FEDERAL SPENDING IN THE COMMONWEALTH: A PRIMER

Republicans know that government spending creates jobs. They just want that spending to be funneled to their projects and districts … and they certainly don't want to say it out loud.

– Former Gov. Jennifer Granholm, D-Michigan

The idea that more taxes and more government spending is the best way to help hardworking middle-class taxpayers - that's an old idea that's failed every time it's been tried.

– Sen. Marco Rubio, R-Florida

It should be no surprise that federal spending plays a significant role in the performance of the Virginia economy. In 2016, contractors in the Northern Virginia cities and counties of the Washington, D.C.-Arlington-Alexandria Metropolitan Statistical Area (MSA) accounted for almost 52% of procurement spending for the entire metro area.[1] Meanwhile, more than 81,000 military service members and almost 60,000 federal civilian employees worked in the Virginia Beach-Norfolk-Newport News MSA (Hampton Roads) in 2017. In fiscal year (FY) 2018, federal government awards in Virginia totaled $109 billion,[2] or $12,866 per Virginian – among the highest in the nation. The Commonwealth economy is fueled, in part, by spending decisions in the halls of Congress and the White House.

Federal spending impacts the lives of many Virginians on a daily basis. Federal dollars flow into the Commonwealth as direct payments to retirees, veterans and the disabled. Federal grants pay for research on everything from the impact of the opioid crisis to how to plan for sea level rise. Federal funds may even pay part of the costs for the construction of sidewalks in low-income neighborhoods in Lynchburg.[3]

1 Keith Waters, (2017), "Federal procurement spending in the Washington Region: 2008-2016," Report, The Stephen S. Fuller Institute, George Mason University.
2 An award is money the federal government has promised to pay a recipient. Funding may be awarded to a company, organization, government entity or individual. It may be obligated (promised) in the form of a contract, grant, loan, insurance, direct payment, etc.
3 https://wset.com/news/local/lynchburg-mayor-pushing-for-99-million-sidewalk-project-in-a-low-income-area.

In many cases, the most visible expenditures of federal funds in Virginia are the purchase of products and services from the private sector, ranging from the building of ships in Newport News to contracts for information technology services in Arlington.

How dependent is Virginia on federal dollars? The answer depends on the measure. In FY 2018, for example, California received $311.7 billion in federal awards, Pennsylvania $209.1 billion, Texas $206.4 billion, Virginia $109 billion and Kentucky $89.6 billion. Absolutely, other states received significantly more in federal awards than the Commonwealth. However, if we adjust for population, Kentucky received $20,126 per capita, Pennsylvania $16,333, Virginia $12,866, California $7,885 and Texas $7,293.

While comparing the size of federal spending across states provides a measure of its magnitude, this does not convey the share of overall economic activity that arises from such spending. Gross domestic product (GDP) is a broad measure of economic activity that provides an estimate of the final value of goods and services in an area over a specific period of time. In 2017, Virginia's nominal GDP was $510.4 billion, of which $31.6 billion (6.2%) was attributed to federal civilian activity and $19.1 billion (3.7%) to military activity.[4] In other words, the economic activity of the military and federal civilian sectors directly contributed approximately 9.9% to Virginia's GDP that year.

In 2017, Virginia ranked fourth among U.S. states in the share of GDP attributed to military and federal civilian activity. Only Maryland, New Mexico and Hawaii had a higher share of GDP from these sources. To put this into perspective, the average for the nation for military and federal civilian activity as a percentage of GDP was 3.9% in 2017. Regardless of the measure, Virginia ranks among the top states in terms of total federal spending.

What makes the Commonwealth different is how federal spending flows into the state. As a percentage of federal awards in 2018, for example, contract awards were only 8.1% of total federal awards for Pennsylvania, 18.5% for California and 22.7% for Texas. Contracts were 53.6% of all awards for Virginia. **Virginia's federal fortunes are more directly tied to the ebb and flow of federal contract spending than many other states.**

Federal procurement spending,[5] that is, the purchase of goods and services from private-sector firms, flows throughout the Commonwealth. Even though the majority of federal procurement spending is concentrated in Hampton Roads and Northern Virginia,[6] nine of Virginia's metropolitan areas had federal procurement spending over $500 per capita in FY 2017. To examine how changes in federal spending affect the economies of Hampton Roads and Northern Virginia, we focus on the impact of the Budget Control Act of 2011 (BCA) on Department of Defense (DOD) spending. These two metro areas account for the majority of federal procurement spending in the Commonwealth and were significantly impacted by the BCA and its subsequent modifications.

We estimate that defense procurement spending declined by $1.5 billion in the Hampton Roads metropolitan area, from FY 2011 to FY 2014, due to the BCA. GDP in Hampton Roads was approximately 3% lower than it would have been in the absence of the cuts in defense spending. In Northern Virginia, defense procurement spending declined 29% from 2011 to 2017. The decline in spending lowered economic activity in the region by over 4%. These declines explain, in part, the tepid performance of Virginia's economy in the first half of the current decade.

Understanding how changes in procurement spending affect economic activity in Virginia is key to improving our economic resiliency. The federal government's fiscal position is unsustainable in the long term and defense spending is the largest discretionary component of the federal budget. Preparing for possible reductions in defense spending is not inviting disaster; it is recognizing that what has come before may happen again.

4 Bureau of Economic Analysis, Table SAGDP2N Gross domestic product (GDP) by state, 2017. Data for 2018 were not available for the federal civilian and military sectors as of October 2019.

5 Our measure of federal procurement spending is based on the individual federal procurement contracts from USAspending.gov. Some large federal contracts take place across fiscal years, therefore we use the original contract awards and subsequent modifications in conjunction with the starting and ending date to create a spending path for each contract. Each contract-spending path is constructed by allocating the award equally over the relevant time frame.

6 We define Hampton Roads as the Virginia Beach-Norfolk-Newport News, VA-NC, metropolitan statistical area, and Northern Virginia as consisting of the following independent counties and cities: the counties of Arlington, Clarke, Culpeper, Fairfax, Fauquier, Loudoun, Madison, Prince William, Rappahannock, Spotsylvania, Stafford and Warren; and the cities of Alexandria, Fairfax, Falls Church, Fredericksburg and Manassas Park.

Not Just Northern Virginia And Hampton Roads: Federal Spending Across Virginia

According to the Bureau of Economic Analysis, federal government consumption and investment expenditures accounted for 6.6% of U.S. GDP in 2017, while federal civilian and military activities contributed 9.2% of Virginia's GDP in 2017. Table 1 illustrates the contribution of federal spending to GDP, by selected categories, for each of Virginia's metropolitan areas in 2017.

Total federal spending ranged from a low of 0.1% of metro GDP in the Winchester MSA to a high of 26.7% of metro GDP for Northern Virginia. A number of metropolitan areas had nontrivial amounts of federal procurement spending, illustrating how the impact of the federal government is spread across the Commonwealth. As one might expect, federal civilian wages were highest in Northern Virginia, while military wages were highest in Hampton Roads.

It's easy to lose sight in those large headline numbers for Northern Virginia and Hampton Roads that federal spending is an important driver of economic activity in other regions. For example, the Richmond, Charlottesville and Roanoke metro areas had 4% or more of their GDP coming from federal spending in 2017. However, the spending originates from different sources, with Charlottesville's coming from overall procurement spending, while Richmond and Roanoke get approximately 2.5% of GDP from federal civilian wages. With over 10% of economic activity in 2017 associated with federal government procurement contracts, Northern Virginia and Hampton Roads' economic fortunes wax and wane, to some extent, on federal government spending and, in particular, DOD procurement spending.

TABLE 1

CATEGORIES OF FEDERAL SPENDING AS A PERCENTAGE OF GDP: SELECTED METROPOLITAN STATISTICAL AREAS, VIRGINIA AND THE UNITED STATES, 2017

