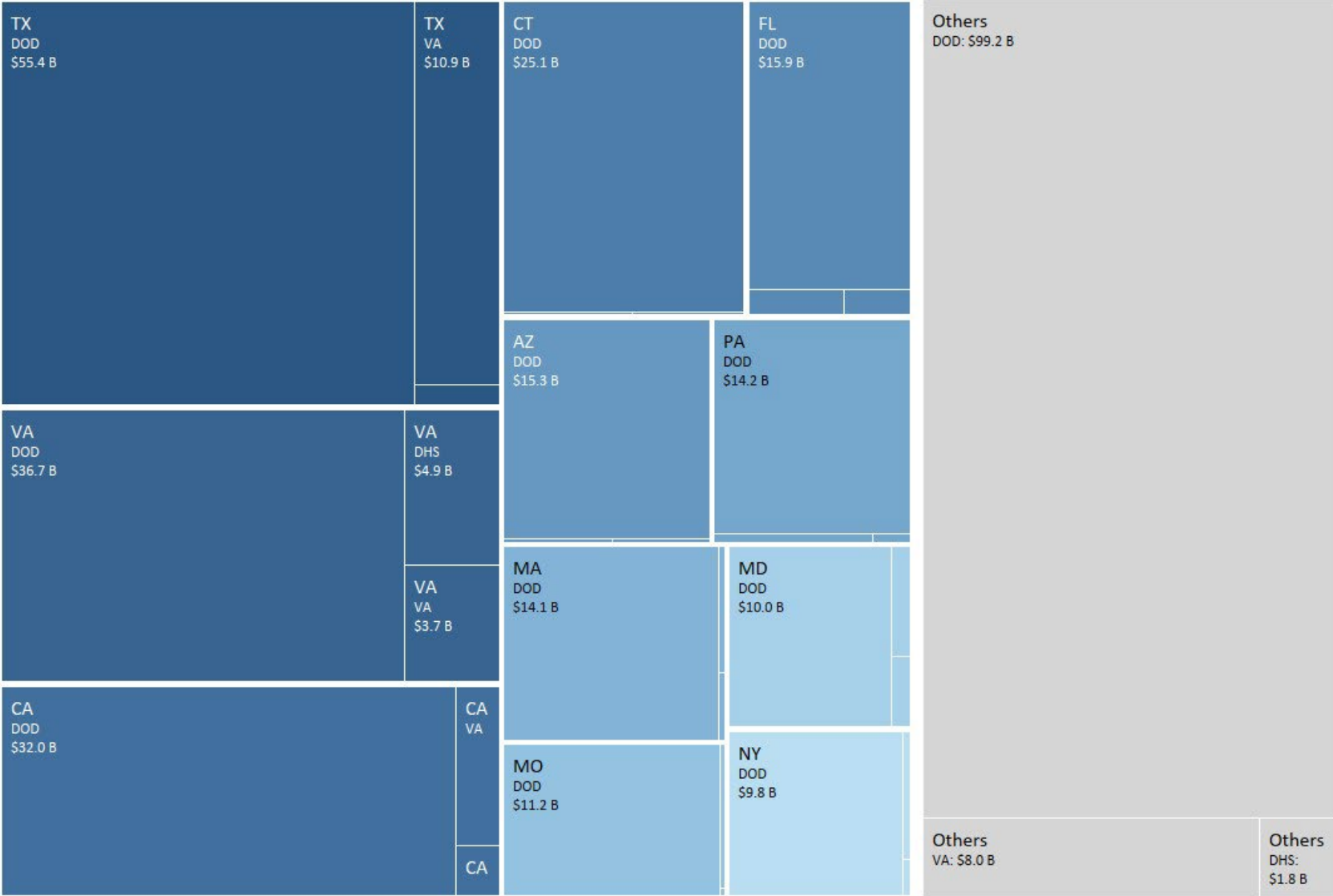
U.S. Department of Energy

The Department of Energy (DOE) conducts a wide variety of work, including some national security-related activities. This report follows the methodology established in prior years to estimate the impact of DOE's national security activity.

Direct Spending

In fiscal year 2023, DOE awarded nearly $5.1 billion to California contractors for projects performed in California, up from $4.9 billion in 2022 (a 4.0% nominal increase). In addition, DOE issued over $738.1 million in grants, an increase from the $486.5 million issued in 2022 (a 51.7% nominal increase). Large portions of this spending are for non-specified research funded by the department's Science Office. For example, this included seven of the 10 largest contracts in fiscal year 2023.[19] Since we cannot verify if these funds were spent on national security-related research, contracts such as these were omitted from the analysis.

