Developing Federal Government Consumption Expenditures and Gross Investment Statistics by State

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Abstract This paper details BEA's ongoing efforts to develop experimental statistics on federal government consumption expenditures and gross investment by state. These new statistics would provide valuable information for policymaking, research, and business decision-making at the state level, complementing BEA's national data on federal spending. The methodology used to prepare the experimental estimates relies on a wide variety of source data and it is consistent with the methodology used for the corresponding national statistics. When state-level detail is available in the source data used for the national statistics, it is directly applied; when such detail is lacking, alternative sources and a modified methodology are used. In general, the statistics are derived from allocators developed for each detailed component of federal government expenditures, which are used to allocate national component totals to states. Preliminary estimates for 2012–2023 show considerable variation in the economic impact of federal government spending across states. For example, on average from 2012 to 2023, federal spending as a percentage of state gross domestic product ranged from 2.5 percent in Delaware to 27.6 percent in Virginia, with the District of Columbia averaging 51.9 percent. As these estimates are preliminary, BEA invites feedback from stakeholders and data users to improve the methodology and accuracy of these statistics.

Keywords Government consumption expenditures; government gross investment; state level statistics

JEL Code H5, R5

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1. Introduction

In the United States, government expenditures account for about 17% of gross domestic product (GDP). In 2024, the federal government portion totaled $1.87 trillion, or approximately 6.4% of GDP, with the remaining share attributed to expenditures by state and local governments.[1] Government expenditures, which include both consumption spending and investment, play a key role in supporting productivity and economic growth as well as fostering regional economic development. Despite government spending's contributions to the economy, its statistics are not available at the subnational level. This paper presents a methodology for preparing such statistics and introduces experimental estimates of federal government spending by state.

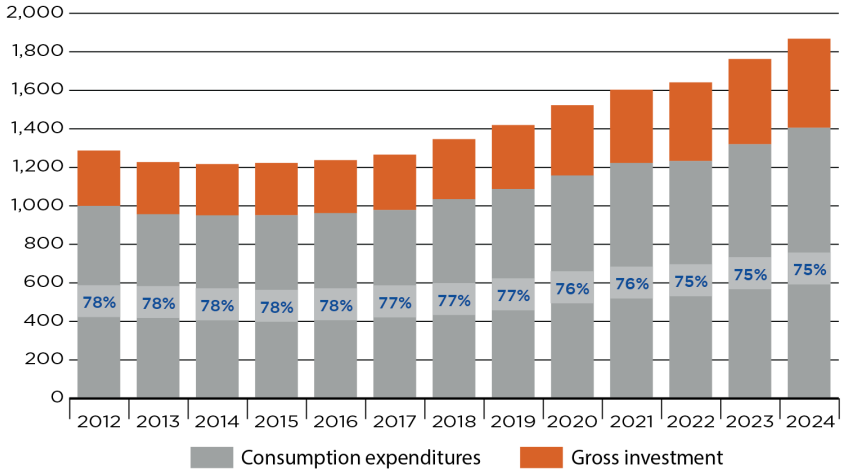
Numerous studies over the years have examined the link between government consumption spending and economic performance (see Ramey 2011 and 2019 for overviews) and highlighted its importance as a policy tool (e.g., Auerbach and Gorodnichenko 2012 and Nakamura and Steinsson 2014). Additional research also suggests that government investment plays an important role in future economic growth and productivity. For example, Moretti et al. (2025) and Deleidi and Mazzucato (2021) find that government investment—especially in research and development (R&D) and defense—fosters innovation in the private sector and has long-run effects on manufacturing growth. Fernald (1999) and Donaldson and Hornbeck (2016) find that public investment in infrastructure boosts industry-level productivity and improves market access.

The U.S. Bureau of Economic Analysis' (BEA's) federal government consumption expenditures and gross investment statistics in the National Income and Product Accounts (NIPAs) provide critical data for these kinds of analyses as well as for policy development and business decision-making. Federal government consumption expenditures consist of short-term spending by the federal government on inputs used to produce goods and services for the public. Examples include salaries and benefits for federal employees like National Park Service rangers, Federal Bureau of Investigation agents, and Internal Revenue Service auditors; office supplies like printer paper, computers, and furniture for federal agencies; and expenditures on utilities, rent, and maintenance for government buildings. In 2024, federal consumption expenditures totaled $1.41 trillion, representing about 75% of all federal spending (figure 1).

The gross investment portion consists of spending by the federal government on fixed assets that support federal agencies' production activities and are expected to last at least 3 years. Examples include construction of new federal office buildings, courthouses, and military bases, as well as purchases of military aircraft, ships, and advanced defense equipment. The government also invests by building highways, bridges, and other infrastructure projects; by funding research and development that creates new knowledge and technology; and by purchasing long-lasting equipment and technology systems. In 2024, federal gross investment totaled $462 billion, representing about 25% of all federal spending.

[1] Source: National Income and Product Accounts Table 3.9.5.

Figure 1. Federal Government Consumption Expenditures and Gross Investment: 2012–2024
Levels (Billions of Dollars) and Percent Share of Total



Source: NIPA Table 3.9.5

Notes: The gray bar is the value of federal consumption expenditures, and the orange bar is the value of gross investment in billions of dollars. The % label on the gray bar is the share of consumption expenditures in the total of consumption expenditures and gross investment.

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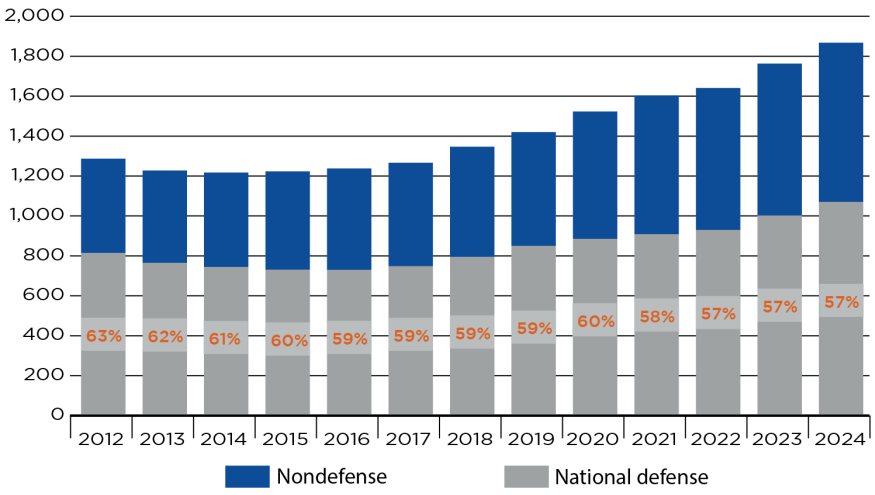
Figure 1 shows how total federal spending has changed from 2012–2024. Total federal spending rose from $1.29 trillion in 2012 to $1.87 trillion in 2024, representing an annualized increase of 3.2%. Consumption expenditures increased from $1.00 trillion to $1.41 trillion at an annualized rate of 2.9%, while gross investment increased from $287 billion to $462 billion at an annualized rate of 4.0%. The faster increase in gross investment has resulted in a decline in the share of consumption expenditures from 78% to 75% over this period.

BEA also publishes national estimates of federal government consumption and gross investment separately for defense and nondefense functions. Defense spending comprises all Department of Defense (DOD) spending on military activities, including military personnel salaries, equipment purchases, base operations, and defense research, as well as Department of Energy (DOE) spending on defense-related atomic energy programs such as nuclear weapons maintenance. Defense spending increased from $814 billion in 2012 to $1.07 trillion in 2024, representing an annualized growth rate of 2.3% (figure 2).

Nondefense spending covers all other federal agencies' expenditures, including education programs, public order and safety, health and medical research, transportation and infrastructure, environmental protection, social services administration, and nondefense-related scientific research. Nondefense spending increased from $473 billion in 2012 to $797 billion in 2024, representing an annualized growth rate of 4.4%. The faster increase in nondefense spending has resulted in a decline of the defense share of total federal spending from 63% in 2012 to 57% in 2024.

Figure 2. Federal Government Defense and Nondefense Expenditures: 2012–2024
Levels (Billions of Dollars) and Percent Share of Total



Source: NIPA Table 3.9.5

Notes: The gray bar is the value of federal defense spending, and the blue bar is the nondefense spending in billions of dollars. The % label on the graph bar is the share of defense spending in the total of defense and nondefense spending.

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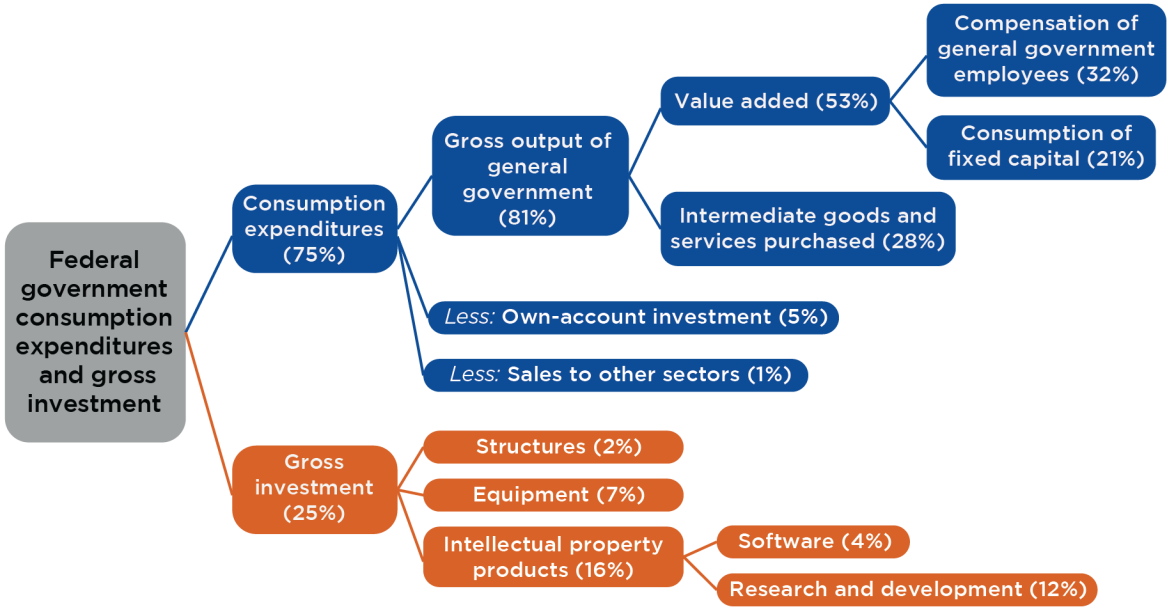
Despite the availability of comprehensive federal spending statistics at the national level, comparable state-level federal government consumption expenditures and gross investment statistics are not available. This lack of geographically detailed federal spending statistics, consistent with the NIPA framework, limits our understanding of how federal spending impacts state economies.

Data users in need of this information have relied on various alternative sources, including BEA's subnational statistics on federal employee compensation and value added by state; Bureau of Labor Statistics (BLS) data on federal wages and employment; National Science Foundation (NSF) data on federal R&D obligations by state; and the Treasury Department's (TREAS) USAspending.gov data. While useful for certain purposes, these data sources either do not fully capture all expenditures included in the federal consumption expenditures and gross investment or do not adhere to the NIPA concepts and framework, limiting comparisons with state GDP and assessments of state economic impacts. Thus, BEA has developed an experimental set of NIPA-consistent federal government consumption expenditures and gross investment by state statistics for the years 2012 to 2023. These new statistics show how much the federal government spends in each state to produce and provide goods and services to the public.

The state-level methodology uses data from BLS' Quarterly Census of Employment and Wages (QCEW) and Occupational Employment and Wage Statistics (OEWS), the TREAS USAspending.gov database, NSF's federal R&D survey, and BEA internal data, adjusts these data to align with the NIPA concepts and framework, and uses the data to develop allocators to allocate to states the national detailed components of federal government consumption expenditures and gross investment statistics. These components are depicted in figure 3.

The consumption expenditures portion consists of compensation of general government employees, intermediate goods and services purchased, and consumption of fixed capital (CFC), *less* own-account investment and sales to other sectors. The gross investment portion consists of investment in structures, equipment, and intellectual property products (IPPs).

Figure 3. Federal Government Consumption Expenditures and Gross Investment Components



Source: NIPA Table 3.9.5 and 3.10.5 and authors' calculations.
Note: Calculations are based on 2023 values.
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The experimental statistics show considerable variation in federal government spending across states and in their impact on state economies over time. The top four states with the largest average federal spending shares between 2012 and 2023 include California (12.2%), Virginia (11.5%), Maryland (7.3%), and Texas (7.1%). The District of Columbia's (DC's) share was 5.5%. These four states and DC jointly account for more than 40% of total federal spending. The experimental results also show that the average federal spending as a share of state GDP between 2012 and 2023 ranged from 2.5% in Delaware to 27.6% in Virginia, with the District of Columbia at 51.9%. From 2012 to 2023, the average annual growth rate of federal spending ranged from 0.8% in California to 8.4% in South Dakota. The increase in DC was 4.5%. An Excel file containing the complete set of experimental statistics to accompany this paper is available for download. As these estimates are still preliminary, BEA invites feedback from stakeholders and data users to improve the methodology and accuracy of these statistics.

The rest of this paper is structured as follows. Section 2 provides an overview of the NIPA framework and relevant concepts, followed by a discussion of the geographic considerations involved in extending these concepts to state-level calculations. Section 3 reviews the source data used in the NIPA estimation and describes in detail the data sources and methods used to prepare the experimental state-level statistics. Section 4 presents some analysis and insights drawn from the state-level experimental statistics of federal government consumption expenditures and gross investment, while Section 5 concludes.

2. Concepts and Framework

In the NIPAs, the federal government plays three distinct roles in the economy: producer, investor, and consumer. As a producer, the federal government uses labor, capital, and intermediate inputs to provide goods and services to the public. This role is reflected in consumption expenditures, particularly in terms of output and value added. Federal government gross output is measured as the sum of value added and intermediate goods and services purchased. Value added represents the contribution of the federal government employees and assets to GDP, and it is the sum of employee compensation and service charges associated with the consumption of fixed capital used in production (or CFC).

Federal government output and value added include only the activities of general government (GG). GG primarily provides nonmarket goods and services to the public at no direct cost and is funded through taxes and fees. Examples of nonmarket goods and services include national defense, health care, and services associated with income redistribution programs. In contrast, government enterprises (GEs) sell goods and services to the public at market prices and recover part or all their operating costs. An example of a federal GE is the U.S. Postal Service (USPS). Table 1 provides the list of 13 federal GEs, which are grouped into 5 categories.[2] The gross output and value added of these federal GEs are recorded in the business sector, alongside those of private businesses.