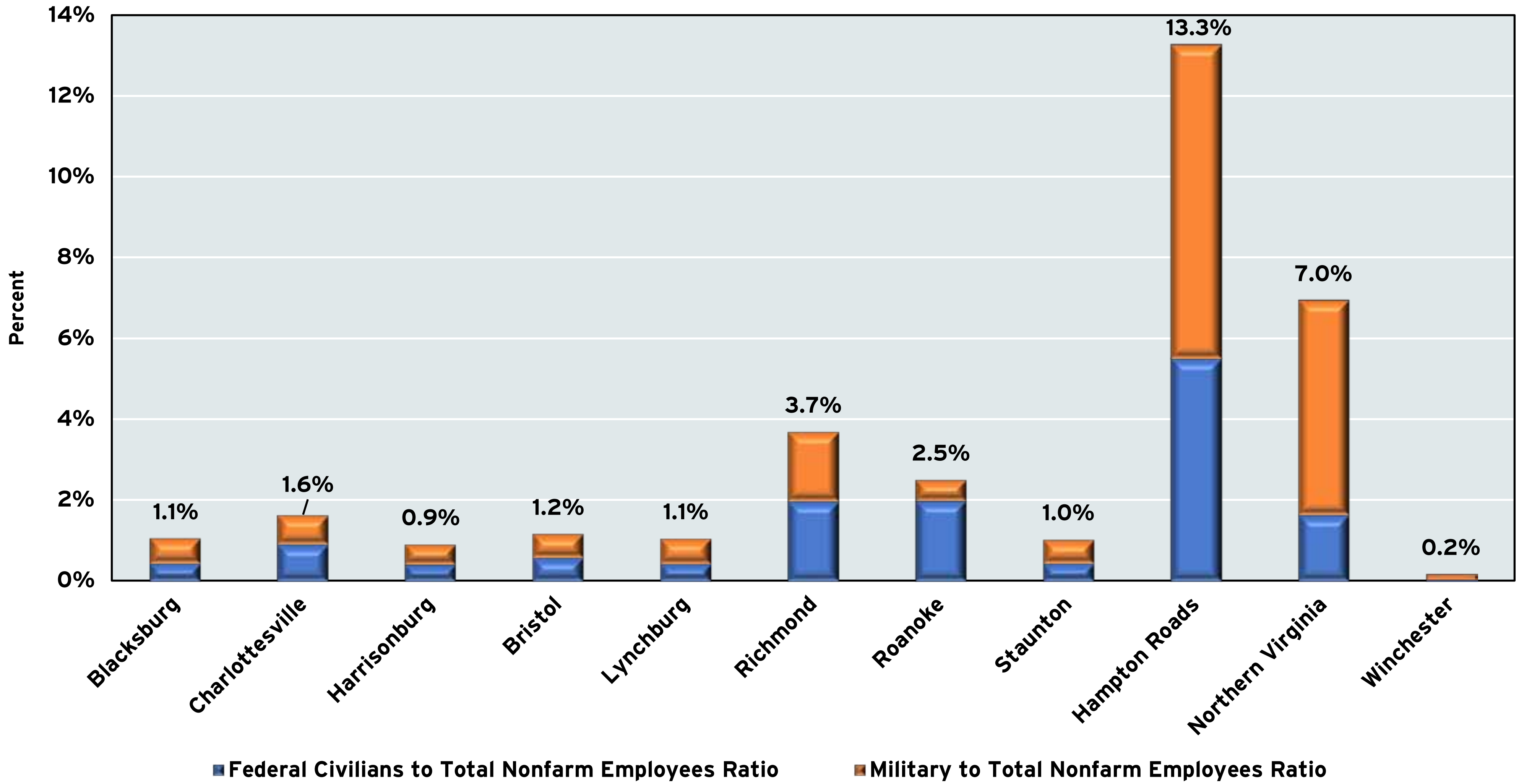
	TOTAL FEDERAL SPENDING	TOTAL PROCUREMENT SPENDING	FEDERAL CIVILIAN WAGES	MILITARY WAGES
United States	4.2%	1.8%	1.7%	0.7%
Virginia	18.2%	10.5%	5.2%	2.5%
Blacksburg	3.4%	2.5%	0.6%	0.4%
Charlottesville	4.5%	2.4%	1.3%	0.7%
Harrisonburg	1.5%	1.0%	0.4%	0.2%
Lynchburg	3.0%	2.2%	0.5%	0.3%
Richmond	5.0%	1.3%	2.4%	1.3%
Roanoke	4.0%	1.0%	2.7%	0.2%
Staunton	0.7%	0.0%	0.5%	0.2%
Hampton Roads	25.3%	10.3%	6.9%	8.1%
Northern Virginia	26.7%	14.0%	11.5%	1.2%
Winchester	0.1%	0.0%	0.0%	0.0%

Sources: USA Spending (2019); Bureau of Economic Analysis (2019); and the Dragas Center for Economic Analysis and Policy, Old Dominion University

Graph 1 displays the ratio of military and federal civilian jobs to total nonfarm jobs for Virginia's metropolitan areas in 2017. Hampton Roads and Northern Virginia had the highest percentages of nonfarm payrolls associated with the federal government that year, followed by Richmond and Roanoke.

GRAPH 1

RATIO OF MILITARY AND FEDERAL CIVILIAN EMPLOYEES TO TOTAL NONFARM EMPLOYEES: METROPOLITAN AREAS IN VIRGINIA, 2017



Sources: Bureau of Economic Analysis (2019) and the Dragas Center for Economic Analysis and Policy, Old Dominion University

Graph 2 illustrates the composition of federal procurement contracts in Virginia in FY 2017. Federal agencies negotiated more than $53 billion in procurement contract spending with private-sector firms. To put this into context, that is approximately 75% of the total 2017 GDP for the state of West Virginia. The Department of Defense accounted for almost two-thirds of all federal procurement contracts, almost 10 times higher than the next department or agency. This illustrates the distinctive relationship between the Commonwealth and the DOD; not only is Virginia home to the world's largest Navy base, but a majority of federal funds flowing into the Commonwealth are for contracts for goods and services, followed by transfer payments to individuals.

Table 2 presents federal procurement contract spending awards per capita for FY 2017 for Virginia's metropolitan areas, Virginia and the United States. Northern Virginia had the highest level of procurement spending per capita, over two times that of the next metro area, Hampton Roads. The separation between Hampton Roads and the next metro area illustrates the disparity in federal procurement spending. In Hampton Roads, procurement spending per capita was four times that of the Charlottesville MSA.

Of particular interest is the degree of dependency on DOD procurement spending. While Northern Virginia had the highest procurement spending per capita, this spending was almost evenly split between DOD and non-DOD sources. In FY 2017, 57% of procurement spending in Northern Virginia originated from the DOD. For Hampton Roads, on the other hand, 90% of procurement spending in FY 2017 flowed from DOD sources. The differences suggest that future changes in DOD and non-DOD procurement spending would have different impacts in these metro areas.

TABLE 2

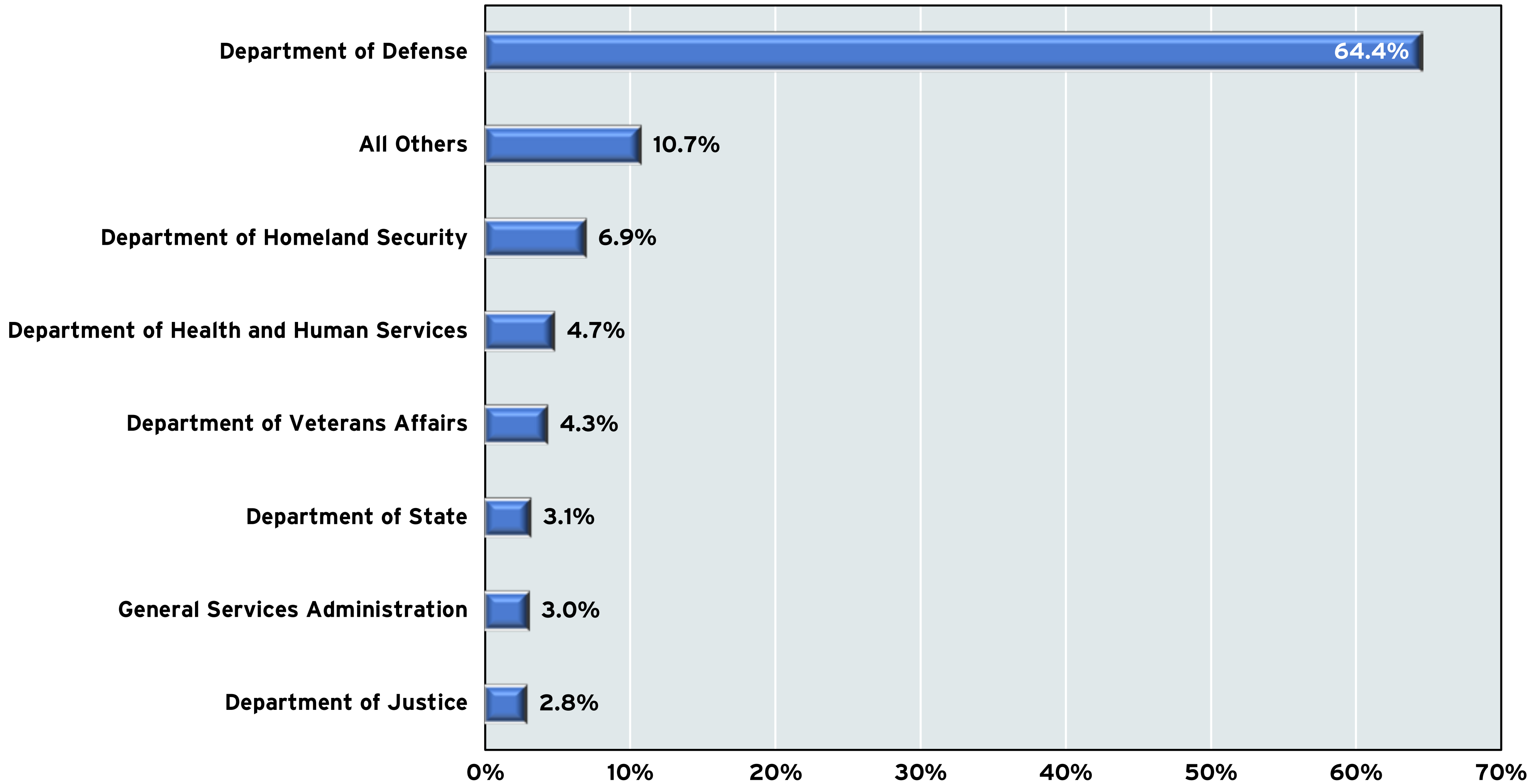
FEDERAL PROCUREMENT CONTRACT AWARDS PER CAPITA: METROPOLITAN AREAS IN VIRGINIA, FISCAL YEAR 2017

MSA	DOD PROCUREMENT SPENDING PER CAPITA	NON-DOD PROCUREMENT SPENDING PER CAPITA	TOTAL PROCUREMENT SPENDING PER CAPITA
United States	$755	$341	$1,096
Virginia	$4,081	$2,253	$6,334
Northern Virginia	$7,530	$5,611	$13,141
Hampton Roads	$5,260	$561	$5,821
Charlottesville	$1,085	$343	$1,428
Blacksburg	$831	$161	$992
Richmond	$687	$182	$869
Lynchburg	$794	$57	$851
Bristol	$747	$25	$772
Harrisonburg	$487	$116	$603
Roanoke	$328	$194	$522
Staunton	$6	$12	$18
Winchester	$0	$0	$0.6

Sources: USA Spending (2019); Bureau of Economic Analysis (2019); and the Dragas Center for Economic Analysis and Policy, Old Dominion University

GRAPH 2

PERCENTAGE OF FEDERAL PROCUREMENT CONTRACTS BY DEPARTMENT AND AGENCY: VIRGINIA, FISCAL YEAR 2017



Sources: USA Spending (2019) and the Dragas Center for Economic Analysis and Policy, Old Dominion University

What Do Federal Contracts Buy In Virginia?