In order to ensure conservative results, this analysis only includes spending from sub-agencies that are directly related to national security.[20] Contracts and grants from these funding sub-agencies total $2.6 billion, 45.5% of the DOE's total spending in the state.

Employment

The Department of Energy is among the smaller Cabinet-agency employers, with 16,286 staff nationwide. The largest share is in the District of Columbia (4,182). Among the states, Washington (2,136), Oregon (1,337), Maryland (1,210), Colorado (883), and New Mexico (878) make up the Top 5. California is seventh with 434 DOE staff.

As discussed in the prior section, a portion of the work performed by DOE staff is not national security related. For the purpose of this estimate, we use the portion of contract spending estimated to be national security related (45.5%) to apportion employment, yielding an estimate of 198 staff.

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[19] This includes five contracts with the University of California and two with Stanford University.

[20] Funding sub-agencies included: Department of Defense Advanced Research Projects Agency (DARPA), Department of the Army, Department of the Air Force, Missile Defense Agency (MDA), Defense Threat Reduction Agency (DTRA), Department of Defense, Department of the Navy and Department of Energy spending with the National Nuclear Security Administration (NNSA) as the funding office.

Economic Impacts

Estimated Output from DOE Activity

Estimated national security-related spending and employment in California from DOE results in approximately $5.5 billion in economic activity. This includes $2.7 billion in direct activity, $1.2 billion in indirect activity, and $1.6 billion in induced activity. Over 50% ($2.9 billion) of that activity is concentrated in scientific research and development services within the professional services sector.

Estimated Employment from DOE Activity

Estimated national security-related spending and employment in California from DOE results in approximately 20,800 FTEs. This includes 8,200 in direct employment (including the 198 DOE staff as well as DOE-employed contractors and vendors), 5,000 in indirect employment, and 7,600 in induced employment. Over 40% (8,400) of that activity is concentrated in scientific research and development services within the professional services sector.

Summary

National security contributes significantly to California's economy. The federal government invests around $53.5 billion and directly employs approximately 336,000 residents in the state. This results in $196.7 billion in economic output and supports nearly 810,000 full-time equivalent jobs in California. Although direct comparisons are challenging, the total impact appears larger than to high-profile sectors such as the agriculture[21] and film industries.[22]

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[21] California Department of Food and Agriculture (2024). California Agricultural Production Statistics.
[22] BEA (2023). Arts and Cultural Production Satellite Account, U.S. and States.

C-17 aircrew from the 758th Airlift Squadron fly in formation with the 418th Flight Test Squadron near Edwards Air Force Base.

Methodology & Data

Scope

As discussed in the introduction, this report focuses on the U.S. Departments of Defense, Homeland Security, and Veterans Affairs.

Within these three federal agencies, three broad areas of economic activity are examined: direct employment; direct purchasing; and spending on veterans' benefits. Figure 19 details the components of these spending areas.

Figure 19: Scope of Analysis
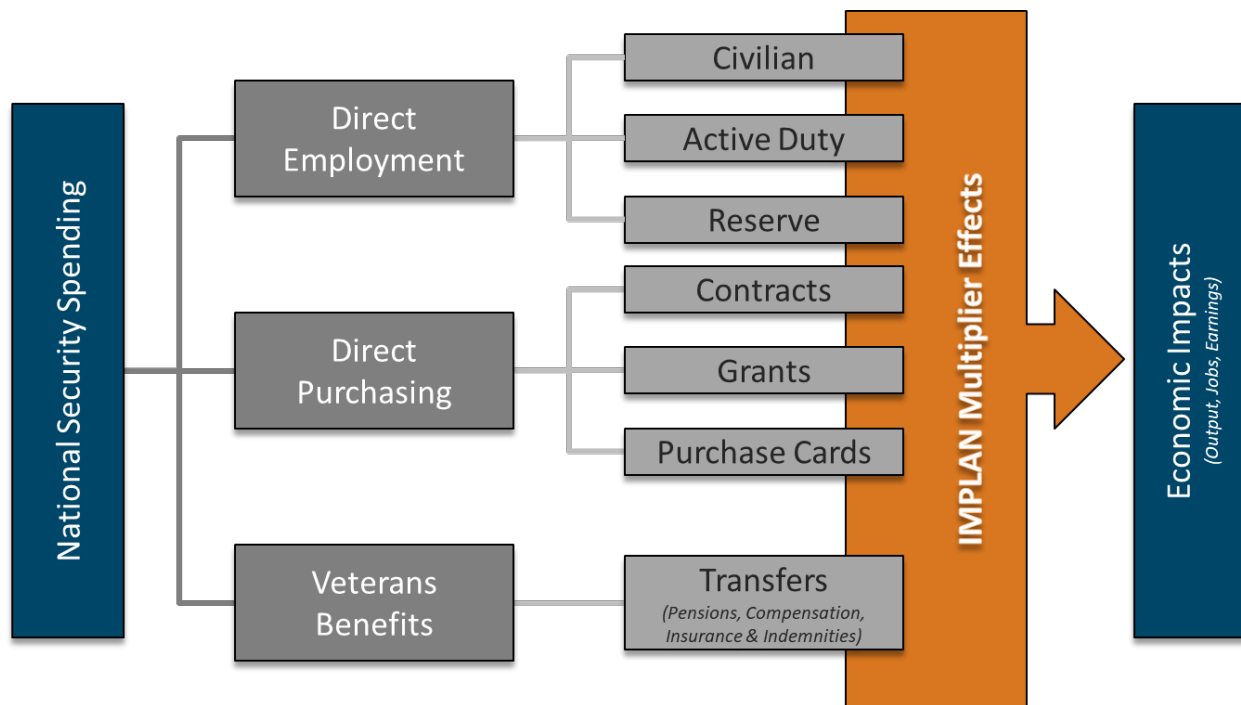
This report does not include impacts from activities other than direct spending and employment by the Departments of Defense, Homeland Security, and Veterans Affairs. Examples of what is not included in this report:

- Purchasing of military equipment by international governments that is enabled by the infrastructure and research performed to provide this equipment to the U.S. government;
- Tourism related to celebrations, conferences or other gatherings related to the military installations; and
- Other partnerships that aerospace and defense companies may have with universities enabled by their security work.

Data

All data was acquired from U.S. government sources. Data is publicly available from the USA Spending database or regularly updated reports.

Spending

USAspending.gov remains the primary source for spending data. USAspending.gov provides a public database of nearly all federal spending. Although the database has limitations[23],[24] it is a very useful tool that provides comprehensive data. Given these limitations, only spending from California-based prime contractors and their California-based subcontractors for projects completed within California are analyzed.

SmartPay data was acquired from the General Services Administration.[25] Data provided by the departments was inconsistent or unavailable. Thus, spending was apportioned to counties and congressional districts based on the share identified in prior reports. Updated SmartPay data from Defense, Homeland Security, and Veterans Affairs was not received at the time of this report's publication.

Employment

Civilian employment was previously acquired from the Office of Personnel Management (OPM), reported by county. This source is no longer available. Data was instead acquired from OPM's FedScope.[26] This tool reports data at the statewide level. In addition, the location of many investigative[27] employees have been suppressed in recent years. These suppressed positions were allocated to California based on the ratio of investigative positions to total positions that existed in prior years. County and congressional district distribution is estimated based on data received from OPM, in response to a Freedom of Information Act request, that details total civilian employment for Homeland Security and Veterans Affairs by county and district.

Military employment was acquired from the Department of Defense's Defense Manpower Data Center's (DMDC) Location Report. DMDC only provides data by state, however. County and district distribution is estimated based on the distribution drawn from the American Community Survey. In addition, full-time equivalent estimates for reservists and National Guard were made based on relative salaries for reservists and active-duty personnel matched by rank and experience. Reservist salaries range from 17.5% of matched active-duty pay to a high of

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[23] POGO (2013). USAspending.gov: NOT Your One-Stop Shop for Following Taxpayer Dollars.
[24] Sunlight Foundation (2017) A brief history of the DATA Act.
[25] Available at About GSA SmartPay under the "Statistics and Reports" and "Sales, Transactions, Card/Account Holder Data" menus.
[26] U.S. Office of Personnel Management (2020) FedScope Employment Cube September 2010-2020.
[27] This includes the large majority of Transportation Security Administration, Customs and Border Protection, Immigration and Customs Enforcement and Citizenship and Immigration Services staff.

21.2%, with an average of 18.25%. As a result, reservists are estimated at 0.1825 FTE (or 5.5 reservists are considered the equivalent of 1 active-duty employee for economic purposes).

Methodology

Input-Output Modeling

This report models economic impacts using IMPLAN software, based on standard input-output methodology. The purpose of the study is to estimate the impacts of existing spending, rather than modeling any policy changes or other counterfactuals. As a result, the analysis estimates gross benefits and does not account for alternate federal spending or other use of resources that might occur in California in the absence of national security spending and employment.