Table 1. Federal Government Enterprises

Government enterprise category	Government enterprises
Postal	U.S. Postal Service
Printing	Government Publishing Office Sales
Utilities	Tennessee Valley Authority
	Bonneville Power Administration
	Southeastern Power Administration
	Southwestern Power Administration
	Western Power Administration
Retail	Military Post Exchanges and Restaurants
	Veterans Canteen Service
Finance & insurance	Federal Crop Insurance Company
	Federal Housing Administration
	National Flood Insurance
	Overseas Private Investment Corporation

In its role as an investor, the federal government adds to or replaces the stocks of government-owned fixed assets. Federal agencies invest in structures, equipment, and IPPs. These expenditures are typically associated with assets that are expected to last and provide productive services for at least 3 years. BEA classifies such expenditures as gross investment. Gross investment includes both purchased investment by federal agencies from private businesses, households, foreign entities, or state and local governments, as well as own-account investment that is produced in-house.

[2] BEA (2005) lists 15 GEs (p. II-30). Instead of Western Power Administration, it includes Department of Energy Colorado River Basin, Department of Interior Colorado River Basin, and Upper Colorado River Storage. This paper combines these three GEs as Western Power Administration.

Examples of purchased investment include the federal government contracting a private construction company to build military housing in a state, contracting a foreign construction company to build an embassy in a foreign country, buying Air Force planes for use from Boeing, or funding research and development at a university. One example of own-account investment is DOD employees developing software applications for internal use. If one federal agency contracts another federal agency to develop statistical software, that is treated as own-account investment since both organizations are part of the same institutional sector.

To reconcile activity across its roles and to avoid double counting in the estimation of GDP, two relatively small components are subtracted from federal government gross output. The first component is own-account investment, which is part of federal government gross output, but is also included in gross investment. The second component is sales to other sectors. When the federal government sells goods and services at a reduced charge, or when such sales are related to GG operations (e.g., services provided by Veterans Administration hospital), the payments made by the public are recorded either as personal consumption expenditures or as intermediate inputs by businesses. Thus, to avoid double counting, these sales should not be included in federal government consumption expenditures.

The remaining portion of the gross output—the difference between the costs incurred in production and the fees collected from the public—is considered federal government consumption expenditures on behalf of the public. In this context, the federal government acts as the consumer or the final purchaser of its own output (less sales and own-account investment). As a consumer, the consumption expenditures measure the federal government's consumption portion in the "final demand" measure of GDP.

Geographic Considerations

For the development of state-level statistics, the federal government is treated as a producer of goods and services. Thus, the components of federal government consumption expenditures are assigned to the state where the production occurs. For example, when a doctor at a veterans hospital provides services to a patient free of charge, the doctor's compensation is attributed to the state where the service was provided, not where the patient or doctor resides.

Gross investment expenditures by the federal government are assigned to the state where the investment occurs. For example, if the federal government contracts a private business in Washington state to build an airplane for military use, the related expenditures are attributed to Washington. The same principle applies to other types of investments: structures such as military buildings, bridges, or highways, are assigned to the states where they are built, whether by private contractors or federal agencies. Equipment, such as ships and airplanes, is also assigned to the state where it is built, as data are not available to distribute its value across all the states where it might later be moved or stationed, including overseas locations. Federal expenditures on IPPs are assigned to the location where they were produced. The CFC associated with the use of the equipment, structures, and IPPs in production is assigned to the states where the investments were originally assigned.

Because these statistics are developed based on the location of production, government consumption expenditures by state statistics should not be interpreted as indicating the extent to which a state's residents benefit from the final consumption of the federal government. Rather, they measure the value of federal government consumption expenditures associated with goods and services production within the state. Similarly, gross investment by state statistics reflect the location where the investment was produced, not where it may ultimately be used.

Another important geographic consideration is that while national federal government consumption and investment spending statistics include federal government activities that occur outside the United States, such activities are excluded from state-level statistics. For instance, compensation for federal civilian employees stationed abroad is excluded from state-level measures of federal government consumption expenditures because their activities are performed outside the United States. This exclusion aligns with other BEA regional statistics such as state personal income and GDP by state, due to the conceptual ambiguity of assigning foreign activities to specific states. The difference between the sum of state values and the national reported values is recorded as an overseas adjustment in the state-level statistics.

3. Source Data and Methodology

The methodology for the state-level estimates aligns with the concepts, definitions, and framework of the NIPAs wherever possible. When state-level data sources differ from those used for national estimates, the methodology ensures consistency by applying the same conceptual framework. Finally, state-level estimates are benchmarked to national totals for all components of federal government consumption and gross investment.[3] The remainder of this section outlines how these source data are used to construct the various components of the experimental state-level estimates of federal government consumption expenditures and gross investment.

Source Data

Table 2 summarizes the principal source data used to estimate the national components of federal government consumption and gross investment expenditures in the NIPAs. BLS QCEW and OEWS data, DOD Contract Awards data, and NSF R&D-related survey data all include state-level information. Thus, the same source data as the NIPAs are used in the state-level estimation for civilian compensation, investment in R&D, and own-account investment in software.

Most of the primary source data needed to estimate intermediate goods and services purchased and investment—such as Federal Budget data, Monthly Treasury Statement (MTS) data, and Census Bureau's Value of Construction Put in Place Survey (VIP) data—do not include information on the state in which such activities occur. In these cases, alternative source data are used. TREAS USA contract spending data are used to allocate national estimates of intermediate goods and services purchased and investment in equipment and structures to states. TREAS USA contract spending data are also used for custom and prepackaged software.[4] In addition, BLS OEWS data are used to estimate the state-level own-account investment in structures.

[3] The national totals of detailed components used in this version of the paper is from December 2024, which may be slightly different from the most current NIPA tables on the BEA website.

[4] The Economic Census, the NIPA source data for custom and prepackaged software, reports state information for the seller rather than the purchaser of the software, making it unsuitable for this project.

Table 2. Source Data for Federal Consumption Expenditures and Gross Investment

Component	NIPA source data	State information available	Alternative state source data
Civilian wages and salaries	BLS QCEW	Yes	---
Military wages and salaries	Federal budget data	No	BEA SPI
Supplements to wages and salaries	SSA Data, reports on retirement funds from OPM, DOD and Thrift Investment Board	No	BEA SPI
Intermediate goods and services purchased	MTS data, DOD financial reports, DOD Defense Energy expenditures, Federal Budget DOD Contract Awards[5]	No Yes	TREAS USAspending
Investment in structures/CFC	DOD financial reports, VIP, GSA data, MTS data	No	TREAS USAspending
Investment in equipment/CFC	GSA data, Federal Budget data, DOD production control reports and financial reports, MTS data DOD contract awards	No Yes	TREAS USAspending
Investment in custom and prepackage software/CFC	Economic Census	Yes (but not suitable)	TREAS USAspending
Investment/CFC/own-account investment in R&D	Higher Education R&D Survey; NSF Survey of Federal Funds for R&D	Yes	---
Own-account investment in software	BLS OEWS	Yes	---
Own-account investment in structures	Census VIP	No	BLS OEWS

BEA: Bureau of Economic Analysis
BLS: Bureau of Labor Statistics
CFC: Consumption of fixed capital
DOD: Department of Defense
GSA: U.S. General Services Administration
MTS: Monthly Treasury Statement
NSF: National Science Foundation
OEWS: Occupational Employment and Wage Statistics
OPM: Office of Personnel Management
QCEW: Quarterly Census of Employment and Wages
R&D: Research and development
SPI: State personal income
TREAS: U.S. Department of Treasury
USDA: U.S. Department of Agriculture
VIP: Value of Construction Put in Place Survey
SSA: Social Security Administration

State Methodology

This subsection outlines how these data sources are used to develop the experimental state-level estimates of federal government consumption expenditures and gross investment. The methodology is summarized and presented by component, based on the source data used for each component or group of components.

[5] DOD Contract Awards data are included in USAspending data.

Compensation of General Government Employees

Compensation of federal government employees consists of nondefense civilian compensation and defense employee compensation, which includes both defense civilian and military compensation. Estimates of federal civilian and military compensation are already published by BEA as part of its state personal income (SPI) and GDP by state statistics. In these statistics, federal civilian compensation includes both GG and GE employees. As noted in Section 2, only GG employee compensation is included in federal government gross output, while compensation of GE employees is included in the value added of the private business sector. To remove the GE portion, QCEW microdata are used to partition federal civilian compensation into its GG and GE components.

BLS provides QCEW microdata to BEA for statistical purposes. These files include monthly employment and quarterly wage and salary information dating back to 2016. The data, published on a quarterly basis, originate from state unemployment insurance programs. They are reported on an establishment basis and include the establishments' 6-digit North American Industry Classification System (NAICS) industry code as well as other important information such as legal names (used for legal purposes) and trade names (known to the public), which enables identification of GG and GE entities. However, the microdata lack complete geographic and time series coverage. For example, in 2023, these data were available for only 41 states and DC. Only 29 states had complete data coverage for all the years from 2016 to 2023.

The method for estimating compensation of federal GG employees by state involves three main steps:

1. *Identifying GE Entities:* For state-year combinations where QCEW microdata are available, GEs are identified by directly matching establishment names with the 13 GEs listed in table 1. In cases where microdata are not available, an alternative identification method is used based on 6-digit NAICS industry codes. First, all NAICS 6-digit codes associated with each GE in the available microdata are identified. For each GE category in table 1, the share of total federal civilian wages is calculated for each corresponding NAICS code. These shares are then used to impute values for state-year combinations which lack microdata coverage.

   Specifically, for states with partial microdata coverage—with data available for some years but not others—the calculated shares for 6-digit NAICS industries from the closest available year are applied to the QCEW 6-digit NAICS wage aggregates to estimate the federal GE employee wage for the missing years. For the nine states for which no microdata are available, average shares derived from all other states with available data are applied. Once total GE employee wages have been computed for each state and year, the shares of federal GE employee wages are calculated for all state-year combinations.

2. *Splitting BEA's SPI Federal Civilian Compensation:* The wage shares derived from the microdata are used to split federal civilian compensation into its GG and GE components. On average, wages and salaries account for about 68% of total federal civilian compensation. The remaining portion—primarily employer contributions for employee pension and insurance funds and employer contributions for government social insurance—is assumed to equal a fixed percentage of wages, so that employer contributions are allocated to the states in the same proportions as wages. To ensure the sum of GG and GE compensation matches the SPI estimates for each state while also ensuring that the total GG and the total GE compensation amounts across all 50 states and DC

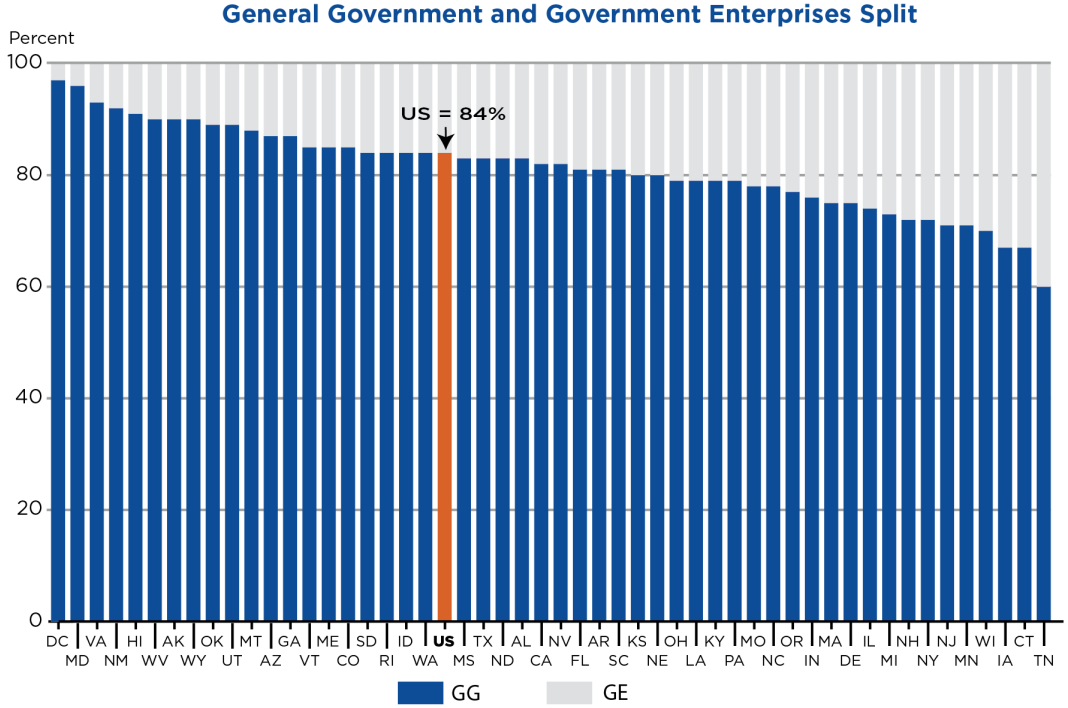
align with national totals, a dual allocation benchmarking procedure based on the RAS algorithm is applied.[6]

3. *Decomposing federal GG civilian compensation into defense and nondefense categories*: Once federal GG civilian compensation is computed, QCEW microdata (excluding GEs) are used to decompose it into defense and nondefense categories. The defense category consists of activities covered by the national defense function, including DOD military activities, defense-related atomic energy activities of the DOE, and defense-related activities of other agencies. DOD employees or those classified under NAICS 5-digit code 92811 (national security) are categorized as defense employees, while all others are classified as nondefense employees.

   For states with at least one year of QCEW microdata, the defense civilian shares of total federal civilian employee wages are calculated. For years where microdata are not available, the value from the closest available year is applied. For states that report no QCEW microdata in any year, the defense share of wages is computed from NIPA national defense and nondefense federal civilian employee wages. Applying the defense-nondefense split to GG civilian compensation and totaling defense civilian compensation and military compensation from SPI yields defense compensation of GG employees.

Nationally, this method results in a GG share of total federal civilian compensation of 84% (figure 4). Within the GE portion, the USPS accounts for 90.99% of total GE compensation, while utilities account for 4.86%. These national results align closely with statistics published in the NIPAs.

