

March 2022

Defense Acquisition Trends 2021

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Alexander Holderness

A Report of the CSIS DEFENSE-INDUSTRIAL INITIATIVES GROUP

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DEFENSE-INDUSTRIAL
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Executive Summary

This report analyzes trends in U.S. defense acquisition drawing on data through FY 2020. FY 2020 marked the peak of a half-decade increase in defense contract spending, topping out at \$421.3 billion. This report analyzes this record spending through the context of the 2018 National Security Strategy and a return to great power competition, as the Department of Defense (DoD) adjusts spending within and among DoD components in an effort to refocus the force toward near-peer competition. As part of this analysis, this paper examines recent efforts by the DoD to leverage innovative acquisition approaches, aiming to deliver technologies to the warfighter at the “speed of relevance.” Other Transaction Authority (OTA) contracts, the establishment of the Defense Innovation Unit, and the implementation of the Adaptive Acquisition Framework (AAF) are all examined as part of the department’s larger strategy. OTA contracts are given special focus, due to their ever-increasing size and prevalence as a tool to enable research and development (R&D) and rapid acquisition. Finally, this paper examines the consolidation of the defense-industrial base, as indicated by vendor size and count.

Fast Facts

- Defense contract obligations grew by 41 percent between FY 2015 and FY 2020 and by 8 percent between FY 2019 and FY 2020. They accounted for nearly 58 percent of the Department of Defense’s (DoD) total obligational authority (TOA) in FY 2020, their highest level of the past 20 years.
- Defense contract obligations for products increased by 54 percent between FY 2015 and FY 2020 and by 11 percent between FY 2019 and FY 2020. Product spending accounted for 52 percent of the DoD’s total contract spending in FY 2020, a peak over the past 20 years.
- Defense contracting across platform portfolios shows shifts in accordance with the objectives of the 2018 National Defense Strategy, as well as long-planned Joint Strike Fighter purchases and rising foreign military sales (FMS). Between FY 2019 and FY 2020, purchases in the following categories rose more than the average 8 percent rate of increase for overall defense contract obligations: air and missile defense (29 percent, or \$3.3 billion), ships and submarines (18 percent, or \$6.0 billion), aircraft (14 percent, or \$13.1 billion), and facilities and construction (13 percent, or \$6.9 billion). Over the past five years, ordnance and missile purchases have increased by 95 percent, growing from \$14.5 to \$28.3 billion, the highest level of growth among overall platform portfolios.
- Total OTA obligations skyrocketed from \$7.6 billion in FY 2019 to \$16.2 billion in FY 2020, a 113 percent growth that contributes to a 2,030 percent increase between FY 2015 and FY 2020. Even though OTA spending was skewed due to the DoD’s administrative and contracting role in the federal government’s response to Covid-

19, OTA agreements have become a vanguard of defense acquisition transformation across the DoD in recent years.

- Contrary to DoD policy goals, obligations for contracts awarded without competition increased by 17 percent in FY 2020. Between FY 2015 and FY 2020, the share of total defense obligations for contracts awarded without competition rose from 44 percent to just under 50 percent.

- The total number of prime vendors serving the DoD fell to below 41.6 thousand in FY 2020, a 10 percent decrease. This sharp decline is part of a continuing trend of the vendor pool shrinking despite the amount of contract dollars growing. This is a key concern because the 2018 National Defense Strategy emphasizes the need to strengthen the national security innovation base.

- Defense contract spending differed significantly for each major DoD component between FY 2019 and FY 2020. Contract spending by the Missile Defense Agency (MDA) and the Navy increased by 37 percent and 20 percent, respectively, while the Air Force and the Army's contract spending increased by only 0.6 percent and 3 percent, respectively. Spending by the Defense Logistics Agency (DLA) decreased by 7 percent from FY 2019 to FY 2020.

Introduction

Defense contract obligations have grown dramatically since DoD contract spending bottomed out in FY 2015. This surge in spending has coincided with dramatic priority shifts in both acquisition and strategy. This paper analyzes current trends in defense acquisition, based on FY 2020 DoD contract data and CSIS’s historical database and analysis. This report also provides core insight on the Adaptive Acquisition Framework (AAF), which proponents claim “will be the most transformational acquisition policy change the department has seen in decades.”¹ A plethora of transformational efforts in the field of defense acquisition policy continues to address the era of renewed great power competition. These policy changes focus on increasing acquisition speed, adaptivity, and efficiency using Other Transaction Authority (OTA) agreements and the AAF. Additionally, understanding the relationship between recent trends in acquisition and national strategy requires an examination of the 2018 National Defense Strategy.

This report uses contract data derived from the Federal Procurement Data System (FPDS)—which is downloaded in bulk from USAspending.gov—and OTA data accessed through SAM.gov, as well as supplementary open-source data. For this report, the CSIS Defense-Industrial Initiatives Group (DIIG) analyzed and reviewed contract data from FY 2000 to FY 2020 and OTA data starting in FY 2015. All figures are in constant FY 2020 dollars, which are calculated using the Office of Management and Budget’s (OMB) gross domestic product deflators.

This data does not include classified programs. The exclusion of these programs may have disproportionate effects across types of allocations and between the services; additionally, research and development (R&D) spending likely relies on classified funding at a higher rate than other accounts. The Air Force likely bears the brunt of this underreporting, as the service is likely investing hefty sums in classified projects and systems related to the B-21 Raider, the Next Generation Air Dominance platform, and space-related systems.

For this report, CSIS focused on the following five key research issues:

- **DoD contract spending.** Have there been any recent major changes in the relationship between the defense budget and contract obligations?

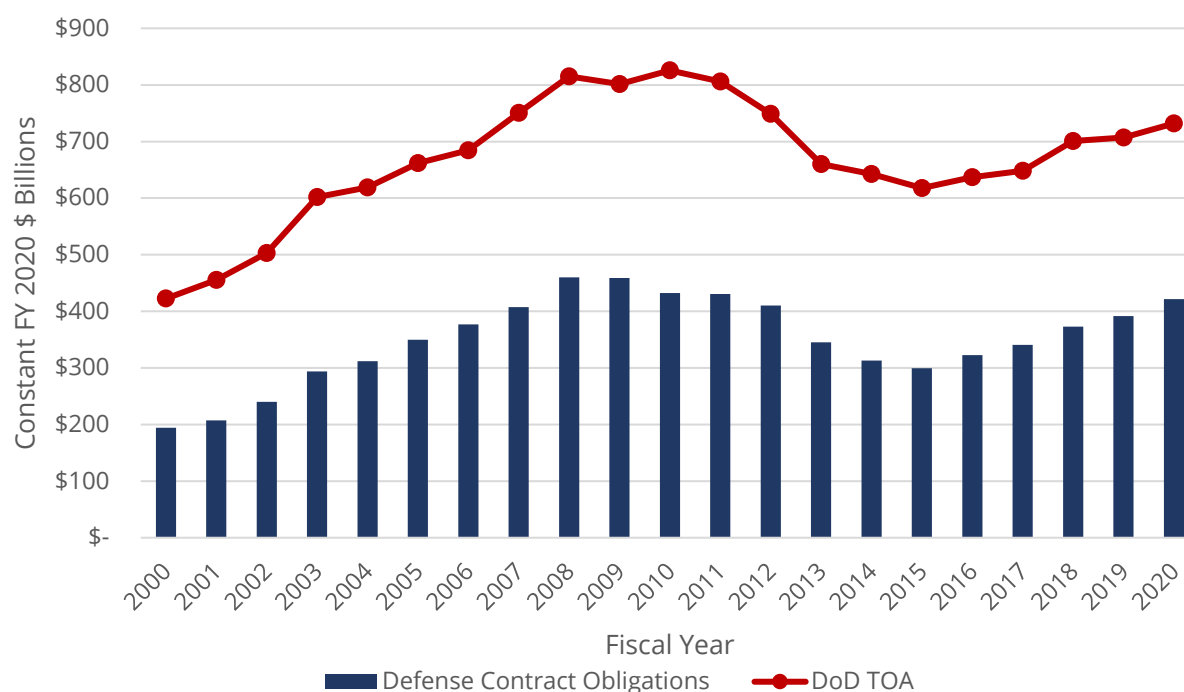
¹ Jim Garamone, “Transformational Change Comes to DOD Acquisition Policy,” U.S. Department of Defense, October 21, 2019, <https://www.defense.gov/News/Feature-Stories/story/Article/1994041/transformational-change-comes-to-dod-acquisition-policy/source/GovDelivery/>.

- **What is the DoD buying?** Have there been any significant changes in spending by product or service area, platform portfolio, R&D, and services to reflect the 2018 NDS priorities?
- **How is the DoD buying it?** What are the recent updates in the defense acquisition system? What are the key trends in OTA usage and its outcomes? Have there been any significant changes in the competitive environment?
- **From whom is the DoD buying?** Have there been any major trends in the defense-industrial base, as measured by vendor size and vendor count?
- **What are the defense components buying?** Have there been any big shifts in defense contracting trends among the major DoD components?

DoD Contract Spending in a Budgetary Context

Defense contract spending showed continued growth in FY 2020, despite the Covid-19 pandemic. From FY 2019 to FY 2020, the DoD's TOA rose from \$707.1 billion to \$732.0 billion, a 4 percent increase. However, defense contract obligations grew at double that rate, from \$391.5 billion to \$421.3 billion—an 8 percent increase. Overall DoD contract obligations have increased by 41 percent since they hit a low point in FY 2015, which is particularly notable as the DoD's overall TOA only grew by 18 percent in that time. In fact, in FY 2020 contract obligations accounted for 57.6 percent of the DoD's TOA, their highest level in the past 20 years—slightly more than their previous peak of 57.2 percent in FY 2009. Figure 1 shows defense contract obligations and total obligational authority from FY 2000 to FY 2020.

Figure 1. Defense Contract Obligations and Total Obligational Authority, 2000–2020



Source: FPDS; Office of the Undersecretary of the Department of Defense, *National Defense Budget Estimates for Fiscal Year 2022 (Green Book)* (Washington, DC: Department of Defense, August 2021); <https://comptroller.defense.gov/Budget-Materials/Budget2022/>; CSIS analysis and inflation conversion.

What Is the DoD Buying?