Input-output (I-O) models identify relationships between industries, estimating how changes in one industry flow through into other industries. For example, the purchase of required inputs that result in logistics or business services and changes to household purchasing due to shifts in employment and earnings.

Cumulatively, I-O models estimate the amount of times the modeled dollar is re-spent within a geographic area before it fully leaks out.

The concept was pioneered by Wasilly Leontief, who was awarded the Nobel Prize in 1973 "for the development of the I-O method and for its application to important economic problems."[28]

IMPLAN Economic Model

The IMPLAN (IMpact Analysis for PLANning) I-O economic model was selected for this analysis based on its reputation and the resources available. IMPLAN was developed by the U.S. Department of Agriculture Forest Service in the 1970s to fulfill the requirements of the Rural Development Act of 1972 to estimate the impacts of alternate uses for U.S. public forest resources.

IMPLAN models the economy within a specified region as 546 sectors with unique spending patterns derived from U.S. Bureau of Economic Analysis expenditure patterns.

As depicted in Figure 20, the model begins with the direct effects of the modeled economic activity. This includes the employment/wages and output of the sector being analyzed. From here, the model estimates the supply chain impacts for the output of the direct effects. This includes leakages, such as imported inputs, taxes and profits, and local purchases of inputs toward the final product. These local purchases generate labor income (which includes total compensation of both the employee and the proprietor), which joins the stream with the labor income from the direct effect. This stream then has leakages, including imports, income to employees living beyond the modeled region, taxes and savings. Remaining income – spent on

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[28] NobelPrize.org. Wassily Leontief – Facts.

locally purchased goods and services – cycles back around and the cycle begins anew until all remaining funds are exhausted due to leakage.

Figure 20: IMPLAN Model[29]
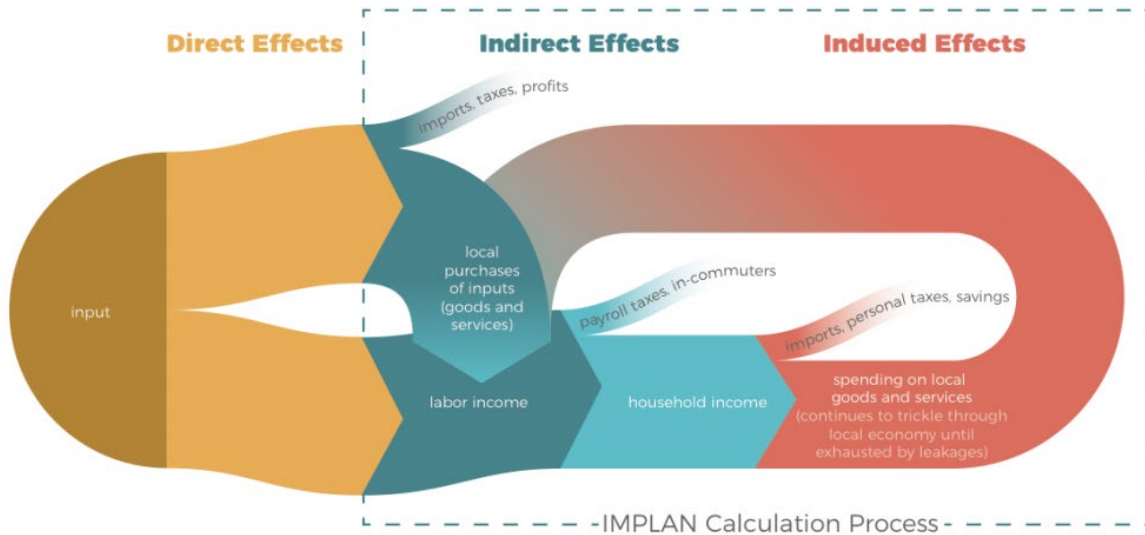
MRIO Analysis

IMPLAN's Multi-Regional Input-Output (MRIO) analysis tool offers a simplified path to fully account for localized impacts, without the need to generate 174 models required to complete the custom methodology employed in 2018 and prior reports.