Figure 4. Federal Civilian Compensation by State, 2023
General Government and Government Enterprises Split



GG: General government
GE: Government enterprises
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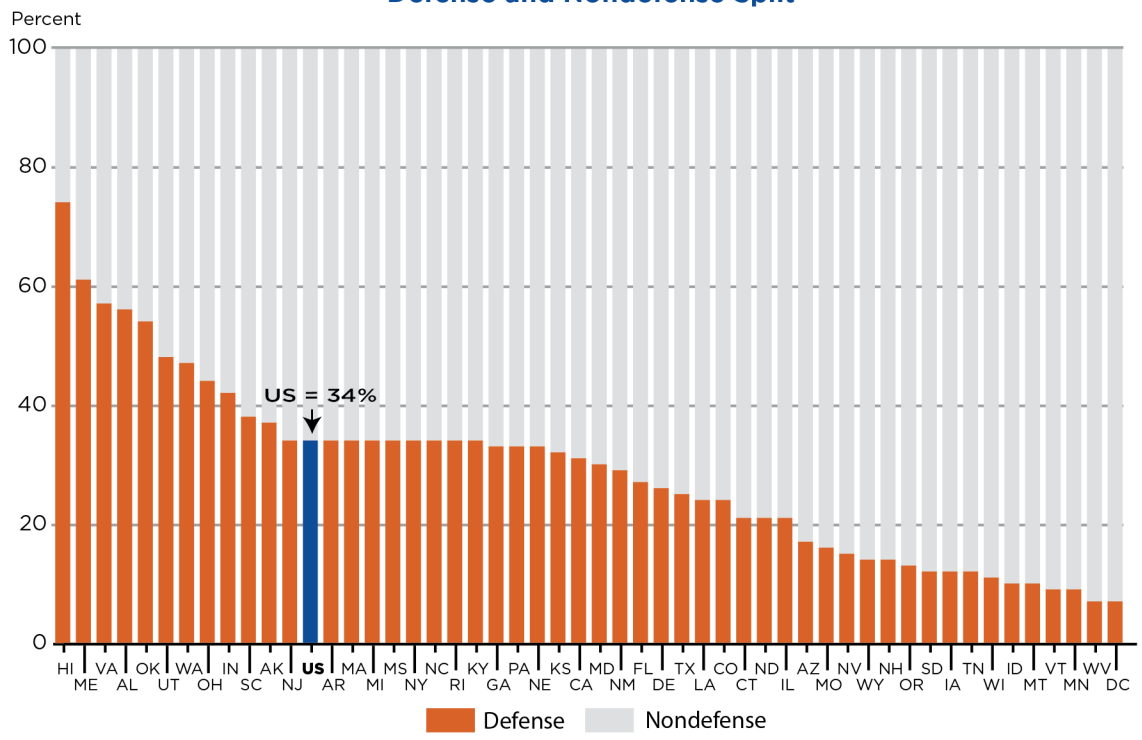
[6] See Appendix 1 for detailed explanation of the dual allocation procedure.

GG shares of total federal civilian compensation vary significantly across states. For instance, while USPS operates in all states and DC, utilities show high geographic concentration in select states. Figure 4 presents the GG (blue bars) and GE (gray bars) compensation shares for all 50 states and DC for 2023. Tennessee has the lowest GG share at 60%, primarily attributable to the Tennessee Valley Authority (TVA). Connecticut follows with a 67% share, reflecting the state's relatively large number of Navy Exchange and Coast Guard community services employees, in addition to a substantial USPS workforce.

In contrast, DC (97%), Maryland (95%), and Virginia (93%) have the highest GG compensation shares, resulting from the presence of a large federal government civilian workforce. New Mexico, West Virginia and Hawaii also have above-average GG shares, reflecting a higher concentration of federal employees than most states.

Figure 5. Federal General Government Civilian Compensation by State, 2023
Defense and Nondefense Split



GG: General government
GE: Government enterprises
U.S. Bureau of Economic Analysis

Figure 5 shows the distribution of defense (orange bars) and nondefense (gray bars) federal GG civilian compensation across all 50 states and DC for 2023. At the national level, the defense compensation comprises 34% of the total, with 12 states exceeding this share. Hawaii had the highest defense compensation share at 74%, followed by Maine (61%), Virginia (57%), Alabama (56%), and Oklahoma (54%). Nondefense compensation shares were highest in DC (93%), West Virginia (93%), Minnesota (91%), Vermont (91%), and Montana (90%).

Intermediate Goods and Services Purchased and Gross Investment

Contract spending data are used for two components: intermediate goods and services purchased and gross investment. These data are from USAspending.gov, the official and publicly available open source of unclassified federal spending information maintained by the TREAS. This source includes information on federal awards such as contracts, grants, and loans. The data cover all transactions associated with federal government contracts and represent the principal method through which federal agencies procure goods and services above a statutory threshold (currently $10,000).

The transaction types include both initial ("base") contracts and any amendments or modifications to past contracts. The data reflect obligation values rather than actual outlays. When the data include obligations that are negative in value, these represent de-obligations included to correct errors or reflect updated information (e.g., when project costs are lower than expected). The data are organized by fiscal year and contain information on the primary place of performance of the contract work as well as recipient location (the legal business address).

Several adjustments are made to these data. For multi-year transactions—when start and end dates span multiple years—transaction values are attributed proportionally based on the number of days in each year. When the transaction start date precedes the contracting action date, the start date is replaced with the action date. In addition, the data are converted from a fiscal year basis to a calendar year basis.

The contract spending data provide information on both the nature and location of spending that is relevant to the calculation of federal government spending by state. Defense and nondefense spending are computed separately using contracting agency information. A transaction is classified as defense spending if awarded by DOD, and as nondefense spending if awarded by any other federal agency. Transactions are attributed to states based on where the most significant portion of the work is performed (primary place of performance)—for example, in a manufacturing contract, the main plant where items are produced. As discussed in Section 2, the defense category also includes defense-related atomic energy activities of the DOE. Because contract spending data do not explicitly identify these contracts, all DOE contracts in Bernalillo and Los Alamos counties of New Mexico are classified as defense expenditures.[7]

The contract spending data also contain information on Product and Service Codes (PSC), a classification system consisting of over 2,000 four-digit codes that describe the type of product or service purchased (or, when the contract includes multiple items, the predominant product or service). Using a concordance published by the Defense Pricing and Contracting Office,[8] PSCs are grouped into 16 Object Class Codes (OCC) to facilitate mapping the PSCs to expenditure categories, including intermediate goods, services, investment in equipment, structures and software.[9]

[7] This adjustment may slightly overestimate federal defense spendings in New Mexico, but the risk of underestimation is more severe if DOE's atomic activities in New Mexico are not captured.

[8] The concordance can be downloaded from: https://psctool.us/mappings.

[9] Transactions related to insurance claims and indemnities and R&D contracts are not used in this paper. Investment in R&D is estimated using different data sources, which is explained in a later section.

Intermediate purchases: The OCCs used to identify transactions related to purchases of intermediate goods and services are 21.0 through 25.8 (except 25.5—R&D contracts), which are classified as intermediate services, and 26.0 (supplies and materials), which is classified as intermediate goods (table 3). Goods are further divided into durable and nondurable categories based on the descriptions in the PSC. In addition to the codes above, OCC 31.0 (equipment) is used for some of the intermediate durable goods. This is because, in the NIPAs, some equipment is split between investment and intermediate durable goods according to a predefined ratio. The same ratios are used to split equipment spending into investment and intermediate durable goods for each state at the most detailed PSC level.

Table 3. Object Class Codes and Description

Category	OCC Code	Description
Services	21.0	Travel and transportation of persons
	22.0	Transportation of things
	23.2	Rental payments to others
	23.3	Communications, utilities, and miscellaneous charges
	24.0	Printing and reproduction
	25.1	Advisory and assistance services
	25.2	Other services from non-Federal sources
	25.4	Operation and maintenance of facilities
	25.6	Medical care
	25.7	Operation and maintenance of equipment
	25.8	Subsistence and support of persons
Goods	26.0	Supplies and materials
Equipment	31.0	Equipment
Structures	32.0	Land and structures
Other	42.0	Insurance claims and indemnities
IPPs	25.5	Research and development contracts

OCC: Object Class Codes

IPPs: Intellectual property products

Intermediate durable goods, nondurable goods, and services are further divided into defense (14 detailed items) and nondefense (4 detailed items) subcategories based on the description of PSCs (table 4). The allocation of intermediate services and nondurable goods between defense and nondefense is based on the ratio of defense to nondefense employee compensation. No further disaggregation is performed within the defense and nondefense categories for nondurable goods and services. Contract spending by USPS and the Government Publishing Office[10] is excluded in the calculation of GG intermediate goods and services purchased.

Table 4. Detailed Categories of Intermediate Durable Goods

Defense	Nondefense
182 Ships parts	082 Intermediate expenditures, NASA equipment
188 Vehicle parts and equipment	084 Vehicle parts
202 Inter. purch., def.: computers	086 Commercial computer parts
218 Inter. purch., def.: DLA construction dur.	102 Other dur., nondef. purch.
220 Inter. purch., def.: DLA medical dur.	
222 Inter. purch., def.: general goods	
235 Inter. purch., def.: industrial goods	
240 Ammunition Plant Equipment	
242 DOE atomic energy equipment	
244 Intermediate def. aircraft expenditures	
261 Intermediate electronic equipment expenditures	
293 Intermediate expenditures, missiles, space, torpedoes	
320 Other military equipment, n.e.c.	
344 Weapons and fire control equipment	

Def: Defense
Dur: Durable
n.e.c.: Not elsewhere classified
DLA: Defense Logistics Agency
Inter: Intermediate
Nondef: Nondefense
DOE: Department of Energy
NASA: National Aeronautics and Space Administration
Purch: Purchase

[10] Only these two GEs could be precisely identified in the data using funding agency.

Equipment: Portions of OCC 31.0 (equipment) that are classified as investment in equipment after subtracting the intermediate durable goods portions are used as allocators for national investment in equipment values. These equipment values are further divided into defense (14 detailed items) and nondefense (5 detailed items) subcategories using PSCs (table 5).

Table 5. Detailed Categories of Gross Investment in Equipment

Defense	Nondefense
526 Ships, investment	300 Commercial computers, general government
562 Vehicles	317 Fixed investment, NASA equipment
609 Missiles	328 Nondef. other dur., nondef. purch.
684 Aircraft	334 Nondef dur. medical supplies inv
781 Ammunition plant equipment	335 Nondefense vehicles, general government
783 Def. DLA construction dur.	
785 Def. DLA medical dur.	
787 Def. general goods	
799 Def. industrial goods	
803 DOE atomic energy equipment	
805 Other military equipment, n.e.c.	
829 Weapons and fire control equipment	
841 Commercial computers	
858/861/864/872/875/878/881/885 Other electronics fixed investment	

Def: Defense
DLA: Defense Logistics Agency
DOE: Department of Energy
Dur: Durable
Inv: Investment
NASA: National Aeronautics and Space Administration
n.e.c.: not elsewhere classified
Nondef: Nondefense
Purch: Purchase

Purchased software: For custom and prepackaged software, PSCs under IT products are used to allocate national investment in software to states.

Structures: For investment in structures, PSCs matched to OCC 32.0 (land and structures) serve as indicators to allocate the national values to states. PSCs are matched to individual asset categories in the NIPAs based on the PSC description. They are further divided into defense investment in structures (4 detailed items) and nondefense (13 detailed items) (table 6).

All military equipment and structures located overseas, as well as mobile military equipment located domestically, are excluded from the GDP by state accounts but are included in the national estimates. To reconcile the national totals from the NIPAs with the state-level framework, an overseas adjustment is applied to exclude non-domestic investment. For defense, the overseas adjustment is calculated as the weighted average of the share of overseas employee compensation of defense civilian employees and military personnel. For nondefense, the adjustment is based on the share of overseas employee compensation of nondefense civilian employees. The same overseas adjustments are applied consistently across all relevant components.

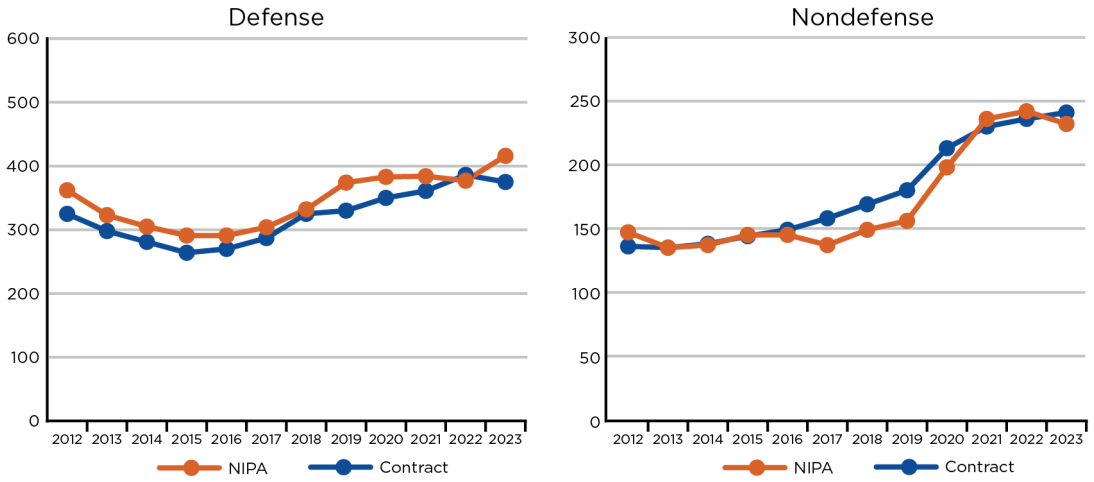
Table 6. Detailed Categories of Gross Investment in Structures

Defense	Nondefense
890 Military facilities	345 Federal nondef. structures, amusement and recreation
898 Residential	346 Federal nondef. structures, commercial
901 Industrial facilities	349 Federal nondef. structures, conservation and development
903 Used structures	354 Federal nondef. structures, educational
	355 Federal nondef. structures, health care
	356 Federal nondef. structures, highways and streets
	357 Federal nondef. structures, office
	360 Federal nondef. structures, power
	363 Federal nondef. structures, public safety
	364 Federal nondef. structures, residential
	365 Federal nondef. structures, transportation
	366 Federal nondef. structures, other
	369 Used structures

Nondef: Nondefense

Figure 6 compares national totals for federal government purchases of goods, services, structures, and equipment, constructed using the contract spending data and the corresponding NIPA values for the years 2012 to 2023. While the contract-spending-based statistics closely track the overall trend in the NIPA estimates, some discrepancies remain. These differences arise partly because the NIPAs integrate multiple data sources in addition to federal budget data, resulting in source data coverage differences. In addition, contract data represent obligations, whereas NIPA sources reflect final payments. Contract data also exclude purchases under $10,000 (credit card purchases), and equal spreading of contract values between start and end dates may not align with timing reported in the NIPA data sources. Despite these limitations, contract spending data are the most comprehensive and detailed source currently available for producing experimental estimates of federal government spending by state.