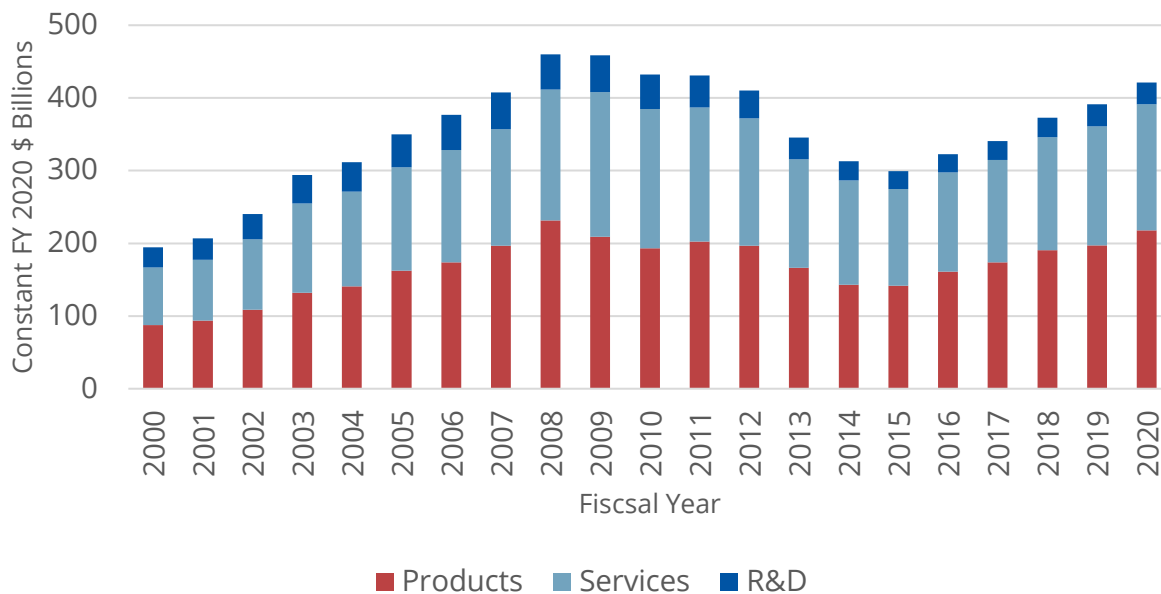
DoD Contract Obligations by Area

Although defense contract obligations continue to grow, they vary greatly by product and service area. Analysis of the DoD's contracting portfolio shows that contract obligations for products have increased faster than those for services or R&D. Between FY 2019 and FY 2020, purchases of defense products rose from \$197.1 billion to \$218.1 billion, an 11 percent increase. Contracts for services grew from \$163.8 billion to \$173.0 billion, a 6 percent rise. Surprisingly, R&D contracting fell by 0.4 percent, from \$30.4 billion to \$30.2 billion.² This small decline might be offset by growth in classified R&D contracts, but it nonetheless clashes with the emphasis on investing in new technology put forward by both the broader DoD leadership and Congress. Between FY 2015 and FY 2020, data show products similarly in the lead. Defense contract obligations for products increased by 54 percent over the five years, compared to an average increase of 41 percent. However, spending on both defense services and defense R&D has grown more slowly: 30 percent and 23 percent, respectively.

Of total defense contract obligations in FY 2020, spending on products accounted for 52 percent, their highest level in the past 20 years; defense contract spending for services and R&D accounted for 41 percent and 7 percent, respectively. By contrast, between FY 2000 and FY 2011, R&D had routinely constituted more than 10 percent of unclassified contract spending. Figure 2 shows defense contract obligations by product or service area from FY 2000 to FY 2020.

² These figures do not include R&D spending under the OTA.

Figure 2. Defense Contract Obligations by Product or Service Area, 2000–2020



Source: FPDS; CSIS analysis.

DoD Contract Obligations by Platform Portfolio

Across the different platform portfolios, defense contract obligations show some changes driven by the DoD's efforts to align the armed forces to strategic goals and probable mission sets, as laid out in the 2018 National Defense Strategy.³ Foreign military sales (FMS), not just domestic purchases, are an important part of the story, as is the long-planned ramping up of the F-35 program for U.S. and international buyers.⁴ Figure 3 shows the trends in defense contract obligations by platform portfolio from FY 2000 to FY 2020. Between FY 2019 and FY 2020, contract obligations for some platform portfolios—including air and missile defense (29 percent growth), ships and submarines (18 percent), aircraft (14 percent), and facilities and construction (13 percent)—grew at a greater rate than the average for overall defense contract obligations (8 percent). However, some portfolios and trends were far behind the average and even showed a decrease, such as unclassified contract obligations for land vehicles (which fell by 11 percent); electronics, communications, and sensors (down 2 percent); and space systems (down 2 percent).

These annual changes mirror those of the past five years, during which contract obligations for ordnance and missiles (95 percent), ships and submarines (71 percent), aircraft (56 percent), and air and missile defense (45 percent) grew more than the average 41 percent

³ Jim Mattis, *Summary of the 2018 National Defense Strategy of The United States of America: Sharpening the American Military's Competitive Edge* (Washington, DC: U.S. Department of Defense, 2018), <https://dod.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf>.

⁴ Yasmin Tadjeh, "SALES TAKING OFF: International Market for F-35 Heats Up," *National Defense Magazine*, May 24, 2019, <https://www.nationaldefensemagazine.org/articles/2019/5/24/international-market-for-f-35-heats-up>.

increase for overall defense contract obligations. During the same period, contract obligations for space systems (11 percent) and electronics, communications, and sensors (27 percent) have grown less than the average.⁵

Contracts for ships, submarines, and aircraft merit additional attention for their considerable growth. Surface combatants and submarines can be highly capable platforms in the context of great power competition and align with a pivot toward the Indo-Pacific region.⁶ Additionally, Air Force and Navy aircraft provide a backbone for U.S. operations against near-peer threats.⁷

The NDS highlighted eight modernization priorities: nuclear forces; space and cyberspace as warfighting domains; command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR); missile defense; joint lethality in contested environments; forward force maneuver and posture resilience; advanced autonomous systems; and resilient and agile logistics.⁸ Two growth areas are worth noting in light of these priorities: air and missile defense and ordnance and missiles. Air and missile defense is relevant to countering anti-access/area-denial (A2/AD) systems. Ordnance and missiles—especially long-range precision fires—are critical tools for penetrating A2/AD systems, as well as for high-end warfare more broadly. On the other hand, the FY 2020 reductions in spending on electronics, communications, and sensors (a backbone of C4ISR and cyber operations), as well as on space systems, run contrary to the priorities articulated in the NDS.

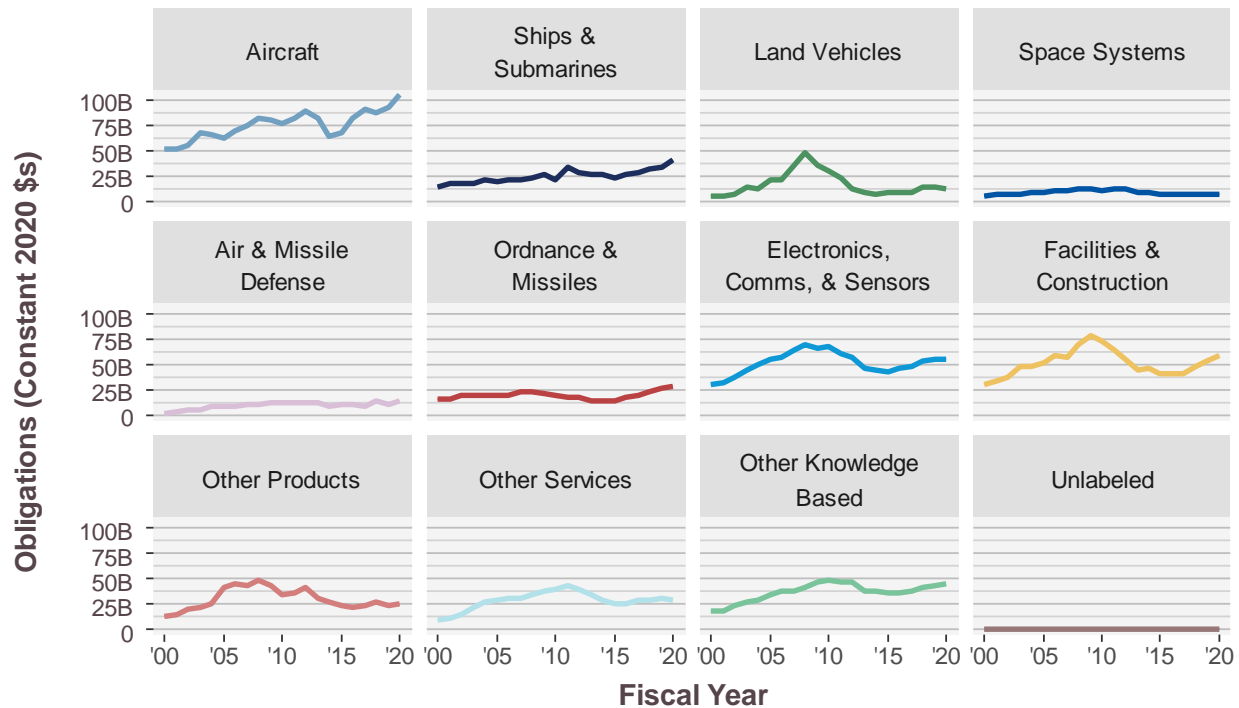
⁵ These categories are mutually exclusive and, along with others shown in Figure 3, exhaustive. For example, a Patriot Missile Battery is classified as an air and missile defense system and is not listed under “missiles and ordnance.” CSIS’s categorization of platform portfolios is described in “Appendix A: Methodology,” in Rhys McCormick et al., *Acquisition Trends 2018: Defense Contract Spending Bounces Back* (Washington, DC: Center for Strategic and International Studies, 2019), 200, <https://www.csis.org/analysis/acquisition-trends-2018-defense-contract-spending-bounces-back>.

⁶ U.S. Congress, House, *Indo-Pacific Deterrence Initiative*, HR 6613, 116th Cong., 2nd sess., introduced in House April 23, 2020, <https://www.congress.gov/bill/116th-congress/house-bill/6613/titles>.