Firms in Virginia provide products and services for almost all of the U.S. federal agencies. However, many of these agencies receive a relatively small proportion of the overall procurement spending in the Commonwealth. The DOD is the Commonwealth's largest customer and accounted for 64% of the federal government's procurement purchases in Virginia in 2017.

Graph 3 shows the assortment of goods and services the DOD procured in Virginia in FY 2011, 2015 and 2017. The categories ranged from the construction of ships, small crafts, pontoons and floating docks to high-tech research and development services. The composition of the expenditures in these categories has stayed relatively constant over the last decade.

There is a clear distinction in DOD procurement patterns between metropolitan areas in Virginia. Hampton Roads, for example, has military ship construction roots that date back to the early 1800s and the region's forte has been to maintain, train and assemble forces and systems. Naval Air Station Oceana is the Navy's East Coast master jet base, home to F/A-18 Hornets and Super Hornets. The base, including Dam Neck Annex, has about 10,500 active Navy personnel, as well as 10,000 family members and 4,500 civilian personnel.[7] Hampton Roads' active-duty forces primarily focus on being prepared to support the nation's military objectives.

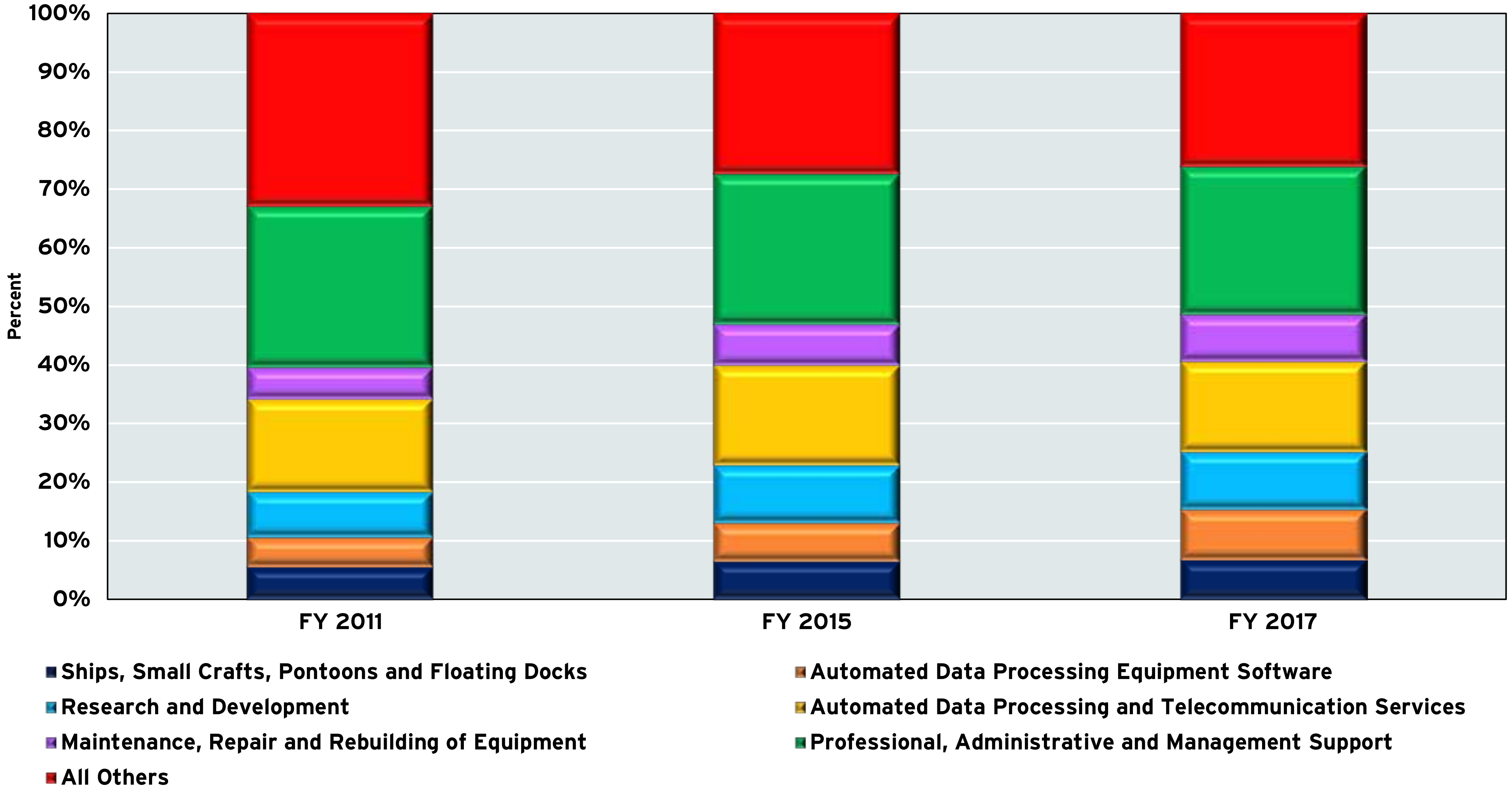
Private-sector firms with DOD procurement contracts in Hampton Roads focus on assembling, maintaining and supporting the operations of people and weapons systems. Shipbuilding, along with maintenance, repair and rebuilding of equipment (often related to ships), almost exclusively takes place in Hampton Roads. Huntington Ingalls Industries in Newport News is far and away the largest firm in these categories and in procurement contracts as a whole in the region. The Newport News facility is the nation's sole designer, builder and refueler of nuclear-powered aircraft carriers and one of only two shipyards with the ability to design and build nuclear-powered submarines.

Three different major DOD spending categories – automated data processing services, automated data processing equipment and software, and professional, administrative and management support – all have strong footholds in Northern Virginia. These largely technology-based service industries do have spending sprinkled in other places. Hampton Roads, for example, accounts for approximately 13% of the spending in these areas. Companies in this technology-based industry service government contracts and conduct business with other private-sector firms. In general, Northern Virginia focuses more on services, while Hampton Roads concentrates more on products.

7 https://www.cnic.navy.mil/regions/cnrma/installations/nas_oceana.html.

GRAPH 3

BREAKDOWN OF VIRGINIA DEPARTMENT OF DEFENSE CONTRACTS BY CATEGORY, FISCAL YEARS 2011, 2015 AND 2017



Sources: USA Spending (2019) and the Dragas Center for Economic Analysis and Policy, Old Dominion University

A Shift In People And Money: 1983-2008

To understand how changes in Department of Defense procurement spending influence economic activity in Virginia, we need to look at how DOD spending has evolved over time in the Commonwealth. From 1983 to 2008, there was a shift in how federal funds flowed into Virginia. Graph 4 illustrates how federal civilian and military employment changed over this period. The number of military personnel stationed in the Commonwealth peaked at almost 214,000 service members in 1989, declining steadily to approximately 161,000 in 2008. From 1983 to 2008, the number of military personnel in Virginia fell by almost 25%.