Figure 6. Comparison of Contract Spending Data and NIPA Estimates: Government Purchases of Intermediate Goods and Services, and Gross Investment in Structures and Equipment (Billions of Dollars)



NIPA: National Income and Product Accounts

U.S. Bureau of Economic Analysis

Consumption of Fixed Capital

CFC, or depreciation, measures the decline in the value of the stock of fixed assets due to physical deterioration, normal obsolescence, and accidental damage. Federal government CFC provides a measure of the services derived from the use of government fixed capital—that is, of the value added (measured as the expense incurred) resulting from using government capital goods in the production of services.

In the NIPAs, CFC of the federal government is calculated using capital stocks, investment and depreciation rates for a very detailed set of asset categories (103 assets for defense and 39 assets for nondefense). However, federal CFC by state can only be calculated at more aggregated asset levels—21 categories for defense and 19 categories for nondefense—because of data limitations. R&D-related CFC is calculated separately and described in the next section. Broadly, state-level CFC is estimated using a version of the perpetual inventory method (PIM) and requires three key inputs: the implied depreciation rate for each asset category, investment by state and asset category, and initial capital stock by state and asset category.

The first of these inputs is the implied depreciation rate of each asset. Because NIPA depreciation rates are available at a more detailed asset level than the 21 defense and the 19 nondefense asset categories used here, these rates cannot be applied directly. Therefore, the implied depreciation rate of asset j in year t is calculated in the following way:

$$d_t^j = (K_{t-1}^{j,CO} + I_t^{j,CO} - K_t^{j,CO})/(K_{t-1}^{j,CO} + \frac{1}{2} I_t^{j,CO}),$$

where $K_t^{j,CO}$ denotes constant-dollar net stock of asset category j at year t; $I_t^{j,CO}$ denotes constant-dollar investment in asset category j at year t. It is assumed that new assets are placed in service at midyear. Therefore, depreciation of new assets is equal to one-half of the new investment amount multiplied by the depreciation rate.

The implied depreciation rates may vary slightly across years as the compositions of the aggregate asset categories vary. These rates are equivalent to the weighted averages of the depreciation rates of individual assets m within category j, using $K_{t-1}^{jm,CO} + \frac{1}{2} I_t^{jm,CO}$ as weights.[11] While there are potential alternative weighting schemes that could be employed, this specific approach has the desirable property that it preserves the summation property of CFCs, i.e., $CFC_t^{j,CO} = \sum_m CFC_t^{jm,CO}$.

The second input to the PIM is the value of investment by state for the 21 defense and the 19 nondefense asset categories. Because the categories of investment do not match the NIPAs asset categories precisely, all transactions in the contract spending data classified as investment are mapped to CFC asset categories based on the description of the PSCs. Since in some cases the PSCs and in other cases the NIPAs asset categories are more detailed, asset categories are aggregated to the most detailed level at which both the NIPAs CFC asset categories and the PSCs can be aggregated consistently. This process results in 21 defense and the 19 nondefense asset categories.

Although the investment estimates calculated from the contract spending data are in current dollars, the share of investment in asset category j for state s in year t would be the same as investment in constant dollars, under the assumption that the price deflator for asset j in year t does not vary across states. Therefore, these state level investment shares are used to allocate the national constant-dollar investment

[11] See Appendix 2 for the derivation.

estimate for asset category j, $I_t^{j,CO}$, to each state. This yields state-level constant-dollar investment estimates $I_t^{js,CO}$ for each year from 2012 and 2023.

The third input to the PIM is the state-level initial stock of each asset at the beginning of the period, which is estimated based on investment growth and depreciation assumptions. Specifically, it is assumed that investment in asset category j for state s grows at a constant growth rate g^{js}, and reaches a known value $I_{2023}^{js,CO}$ by year 2023. In addition, asset category j is assumed to depreciate at a constant rate d^j. Under these assumptions, the constant-dollar net stock of asset category j of state s in 2011 is computed as[12]:

$$K_{2011}^{js,co} = \frac{I_{2023}^{js,CO}}{g^{js}+d^j}.$$

The constant growth rate g^{js} is calculated as the average annual growth rate (AAGR)[13] of investment in asset category j in state s over the period 2012–2023. However, due to the volatility of investment data, the calculated annual growth rate may be a large positive or negative value, potentially leading to implausible estimates of $K_{2011}^{js,co}$. To mitigate this issue, the growth rate g^{js} is constrained to lie within the interval $[-0.5 * d^j, 0.5 * d^j]$.[14]

Applying this method, the sum of 2011 asset stocks for all 50 states and DC equals approximately 91% of the NIPA national value for defense assets and 118% for nondefense assets. These results suggest that this is a sensible method to calculate federal asset stocks.

Once all three required values are estimated, CFCs and asset stocks for each asset category j in state s, denoted $CFC_t^{js,CO}$ and $K_t^{js,CO}$, are calculated iteratively for each year $t\epsilon\{2012,\dots,2023\}$ using the following equations:

$$CFC_t^{js,CO} = \left(K_{t-1}^{js,CO} + \frac{1}{2} I_t^{js,CO}\right) \times d_t^j,$$

$$K_t^{js,CO} = K_{t-1}^{js,CO} + I_t^{js,CO} - CFC_t^{js,CO},$$

where d_t^j is the implied deprecated rate calculated above.

The share for state s in CFC of asset j in year t in constant dollars is the same as CFC in current dollars because it is assumed that the price of CFC does not vary across state. The current-dollar CFC of asset category j in state s and year t, denoted $CFC_t^{js,CU}$, is computed as:

$$CFC_t^{js,CU} = \frac{CFC_t^{js,CO}}{\sum_s CFC_t^{js,CO}} * CFC_t^{j,CU},$$

where $CFC_t^{j,CU}$ is the national-level CFC in current dollars for asset category j in year t, obtained from the NIPAs.

[12] See Appendix 3 for the derivation.

[13] As an alternative to AAGR, compound annual growth rate (CAGR) has also shown comparable results.

[14] A wider band, $[-0.9 * d^j, 0.9 * d^j]$, has also been tested, and the results are comparable.

Research and Development Investment and CFC

The Survey of Federal Funds for R&D collected by the NSF is the primary source for the federal R&D-related estimates. This is the same source used to estimate national R&D investment. This survey contains information on obligations for R&D for all 50 states and DC reported on a fiscal year basis. Key information includes federally funded R&D performed by entities outside the federal government (known as extramural R&D) including universities and colleges, businesses, nonprofit institutions, and Federally Funded Research and Development Centers (FFRDC) administered by these entities. The survey also contains information on R&D funded and performed in-house by federal agencies, which BEA classifies as own-account (or intramural) R&D.

The main federal agencies that fund R&D include DOD, DOE, the Department of Transportation, the Department of Health and Human Services, the Department of Commerce, and the National Aeronautics and Space Administration. Like the national estimates, the state data are adjusted to align with NIPA concepts and framework. For example, the state data are converted from a fiscal year to a calendar year basis and federal agencies are mapped to BEA's federal sector groupings, with DOD mapped to defense and all other agencies mapped to nondefense.

The Federal Funds Survey data present a few challenges. The data often lag by one year, so to produce timely estimates, the last year of the time series is extrapolated forward using a 3-year geometric mean growth rate. An additional state-specific adjustment is made by benchmarking the federal obligations for extramural R&D to corresponding state-level data from NSF's National Patterns of R&D Resources, which reflect actual spending. The adjusted state data are then used as indicators to distribute both national defense and nondefense intramural and extramural R&D expenditures to states.

State-level CFC for R&D is calculated using PIM as well. However, it is important to point out the differences from the procedure outlined in the previous section for non-R&D assets. First, the depreciation rates for R&D are available for the asset categories used here, obviating the need to estimate implied depreciation rates. Second, state-level R&D investment is calculated based on the Survey of Federal Funds for R&D data, rather than contract spending data. Third, the initial state-level R&D stock is computed by allocating the national R&D stock value based on each state's share of national R&D investment.

Own-Account Investment in Software and Structures

BLS OEWS data are the primary source for estimating national own-account investment in software in the NIPAs. To produce state-level estimates, this paper utilizes a research version of the OEWS data by state and industry. These research estimates provide detailed information on wages and employment by state, industry, and occupation—enabling application of the same methodology used in the NIPAs to estimate own-account software investment. In addition, the OEWS research estimates are employed to derive state-level own-account investment in structures. This is necessary because the Census VIP data—used for the national level estimates—do not contain state-level detail.

Table 7. Software Related Occupation List

Vintage	Occupation List	Occupation Code		
		2021–2023	2019–2020	2012–2018
Included in releases before September 2023	Computer Systems Analysts	15-1211	15-1211	15-1121
	Computer Programmers	15-1251	15-1251	15-1131
	Software Developers	15-1252	15-1256	15-1132;15-1133
	Software Quality Assurance Analysts and Testers	15-1253	15-1256	
Added in September 2023 release	Computer and Information Research Scientists	15-1221	15-1221	15-1111
	Computer Network Architects	15-1241	15-1241	15-1143
	Database Administrators	15-1242	15-1245	15-1141
	Database Architects	15-1243	15-1245	
	Network and Computer Systems Administrators	15-1244	15-1244	15-1142
	Web Developers	15-1254	15-1257	15-1134
	Web and Digital Interface Designers	15-1255	15-1257	
	Mathematical Science Occupations, All Other	15-2099	15-2098	15-2099

The OEWS research data present several challenges. First, the data are available starting in 2012, limiting historical analysis. Second, the BLS occupational classification system has changed over time, requiring significant effort to reconcile codes across years to avoid discontinuities in the time series. Third, the set of occupations used by the NIPAs to estimate own-account investment in software has evolved. Prior to 2023, the NIPAs relied on four occupation codes; starting from 2023, eight additional codes were incorporated as part of methodology improvements (table 7). However, these updates were not retroactively carried back through the entire time series, resulting in breaks in the national time series. Last, sheet metal workers (occupation code 47-2210) are classified as a construction occupation by BLS. However, these workers are highly concentrated in shipbuilding, boat, and aircraft related manufacturing and maintenance, which are not typically associated with the construction or maintenance of structures. Therefore, they are excluded from the occupation codes listed in table 8 to estimate state-level own-account investment in structure investment.

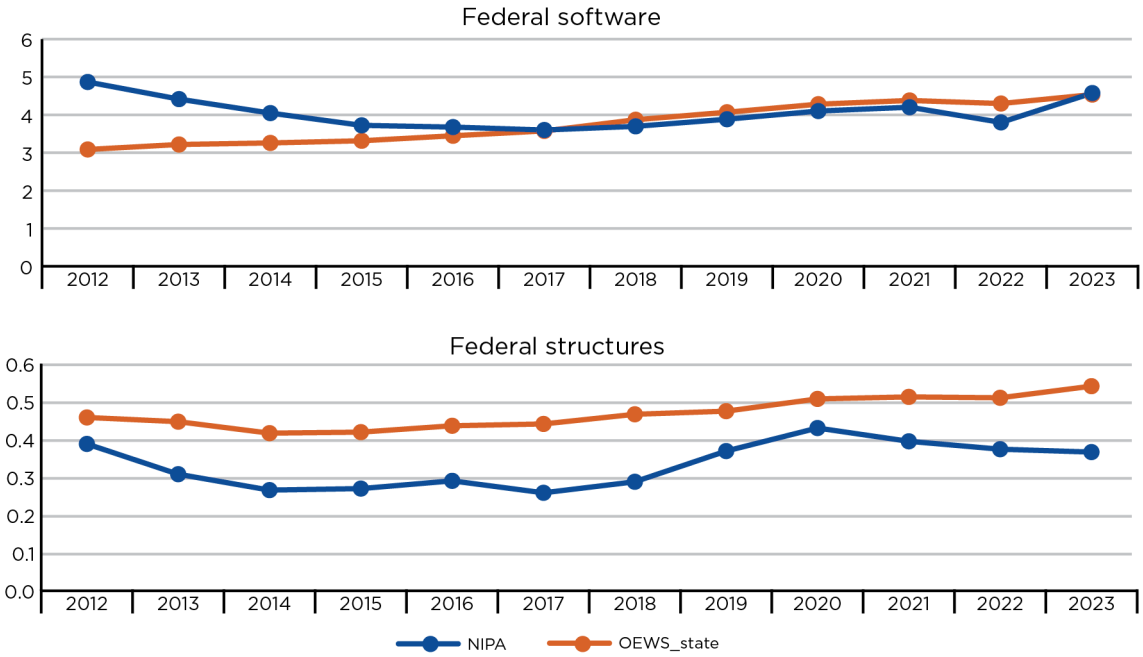
Table 8. Broad Construction Related Occupation List

Occupation List	Occupation Code
Construction Trades Workers	47-2000
Helpers, Construction Trades	47-3000
Other Construction and Related Workers	47-4000

To estimate own-account investment in software and structures by state, the first step is to calculate state-level wages for relevant occupations. This is done by multiplying the number of employees by the mean annual wage per employee for each occupation related to software and construction. Then three adjustment ratios are applied—a time use ratio, an operating expense ratio, and an investment ratio—to convert wages into estimates of total own-account investment expenditures. These ratios are derived at the national level and are applied uniformly across all states.

The time-use ratio represents the proportion of an employee's time spent on software-related or construction-related activities. The operating expense ratio converts wages into full operating costs by accounting for intermediate inputs such as materials, depreciation of capital and administrative overhead. The investment ratio reflects the share of an employee's activity directed toward the creation of new assets, as opposed to maintenance or minor updates. The resulting estimates of own-account investment are then split into defense and nondefense components using the ratio of defense to nondefense civilian employees by state.

Figure 7. Comparison of Own-Account Investment Derived From OEWS Data and NIPA Estimates (Billions of Dollars)



OEWS: Occupational Employment and Wage Statistics
NIPA: National Income and Product Accounts
U.S. Bureau of Economic Analysis

Figure 7 compares the sum of own-account investment in software and structures across the 50 states and DC with the corresponding national totals reported in the NIPAs. Because they use identical data sources and methods, the state-level estimates for federal government own-account software investment align closely with the national totals reported in the NIPAs from 2016 onward. Prior to 2016, the estimates diverge somewhat from the national values. This is partly because the NIPA own-account software statistics were updated using the new methodology only for 2017–2023, while estimates for years before 2017 were not updated. Because the 2012 value was fixed, estimates for 2012–2017 were "wedged" back using the published trend as an indicator. In contrast, own-account investment in structures shows greater differences between the NIPAs and state-level estimates, reflecting differences in both data sources and estimation methods.