⁷ David C. Gompert, Astrid Stuth Cevallos, and Cristina L. Garafola, *War with China: Thinking Through the Unthinkable* (Santa Monica, CA: RAND Corporation, 2016), <https://doi.org/10.7249/RR1140>.

⁸ Mattis, *Summary of the 2018 National Defense Strategy*, 6–7.

Figure 3. Defense Contract Obligations by Platform Portfolio, 2000–2020



Source: FPDS; CSIS analysis.

Air and missile defense contract obligations rapidly increased by 29 percent, from \$11.5 billion in FY 2019 to \$14.8 billion in FY 2020. Between FY 2015 and FY 2020, contract spending for this portfolio increased by 45 percent, slightly higher than the average 41 percent increase for overall defense contract obligations.

Ship and submarine contract obligations grew from \$34.0 billion in FY 2019 to \$40.0 billion in FY 2020, an 18 percent increase. Between FY 2015 and FY 2020, ship and submarine contract obligations rose by 71 percent—the second-largest increase across all platform portfolios. The fastest-growing subcategory in FY 2020 was the Virginia-class submarine program, with \$9.6 billion in FY 2020 obligations—though this was largely the result of the signing of a multiyear procurement contract that covers nine boats.⁹ Overall, the increase in ship and submarine spending reflects a growing effort to respond to China’s military expansion and modernization within the context of great power competition. FY 2020 saw the delivery of additional ships, bringing the Navy’s fleet to 296 ships, even as budgetary pressure cast the Navy’s 355-ship goal into further doubt.¹⁰ As Mark Cancian observes, the structure of the future fleet across multiple ship categories will be shaped not just by a

⁹ Ronald O’Rourke, *Navy Virginia (SSN-774) Class Attack Submarine Procurement: Background and Issues for Congress* (Washington, DC: Congressional Research Service, October 19, 2021), <https://sgp.fas.org/crs/weapons/RL32418.pdf>.

¹⁰ Mark F. Cancian, “U.S. Military Forces in FY 2022: Navy,” Center for Strategic and International Studies, November 2, 2021, <https://defense360.csis.org/u-s-military-forces-in-fy-2022-navy/>.

revised shipbuilding plan that encourages smaller ships, but also by “contractual commitments and political constraints” as well as “industrial base concerns.”¹¹

Contract obligations for **ordnance and missiles** rose by 5 percent, from \$27.0 billion in FY 2019 to \$28.3 billion in FY 2020. This is their highest level of the past 20 years, exceeding the levels at the peak of the wars in Iraq and Afghanistan. As part of the continuous growth of contract obligations over the past five years, ordnance and missile contract obligations increased by 95 percent, the highest proportional growth among all platform portfolios, in part due to FMS. Guided missiles, which carry higher per-unit acquisition costs, have formed the most significant growth category in this portfolio.

Aircraft contract obligations increased by 14 percent, from \$92.1 billion in FY 2019 to \$105.2 billion in FY 2020, cresting \$100 billion for the first time. Over the past five years, aircraft contract obligations rose by 56 percent, from \$67.4 billion in FY 2015 to \$105.2 billion in FY 2020, higher than the overall 41 percent average. The F-35 Joint Strike Fighter, the largest DoD weapons program, drives these aviation expenditures and includes a major international cooperative program and FMS component.¹² F-35 obligations had already grown from \$12.4 billion in FY 2015 to \$17.5 billion in FY 2019; in FY 2020, obligations more than doubled to \$35.8 billion as production ramped up. This long-planned F-35 spending is not a refocusing in response to the 2018 NDS but is part of a sustained effort at the DoD to maintain high-end combat capabilities.

Even though the Space Force was founded in December 2019 as an independent service, **space systems** contract obligations fell slightly from \$7.4 billion in FY 2019 to \$7.3 billion in FY 2020, a 2 percent decrease. Over the past five years, space systems contract obligations have been comparatively stagnant despite a 41 percent increase in overall defense contract obligations between FY 2015 and FY 2020. Even though the 2018 NDS emphasized space as a key “warfighting domain,” the corresponding contract spending has not occurred, at least not on unclassified contracts.

Electronics, communications, and sensors (EC&S) contract obligations fell slightly from \$55.9 billion in FY 2019 to \$55.0 billion in FY 2020, a 2 percent decrease—the first annual decline since FY 2015. From FY 2015 to FY 2020, EC&S contract obligations increased by 27 percent, lower than the average 41 percent increase for overall defense contract obligations. This also runs contrary to the 2018 NDS’s prioritization of C4ISR, though some C4ISR modernization is captured by the platform employing it—such as the Navy’s E-2D Advanced Hawkeye, which improves long-standing Navy early-warning, battle-management, and data-link capabilities across multiple platforms.¹³

¹¹ Ibid.

¹² Jonathan D. Caverley, Ethan B. Kapstein, and Srdjan Vucetic, “F-35 Sales Are America’s Belt and Road,” *Foreign Policy*, July 12, 2019, <https://foreignpolicy.com/2019/07/12/f-35-sales-are-americas-belt-and-road/>.

¹³ “E-2D Advanced Hawkeye (AHE) | NAVAIR,” U.S. Navy, <https://www.navair.navy.mil/product/E-2D>.

Land-vehicle contract obligations showed a sharp decline from \$13.3 billion in FY 2019 to \$11.8 billion in FY 2020, an 11 percent decrease. However, between FY 2015 and FY 2020, land-vehicle contracts increased by 45 percent. The portfolio's share of total obligations is 3 percent, a sharp downturn from the share it had between FY 2005 and FY 2011, when it consistently broke 5 percent and peaked at 10.5 percent of obligations in FY 2007. This reduction reflects a shift in priority away from the force-protection goals during the wars in Iraq and Afghanistan, as well as ongoing delays in rolling out the next generation of land vehicles.

DoD Contract Obligations by Stage of R&D

As shown in Figure 1, defense R&D contract obligations decreased by 0.4 percent between FY 2019 and FY 2020. However, including both R&D contracts and OTA obligations, overall DoD R&D spending grew from \$37.0 billion in FY 2019 to \$45.0 billion in FY 2020, a 22 percent increase. The FY 2020 data show that overall DoD R&D contract obligations shifted in terms of which stage of R&D activities they focused on (referred to with budget activity (BA) codes 6.1 through 6.7, based on how far along the technology is).¹⁴ From FY 2019 to FY 2020, early- and late-stage R&D contract obligations decreased by 1 percent and 8 percent, respectively, while the middle stages of R&D contracting increased by 3 percent.

Contract obligations for the first stage of R&D activities, defense basic research (BA 6.1), fell from \$3.97 billion in FY 2019 to \$3.76 billion in FY 2020, a 5 percent decrease. In addition, contracting for defense applied research (BA 6.2) fell 1 percent, from \$7.96 billion in FY 2019 to \$7.92 billion in FY 2020. However, over the past five years, basic-research and applied-research contract obligations increased by 10 percent and 18 percent, respectively. Previous CSIS Defense Acquisition Trends reports have noted that this seed-corn early-stage R&D was comparatively protected during the FY 2011–2015 application of budget caps, which may have contributed to it being affected less by the post-2015 rebound.

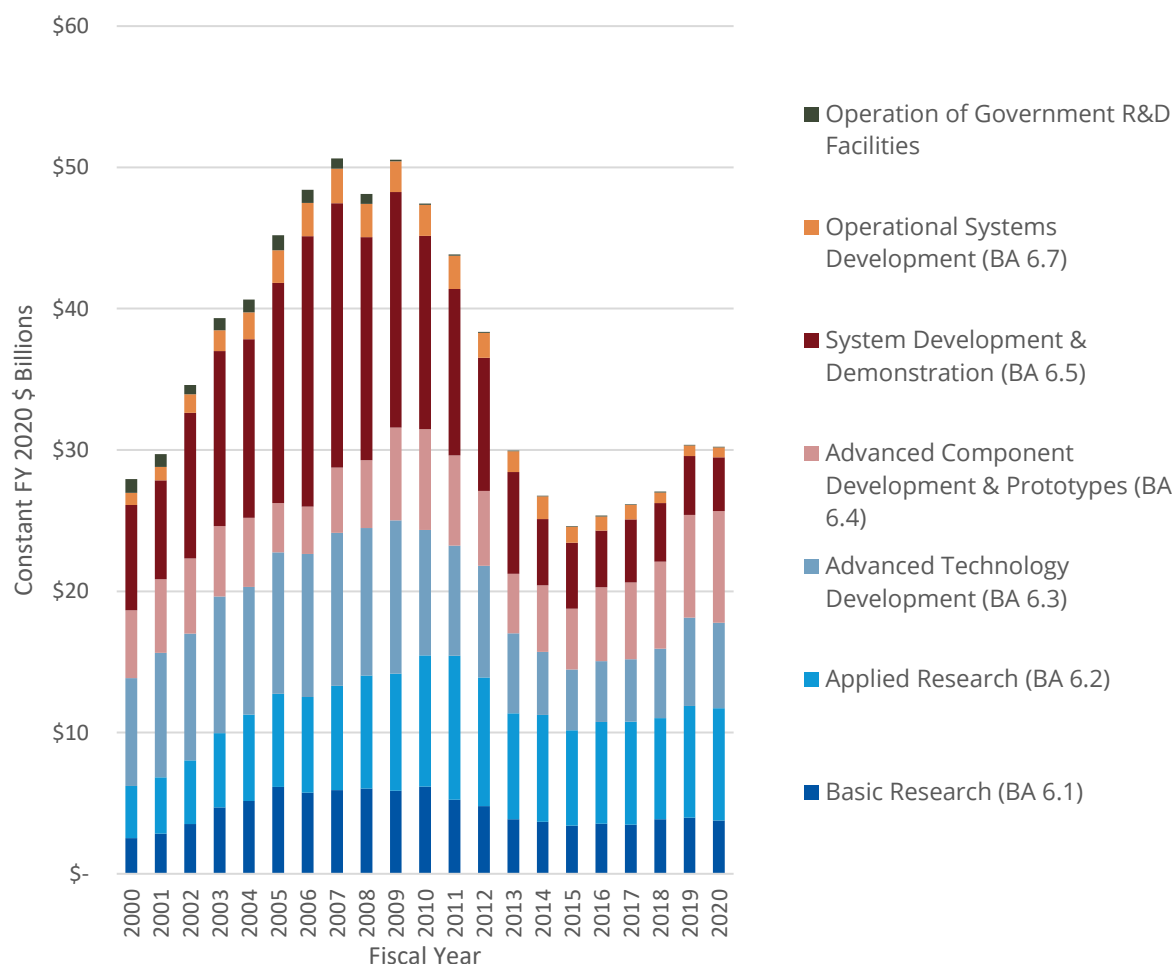
Mid-stage R&D activities also showed mixed trends in contract obligations. Contracting for advanced technology development (BA 6.3) dropped by 3 percent, from \$6.24 billion in FY 2019 to \$6.04 billion in FY 2020. Meanwhile, contracting for advanced component development and prototypes (BA 6.4) grew from \$7.28 billion in FY 2019 to \$7.90 billion in FY 2020, a 9 percent increase. Between FY 2015 and FY 2020, spending in these categories increased by 40 percent and 84 percent, respectively.