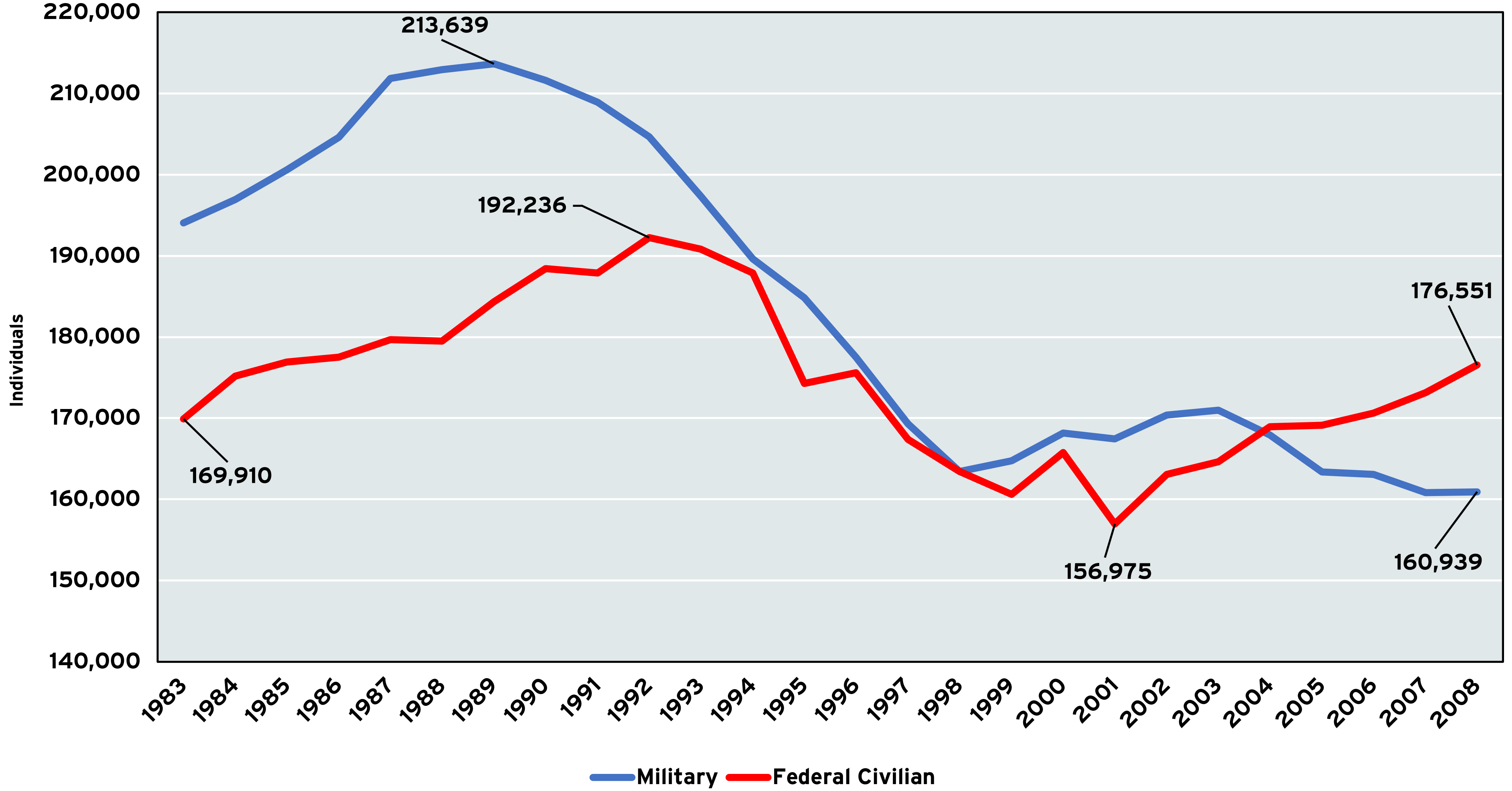
The number of federal civilian employees in Virginia climbed from approximately 170,000 in 1983 to slightly over 192,000 in 1992. By 2001, the number of federal civilian employees had fallen 18.3% to approximately 157,000. The number of employees then steadily increased, eclipsing 176,000 in 2008. Even with the increase after 2001, the total number of federal civilian employees in Virginia was 8.2% below the peak of 1992.

While the number of federal personnel (military and civilian) was well below the historical peak in 2008, procurement spending continued to rise in Virginia from 1983 to 2008. Graph 5 displays the 156% increase in DOD procurement and 700% increase in non-DOD procurement spending in the Commonwealth over this period. **Graphs 4 and 5 reveal a stark contrast in the evolution of federal spending from 1983 to 2008: fewer military personnel and civilian employees, more contracts.**

The rise in federal procurement contracts reflected a philosophical change to the question of whether the federal government should produce goods and services or contract with the private sector to produce goods and services. Debates over outsourcing were largely settled in favor of proponents of the argument, and an increasing number of functions were contracted out to the private sector. What began with janitorial and food service functions evolved to encompass what was once considered core functions of the federal government, to include intelligence and asset protection.

GRAPH 4

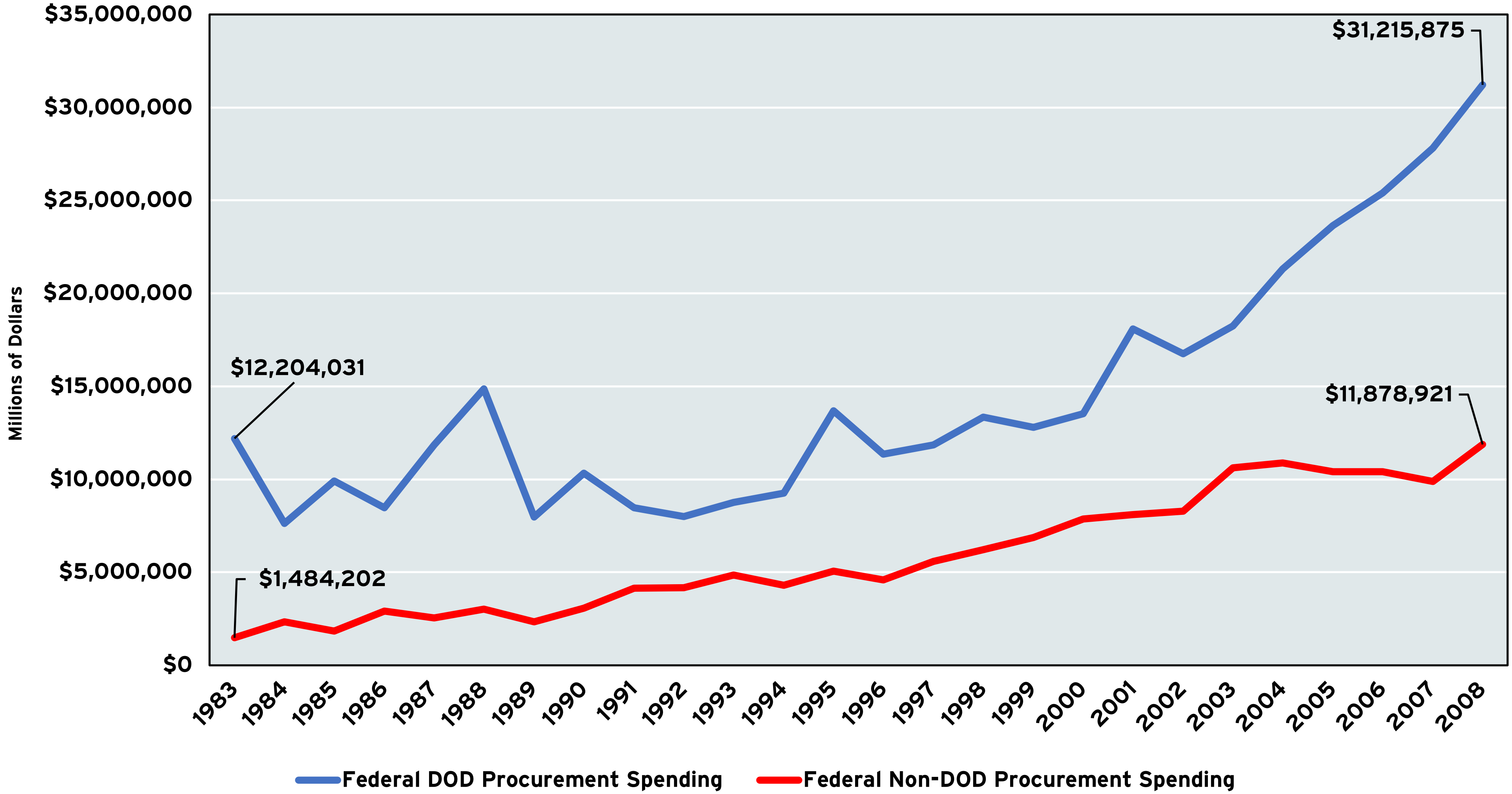
TOTAL FEDERAL CIVILIAN AND MILITARY EMPLOYMENT: VIRGINIA, 1983-2008



Source: Bureau of Economic Analysis, 2019

GRAPH 5

DOD AND NON-DOD PROCUREMENT SPENDING: VIRGINIA, 1983-2008



Sources: Consolidated Federal Funds Report, Bureau of Economic Analysis and Bureau of Labor Statistics (BLS). Procurement spending is adjusted for inflation to 2000 dollars with the BLS Urban Consumer Price Index.

The Budget Control Act Of 2011

Each non-exempt account within a category shall be reduced by a dollar amount calculated by multiplying the enacted level of sequestrable budgetary resources in that account at that time by the uniform percentage necessary to eliminate a breach within that category.

– Section 101 of the Budget Control Act of 2011 modifying Section 251(a)(2) of Balanced Budget and Emergency Deficit Control Act of 1985

The Northern Virginia and Hampton Roads metropolitan area economies were (and remain) the most dependent in the Commonwealth on federal spending. In this section, we examine how declines in federal spending from the Budget Control Act of 2011 impacted the economies of these metros. While the threat of sequestration has receded for now, understanding how declines in federal spending might impact the Commonwealth in the future is important to address concerns about economic resiliency.

The BCA stemmed from a showdown between members of Congress on raising the debt ceiling. The political debate centered on the appropriate level of government spending and the size of the national debt. The passage of the BCA averted the debt ceiling crisis but also brought the word "sequestration" back into the American lexicon. Sequestration entails removing, or "sequestering," funds that have been approved by Congress and otherwise would have been spent. The modern notion of sequestration dates back to the mid-1980s. The Gramm-Rudman-Hollings Act of 1985 (revised in 1987 and again in 1990) was the most recent incarnation of sequestration prior to the passage of the BCA.

The BCA set statutory limits on defense discretionary and nondefense discretionary spending for FY 2012 to FY 2021. Table 3 illustrates the initial limits on discretionary defense spending. The BCA also established the Joint Select Committee on Deficit Reduction, which was charged with coming to an agreement to reduce the deficit by $1.2 trillion over the 10-year period. Failing an agreement, the BCA contained a provision to automatically impose reductions to the discretionary spending limits for each year through FY 2021. Furthermore, the BCA required the automatic sequestration of nonexempt mandatory spending programs if discretionary spending appropriations exceeded the spending limits it established.