Sales to Other Sectors

Sales to other sectors are relatively small and include goods and services such as Veterans Administration hospital sales to households and motor gasoline sales to households and businesses from the Strategic Petroleum Reserves (SPR). National-level defense-related sales to other sectors are allocated to states using BEA data on wages and salaries of full-time active-duty military personnel. For nondefense sales to other sectors, national values of Veterans Administration hospital sales are distributed across states using state-level veteran population from the American Community Survey. Sales of crude oil from the SPR are distributed to states using state-level motor gasoline expenditures, obtained from the State Energy Data System (SEDS) of the U.S. Energy Information Administration. Remaining categories of nondefense sales to other sectors are allocated to states based on state-level estimates of nondefense federal GG civilian employee compensation.

4. A First Look at the Experimental Statistics

This section presents some analysis and insights drawn from the state-level experimental statistics of federal government consumption expenditures and gross investment. The values discussed in this section are in current dollars and have not been adjusted for inflation, so the observed trends may reflect both price changes and real variations.

Figure 8. Federal Consumption Expenditures and Gross Investment by State: State Share of National Total, 2012-2023 Average (%)

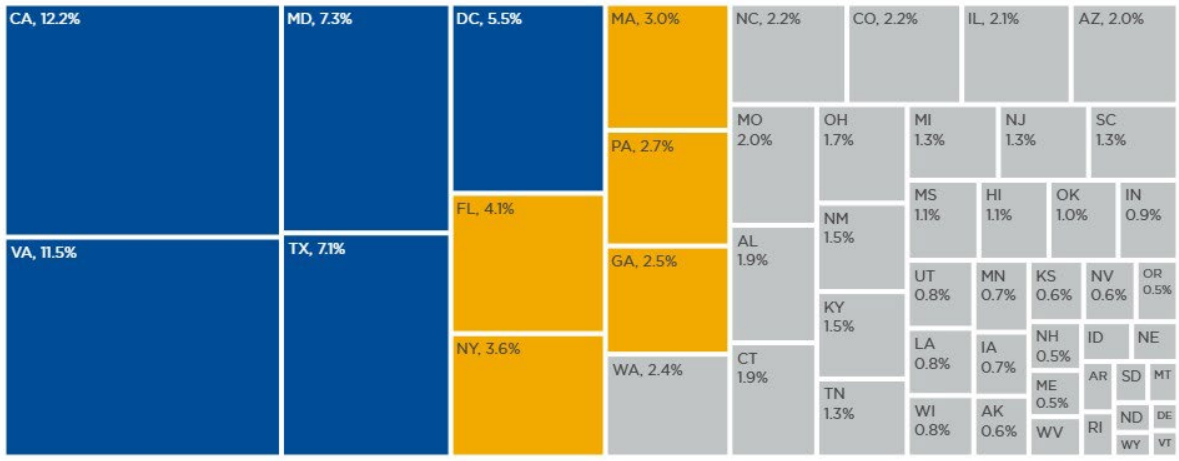


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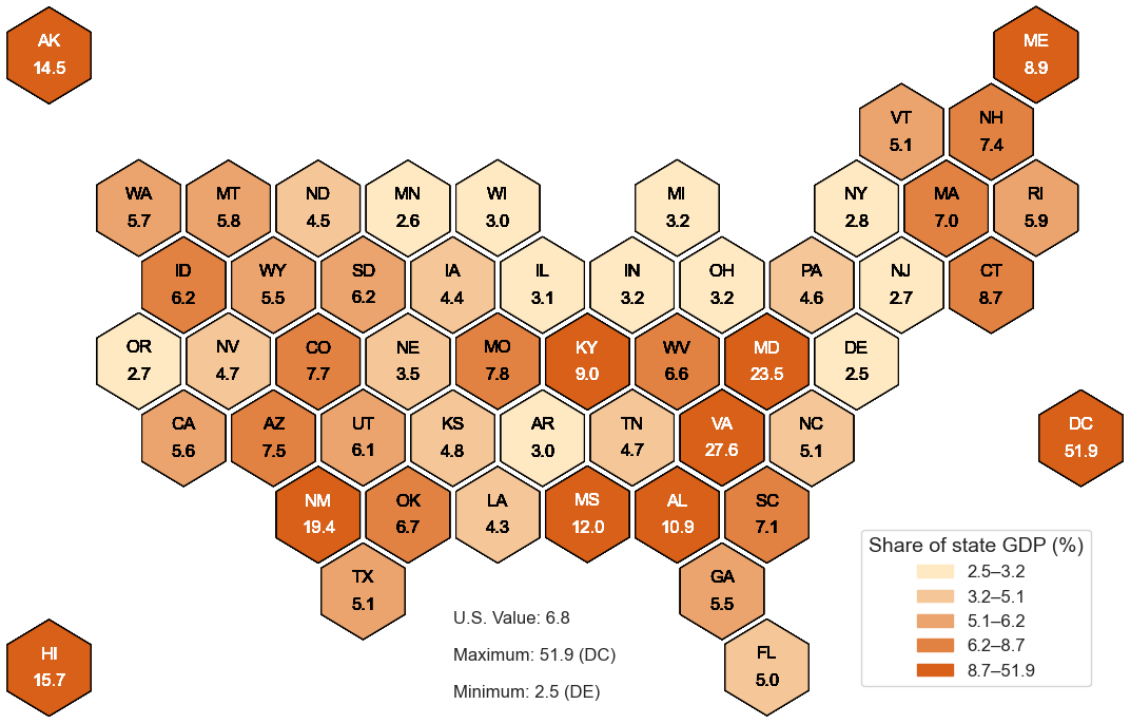
Figure 8 shows the percentage of total federal government consumption and gross investment expenditures attributable to each state. The values are drawn from the last column of table A1 in Appendix 4, which presents this measure by state and year. From 2012–2023, California accounted for an average of 12.2% of the national total—the highest share among all states. Virginia (11.5%), Maryland (7.3%), and DC (5.5%), which host a significant concentration of federal agencies, ranked second, third and fifth, respectively. Other large states, including Texas, Florida, and New York were also among the top states. In contrast, smaller states such as Vermont (0.13%) and Delaware (0.14%) had the lowest shares of federal government expenditures. States in the Midwest—such as North Dakota, South Dakota and Nebraska—

and in the Mountain region—such as Wyoming, Montana and Idaho—also had relatively low shares of federal expenditures.

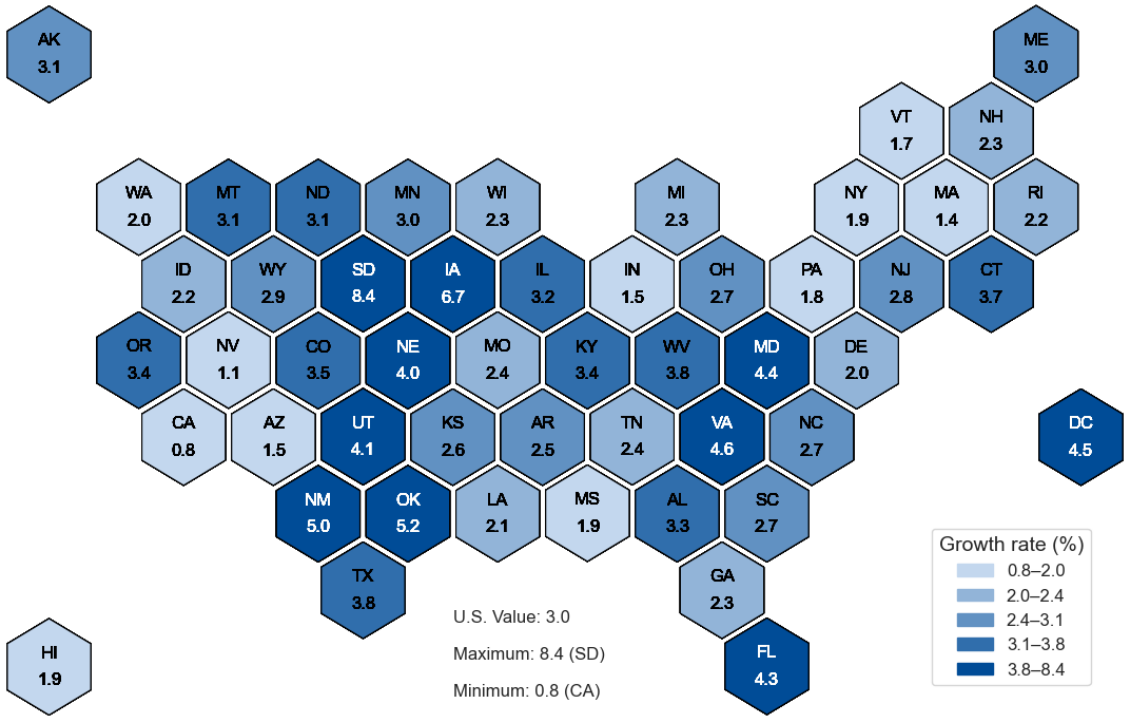
Figure 9. Federal Government Consumption Expenditures and Gross Investment by State: Percent of State GDP, 2012-2023 Average



U.S. Bureau of Economic Analysis

Because federal government consumption and investment spending is, in part, related to the level of economic activity within a state, some of the largest states in figure 8 also comprise a significant portion of federal spending. To account for this, figure 9 shows total federal government spending by state as a percent of each state's GDP. The values in this figure are from the last column of table A2 in Appendix 4, which presents this measure by state and year. On this metric, DC ranked highest, with federal government spending at a level equal to 51.9% of its GDP, followed by Virginia (27.6%) and Maryland (23.5%). Other states in the top quintile included New Mexico, Hawaii, Alaska, Mississippi, Alabama, Kentucky and Maine. States with the lowest federal expenditures relative to their GDP included Delaware, Minnesota, Oregon, New Jersey, New York, Arkansas, Wisconsin, Illinois, Indiana, Ohio and Michigan. Federal expenditures accounted for 2.5% of Delaware's GDP, the lowest among all states and DC.

Figure 10. Federal Government Consumption Expenditures and Gross Investment Growth by State: Percent Change From Preceding Period, 2012–2023 Average



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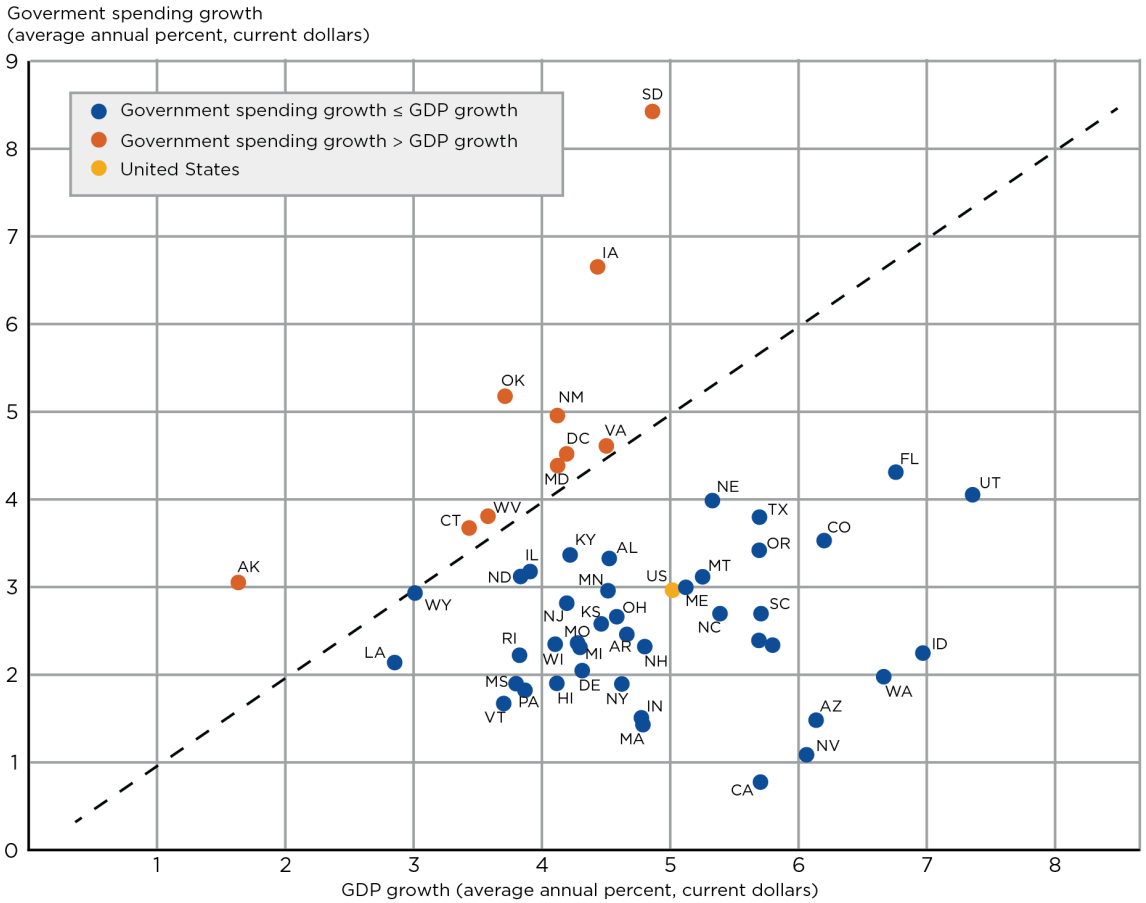
In addition to differences in the level of federal government consumption and gross investment spending across states, these data also show variation across states in how this spending has changed over time. Although South Dakota ranked among the states with the lowest overall federal expenditure levels (figure 8), figure 10 shows that it experienced the fastest growth in federal government expenditures between 2012 and 2023, with an average annual increase of 8.4%. The values in this figure are from the last column of table A3 in Appendix 4, which presents the annual growth rate of each state for all years. Other states with relatively higher growth include Iowa, Oklahoma, New Mexico, Virginia, DC, and Maryland. California was the only state with average annual growth rate less than 1%.