The later stages of R&D activities, system development and demonstration (BA 6.5) and operational systems development (BA 6.7), decreased in FY 2020. Contract obligations for system development and demonstration dropped from \$4.16 billion in FY 2019 to \$3.82 billion in FY 2020, an 8 percent decrease. Contract obligations for operational systems development fell from \$0.74 billion in FY 2019 to \$0.69 billion in FY 2020, a 7 percent

¹⁴ This paper categorizes R&D management and support (6.6) as a “professional, administrative, and managerial service” and does not include it in the R&D analysis.

decrease. Spending in these categories decreased by 18 percent and 39 percent, respectively, between FY 2015 and FY 2020. Figure 4 shows overall defense R&D contract obligations by stage of R&D from FY 2000 to FY 2020.

Figure 4. Overall Defense R&D Contract Obligations by Stage of R&D, 2000–2020



Source: FPDS; CSIS analysis.

In stark contrast to these decreases, OTA R&D agreements skyrocketed by 122 percent in FY 2020 and accounted for 33 percent of the DoD's overall R&D spending. However, of the \$8.7 billion increase in FY 2020, 82 percent (\$7.1 billion) can be traced to a single Army OTA agreement supporting the federal response to the Covid-19 pandemic.¹⁵ While such OTA agreements are not new, spending figures are only reliably available starting in FY 2015; a further exploration of their long-term trends compared to other spending on R&D is included in the OTA section below.

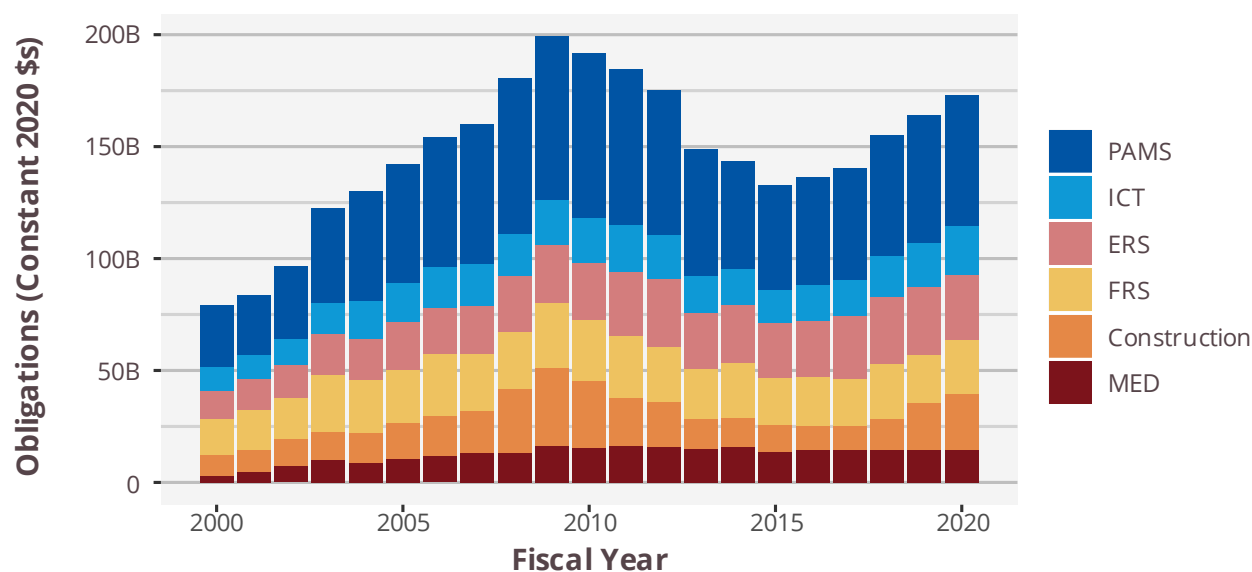
¹⁵ Rhys McCormick and Gregory Sanders, *Trends in Department of Defense Other Transaction Authority (OTA) Usage* (Washington, DC: Center for Strategic and International Studies, August 2021), 9, <https://dair.nps.edu/bitstream/123456789/4509/1/CSIS-CM-21-245.pdf>.

DoD Contract Obligations by Service Category

The DoD's overall contract obligations for services rose by 6 percent, from \$163.8 billion in FY 2019 to \$173.0 billion in FY 2020. Over the past five years, defense service contracting increased by 30 percent, from \$132.9 billion in FY 2015 to \$173.0 billion in FY 2020. However, the share of service contract obligations fell from 44 percent in FY 2015 to 41 percent in FY 2020.

From FY 2019 to FY 2020, the largest service contract obligations increase took place in three categories: construction, facility-related services (FRS), and information and communication technology (ICT) increased by 19 percent, 12 percent, and 11 percent, respectively. Construction and ICT service contracting dominated the increase in overall defense spending on services between FY 2015 and FY 2020. Construction spending increased by 111 percent, while ICT spending saw a 45 percent rise. Both grew more than the average increase (30 percent) in the DoD's overall service contract obligations. However, spending on equipment-related services (ERS) decreased by 4 percent, from \$30.4 billion in FY 2019 to \$29.2 billion in FY 2020. Contract obligations for medical (MED) services and professional, administrative, and management services (PAMS) rose by 1 percent and 3 percent, respectively. PAMS was the largest category of defense service activities, making up 34 percent of spending in FY 2020, followed by ERS (17 percent), construction and FRS (each 14 percent), ICT (12 percent), and MED (8 percent). Figure 5 shows the trends in defense contract obligations by type of service from FY 2000 to FY 2020.

Figure 5. Defense Contract Obligations by Service Category, 2000–2020



Source: FPDS; CSIS analysis.

How Is the DoD Buying It?

Latest Efforts to Reform the Defense Acquisition System

In response to global security changes and rapid development of emerging technologies, the U.S. government has continued to reform the defense acquisition system over the past decade. This section reviews efforts to reform the defense acquisition system through the lens of policy, legislation, acquisition frameworks, and organizations during the post-2015 bounce-back period.

First, the 2018 National Defense Strategy, which drew heavily on the Third Offset Strategy, presented crucial guidelines for building a more lethal force, strengthening alliances, and reforming the DoD's business practices.¹⁶ To give direction to the defense acquisition system, the NDS focused on enhancing key military priorities, including nuclear deterrence, space and cyber capabilities, C4ISR, missile defense, and autonomous systems. Its emphasis on strengthening alliances, including those in the Indo-Pacific region, also has potential implications for the acquisition system via FMS and cooperative projects. Finally, the strategy called for reforming business practices regarding rapid development and fielding, reinforcing the DoD's management structure, and protecting the national security innovation base.¹⁷

Second, Other Transaction Authority agreements—which emerged as an alternative to the traditional acquisition system, often criticized as slow, inflexible, and expensive—have come into rapidly increasing use since 2015. Although OTAs were first conceived by NASA in 1958 and had previously been employed for such DoD efforts as the Future Combat System, the FY 2015 and FY 2016 National Defense Authorization Acts (NDAA) created a pathway for using them more routinely.¹⁸ Section 812 of the FY 2015 NDAA broadened the DoD's OTA authority, and Section 814 of the FY 2016 NDAA made this authority permanent, modified the definition of “non-traditional defense contractor,” and allowed the DoD to issue follow-on production contracts for OTA prototype agreements. From FY 2018 to FY 2020, Congress

¹⁶ Gian Gentile et al., *A History of the Third Offset, 2014–2018* (Santa Monica, CA: RAND Corporation, March 31, 2021), https://www.rand.org/pubs/research_reports/RRA454-1.html.

¹⁷ Mattis, *Summary of the 2018 National Defense Strategy*.

¹⁸ Surya Gablin Gunasekara, “‘Other Transaction’ Authority: Nasa’s Dynamic Acquisition Instrument for the Commercialization of Manned Spaceflight or Cold War Relic?” *Public Contract Law Journal* 40, no. 4 (2011): 893–909, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1992483; Christopher G. Pernin et al., *Lessons from the Army’s Future Combat Systems Program* (Santa Monica, CA: RAND Corporation, December 5, 2012), <https://www.rand.org/pubs/monographs/MG1206.html>.

expanded OTA authorities to include nonprofit research institutions and facilitated participation by vendors based in other nations (Australia, Canada, and the United Kingdom) within the National Technology and Industrial Base. Congress also mandated that the DoD maintain and make available a list of OTA consortia.¹⁹

As OTA use increased following the enactment of the 2015 NDAA, new rapid acquisition methods—including middle-tier acquisition (MTA)—gained prominence. MTA programs have greater flexibility to develop prototypes and possible follow-on production contracts for projects that can be completed quickly (usually within two to five years).²⁰ Another congressional reform well-suited to OTAs are modular open system approaches, which seek to encourage innovation and rapid insertion of technology by making it easier for the government to reuse assets, evolve technology, and enable competition at the subsystem level.²¹

Third, following these successive acquisition reforms, in October 2019 DoD announced the Adaptive Acquisition Framework, a comprehensive acquisition-reform strategy.²² The AAF includes six comprehensive acquisition approaches: major-capability acquisition (representing a traditional approach), MTA, urgent operational needs, software acquisition, acquisition of services, and the defense business system. In order “to deliver warfighting capability at the speed of relevance,” the AAF aims to enable effective and affordable acquisition outcomes while simultaneously emphasizing transparency, speed of delivery, continuous adaptation, and frequent modular upgrades.²³ Under Secretary of Defense for Acquisition and Sustainment Ellen Lord emphasized that the AAF “embraces the delegation of decision-making tailoring program oversight to minimize unnecessary bureaucratic processes and actively managing risks based on the unique characteristics of the capability being acquired.”²⁴

Finally, the Defense Innovation Unit-Experimental (DIU) attracted attention for its potential to realize rapid acquisition. The DIU was established in April 2015 with offices in the heart of Silicon Valley; strong support from Secretary of Defense Ashton Carter enabled the organization to expand its offices to Boston (July 2016) and Austin (September 2016). In February 2018, when it became part of the office of the Under Secretary of Defense for Research and Engineering in Washington, D.C., DoD leadership removed “experimental”

¹⁹ McCormick and Sanders, Trends in Department of Defense Other Transaction Authority (OTA) Usage, 5.