Table 3 illustrates the initial BCA limits on defense discretionary spending and the subsequent reduction in January 2012, when the Joint Select Committee failed to reach an agreement on how to reduce the deficit. While the American Taxpayer Relief Act of 2012 delayed the FY 2013 sequester from January 2013 to March 2013, the Department of Defense faced a sequester of appropriations in FY 2013. To say this was disruptive would be an understatement. The delay in the start of the sequester meant that many civilian employees were furloughed, maintenance was delayed and operations were slowed significantly in some areas.

The BCA focused on discretionary defense and nondefense federal spending. Thus, Social Security and Medicaid were exempt from the spending caps. However, the BCA included a 2% limit on any reductions in spending for Medicare and certain health care programs in the nondefense spending cap. Furthermore, the BCA excluded military personnel pay from the discretionary defense spending limit. This created important differences in how the BCA caps impacted the DOD and all nondefense agencies.

Table 3 also shows the modifications of the BCA spending caps this decade. The most recent change, the Bipartisan Budget Act of 2019, increased the discretionary defense cap by $90 billion for FY 2020 and $81 billion for FY 2021. Under current law, there are no caps for defense and nondefense discretionary spending past FY 2021. Congress can return to regular order for the budget process, although recent practice suggests that the process is neither regular nor orderly.

TABLE 3

DEFENSE DISCRETIONARY BUDGET AUTHORITY LIMITS UNDER THE BUDGET CONTROL ACT (AS AMENDED), AUGUST 2011 – CURRENT

		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
BCA	Aug 2011	$555	$546	$556	$566	$577	$590	$603	$616	$630	$644
BCA Sequester	Jan 2012	$555	$492	$501	$511	$522	$535	$548	$561	$575	$589
ATRA	Jan 2013	$555	$518	$497	$511	$522	$535	$548	$561	$575	$589
BBA 2013	Dec 2013	$555	$518	$520	$521	$522	$536	$549	$562	$576	$590
BBA 2015	Nov 2015	$555	$518	$520	$521	$548	$551	$549	$562	$576	$590
BBA 2018	Feb 2018	$555	$518	$520	$521	$548	$551	$629	$647	$576	$590
BBA 2019	Aug 2019	$555	$518	$520	$521	$548	$551	$629	$647	$667	$672

Source: Congressional Research Service, "The Budget Control Act: Frequently Asked Questions. Updated Oct. 1, 2019," CRS Report, R44874

Examining The BCA's Impact On Virginia

Graph 6 shows how the Budget Control Act and the subsequent modifications impacted federal personnel in Virginia. Military personnel continued to decline, falling to slightly more than 137,000 in 2017. The 11% decline in military personnel from 2009 to 2017 was primarily the result of a smaller force structure in Hampton Roads. On the other hand, the federal civilian workforce grew by almost 15,000 employees (8%) over the same period. Overall, federal civilian and military employment declined by approximately 2,500 from 2009 to 2017.

Graph 7 illustrates the dramatic impact of the Budget Control Act on Department of Defense procurement spending in Virginia. DOD procurement spending peaked at $49.4 billion in FY 2011 and subsequently declined to $34.6 billion in FY 2017. Even though non-DOD procurement spending increased by about $1.0 billion from FY 2011 to FY 2017, DOD procurement spending declined by $14.9 billion over the same period. The net loss of approximately $13.8 billion in DOD procurement spending undoubtedly took some of the wind out of the Commonwealth's economic sails.

Table 4 further breaks these categories down between products, services, and research and development (R&D) for fiscal years 2011, 2014 and 2017. Between FY 2011 and FY 2017, DOD product spending declined by 27.1% (-$3.7 billion), while DOD services plummeted 33.9% ($-10.8 billion). DOD R&D fell 11.7% and non-DOD R&D dropped 37.9%, a troubling development given Virginia's desire to engage in innovation and research. There are two small measures of good news, however, which can be seen in Table 4. Non-DOD product purchases increased by 12.2% ($309 million) and non-DOD service spending increased by 7.6% ($1.0 billion) over the same period.

TABLE 4

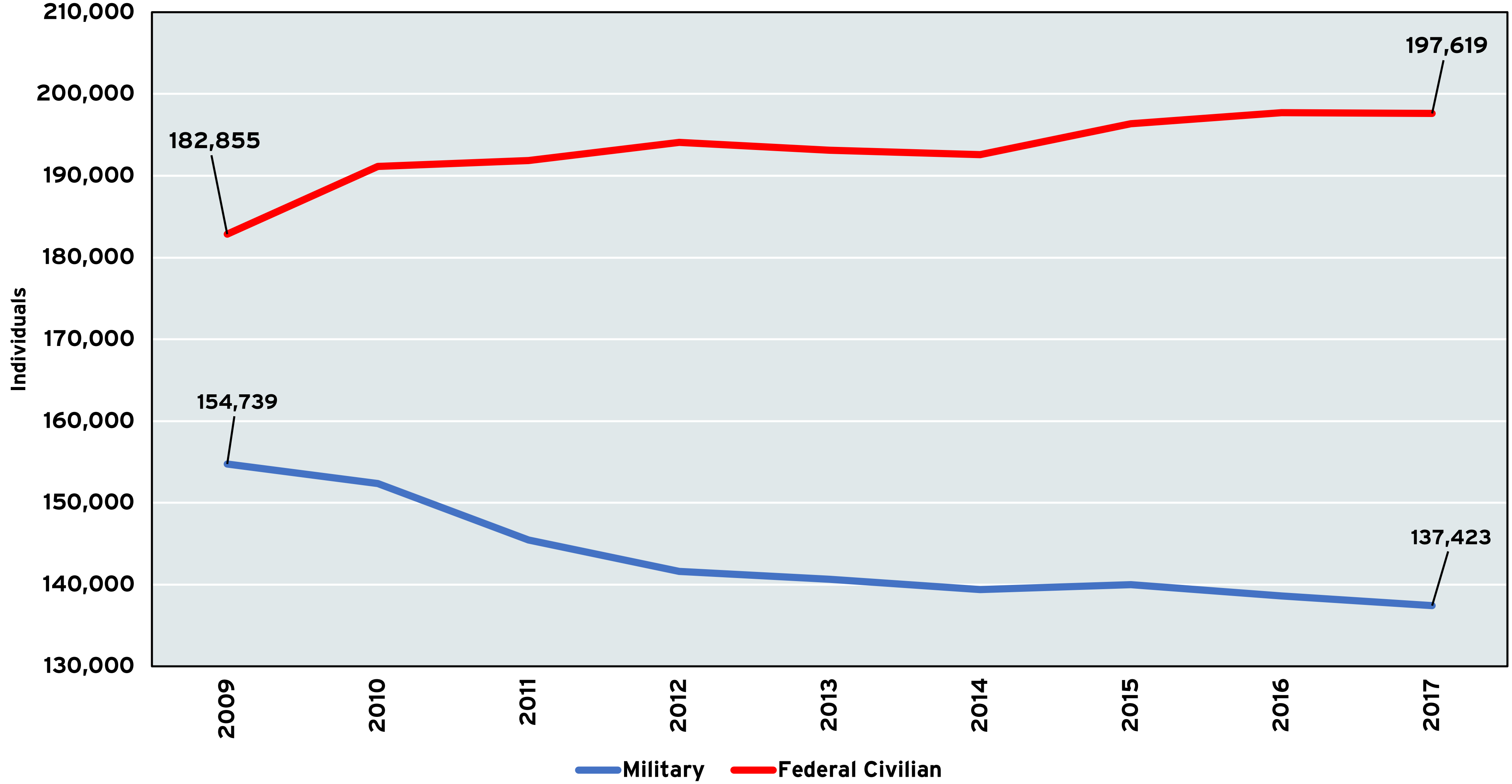
VIRGINIA PROCUREMENT SPENDING BY PRODUCTS, SERVICES, AND RESEARCH AND DEVELOPMENT, FISCAL YEARS 2011, 2014 AND 2017 (IN BILLIONS OF $)

SPENDING CATEGORY	2011	2014	2017	PERCENT CHANGE 2011-2014	PERCENT CHANGE 2011-2017
Products DOD	$13,717	$10,280	$9,995	-25.1%	-27.1%
Products Non-DOD	$2,527	$2,736	$2,836	+8.3%	+12.2%
Services DOD	$31,818	$23,384	$21,044	-26.5%	-33.9%
Services Non-DOD	$14,387	$15,512	$15,475	+7.8%	+7.6%
Research and Development DOD	$3,825	$3,700	$3,376	-3.3%	-11.7%
Research and Development Non-DOD	$1,099	$812	$683	-26.1%	-37.9%

Sources: USA Spending and the Dragas Center for Economic Analysis and Policy, Old Dominion University. Data are adjusted for inflation to 2018 dollars with the Urban Consumer Price Index from the Bureau of Labor Statistics.