Figure 11. Federal Government Expenditures by State and State GDP: Percent Change From Preceding Period, 2012–2023 Average



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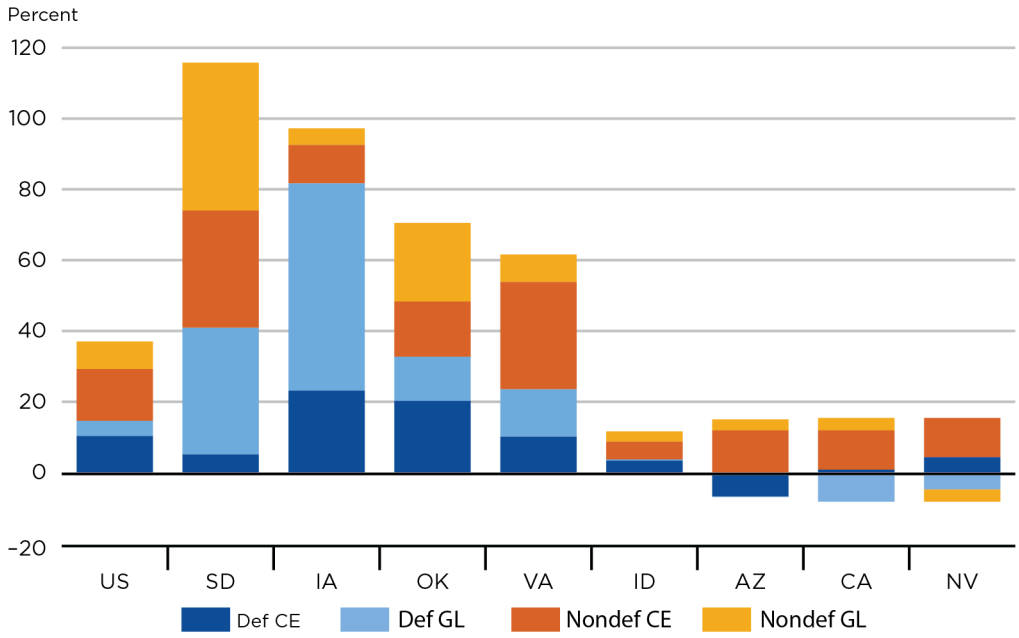
The average annual growth in federal government spending in figure 10 can be compared with state GDP growth over the same period (figure 11). Interestingly, the correlation between the two over this period is slightly negative, indicating that, on average, states with larger GDP growth had smaller increases in federal spending. From 2012 to 2023, total U.S. federal government expenditures grew at an average annual rate of 3.0%, slower than the 5.0% annual growth in U.S. GDP. Consistent with this national trend, most states experienced slower growth in federal government expenditures than in their state GDP. However, in nine states—shown in dark orange in figure 11—federal government expenditures outpaced state GDP growth. In most of these cases, this was due to relatively high government spending growth, rather than low GDP growth. Alaska is the exception: its inclusion in this category reflects that it had the lowest GDP growth among all states, despite federal expenditures increasing on average 3.1% annually.

Figure 12. Component Contributions to Total Percent Increase in Federal Government Expenditures by State: Selected States, 2012–2023



Def CE: defense consumption expenditures
Nondef CE: nondefense consumption expenditures
Def GI: defense gross investment
Nondef GI: nondefense gross investment

U.S. Bureau of Economic Analysis

The average annual growth rate of 3.0% for the United States, shown in figure 10, is associated with a 37% increase in federal government spending over the 11 years spanning 2012 to 2023 (the left-most bar in figure 12). Of this total increase, defense consumption expenditures contributed 10.3 percentage points, defense gross investment 4.3 percentage points, nondefense consumption expenditures 14.6 percentage points, and nondefense gross investment 7.8 percentage points.

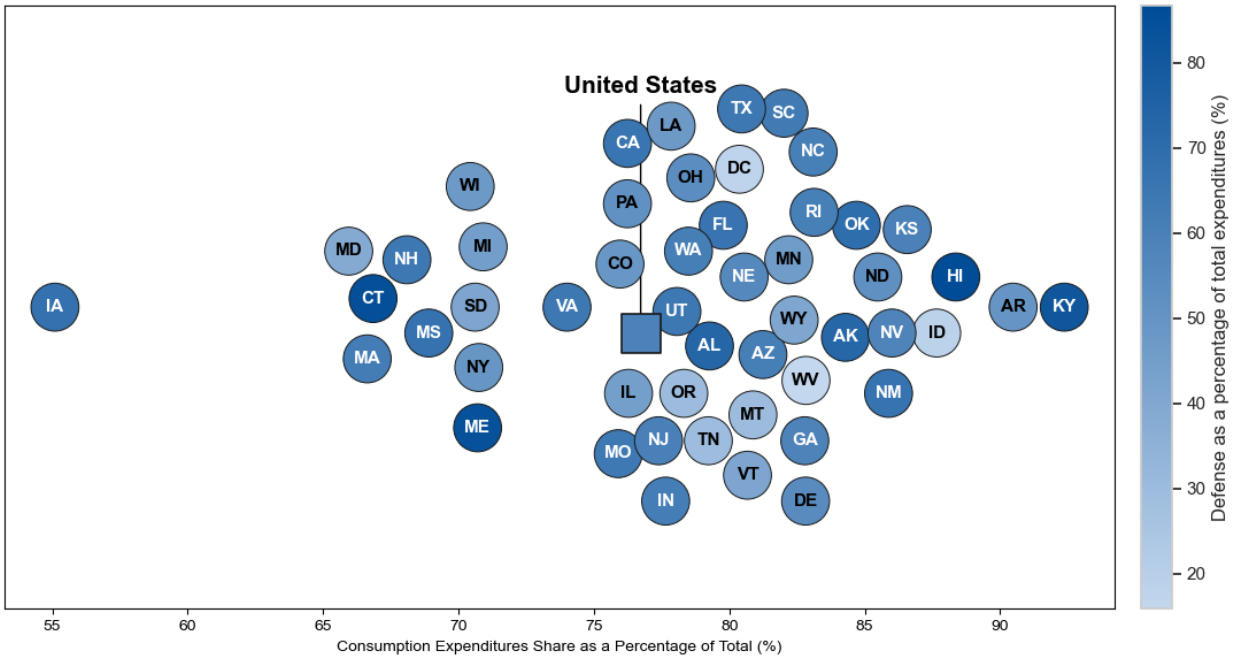
The states with the largest increases in total spending over this period were South Dakota, Iowa, Oklahoma, and Virginia.[15] The expenditure growth composition in figure 12 reveals differing patterns across these states. In South Dakota and Virginia, growth was driven primarily by increases in federal nondefense expenditures. In Oklahoma, defense and nondefense expenditures contributed almost equally, with the nondefense spending contribution being slightly higher. In contrast, Iowa's growth was largely fueled by defense expenditures, particularly defense investment. In South Dakota, defense investment contributed to growth at a level comparable to that of nondefense consumption expenditures and nondefense investment.

All states experienced growth in federal government expenditures from 2012 to 2023, with the smallest increases in Nevada, California, Arizona and Idaho. Nevada had the smallest overall growth at 7.8%, driven by gains of 4.3 percentage points from defense consumption and 11.1 percentage points from nondefense consumption, more than offsetting declines of 4.0 and 3.5 percentage points from defense and nondefense investment respectively. In California, a drop in defense investment reduced growth by 7.5 percentage points, more than offset by a 15.4-percentage-point increase from the other three components. In Arizona, a 6.0-percentage-point decline in defense consumption expenditures was more

[15] Note that the state ranking here may differ slightly from those using values in Figure 10. Here the growth is calculated using the value of 2023 and that of 2012, while the values in Figure 10 are calculated as the average of the annual growth rate for all the years from 2012 to 2023.

than offset by a 14.8-percentage-point increase from the remaining components. Idaho's federal expenditure grew 11.6% over the period.

Figure 13. Distribution of Proportion of Consumption Spending across States with Heatmap of Defense Spending Proportion, 2012–2023 Average



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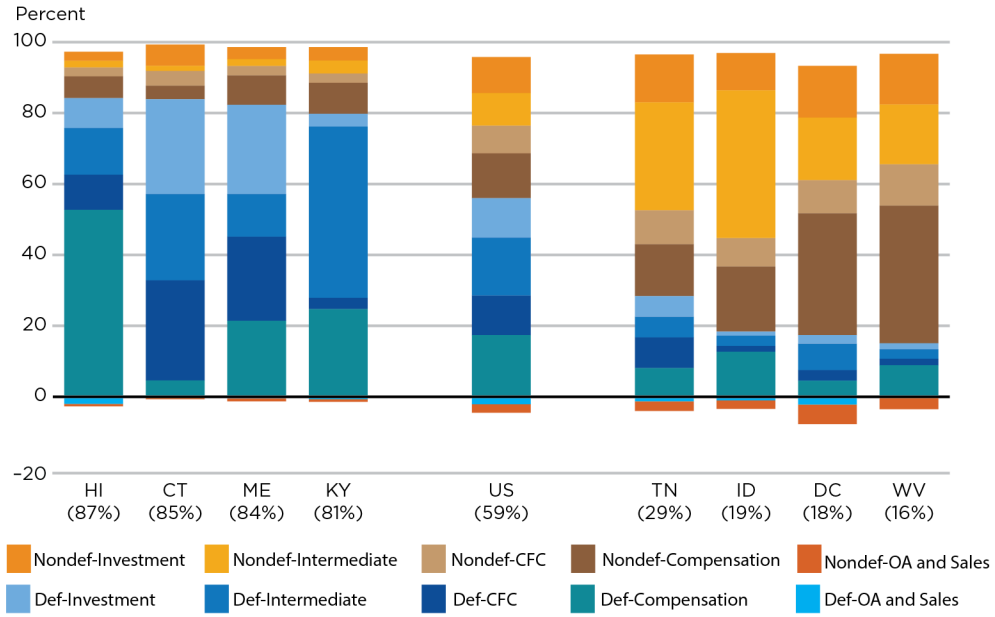
The contributions to growth in figure 12 depend both on the growth rate and the starting level of each component. For example, because Hawaii has very low levels of nondefense investment, this component will contribute very little to growth even if it grows at a high rate. Figure 13 shows the extent to which states vary in terms of the composition of government spending in level terms (averaged from 2012 to 2023). States are ordered from left to right by increasing consumption spending (or equivalently, decreasing investment spending) as a proportion of the state total.

There is significant variation in consumption spending, with Iowa exhibiting the highest gross investment (45%) and Kentucky the highest consumption (92%), relative to total federal spending in those states. The markers are spread out from one another to fill the vertical space, so that the figure also depicts the density of the observations. This graph shows that the largest group of 37 states and DC fall in the range of 75%–90% of consumption expenditures as a proportion of total spending, while another group of 11 states exhibit consumption expenditures from 65% to less than 75%.

The color of each marker indicates defense spending as a percentage of the total, with darker hues indicating higher defense spending as a percentage of the state's total federal spending. The interstate variation in defense spending is substantial, ranging from 87% defense/13% nondefense in Hawaii to 16% defense/84% nondefense in West Virginia. The four states with the highest shares of federal government defense spending include Hawaii, Connecticut, Maine and Kentucky and while the four states with the highest shares of federal nondefense spending include West Virginia, DC, Idaho, and Tennessee.

Figure 14. Composition of Federal Government Expenditures: Top Four and Bottom Four States Based on Defense Share of Federal Government Expenditures Total, 2012–2023 Average

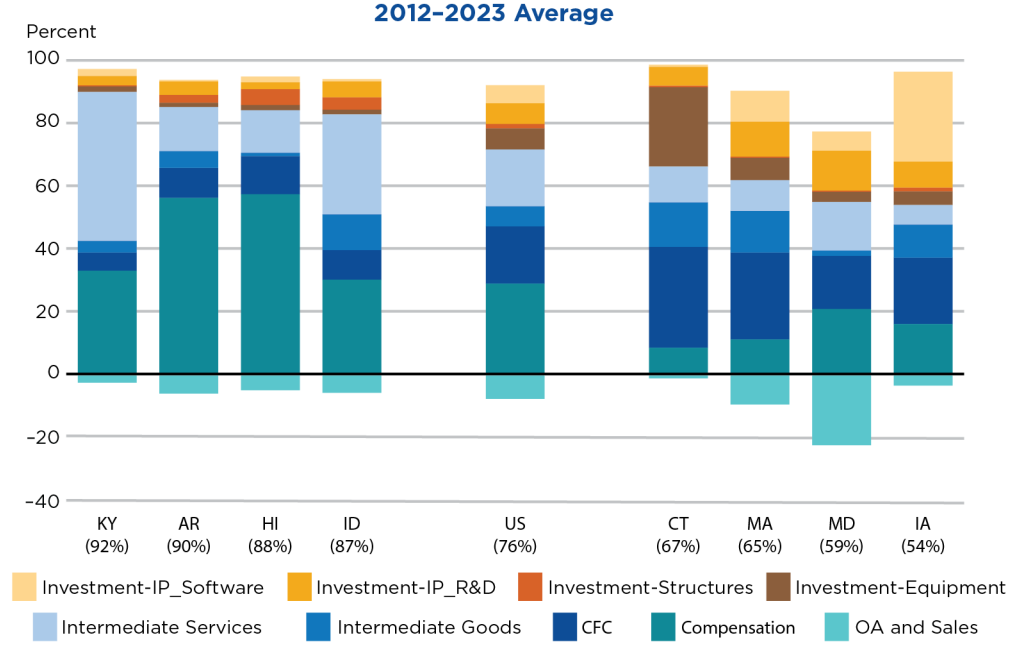


Def: defense
OA: overseas adjustment
CFC: consumption of fixed capital
Nondef: nondefense

U.S. Bureau of Economic Analysis

Figure 14 shows finer category detail for the top four states with the highest defense expenditure shares—ranging from 87% to 81%—and the four states with the lowest, where defense expenditure shares range from 29% to 16%. Clear differences in spending patterns emerge. In Hawaii, defense compensation accounts for the largest portion of spending, while in Kentucky, defense intermediate inputs are dominant. In Connecticut, defense CFC, defense intermediates, and defense investment each contribute significant shares. In Maine, defense compensation, defense CFC, and defense investment have comparable shares. The four states with the lowest defense expenditure shares are the top four states with the highest nondefense expenditure shares. In West Virginia and DC, nondefense compensation comprises the largest share, whereas in Idaho and Tennessee, nondefense intermediate inputs are the predominant contributors.