²⁰ Kevin Fahey, “DoD’s Transformational Adaptive Acquisition Framework,” Defense Acquisition University, November 5, 2019, <https://www.dau.edu/News/DoDs-Transformational-Adaptive-Acquisition-Framework>.

²¹ Maura Rose McQuade and Andrew P. Hunter, *The Change We Need: Making Defense More Future Proof through Adaptable Systems* (Washington, DC: Center for Strategic and International Studies, March 12, 2019), <https://www.csis.org/analysis/change-we-need-making-defense-more-future-proof-through-adaptable-systems>.

²² Office of the Under Secretary of Defense for Acquisition and Sustainment, *DoD Instruction 5000.02: Operation of the Adaptive Acquisition Framework* (Washington, DC: U.S. Department of Defense, January 23, 2020), <https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodi/500002p.pdf>.

²³ Fahey, “DoD’s Transformational Adaptive Acquisition Framework.”

²⁴ Garamone, “Transformational Change Comes to DOD Acquisition Polity.”

from the original name, signaling the department's long-term commitment. The DoD also plans to expand the DIU's offices to Chicago in 2022.²⁵

Secretary of Defense Mark Esper said in 2020 that “the Defense Innovation Unit . . . has played a critical role in bringing new processes, methodologies, and technologies to the Department.”²⁶ Between 2016 and 2020, the DIU received 2,381 commercial proposals and awarded 208 prototype OTAs to commercial companies, completing 36 projects with an average duration of 13 months.²⁷ The DIU reaches out beyond the traditional defense-industrial base to companies working on cutting-edge technologies with national security implications across six portfolios: artificial intelligence (AI), autonomy, cyber, human systems, space, and the recently added advanced energy and materials.²⁸

Stimulated by DIU innovation and hoping to acquire advanced technologies with greater ease, the Armed Services began to establish innovation offices of their own. The Air Force, Navy, and Space Force now operate AFWERX (2017), NavalX (2019), and SpaceWERX (2020), respectively, to meet their immediate acquisition needs and adopt emerging technologies quickly. The Armed Services also created appropriate organizations—including the Army Rapid Capabilities Office (2016), Maritime Accelerated Capabilities Office (2016), and Space Rapid Capabilities Office (2017)—to manage these rapid-acquisition programs.²⁹

In another approach to accelerating innovative connections, the Air Force's “pitch days” bring in a range of small vendors working with cutting-edge technology. This allows the Air Force to get the best ideas under contract within minutes rather than wait the 90-day minimum required under traditional approaches. The inaugural Air Force pitch day occurred in March 2019, and since then there have been eight more in-person or virtual pitch days across the Department of the Air Force, including some by the Space Force.³⁰

Meanwhile, the Defense Innovation Board (DIB), set up in 2016, has issued over 70 recommendations to the DoD between 2017 and 2020.³¹ It has continued working on supporting emerging technologies and on easing barriers between commercial companies and the department. Some of its major reports examine the application of an AI-ready force, the 5G ecosystem, software development, and establishing a chief innovation office. Overall, recent efforts to reform the defense acquisition system seem to be proceeding in line with larger goals. Working from the 2018 National Defense Strategy—and enabled by

²⁵ Defense Innovation Unit, “DIU to expand efforts to Midwest to identify broader commercial solutions for DoD needs,” Press release, November 4, 2021, <https://www.diu.mil/latest/dius-new-regional-focus>.

²⁶ Mark Esper, “Congratulations to the Defense Innovation Unit on your Fifth Anniversary,” U.S. Department of Defense, August 25, 2020, https://media.defense.gov/2020/Aug/27/2002485583/-1/-1/1/DIU_BIRTHDAY_LETTER.PDF.

²⁷ Defense Innovation Unit, *Annual Report 2020* (Washington, DC: U.S. Department of Defense, July 2021), <https://apps.dtic.mil/sti/pdfs/AD1123706.pdf>.

²⁸ “Solutions – Portfolio,” Defense Innovation Unit, <https://www.diu.mil/solutions/portfolio>.

²⁹ The Army Rapid Capabilities Office expanded its mission and changed its official name to Army Rapid Capabilities and Critical Technologies Office (RCCTO) in September 2019.

³⁰ “Air Force Pitch Day,” U.S. Air Force SBIR/STTR, <https://www.afsbirsttr.af.mil/Events/Pitch-Days/>.

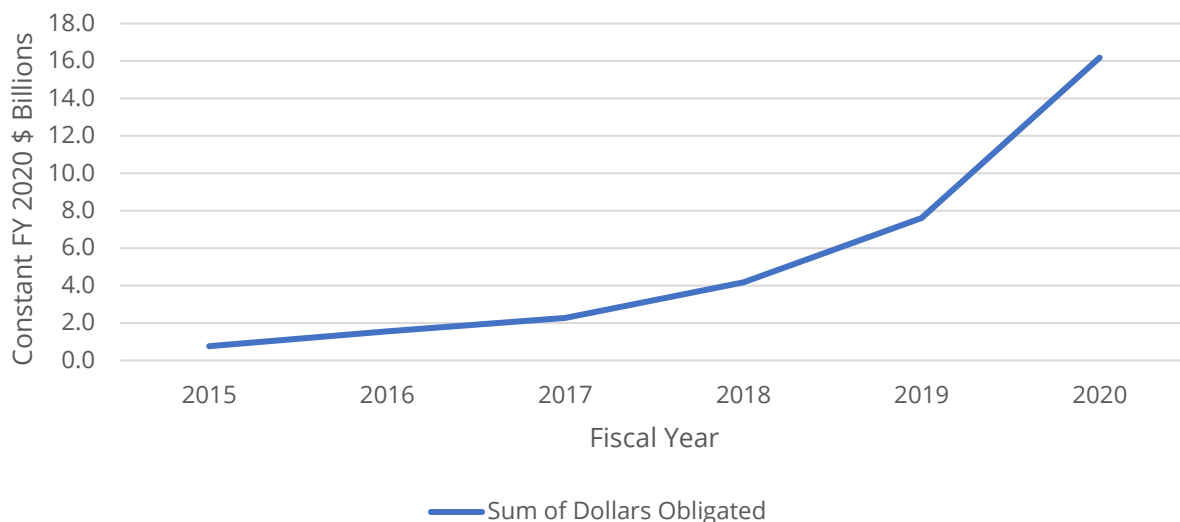
³¹ DIB reports are available at “Reports & Recommendations,” U.S. Department of Defense, Defense Innovation Board, <https://innovation.defense.gov/Recommendations/>.

new authority from Congress—the DoD continues to innovate its acquisition processes in response to renewed great power competition. These efforts will face a crucial test as new programs mature and enter the testing, production, and deployment stages. As the DoD’s new approaches take root—especially those with large-scale spending—key next steps will be to evolve the means to measure progress and ensure transparency before Congress, while keeping the methods compatible with the ideal of flexibility that motivated these reforms.

OTA Usage across the DoD³²

OTA agreements have become a vanguard of acquisition transformation across the DoD in recent years. OTA obligations grew rapidly from \$7.6 billion in FY 2019 to \$16.2 billion in FY 2020, a 113 percent increase. While FY 2020 spending was skewed because of the DoD’s leadership during the federal response to Covid-19, the increase in spending between FY 2015 and FY 2020 was still a staggering 2,030 percent, going from \$0.76 billion in FY 2015 to \$16.2 billion in FY 2020. Figure 6 shows the DoD’s OTA obligations starting from FY 2015, when reliable data on OTA agreements began to be available.

Figure 6. Defense OTA Obligations, 2015–2020



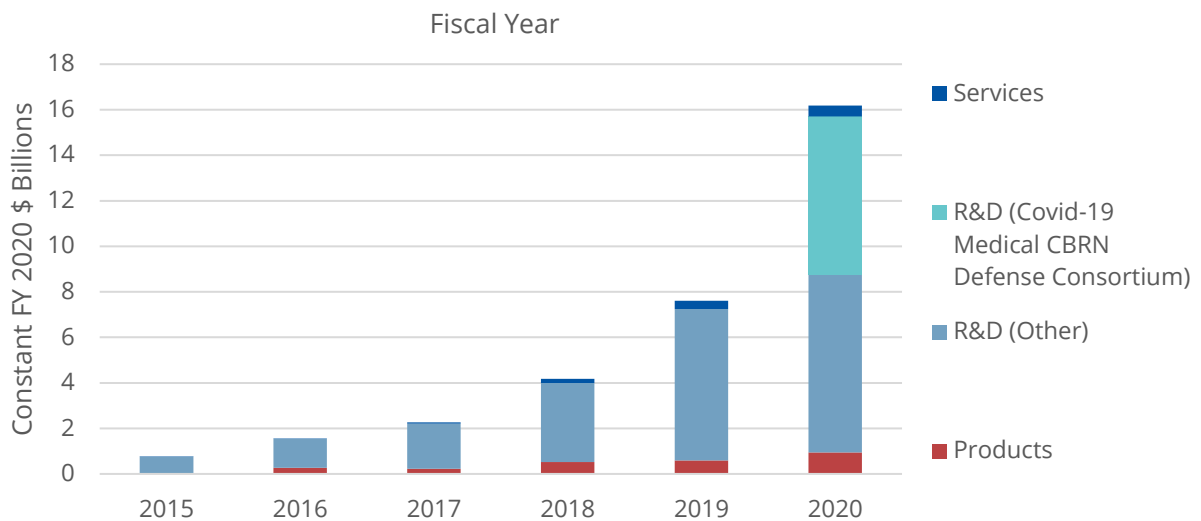
Source: FPDS; CSIS analysis.