GRAPH 6

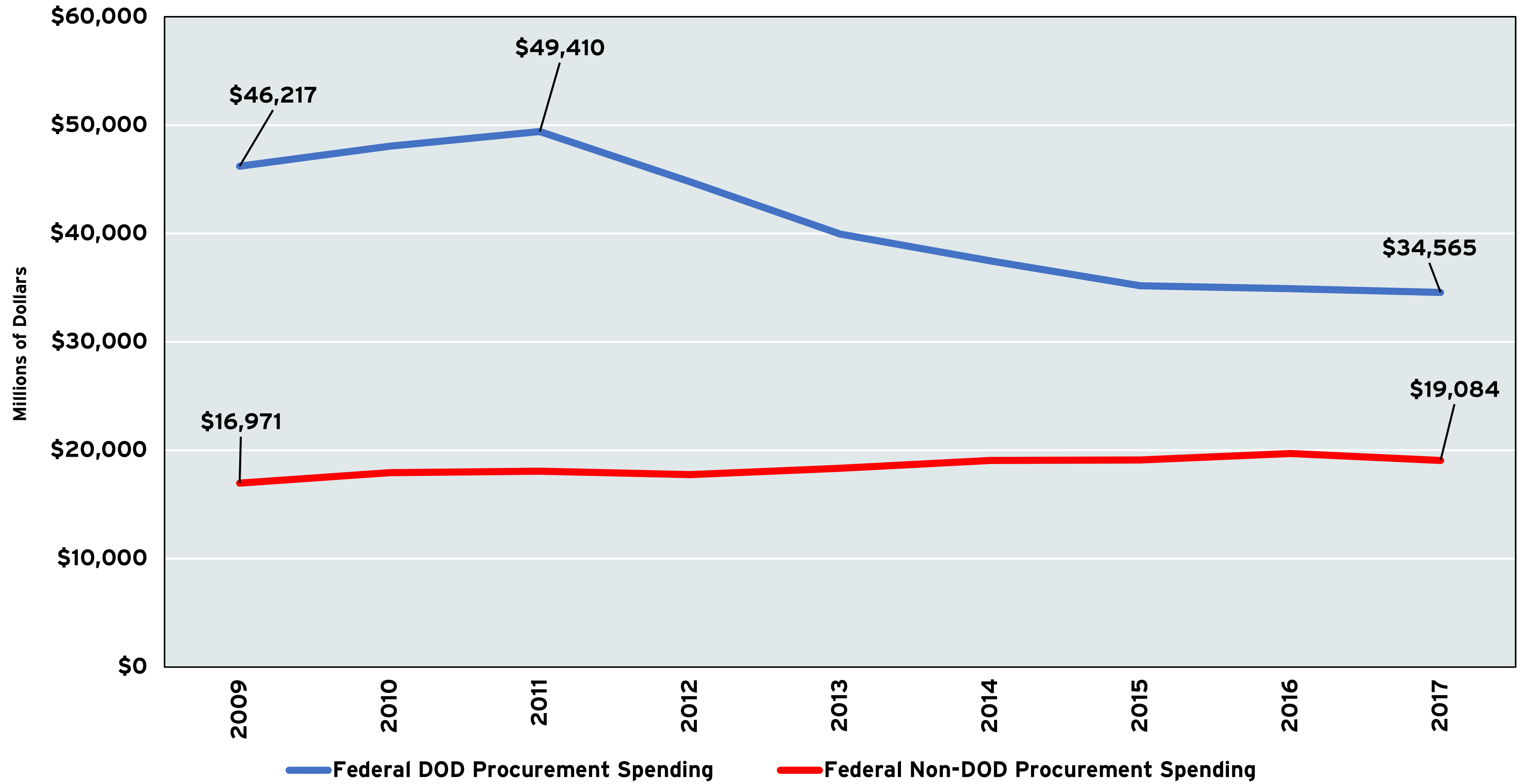
TOTAL FEDERAL CIVILIAN AND MILITARY EMPLOYMENT: VIRGINIA, 2009-2017



Source: Bureau of Economic Analysis, 2019

GRAPH 7

DOD AND NON-DOD PROCUREMENT SPENDING: VIRGINIA, FISCAL YEARS 2009-2017



Sources: Consolidated Federal Funds Report, Bureau of Economic Analysis, and Bureau of Labor Statistics. Procurement spending is adjusted for inflation to 2000 dollars with the Urban Consumer Price Index from the Bureau of Labor Statistics.

A Primer On Economic Impact Analysis

To estimate the impact of sequestration and the subsequent caps on federal spending, we quantify the direct, indirect and induced economic impacts. We focus our analysis on changes in defense procurement spending from the Budget Control Act for Hampton Roads and Northern Virginia.

To understand our approach, it is helpful to imagine a pebble dropped into a puddle of water to visualize how the economy reacts to a change in procurement contracts. The impact represents the initial round of economic activity on output, earnings and employment. The initial round of economic activity ripples through the rest of the economy like the waves moving through the puddle. These ripples represent the indirect and induced impacts that come about through the interconnectedness of the local economy. The indirect economic impact comes from economic activity by suppliers to firms that have won Department of Defense procurement contracts. On the other hand, the induced impact comes from income and employment in industries directly and indirectly affected by direct procurement contracts.

These spillovers can create a total economic impact from DOD spending that is much larger than the direct impact on a firm that wins a contract. The notion of an economic multiplier summarizes the total economic impact of a change in economic activity. For example, if a firm wins a $1 million DOD contract (direct impact) that generates $300,00 in indirect economic impacts and $200,00 in induced economic impacts, then the economic impact multiplier effect is ($1,000,000 + $300,000 + $200,000) / $1,000,000 = 1.5.

There are two important considerations when evaluating economic multipliers. First, the size of the multiplier inherently depends on how much of the economic activity continues to recycle within the region. If, for example, shipbuilding and repair firms source most of their materials from outside of the region (a "leakage"), then the actual multiplier effect will necessarily be smaller. Second, the multiplier effect, where spending spills over to a variety of other sectors, is great when the direct impact is positive, however; it is equally painful when there is a reduction in direct economic activity.

To estimate the impact from DOD procurement spending on employment and output in the Hampton Roads and Northern Virginia metropolitan areas, we use defense-spending data from USAspending.gov and the JobsEQ software developed by Chmura Economics and Analytics. The JobsEQ software uses regional input-output tables to measure the connectedness of economic activity in the region.

The Economic Impact Of The BCA On Hampton Roads

As Hampton Roads and Northern Virginia received the lion's share of Department of Defense contracts prior to the passage of the Budget Control Act, we focus our analysis on the BCA's economic impact on these two metropolitan areas. First, we start with estimates of how the BCA impacted the Hampton Roads economy. Federal spending in Hampton Roads is concentrated in the manufacturing sector with the construction and maintenance of ships. Manufacturing procurement contracts comprised 56% of DOD contracts in 2011 and 52% in 2017. Graph 8 depicts the total economic impact of DOD spending on output in Hampton Roads, while Graph 9 shows the impact on employment. In 2011, the $10.4 billion in direct DOD procurement spending created a total output of $15 billion. This level plummeted in 2014.

As illustrated in Graph 8, direct DOD procurement spending declined from approximately $10.4 billion in FY 2011 to about $8.6 billion in FY 2014. As a result, the estimated economic impact of DOD spending in Hampton Roads declined from $15 billion in FY 2011 to $12.3 billion in FY 2014, an economic loss of $2.7 billion. In other words, the impact of the BCA equaled about 3% of the region's annual GDP.

Furthermore, the defense sector rebounded only slightly by 2017, with direct defense spending reaching about $8.9 billion. The total

economic impact of DOD spending increased from a low of $12.3 billion in FY 2014 to $12.8 billion in FY 2017.

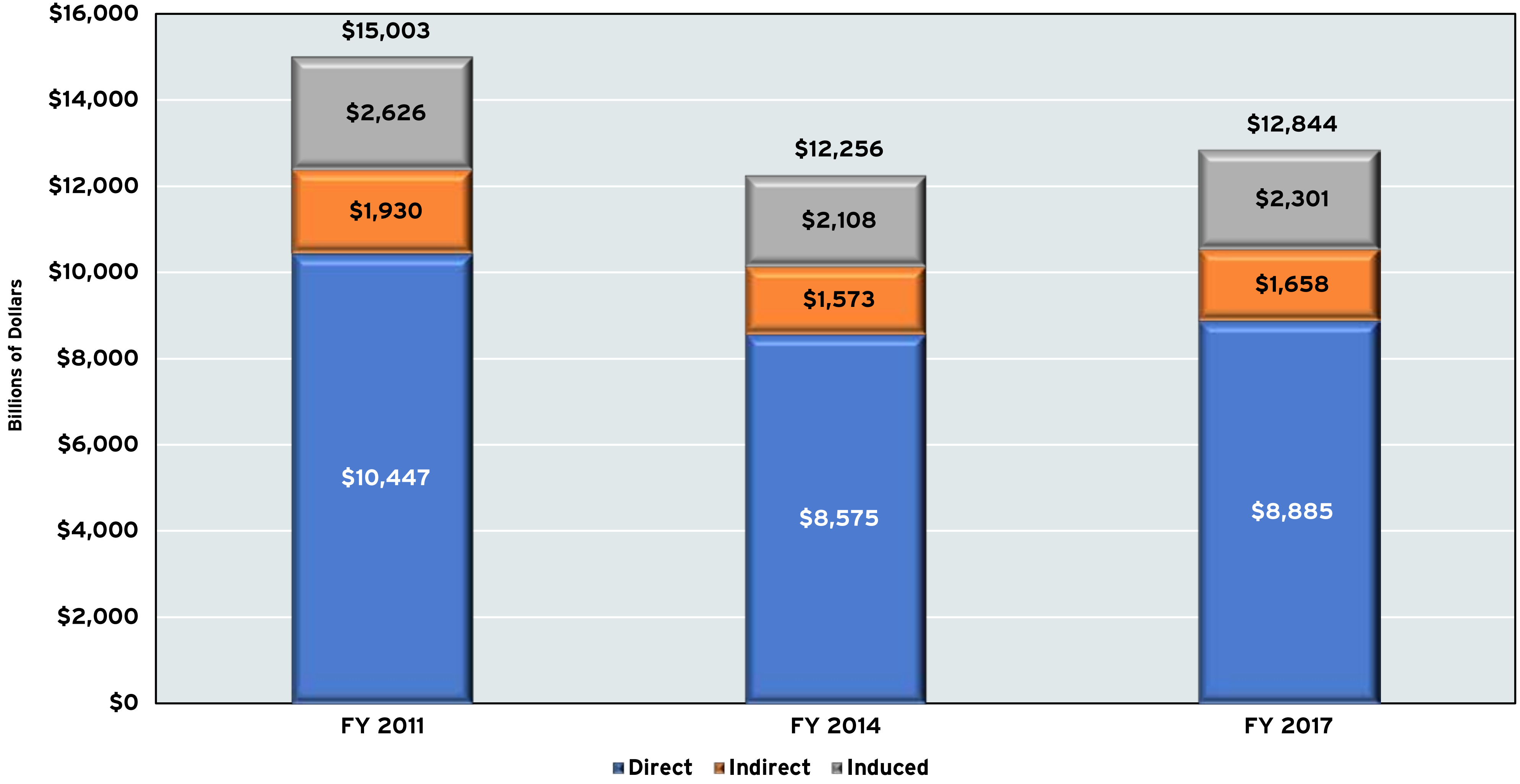
Graph 9 shows a similar detrimental employment effect from 2011 to 2014 and 2017. Overall, total employment from DOD procurement spending declined by 13,000 private-sector jobs from 2011 to 2014. By 2017, the total estimated employment loss had declined to approximately 8,000 jobs. If there is good news to report, it is that the increases in DOD spending in fiscal years 2018 and 2019 should raise the DOD's overall economic impact in Hampton Roads. Whether the DOD's overall contribution returns to the peak observed prior to the BCA remains an unanswered question.