Figure 15. Composition of Federal Government Expenditures: Top Four and Bottom Four States Based on Consumption Share of Federal Government Expenditures Total, 2012–2023 Average



CFC: consumption of fixed capital
IP: intellectual products
OA: overseas adjustment
R&D: research & development

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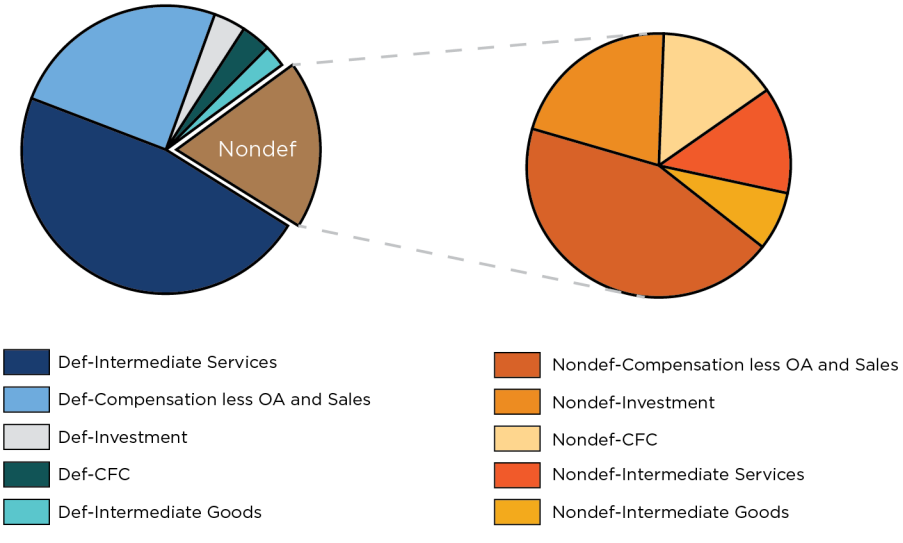
Figure 15 shows the detailed composition of federal spending for a collection of states based on a different criterion: consumption expenditures (the sum of defense and nondefense consumption) as a share of total federal expenditures. It includes the top four states—with consumption expenditure shares ranging from 92% to 87%—and the bottom four states— with consumption expenditure shares ranging from 67% to 54%. In Kentucky, intermediate services purchased make up the largest portion, whereas compensation is the dominant category in Arizona and Hawaii. In Idaho, intermediate services and compensation contribute nearly equally. The bottom four are the states with the highest federal investment shares. In Iowa, federal investment is primarily in software, while in Connecticut, it is concentrated in equipment. In Massachusetts and Maryland, federal investment is relatively more focused on R&D.

Using Kentucky—the state with the highest share of consumption expenditures—as an example, figure 16 shows more detailed statistics, revealing that defense-related intermediate service purchases are the primary driver for both its high consumption expenditure share and high defense expenditure share. These purchases account for nearly half of the total federal government expenditures in Kentucky. In fact, Kentucky ranks sixth in federal defense service purchases—trailing only Virginia, California, Texas, Maryland and New Mexico—and represents 5.6% of U.S. total federal defense intermediate service purchased. Notably, 73% of these expenditures are for healthcare services, which aligns with the presence of a major health insurance provider headquartered in Louisville that delivers substantial services to military personnel.[16]

[16] A Louisville, Kentucky-based health insurance company is the main player, which has a history of providing military health care services. From 2004 to 2009, this health insurance company was the managed-care contractor for the DOD Military Health System Tricare South Region. In 2011, the same insurance company regained the 5-year contract to administer medical benefits to military members and families in the South region. On December 2022, the DOD announced the award of the managed care support contract for the Tricare East Region again to the same company.

Figure 16. Composition of Federal Government Expenditures in Kentucky: 2012–2023 Average



Def: defense
CFC: consumption of fixed capital
OA: overseas adjustment
Nondef: nondefense

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5. Conclusion

BEA periodically receives inquiries from data users about state-level statistics on government consumption expenditures and gross investment. This paper presents the results of an effort to develop experimental statistics to meet the need for high-quality and consistent statistics that can be used to evaluate the impact of government expenditures at the state level. While the focus here is on federal expenditures, this project is being done alongside a complementary initiative focused on the development of state and local government spending by state statistics. This paper covers the details of the methodology and provides a preview of the federal expenditure statistics. These statistics are based on where government production occurs and do not necessarily reflect where the benefits from federal government expenditures are received. A downloadable Excel file containing the complete set of experimental statistics on federal government consumption expenditures and gross investment by state is also made available with this paper for data users to explore.

BEA invites and encourages feedback from data users and subject matter experts on concepts, data sources, methods, and the experimental statistics as it continues to refine and improve these methods.

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Appendices

Appendix 1

The dual allocation benchmark procedure is as follows:
We start with the following notation and known values:

- $s \in \{1,\ldots,S\}$ denotes a state (or the District of Columbia)
- $i \in \{GG,GE\}$ denotes category (general government, government enterprise)
- Y_{si} – wages and salaries for government employees of category i in state s (the unknown target quantity)
- Y_s – total wages and salaries for all government employees for state s (known)
- Y_{GG} – total general government wages and salaries (national) (known)
- Y_{GE} – total government enterprise wages and salaries (national) (known)
- ρ_{si} – proportion of state government wages going to category i (initial) (known)
- Iteration number in the IPFP will be denoted with a superscript (j)

After this, we perform the following iterative procedure:

- Step 1: Compute initial values for each state using the two values of ρ_{si} for each state and using state totals Y_s:
$$Y_{si}^{(0)} = \rho_{si} Y_s$$
- Step 2: Compute the implied national totals by summing state-level values for each of GG and GE:
$$Y_i^{(0)} = \sum_{s=1}^{S} Y_{si}^{(0)}$$
- Step 3: Compute national ratios (denoted $\alpha_i^{(j)}$) for GG and GE (i) as
$$\alpha_i^{(0)} = {Y_i}\Big/{Y_i^{(0)}}$$
- Step 4: Compute new state-level GE and GG values by multiplying by this ratio:
$$Y_{si}^{(1)} = \alpha_i^{(0)} Y_{si}^{(0)}$$
- Step 5: Compute the implied state-specific ratios (denoted $\beta_s^{(j)}$) for total government wages and salaries:
$$\beta_s^{(1)} = {Y_s}\Big/{\left(Y_{sGG}^{(1)} + Y_{sGE}^{(1)}\right)}$$
- Step 6: Compute new state-level GE and GG values by multiplying by this ratio:
$$Y_{si}^{(2)} = \beta_s^{(1)} Y_{si}^{(1)}$$
- Step 7: Go back to step 2, using $Y_{si}^{(2)}$ in place of $Y_{si}^{(0)}$.

The process will continue with steps 2-4 for even iterations (j=0,2,4,…) followed by steps 5-6 for odd iterations (j=1,3,5,…) until the values change by an amount less than a set tolerance level, at which point we stop and use as our estimate the values $Y_{si} = Y_{si}^{(j)}$ from the last iteration.

Appendix 2

Express the implied depreciation rate in the format of weighted average of depreciation rates:

$$
\begin{aligned}
d_t^j &= \frac{\left(K_{t-1}^{j,CO} + I_t^{j,CO} - K_t^{j,CO}\right)}{\left(K_{t-1}^{j,CO} + \frac{1}{2} I_t^{j,CO}\right)} \\
&= \frac{\sum_m \left(K_{t-1}^{jm,CO} + I_t^{jm,CO} - K_t^{jm,CO}\right)}{\sum_m \left(K_{t-1}^{jm,CO} + \frac{1}{2} I_t^{jm,CO}\right)} \\
&= \sum_m \frac{\left(K_{t-1}^{jm,CO} + I_t^{jm,CO} - K_t^{jm,CO}\right)}{\sum_m \left(K_{t-1}^{jm,CO} + \frac{1}{2} I_t^{jm,CO}\right)} \\
&= \sum_m \left(\frac{\left(K_{t-1}^{jm,CO} + I_t^{jm,CO} - K_t^{jm,CO}\right)}{K_{t-1}^{jm,CO} + \frac{1}{2} I_t^{jm,CO}} \times \frac{K_{t-1}^{jm,CO} + \frac{1}{2} I_t^{jm,CO}}{\sum_m \left(K_{t-1}^{jm,CO} + \frac{1}{2} I_t^{jm,CO}\right)} \right) \\
&= \sum_m \left(d_t^{jm} \times \frac{K_{t-1}^{jmCO} + \frac{1}{2} I_t^{jm,CO}}{\sum_m \left(K_{t-1}^{jm,CO} + \frac{1}{2} I_t^{jm,CO}\right)} \right)
\end{aligned}
$$

Appendix 3

Derivation of net stock in the initial year:

- I: investment in year $t+1$
- g: average investment growth rate
- d: depreciation rate

year		$t-4$	$t-3$	$t-2$	$t-1$	t	$t+1$
Investment	……	$\frac{I}{(1+g)^5}$	$\frac{I}{(1+g)^4}$	$\frac{I}{(1+g)^3}$	$\frac{I}{(1+g)^2}$	$\frac{I}{(1+g)}$	I
Stock in year t	……	$I*\frac{(1-d)^4}{(1+g)^5}$	$I*\frac{(1-d)^3}{(1+g)^4}$	$I*\frac{(1-d)^2}{(1+g)^3}$	$I*\frac{(1-d)^1}{(1+g)^2}$	$I*\frac{1}{(1+g)}$	

- $K_t = \frac{I}{(1+g)} + \frac{I*(1-d)^1}{(1+g)^2} + \frac{I*(1-d)^2}{(1+g)^3} + \frac{I*(1-d)^3}{(1+g)^4} + \ldots\ldots$ (1)
- $\frac{K_t*(1-d)}{(1+g)} = \frac{I*(1-d)^1}{(1+g)^2} + \frac{I*(1-d)^2}{(1+g)^3} + \frac{I*(1-d)^3}{(1+g)^4} + \frac{I*(1-d)^4}{(1+g)^5} + \ldots\ldots$ (2)
- (1)-(2) $\Rightarrow \frac{K_t*(g+d)}{(1+g)} = \frac{I}{(1+g)} \Rightarrow K_t = \frac{I}{(g+d)}$

Appendix 4

Table A1. Federal Consumption Expenditures and Gross Investment by State: State Share of National Total, 2012–2023(%)

State	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Average
Alabama	1.9	1.9	2.1	2.0	1.9	1.8	1.9	2.1	1.9	1.8	1.8	1.9	1.9
Alaska	0.6	0.6	0.7	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.6
Arizona	2.4	2.1	1.8	1.9	1.9	2.1	2.0	2.1	2.4	2.0	1.8	1.9	2.0
Arkansas	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
California	12.6	13.0	13.0	13.5	13.5	13.6	13.6	12.0	11.1	10.3	10.1	10.0	12.2
Colorado	2.1	2.2	2.3	2.3	2.1	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.2
Connecticut	1.7	1.9	1.8	1.8	2.0	2.1	2.0	1.9	1.8	1.7	1.7	1.8	1.9
Delaware	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1
District of Columbia	5.0	5.0	5.2	5.5	5.5	5.5	5.5	5.4	5.7	5.9	6.0	5.9	5.5
Florida	3.9	3.8	3.7	3.8	3.9	4.0	4.1	4.2	4.1	4.2	4.4	4.5	4.1
Georgia	2.6	2.6	2.5	2.6	2.6	2.6	2.6	2.6	2.6	2.5	2.4	2.4	2.5
Hawaii	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.1
Idaho	0.4	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.4
Illinois	2.0	2.0	2.0	2.1	2.2	2.1	2.0	2.1	2.1	2.2	2.0	2.0	2.1
Indiana	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.9
Iowa	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.8	0.7
Kansas	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6
Kentucky	1.5	1.4	1.5	1.4	1.4	1.3	1.9	1.4	1.6	1.4	1.7	1.3	1.5
Louisiana	1.0	0.9	0.8	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8
Maine	0.5	0.5	0.4	0.4	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5
Maryland	6.4	6.7	7.1	7.3	7.2	7.4	7.4	7.7	7.7	7.6	7.8	7.5	7.3
Massachusetts	3.1	3.2	3.2	3.2	3.0	2.8	2.7	2.8	2.9	3.2	2.8	2.6	3.0
Michigan	1.4	1.3	1.3	1.3	1.4	1.3	1.3	1.3	1.3	1.3	1.2	1.3	1.3
Minnesota	0.6	0.8	0.9	1.0	0.9	1.0	0.7	0.6	0.6	0.6	0.6	0.6	0.7
Mississippi	1.1	1.1	1.2	1.1	1.1	1.1	1.0	1.1	1.1	1.0	1.0	1.0	1.1
Missouri	1.9	2.1	1.9	2.0	1.8	1.9	2.1	2.2	2.1	2.0	1.8	1.8	2.0
Montana	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2
Nebraska	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3
Nevada	0.6	0.7	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.5	0.6
New Hampshire	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5
New Jersey	1.4	1.4	1.2	1.2	1.3	1.3	1.2	1.2	1.2	1.2	1.4	1.3	1.3
New Mexico	1.7	1.4	1.4	1.4	1.6	1.2	1.0	1.3	1.6	1.9	1.7	1.7	1.5
New York	3.7	3.7	3.9	3.6	3.6	3.6	3.4	3.3	3.3	3.8	3.8	3.2	3.6
North Carolina	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
North Dakota	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Ohio	1.8	1.7	1.7	1.7	1.7	1.7	1.6	1.6	1.6	1.6	1.6	1.7	1.7
Oklahoma	0.9	0.9	0.9	0.9	1.0	1.1	1.1	1.1	1.1	1.0	1.2	1.2	1.0
Oregon	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Pennsylvania	3.0	3.0	2.9	2.9	2.7	2.7	2.7	2.5	2.5	2.4	2.5	2.6	2.7
Rhode Island	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
South Carolina	1.3	1.3	1.2	1.3	1.3	1.1	1.2	1.4	1.5	1.4	1.2	1.2	1.3
South Dakota	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.3	0.3
Tennessee	1.4	1.3	1.2	1.2	1.2	1.2	1.4	1.4	1.5	1.6	1.3	1.3	1.3
Texas	7.2	7.1	7.0	6.5	6.5	6.7	6.8	7.0	7.2	7.8	8.0	7.8	7.1
Utah	0.9	0.8	0.9	0.8	0.8	0.8	0.8	1.0	0.9	0.8	0.8	0.9	0.8
Vermont	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1
Virginia	11.1	11.0	11.1	11.0	11.0	10.5	10.8	11.5	11.7	12.0	12.6	13.2	11.5
Washington	2.5	2.3	2.3	2.4	2.5	2.7	2.5	2.4	2.4	2.4	2.3	2.2	2.4
West Virginia	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Wisconsin	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8
Wyoming	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Table A2. Federal Government Consumption Expenditures and Gross Investment by State: Share of State GDP, 2012–2023 (%)