As evident in detailed data on defense OTA obligations, R&D was the biggest driver for the increase: OTA R&D contract obligations rose by 122 percent, from \$6.65 billion in FY 2019 to \$14.75 billion in FY 2020. Over the past five years, OTA R&D has increased by 1,850 percent, from \$0.76 billion in FY 2015 to \$14.75 billion in FY 2020. Thanks in large part to the government’s response to Covid-19, which employed Army contracting authority, R&D comprised 91 percent of OTA contracts in FY 2020; OTA products and services only accounted for 6 percent and 3 percent, respectively. Over the past five years, R&D has

³² Portions of this section have been adapted from McCormick and Sanders, *Trends in Department of Defense Other Transaction Authority (OTA) Usage*.

remained dominant, taking up 89 percent of OTA spending between FY 2015 and FY 2020. Figure 7 shows defense OTA obligations by area from FY 2015 to FY 2020.

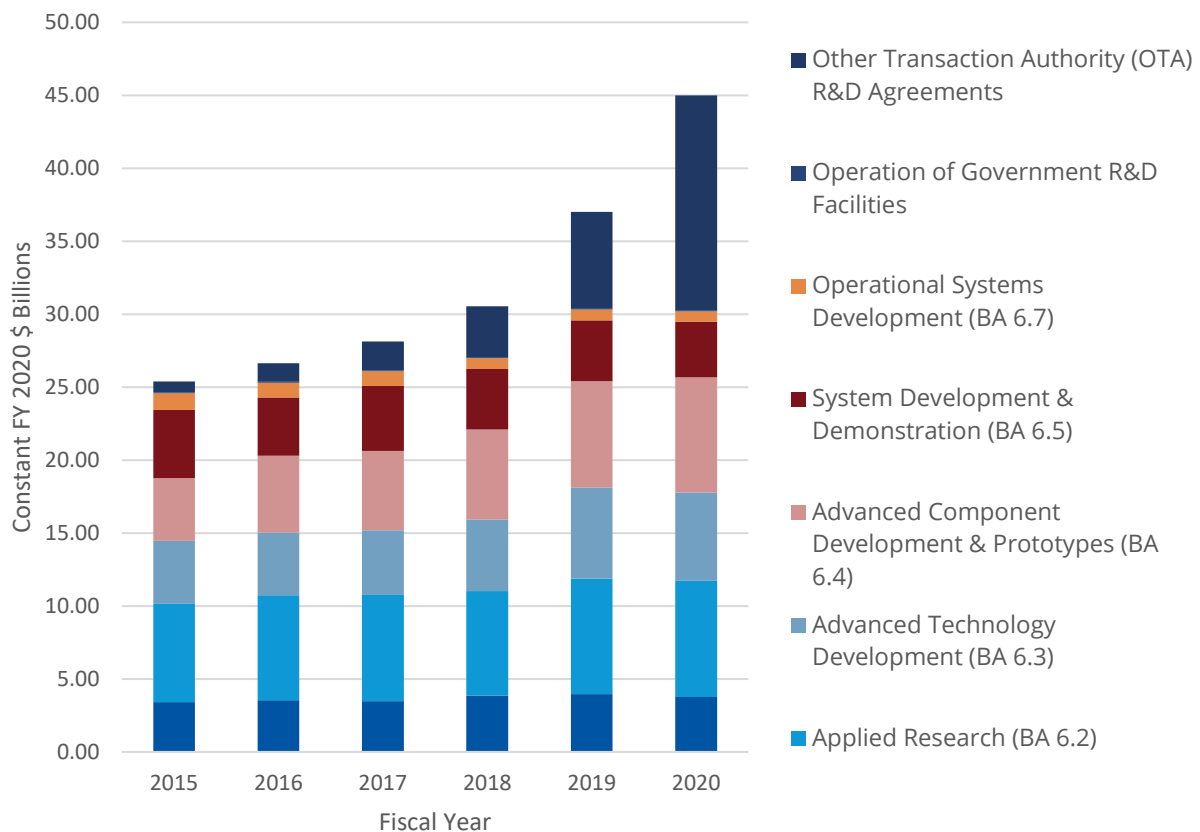
Figure 7. Defense OTA Obligations by Area, 2015–2020



Source: FPDS; CSIS analysis.

Between FY 2019 and FY 2020, traditional defense R&D contract obligations decreased by 0.4 percent, from \$30.36 billion to \$30.24 billion. However, OTA R&D obligations—a new approach to R&D—increased by 122 percent, from \$6.65 billion to \$14.75 billion (for example, contrast Figure 4 and Figure 8). Over the past five years, OTA R&D obligations skyrocketed by 1,850 percent, while traditional defense R&D contract spending only increased by 77 percent. As a share of combined defense R&D OTA and contracting, OTA R&D contract obligations grew from just 3 percent in FY 2015 to 33 percent in FY 2020. Figure 8 shows defense R&D and OTA R&D contract obligations by stage of R&D from FY 2015 to FY 2020.

Figure 8. Defense R&D and OTA R&D Contract Obligations, 2015–2020



Source: FPDS; CSIS analysis.

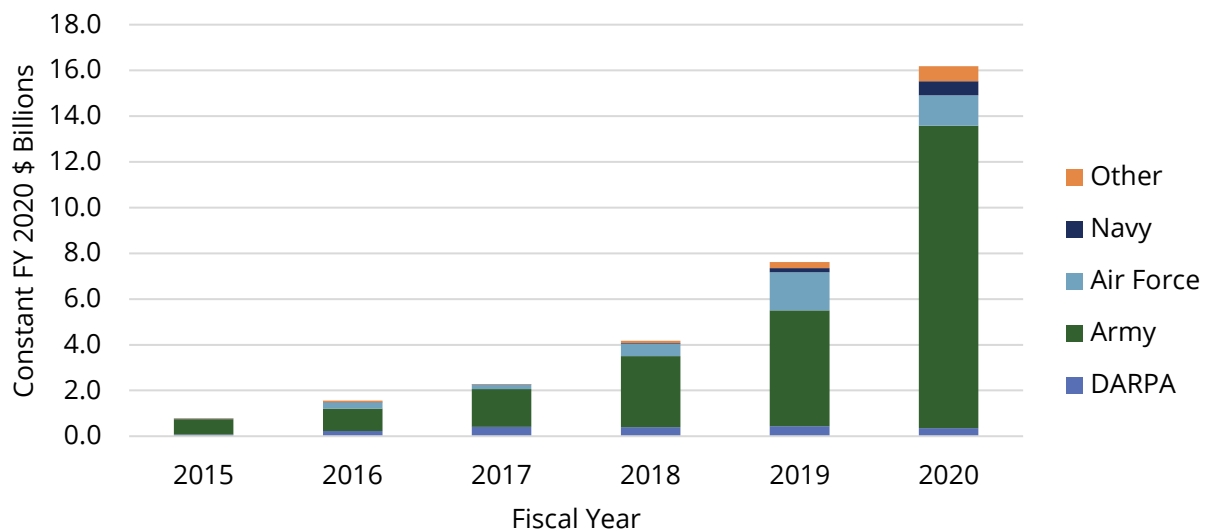
As mentioned earlier, the FY 2020 increase was driven by the federal response to Covid-19. However, even setting that spending aside, OTA contracts accounted for one in five obligated unclassified R&D dollars and remained the fastest-growing category. This ongoing trend suggests that defense R&D contract spending has been shifting away from the traditional pipeline toward a greater use of OTA agreements. This trend fits within the broader picture of the 2018 National Defense Strategy, which encouraged greater investment in emerging technologies and accelerating timelines.³³ That said, the shift may also be partially explained by the greater portion of R&D contract obligations—especially for projects such as the B-21 Raider—that remain, at least in part, in the classified budget.

The Army (the main agency for the Covid-19 response), remained the leader in OTA usage in FY 2020. Army OTA contract obligations rose from \$5.08 billion in FY 2019 to \$13.22 billion in FY 2020, a 161 percent increase. Navy OTA contract obligations only grew by \$0.45 billion (252 percent) in FY 2020, while those for the Air Force and the Defense Advanced Research Projects Agency (DARPA) decreased by 20 percent and 18 percent, respectively. Over the past

³³ Rhys McCormick, “Defense Acquisition Trends 2020: Topline DoD Trends,” Center for Strategic and International Studies, CSIS Briefs, October 8, 2020, <https://www.csis.org/analysis/defense-acquisition-trends-2020-topline-dod-trends>.

five years, Army OTA contracting increased by 1,840 percent, from \$0.68 billion in FY 2015 to \$13.22 billion in FY 2020. Army OTA obligations accounted for 82 percent of total obligations in FY 2020; the Air Force (8 percent), Navy (4 percent), and DARPA (2 percent) have comparatively low levels of OTA contracting obligations. Figure 9 shows defense OTA obligations by component from FY 2015 to FY 2020.

Figure 9. Defense OTA Obligations by Component, 2015–2020



Source: FPDS; CSIS analysis.