The Economic Impact Of The BCA On Northern Virginia

Northern Virginia had 61% of its procurement spending on professional, scientific and technical services in FY 2011. Graph 10 shows the total economic impact on output in Northern Virginia from declining Departmentof Defense spending, while Graph 11 shows the labor market impact. **The headline numbers are even starker in Northern Virginia than they are in Hampton Roads. Direct DOD procurement spending declined by $9.1 billion, leading overall output to decline between 2011 and 2017 by $14 billion, a 29% drop. This represented a drop of approximately 4.5% from Northern Virginia's GDP. By the same token, total employment declined by 28%, or 58,000 jobs.**

GRAPH 8

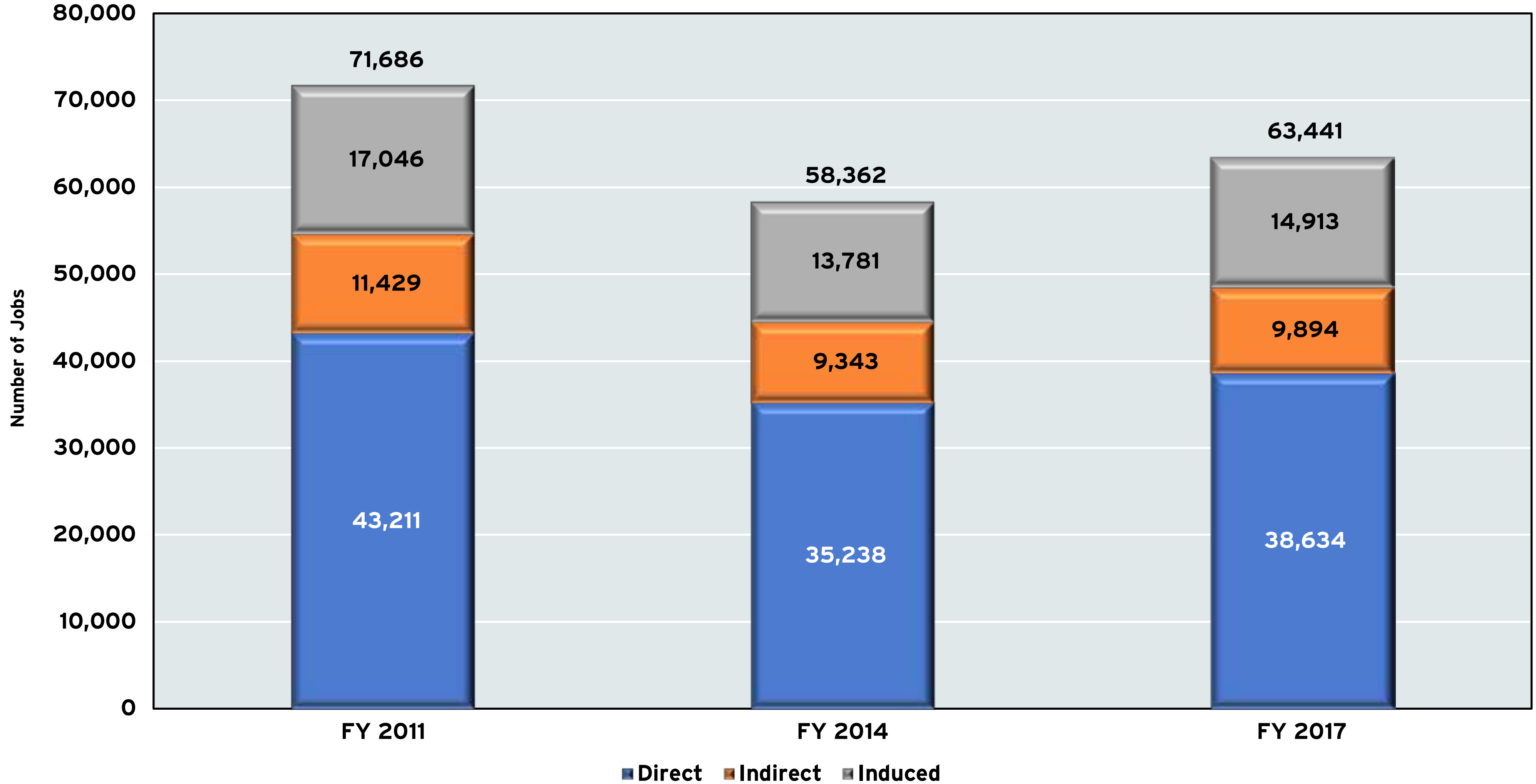
ESTIMATED ECONOMIC IMPACT OF DEFENSE PROCUREMENT SPENDING ON OUTPUT IN HAMPTON ROADS, FISCAL YEARS 2011, 2014 AND 2017



Sources: USA Spending, JobsEQ and the Dragas Center for Economic Analysis and Policy, Old Dominion University

GRAPH 9

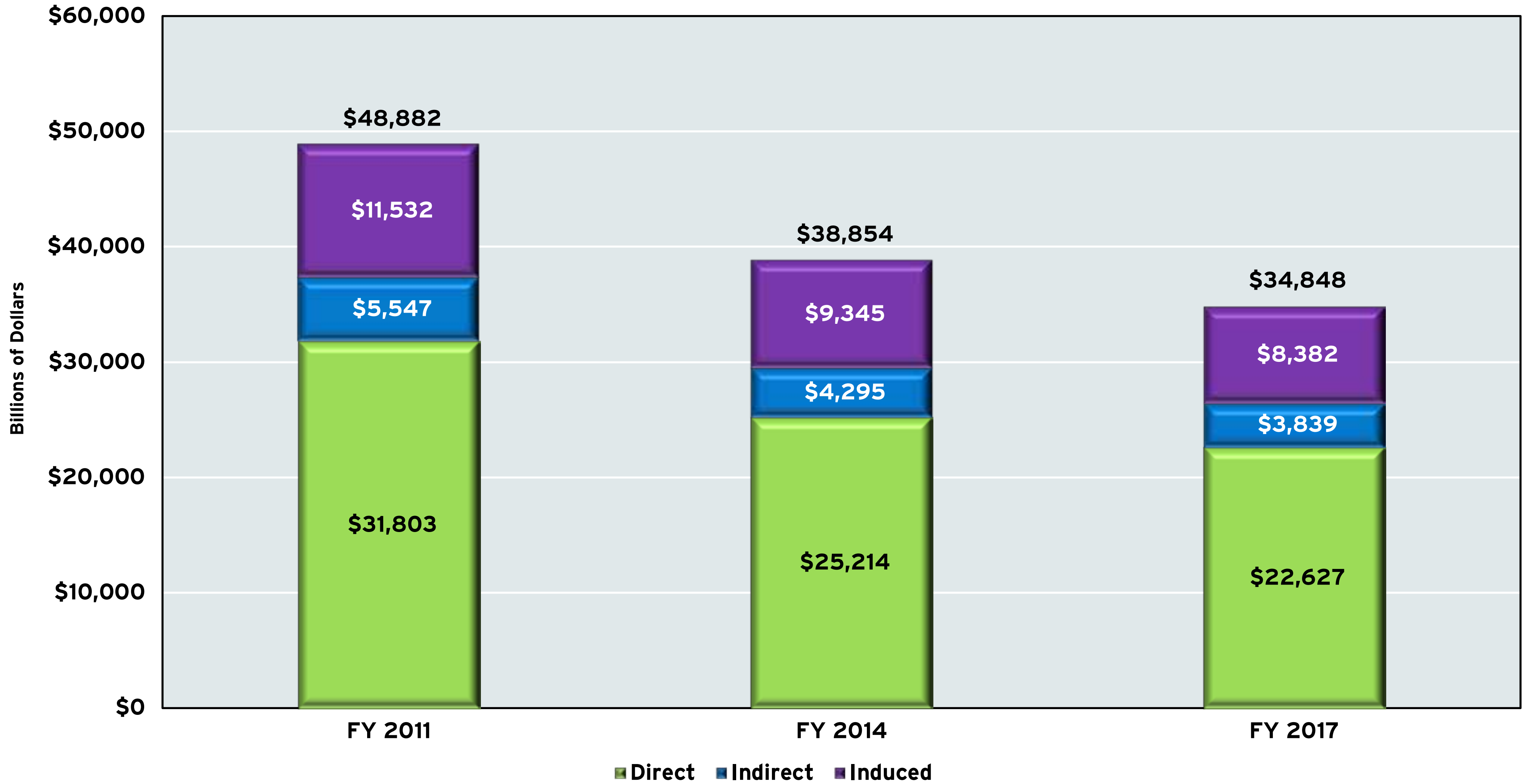
ESTIMATED ECONOMIC IMPACT OF DEFENSE PROCUREMENT SPENDING ON EMPLOYMENT IN HAMPTON ROADS, FISCAL YEARS 2011, 2014 AND 2017