State	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Average
United States	7.9	7.3	6.9	6.7	6.6	6.5	6.5	6.6	7.1	6.8	6.3	6.4	6.8
Alabama	12.1	11.4	12.2	11.0	10.6	10.0	10.6	11.6	11.4	10.5	9.6	10.4	10.9
Alaska	13.2	12.6	13.4	14.3	13.3	13.9	15.5	16.2	16.8	15.0	14.3	15.4	14.5
Arizona	10.4	8.5	7.2	7.2	7.1	7.6	7.2	7.5	8.9	7.0	5.7	5.9	7.5
Arkansas	3.5	3.2	3.1	3.2	3.2	3.0	2.8	2.9	3.2	2.8	2.5	2.7	3.0
California	7.2	6.7	6.3	6.2	6.1	5.9	5.9	5.1	5.1	4.5	4.2	4.2	5.6
Colorado	9.2	8.8	8.3	8.1	7.3	7.5	7.5	7.3	7.5	7.1	6.8	6.9	7.7
Connecticut	8.7	9.3	8.3	7.8	8.8	9.3	9.1	8.7	9.1	8.7	8.3	8.7	8.7
Delaware	3.1	2.6	2.4	2.2	2.3	2.3	2.3	2.2	2.7	3.0	2.3	2.3	2.5
District of Columbia	53.7	49.8	49.4	50.3	50.1	49.5	49.0	49.0	54.7	57.0	55.2	55.0	51.9
Florida	6.0	5.4	5.0	4.7	4.8	4.8	4.7	4.9	5.1	4.9	4.6	4.6	5.0
Georgia	6.9	6.4	5.8	5.7	5.4	5.3	5.2	5.2	5.7	5.2	4.6	4.8	5.5
Hawaii	19.1	17.6	16.4	15.7	15.0	14.9	14.1	14.1	16.4	15.9	14.6	15.1	15.7
Idaho	9.2	9.2	9.3	6.1	5.7	4.9	5.2	5.4	5.7	5.2	4.2	4.9	6.2
Illinois	3.3	3.1	2.9	3.0	3.1	3.0	2.9	3.1	3.5	3.5	2.9	3.0	3.1
Indiana	4.0	3.5	3.3	3.1	3.2	3.1	2.9	3.1	3.2	3.1	2.7	2.8	3.2
Iowa	4.4	4.1	3.9	3.9	3.9	3.9	4.3	4.5	5.0	4.9	4.6	5.5	4.4
Kansas	5.8	5.3	4.9	4.8	4.4	4.2	4.3	4.5	5.0	4.9	4.5	4.7	4.8
Kentucky	10.1	8.7	8.8	8.5	8.2	8.0	11.4	8.6	10.2	8.6	9.6	7.9	9.0
Louisiana	5.0	4.4	3.9	4.3	4.5	4.0	4.0	4.0	4.7	4.4	4.2	4.5	4.3
Maine	11.2	9.4	8.6	8.7	8.9	8.6	8.0	8.0	8.9	9.7	8.2	8.5	8.9
Maryland	23.1	22.7	23.0	22.7	21.8	22.2	22.5	24.2	26.3	25.3	24.5	23.7	23.5
Massachusetts	8.6	8.1	7.7	7.4	6.8	6.4	6.1	6.4	6.9	7.3	6.2	5.9	7.0
Michigan	3.8	3.4	3.3	3.1	3.2	3.1	3.0	3.1	3.5	3.3	3.0	3.1	3.2
Minnesota	2.6	2.8	3.3	3.3	3.1	3.3	2.4	2.2	2.3	2.1	1.9	2.0	2.6
Mississippi	13.0	12.5	12.6	12.3	12.0	12.0	11.3	12.9	13.2	11.5	10.5	10.5	12.0
Missouri	8.5	8.4	7.6	7.6	7.1	7.5	8.0	8.9	8.7	8.0	6.9	6.8	7.8
Montana	6.5	6.1	6.1	5.9	5.9	5.5	5.5	5.7	6.3	5.8	5.8	5.2	5.8
Nebraska	3.6	3.4	3.4	3.4	3.7	3.9	3.6	3.6	3.6	3.5	3.0	3.1	3.5
Nevada	6.0	6.0	5.0	5.1	4.9	4.3	4.0	4.2	4.6	4.3	4.2	3.4	4.7
New Hampshire	8.4	8.8	8.7	7.3	7.2	6.9	7.5	7.4	7.7	6.7	6.2	6.3	7.4
New Jersey	3.2	2.9	2.6	2.4	2.5	2.6	2.5	2.4	2.7	2.7	2.8	2.7	2.7
New Mexico	23.8	18.4	17.3	17.3	21.2	15.9	12.3	16.7	23.2	25.2	20.2	20.9	19.4
New York	3.4	3.1	3.1	2.8	2.7	2.7	2.5	2.4	2.7	2.9	2.9	2.4	2.8
North Carolina	6.0	5.6	5.3	5.1	4.9	4.9	4.9	4.9	5.3	5.0	4.6	4.5	5.1
North Dakota	4.8	4.1	4.2	4.1	4.9	4.8	4.4	4.2	5.2	4.7	4.1	4.5	4.5
Ohio	3.9	3.5	3.2	3.2	3.1	3.1	3.0	3.1	3.4	3.2	3.0	3.2	3.2
Oklahoma	6.5	5.5	5.3	5.8	6.6	6.9	6.8	7.0	7.9	7.1	7.2	7.6	6.7
Oregon	3.4	3.0	3.0	2.9	2.7	2.6	2.6	2.5	2.7	2.5	2.4	2.7	2.7
Pennsylvania	5.6	5.1	4.8	4.6	4.3	4.4	4.4	4.1	4.5	4.3	4.1	4.4	4.6
Rhode Island	6.7	6.0	6.1	5.8	5.8	5.7	5.6	5.6	6.0	5.7	5.8	5.6	5.9
South Carolina	8.8	7.8	7.0	6.9	6.8	6.1	6.3	7.4	8.4	7.6	6.2	6.1	7.1
South Dakota	5.7	4.9	4.8	4.9	5.3	5.6	6.3	7.3	9.5	6.4	6.3	7.3	6.2
Tennessee	5.9	5.2	4.5	4.1	4.2	4.0	4.6	4.8	5.4	5.4	4.1	3.9	4.7
Texas	6.1	5.4	5.0	4.7	4.8	4.8	4.7	4.9	5.6	5.6	5.0	4.9	5.1
Utah	8.0	7.0	7.0	6.3	5.8	5.7	5.3	6.6	6.5	4.9	4.6	5.3	6.1
Vermont	5.7	5.0	4.7	4.8	5.0	5.2	5.7	5.8	5.6	4.8	4.4	4.5	5.1
Virginia	30.0	27.6	27.3	26.0	25.9	24.6	25.2	27.0	29.4	29.2	28.9	29.9	27.6
Washington	7.5	6.5	6.0	5.8	6.1	6.3	5.4	5.2	5.4	5.1	4.7	4.5	5.7
West Virginia	6.2	6.1	6.3	6.3	6.8	6.8	6.6	6.6	7.4	7.3	5.9	6.4	6.6
Wisconsin	3.7	3.2	2.9	2.7	2.8	2.7	2.7	2.9	3.3	3.2	3.0	3.0	3.0
Wyoming	5.7	5.0	5.4	5.0	5.4	5.3	5.2	5.7	6.6	5.9	5.2	5.6	5.5

Table A3. Federal Government Consumption Expenditures and Gross Investment Growth by State: Percent Change from Preceding Period, 2012–2023 (%)

State	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Average
United States	-4.6	-0.8	0.5	1.2	2.3	6.3	5.4	7.3	5.3	2.4	7.4	3.0
Alabama	-3.5	9.1	-6.7	-1.7	-1.9	10.4	14.0	-1.8	2.0	-0.2	16.8	3.3
Alaska	-5.5	4.2	-2.6	-7.9	9.6	13.6	4.4	-2.5	3.0	6.6	10.7	3.1
Arizona	-16.5	-12.2	3.6	3.2	13.5	1.6	9.6	22.8	-11.3	-10.0	12.2	1.5
Arkansas	-2.5	0.5	2.6	2.0	-4.5	-1.8	5.6	15.4	-1.3	-2.7	13.7	2.5
California	-1.6	-1.4	4.8	2.2	3.1	4.9	-7.8	-0.3	-1.9	-0.4	7.2	0.8
Colorado	1.2	0.3	1.1	-6.8	7.7	7.0	3.9	1.9	6.8	7.0	8.7	3.5
Connecticut	7.3	-8.4	-0.3	14.0	9.6	-0.2	-2.3	1.5	2.9	2.4	13.9	3.7
Delaware	-16.0	3.2	-3.5	0.0	-0.1	5.5	1.4	21.5	20.2	-16.6	6.9	2.0
District of Columbia	-5.4	3.7	5.8	3.8	2.0	4.2	2.6	13.0	11.1	2.7	6.1	4.5
Florida	-7.1	-3.2	1.4	6.7	4.7	5.3	9.4	5.7	7.9	6.5	10.1	4.3
Georgia	-3.6	-3.8	3.4	1.7	2.5	3.4	5.5	8.4	0.3	-1.9	9.8	2.3
Hawaii	-4.2	-3.7	1.0	-0.7	2.9	-1.9	2.9	6.0	6.3	1.4	11.0	1.9
Idaho	6.7	5.0	-32.3	-1.6	-10.4	15.1	10.3	10.5	5.0	-11.1	27.6	2.2
Illinois	-4.6	-2.3	7.9	5.3	-0.3	-0.6	11.3	7.3	11.1	-9.2	9.1	3.2
Indiana	-8.9	-2.0	-2.7	3.4	1.2	1.2	7.0	3.5	6.8	-3.2	10.2	1.5
Iowa	-4.7	0.8	4.0	3.3	1.9	12.8	5.6	11.8	12.4	-0.1	25.4	6.7
Kansas	-6.1	-4.4	0.5	-4.2	-0.9	6.7	6.1	11.4	5.7	2.1	11.5	2.6
Kentucky	-10.3	2.8	0.2	-2.1	-0.5	47.7	-21.0	17.5	-7.7	23.0	-12.5	3.4
Louisiana	-13.7	-7.0	7.7	1.2	-6.1	6.3	-0.1	8.4	6.6	5.8	14.3	2.1
Maine	-14.0	-6.7	6.0	5.6	0.1	-2.3	5.8	14.4	19.1	-7.3	12.3	3.0
Maryland	0.8	4.7	3.3	0.7	5.7	4.1	9.6	7.2	4.3	4.6	3.2	4.4
Massachusetts	-3.3	-1.0	0.9	-5.0	-3.4	0.6	10.8	9.4	16.1	-9.0	-0.4	1.4
Michigan	-8.0	-0.1	-2.0	8.2	-0.3	0.9	5.9	8.4	2.7	-1.8	11.5	2.3
Minnesota	15.4	21.6	2.7	-2.6	8.5	-24.1	-4.1	0.6	2.5	0.7	11.3	3.0
Mississippi	-1.9	3.3	-1.1	-1.4	2.4	-3.5	17.1	2.5	-2.4	0.3	5.7	1.9
Missouri	2.2	-7.1	3.0	-5.4	8.1	10.9	15.1	-1.8	0.7	-5.8	6.1	2.4
Montana	-3.5	4.8	-1.9	-0.2	-2.6	5.4	8.1	10.3	4.5	14.1	-4.8	3.1
Nebraska	-1.2	5.5	2.3	12.0	9.5	-5.8	4.1	2.0	7.7	-4.7	12.5	4.0
Nevada	2.2	-15.2	9.2	2.0	-8.2	-1.5	12.8	4.4	8.4	9.4	-11.6	1.1
New Hampshire	8.8	2.3	-10.6	0.6	-1.8	11.5	3.8	5.0	-3.1	-0.2	9.2	2.3
New Jersey	-4.9	-9.5	-2.7	6.4	5.3	1.1	-0.3	9.9	8.7	14.5	2.5	2.8
New Mexico	-22.0	-2.0	-1.6	22.0	-22.6	-17.8	42.0	34.6	22.0	-8.8	8.7	5.0
New York	-4.1	3.7	-5.6	0.7	4.0	-1.3	-0.2	9.5	20.1	3.5	-9.5	1.9
North Carolina	-3.3	-1.4	1.0	0.9	1.9	5.7	4.2	8.8	3.4	1.1	7.5	2.7
North Dakota	-8.9	11.8	-7.3	10.1	3.6	-2.2	-1.9	12.7	3.4	1.6	11.6	3.1
Ohio	-7.7	-3.3	1.9	0.8	2.7	1.0	5.7	8.5	3.9	2.8	13.1	2.7
Oklahoma	-10.8	2.0	4.2	10.8	11.0	4.3	3.9	4.6	2.2	14.4	10.4	5.2
Oregon	-10.6	3.8	3.0	0.6	3.4	4.3	1.5	6.2	2.7	4.9	17.8	3.4
Pennsylvania	-5.5	-3.1	0.1	-4.2	4.0	3.8	-3.2	6.7	3.8	2.4	15.4	1.8
Rhode Island	-7.8	3.6	-0.1	1.6	0.1	-0.4	4.4	6.5	2.9	10.2	3.4	2.2
South Carolina	-7.8	-5.6	5.4	2.6	-6.9	7.9	24.9	13.2	-1.7	-9.2	6.9	2.7
South Dakota	-11.7	2.1	5.8	9.3	9.3	16.7	20.2	33.5	-24.5	8.0	23.9	8.4
Tennessee	-8.3	-10.7	-2.6	6.6	-0.7	19.6	10.0	12.9	13.5	-16.9	2.9	2.4
Texas	-5.4	-2.7	-6.5	2.8	5.2	6.7	7.2	10.4	14.9	4.0	5.4	3.8
Utah	-8.6	4.4	-5.3	-2.5	7.3	0.7	33.0	1.4	-14.4	3.7	24.8	4.1
Vermont	-10.9	-4.1	5.7	5.8	7.6	12.6	4.7	-4.4	-6.9	1.2	7.2	1.7
Virginia	-5.3	0.5	-0.7	2.7	-2.1	6.9	11.9	9.5	8.3	7.2	11.8	4.6
Washington	-10.2	-2.7	4.1	8.8	11.2	-6.2	2.2	6.3	5.3	-1.3	4.3	2.0
West Virginia	0.4	4.2	-1.4	7.7	4.6	3.3	0.6	7.9	9.8	-7.7	12.6	3.8
Wisconsin	-10.2	-3.8	-3.7	3.5	-0.6	6.0	8.6	12.3	7.1	-0.4	7.1	2.3
Wyoming	-10.0	10.8	-11.5	1.7	2.0	2.3	11.9	6.2	2.7	4.3	11.9	2.9