Competition for Defense Contracts

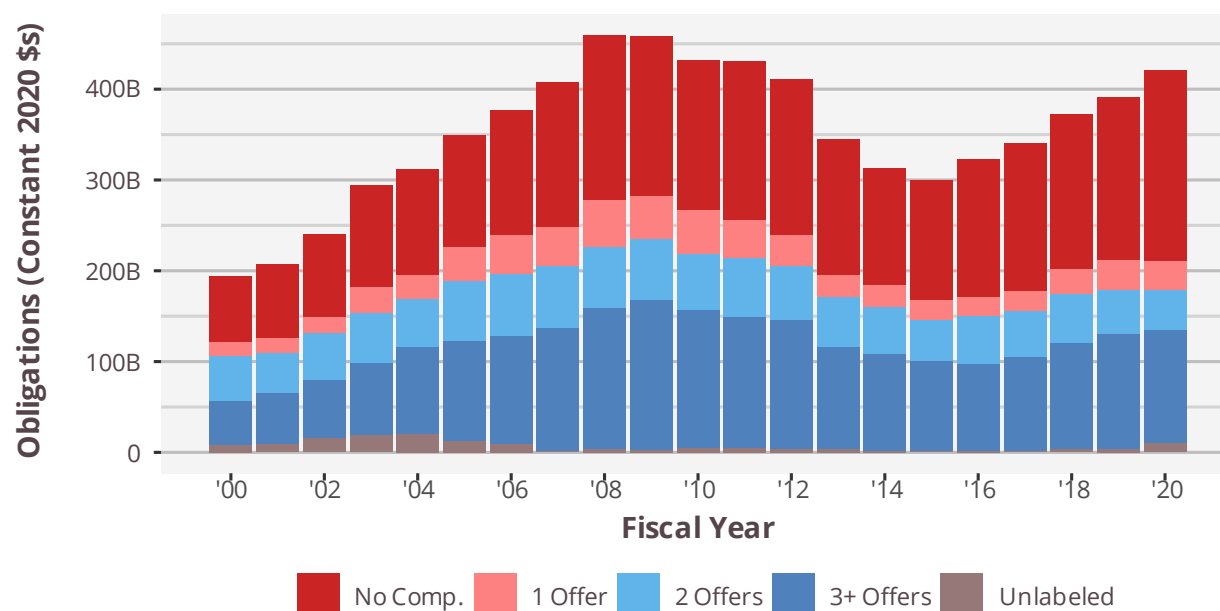
Even though DoD policy guidance stresses the importance of increased competition, the rising share of obligations going to established products, notably the F-35, led to a sharp rise in contracts being awarded without competition: from \$179.2 billion in FY 2019 to \$209.9 billion in FY 2020, a 17 percent increase.³⁴ Comparatively, contracts awarded after effective competition (i.e., with at least two offers) decreased by 4 percent, from \$175.5 billion in FY 2019 to \$168.3 billion in FY 2020. This decline may be overstated due to changes in FPDS reporting that make it more difficult to determine whether a single-award contract was originally effectively competed, but even if all the unlabeled contracts were competed with multiple offers, growth in this category would be marginal at best.

Between FY 2015 and FY 2020, obligations to contracts awarded without competition increased sharply, by 59 percent, while obligations to contracts awarded after effective

³⁴ Jesse Ellman et al., *Defense Acquisition Trends, 2016: The End of the Contracting Drawdown* (Washington, DC: Center for Strategic and International Studies, March 2017), <https://www.csis.org/analysis/defense-acquisition-trends-2016>; Rhys McCormick, Samantha Cohen, and Maura Rose McQuade, *Measuring the Outcomes of Acquisition Reform by Major DoD Components* (Washington, DC: Center for Strategic and International Studies, September 2015), <https://www.csis.org/analysis/measuring-outcomes-acquisition-reform-major-dod-components>.

competition increased by only 17 percent. The share of no-competition contract obligations increased from 44 percent in FY 2015 to 50 percent in FY 2020, the highest figure of the past 20 years.³⁵ A rise in FMS partially explains this shift, as the Government Accountability Office (GAO) has previously noted that “FMS awards are generally noncompetitive” regardless of whether the contract award was preceded by a competition in the purchasing country.³⁶ Nonetheless, the data show that DoD policy guidance did not translate into preserving effective competition in defense contracting during the post-2015 rebound. Figure 10 shows defense contract obligations by level of competition from FY 2000 to FY 2020.

Figure 10. Defense Contract Obligations by Level of Competition, 2000–2020



Source: FPDS; CSIS analysis.

³⁵ CSIS’s methodology defines “effective competition” as competitively sourced contracts receiving at least two offers. This intentionally excludes competitively sourced contracts that receive only one offer; the authors believe that many of these contracts would have been more appropriately classified as sole-source and that, in any case, the DoD is less likely to receive the benefits of competition when there is only one offer.

³⁶ U. S. Government Accountability Office, “Defense Contracting: Actions Needed to Increase Competition” (Washington, DC: U. S. Government Accountability Office, March 2013), 15–16, <https://www.gao.gov/products/gao-13-325>.

From Whom Is the DoD Buying?

Vendor Size

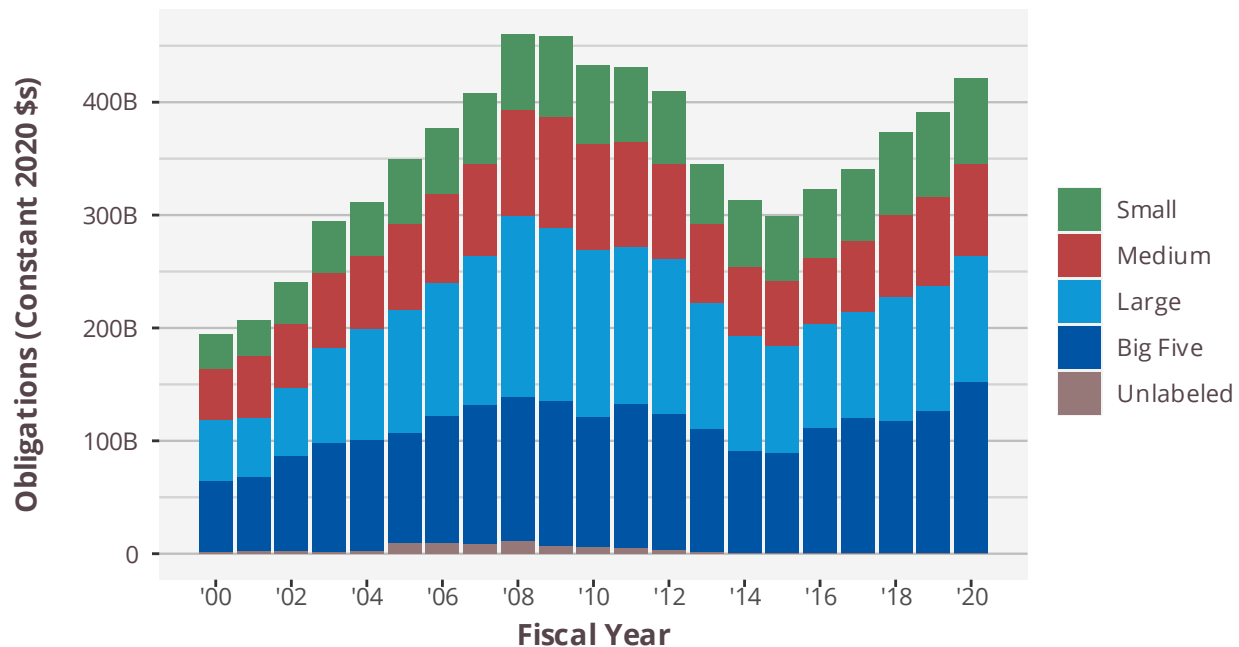
The FY 2020 data show that defense contracting obligations continued to be dominated by the “Big Five” defense contracting firms (Lockheed Martin, Raytheon Technologies, General Dynamics, Boeing, and Northrop Grumman), while small-, medium-, and large-sized vendors’ shares increased only slightly.³⁷ Big Five defense contract obligations rose sharply from \$126.1 billion in FY 2019 to \$152.8 billion in FY 2020, a 21 percent increase, reaching their highest level of the past 20 years. Their share of defense contracting also grew from 32 percent in FY 2019 to 36 percent in FY 2020, their highest share of spending of the past two decades. Over the past five years, defense obligations for the Big Five increased by 71 percent, much more than the average 41 percent increase for defense contracting during that period. As a result, the share of Big Five defense contracting increased by 6 percentage points between FY 2015 and FY 2020.

By contrast, large vendors’ defense contract obligations grew only by 0.2 percent, from \$109.8 billion in FY 2019 to \$110.9 billion in FY 2020. Over the past five years, large vendors’ contracting only increased by 18 percent, less than the 41 percent average; their share of total contracting also declined from 31 percent in FY 2015 to 26 percent in FY 2020.

Small- and medium-sized vendors’ defense contracting increased slightly between FY 2019 and FY 2020 by 1 percent and 3 percent, respectively. Over the past five years, medium-sized vendors’ contracting increased by 41 percent, and small vendors’ contracting by only 32 percent. That said, small contractors had seen the most modest reduction during the FY 2012–2015 drawdown, so they were building up from a larger base. Small- and medium-sized vendors were responsible for 18 percent and 19 percent of contract obligations, respectively, in FY 2020. Figure 11 shows defense contract obligations by vendor size from FY 2000 to FY 2020.

³⁷ CSIS categorizes vendors as “small,” “medium,” “large,” and “Big Five” (Lockheed Martin, Boeing, Raytheon Technologies, Northrop Grumman, and General Dynamics). For more details, see “Appendix A: Methodology,” in McCormick et al., *Acquisition Trends 2018*, 198–9.

Figure 11. Defense Contract Obligations by Vendor Size, 2000–2020



Source: FPDS; CSIS analysis.

Note: The merger of Raytheon and United Technologies took place in April of 2020 and thus did not make the cutoff for inclusion in FY 2020.

Big Five Vendors

Taking a closer look at the top five vendors (as calculated by the federal government), obligations to the largest vendor, Lockheed Martin, grew by 56 percent between FY 2019 and FY 2020. The net \$17.5 billion increase in F-35 spending, including FMS, is a key contributor to Lockheed Martin's growth. One standout contract for Lockheed Martin contained \$23.9 in FY 2020 billion for the F-35 program, including for low-rate initial production (LRIP) lot 14 and adapting to Turkey's removal from the program.³⁸ In recent years, spending in the aviation sector has seesawed, with sharp rises and falls reflecting the unevenly spaced contracts for the F-35 program. Nonetheless, Lockheed Martin's 134 percent growth between FY 2015 and FY 2020 is remarkable, significantly outpacing the overall growth in defense obligations.

The growth by Big Five contractors has not only been driven by purchases of major systems, but also by merger and acquisition activities. Headline deals completed in 2015 or later include Lockheed Martin's acquisition of Sikorsky in November 2015, Northrop Grumman's acquisition of Orbital ATK in June 2018, the United Technologies' acquisition of Rockwell Collins in November 2018, and the subsequent merger between Raytheon and United Technologies in April 2020. As reported by Marcus Weisgerber, the Trump administration generally supported having "companies decide themselves what they want to do," but

³⁸ Additional information about this contract is available at "Definitive Contract: PIID N0001917C0001," USAspending.gov, https://www.usaspending.gov/award/CONT_AWD_N0001917C0001_9700_-NONE_-NONE-.