"MRIO expands backward supply linkages beyond the boundaries of a single-region Study Area. MRIO analyses utilize interregional commodity trade and commuting flows to quantify the demand changes across many regions stemming from a change in production and/or income in another region. This powerful analytical method allows analysts to go beyond a single study region, measuring the economic interdependence of regions. In an MRIO analysis, the Direct Effect in one region, Region A, can trigger Indirect and Induced Effects in linked regions, capturing some of what would have been a leakage in a traditional I-O model."[30]

An approach such as MRIO more fully accounts for the localized impacts within the state, but does not impact the statewide estimates. While a single economic model can be run to estimate the impact of spending within each region, this methodology would understate the total impact, because it would omit spillover effects from spending in other counties. This more basic methodology would have overlooked approximately 10% of total state output in the 2019

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[29] IMPLAN. Assisted Economy.
[30] Clouse, C. (2024). MRIO: Introduction to Multi-Regional Input-Output Analysis. IMPLAN.

regional structure and approximately 17% in the 2018 county structure.[31] The number of regions impacts the amount of activity that would be omitted by the simpler methodology. If there are more regions, each region includes less economic activity and, thus, loses more spillover activity to surrounding regions. For example, if one were to consider the greater Sacramento region, as in the 2019 report, it would include the spillover that spending in Sacramento County would provide to nearby Yolo County. However, if it was focused on specific counties, as in the 2018 report, Yolo County would be considered separately from Sacramento County. This would result in the spillover being missed in the simpler methodology and explains why the estimate for 2019 was less than 2018. In either case, these spillover impacts are captured by the methodology used in these reports and are included in the results.

Figure 21: MRIO[32]

Limitations of the Input-Output Model

Readers should be aware of a number of limitations with the modeling techniques employed, as Leontief himself acknowledged.[33]

I-O models are based on fixed assumptions about the economy being modeled. It assumes that X input leads to Y output. Reality, however, may play out differently. For example, if the scenario led to the need to purchase more widgets, the model would assume the local widget industry would be able to expand as necessary to maintain the level at which it currently fulfills local widget needs. This assumption could be flawed in ways that could over or understate the impact. The local economy might not have the resources, physical space, capital and/or workforce to support that expansion and the widget industry may not grow at all. Conversely, if it is able to expand to fulfill the modeled needs, expansion may lead to the widget industry investing the capital to expand sufficiently to fulfill all of the added demand or even supplant demand currently fulfilled by imports. Similarly, the growth will impact the workforce in ways that could further grow the economy by bringing in additional workers or shrink other aspects

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[31] Clouse, C. (2024). MRIO: Introduction to Multi-Regional Input-Output Analysis. IMPLAN.
[32] Clouse, C. (2024). MRIO: Introduction to Multi-Regional Input-Output Analysis. IMPLAN.
[33] Leontief, W. (1955). Some Basic Problems of Empirical Input-Output Analysis. Input-Output Analysis: An Appraisal.

of the economy by competing for a limited pool of employees. Similarly, it assumes that prices are fixed and that ratios for intermediate inputs (i.e., efficiency) are fixed.

These issues are most pronounced at the largest scales (both relatively and absolutely). For example, if we were to introduce an additional $10 trillion in spending nationally, it would not double the overall size of the economy, as an I-O model would estimate. Instead, it would largely crowd out other economic activity, since the country's workforce and resources could not absorb the extra demand for goods and services, resulting in significant inflation, but little real economic growth.

Because the purpose of this study is to estimate the existing impacts of current spending levels, these limitations are less significant.

Beyond specific limitations of I-O modeling, as Leontief described it, the "theoretical formulation is designed to protect the investigator from this danger: it does not permit him to draw any special or general conclusions before he or someone else completes the always difficult and seldom glamorous task of ascertaining the necessary facts."[34] In other words, any model is only as good as its data.

The inputs used are entirely U.S. administrative data, which is typically considered among the most reliable sources. There are limitations, however. Several datasets do not perfectly align with the model or the needs of this study. Some spending data is tagged to a specific company but not a specific industry. In these cases, the California Research Bureau made a judgement as to which IMPLAN sector code to assign that spending. In cases where sufficient detail is not available to differentiate between similar sectors, the sector with multipliers closest to the average of the other sectors was assigned. Provision of SmartPay data by the departments has proven unreliable. As a result, national data is apportioned based on the most recent year when more detailed data was available, which varies by department. As discussed above, this analysis does not include data on in-state subcontractors operating under out-of-state prime-contractors, largely because of the condition of the original datasets and concerns about duplicating counts.

These limitations notwithstanding, I-O modeling generally, and the IMPLAN model specifically, are widely accepted tools for estimating impacts for government spending. The estimates provide a reasonable approximation of the impacts.

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[34] Dietzenbacher, E. & Lahr, M.L. (2004). Wassily Leontief and Input-Output Economics. Cambridge University Press.

The USS Frank E. Petersen (DDG 121) passes by Anacapa Island in route to Naval Surface Warfare Center, Port Hueneme Division.