Sources: USA Spending, JobsEQ and the Dragas Center for Economic Analysis and Policy, Old Dominion University

GRAPH 10

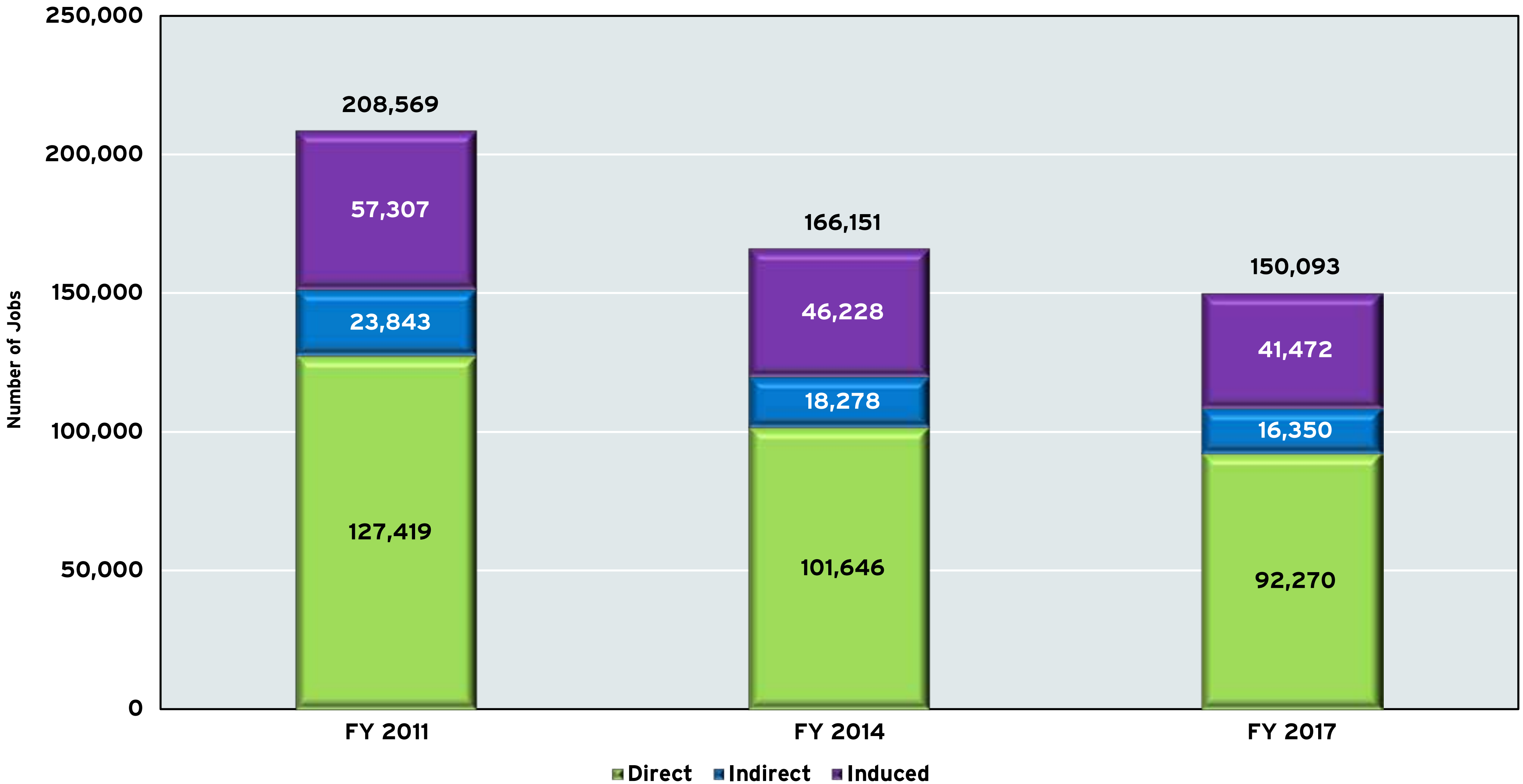
ESTIMATED ECONOMIC IMPACT OF DEFENSE PROCUREMENT SPENDING ON OUTPUT IN NORTHERN VIRGINIA, FISCAL YEARS 2011, 2014 AND 2017



Sources: USA Spending, JobsEQ and the Dragas Center for Economic Analysis and Policy, Old Dominion University

GRAPH 11

ESTIMATED ECONOMIC IMPACT OF DEFENSE PROCUREMENT SPENDING ON EMPLOYMENT IN NORTHERN VIRGINIA, FISCAL YEARS 2011, 2014 AND 2017



Sources: USA Spending, JobsEQ and the Dragas Center for Economic Analysis and Policy, Old Dominion University

Final Thoughts

Federal contracting is big business in the Commonwealth, particularly for the metropolitan areas of Northern Virginia and Hampton Roads. While aircraft carriers and the Pentagon are highly visible, many federal contracts are outside the media spotlight and only capture public attention when something goes wrong. We would be wrong to conclude that only Northern Virginia and Hampton Roads benefit from federal government procurement spending. Each metro area in Virginia has a hand in the federal cookie jar to some degree.

One unfortunate consequence of the Commonwealth's dependence on federal spending is that it can get its hand caught in the cookie jar. The BCA, sequestration and subsequent spending caps revealed Virginia's vulnerability to a slowdown in federal, and in particular, DOD, procurement spending. Northern Virginia and Hampton Roads both have experienced double-digit declines in output and employment related to DOD spending. Only recently, with increases in DOD spending, have we seen economic activity rebound in Hampton Roads. Northern Virginia, which has a more economically diverse economy, has grown more robustly but still has struggled at times this decade.

It is clear that changes in fiscal policy in Washington have the power to create a recession in some of Virginia's metropolitan areas. This dependence on federal spending could hurt the economies of Hampton Roads and Northern Virginia more in the future if decreases in federal spending continue. Even though the Bipartisan Budget Act of 2019 increased the caps for discretionary spending for defense and nondefense purposes, with the rising nominal national debt, the choice to increase the debt or start to cut discretionary spending is near. The eventual decision to curtail discretionary spending will undoubtably hurt Virginia, due to defense being the largest discretionary spending option to cut.

While the ailment is the same for Northern Virginia and Hampton Roads, nevertheless the treatment is likely different for the two regions. Northern Virginia is making strides diversifying its workforce, with Amazon HQ2 in Arlington as a prime example. In contrast, Hampton Roads still has work to do in alleviating some of the structural challenges it faces, such as sea level rise, and dealing with its reliance on DOD spending. Taking steps to reduce its reliance on defense spending would be highly beneficial, due primarily to the predicted decrease in discretionary defense spending over the next decade. Hampton Roads would benefit from promoting policies that encourage innovation and an entrepreneurial spirit. This would help the region leverage the idea of dual-use products and services. Hampton Roads already has experience and expertise in procuring government contracts. However, firms would also benefit by looking for outlets for their products in the private sector. For example, a company working on the next generation of marine propulsion equipment might have developed its technology initially for the military, yet this technology could also have valuable private-sector applications. The military-to-civilian transition is important also for private firms, business lines and spurring innovation.

Regardless of one's view of the size and scope of the federal government, we must deal with the stark reality that federal government spending provides fuel for the economic engine that drives the Commonwealth. Over the last two decades, the federal government's share in Virginia's GDP has declined, but the federal government still accounted for approximately 1 out of every 5 dollars of economic activity in our state in 2018. Virginia's distinctive relationship with the DOD is a strength in times of increasing budgets, and a challenge in times of increasing uncertainty, or constrained DOD budgets. Hampton Roads and Northern Virginia illustrate how DOD spending, to paraphrase the Book of Job, gives and takes away. The challenge of the coming decade is to recognize that no budget can increase forever and that a downturn in DOD spending will eventually come again. Investments in creating a skilled workforce, making infrastructure improvements and remaining friendly to businesses constitute a wise course of action. These policies not only complement Virginia's relationship with the federal government, but also improve the Commonwealth's attractiveness to private investment and job creation.