President Biden’s incoming deputy secretary of defense, Kathleen Hicks, was more skeptical, noting: “Some consolidation is probably inevitable [because] the Defense Department isn’t sized . . . in many areas to maintain a large base, but extreme consolidation does create challenges for innovation.”³⁹

Table 1. Top Five Defense Vendors for Contracts and OTAs, 2019–2020

	Top Five Vendors in FY 2019	Obligations in Millions of U.S. Dollars (2020)	Top Five Vendors in FY 2020	Obligations in Millions of U.S. Dollars (2020)
1	Lockheed Martin	48,031	Lockheed Martin	75,212
2	Boeing	26,853	Raytheon Technologies	27,406
3	General Dynamics	16,840	General Dynamics	21,842
4	Raytheon	15,931	Boeing	21,737
5	Northrop Grumman	14,471	Northrop Grumman	12,334
	Top Five Total	122,127	Top Five Total	158,532

Source: SAM.gov, Top 100 Contractors Reports, available at <https://sam.gov/reports/awards/static>. The 2019 figures have been adjusted using OMB deflators.

Vendor Count

The total number of prime vendors serving the DoD fell to 41.6 thousand in FY 2020, a 10 percent decrease. This sharp decline reflects a continuing trend of the pool of vendors shrinking despite a growing number of dollars awarded. As shown in Figure 11, spending growth in FY 2020 predominantly went to the Big Five contractors.⁴⁰ As shown in Figure 12, in FY 2020 26.6 thousand vendors were consistently categorized by their contracting officers as “small” and are thus referred to in this paper as “always small,” 7.8 thousand vendors were consistently classified as “other than small,” and the remaining 7.1 thousand vendors fell in both categories and are thus referred to in this paper as “sometimes small.”⁴¹ From FY 2019 to FY 2020, each of these three vendor categories declined at roughly the same 10 percent rate as the overall count.

While the decline in vendor count since 2011—after the sudden reductions caused by sequestration and the lowering of budget caps—was not surprising, the continued contraction during a period of growth requires more nuanced explanation. Reporting rules have changed since 2015, although Figures 12 and 13 already adjust for rising reporting thresholds by retroactively removing small contractors from prior years that would not need to be reported under present rules. More significantly, however, the GAO identified two key drivers for the decline in small business vendors despite growing DoD spending. First, the government has made a concerted effort to use the same “best in class” contracts across multiple agencies to reduce costs and administrative burden. Vendors that miss the on-

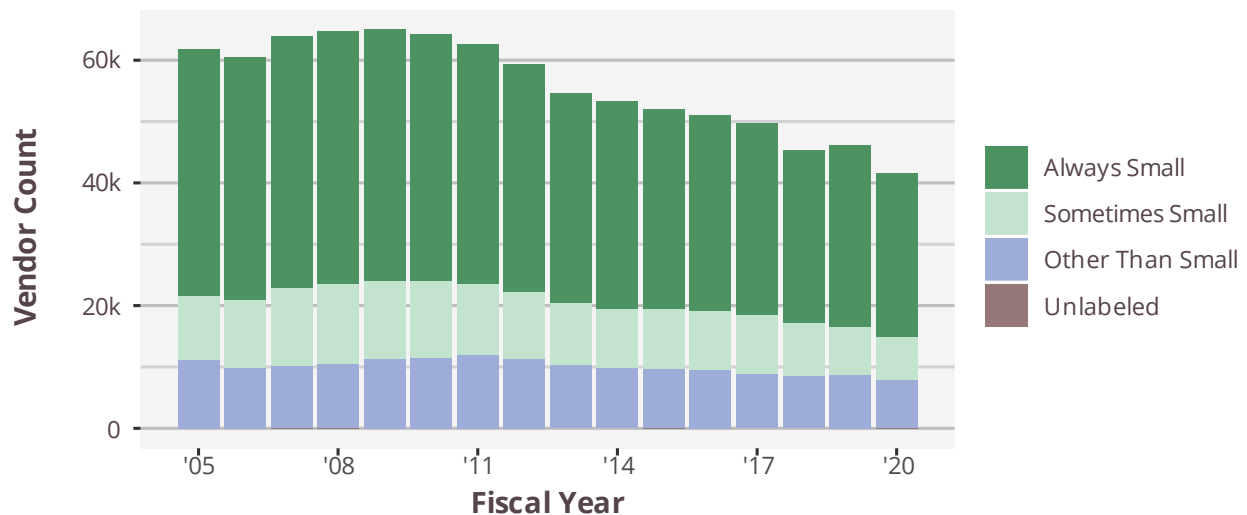
³⁹ Marcus Weisgerber, “Hicks Warns Against ‘Extreme Consolidation’ in Defense Industry,” *Defense One*, February 2, 2021, <https://www.defenseone.com/business/2021/02/hicks-warns-against-extreme-consolidation-defense-industry/171811/>.

⁴⁰ McCormick et al., *Acquisition Trends 2018*, 128–131.

⁴¹ The contracting officer is responsible for determining business size based on Small Business Administration classifications at time of award. Two common reasons a vendor may be “sometimes small” are because of growth reflected in new contracts or because they participate in multiple industrial categories with different size standards.

ramp for these contracts or that lose their eligibility because they grow out of “small” status have a harder time selling to the government. Second, on top of long-standing administrative requirements, mounting cybersecurity concerns—including revamped requirements as part of the Cybersecurity Maturity Model Certification process—impose additional demands on DoD contractors, potentially raising the barriers to entry for defense contracts.⁴²

Figure 12. Defense Vendor Count by Entity Size, 2005–2020



Source: FPDS; CSIS analysis.

Furthermore, the number of vendors for each platform portfolio shrank between FY 2019 and FY 2020, although the reduction was notably minimal for vendors of electronics, communications, and sensors (a drop of 0.8 percent) and air and missile defense vendors (a drop of 3.2 percent). The trends from FY 2015 to FY 2020 provide a more meaningful basis for comparison. In most categories, the decline roughly paralleled the overall 20.1 percent reduction in vendor count, including for aircraft (falling by 20.7 percent), facilities and construction (by 21.3 percent), land vehicles (by 20.1 percent), other knowledge-based contracts (by 21.8 percent), and other services (also by 21.8 percent). Despite following the overall trend, in absolute terms the facilities and construction portfolio drove the largest decline, from 24.3 thousand vendors to 19.1 thousand. The decline in vendors for ships and submarines was larger (a drop of 24.3 percent), but this is magnified by FY 2015 being the sector’s peak over the past two decades. The largest percentage decline was in space systems (by 32.9 percent), which had under 0.4 thousand vendors in FY 2020. This tracks with the sector’s slow growth in unclassified obligations (11 percent) compared to overall DoD spending (41 percent).

Three portfolios contrast with the broader FY 2015–FY 2020 trend. Air and missile defense was the only portfolio to see growth in its corresponding contractor base—by a mere 500

⁴² U. S. Government Accountability Office, *Small Business Contracting: Actions Needed to Implement and Monitor DOD’s Small Business Strategy* (Washington, DC: U.S. Government Accountability Office, October 2021), <https://www.gao.gov/products/gao-22-104621>.

vendors, but this is still notable for not being a decrease. The ordnance and missiles portfolio includes a variety of smaller projects and had overall spending growth of 95 percent, which may explain why its decline in vendor count (by 10.3 percent) was nearly half of the average. Finally, vendors for electronics, communications, and sensors declined from 12.9 thousand to 10.9 thousand, only three-quarters the rate of most portfolios (a 15.4 percent drop) despite spending growth below the DoD wide average. The smaller reduction in this high-tech sector suggests that efforts such as the DIU, the Air Force's pitch day, and a drive to modular open systems may have had some success in pushing back against the tide of a consolidating defense-industrial base.

The total number of prime vendors is a crude metric for the size of the national security innovation base, a key concern listed in the 2018 National Defense Strategy. Much of the information critical to measuring the health of the innovation base or of the traditional defense-industrial base requires information about both prime contractors and subcontractors, but the quality of open-source data on lower tiers is limited.⁴³ The House Armed Services Committee's 2021 investigation of defense supply chains highlighted this problem, concluding that "neither DOD nor the majority of the Defense Industrial Base (DIB) has sufficient visibility on the supply chain to understand its vulnerabilities."⁴⁴ The DoD regularly takes targeted looks at key supply chains, but recent trends have underlined the federal government's need for a capacity to track complex supply chains dynamically.⁴⁵

⁴³ The Federal Subaward Reporting System is available to the public but limited. A past CSIS analysis found that it reported information on only 1 percent of the obligations of major defense acquisition programs such as the F-35. See Rhys McCormick, Andrew P. Hunter, and Gregory Sanders, *Measuring the Impact of Sequestration and the Drawdown on the Defense Industrial Base* (Washington, DC: Center for Strategic & International Studies; Lanham: Rowman & Littlefield, 2017), 22, <https://defense360.csis.org/measuring-impact-sequestration-drawdown-defense-industrial-base/>.

⁴⁴ Elissa Slotkin et al., *Report of the Defense Critical Supply Chain Task Force* (Washington, DC: House Armed Services Committee, July 22, 2021), https://armedservices.house.gov/_cache/files/e/5/e5b9a98f-9923-47f6-a5b5-ccf77ebbb441/7E26814EA08F7F01B16D4C5FA37F043.defense-critical-supply-chain-task-force-report.pdf.

⁴⁵ Henry Farrell and Abraham Newman, "The Folly of Decoupling from China," *Foreign Affairs*, June 3, 2020, <https://www.foreignaffairs.com/articles/china/2020-06-03/folly-decoupling-china>.

What Are the Defense Components Buying?

Defense contract obligations differed significantly for most major DoD components between FY 2019 and FY 2020. In FY 2020, Navy and Missile Defense Agency (MDA) contract obligations increased by \$25.5 billion (20 percent) and \$3.2 billion (37 percent), respectively, while those for the Defense Logistics Agency (DLA) decreased by \$3.4 billion (7 percent). Over the past five years, there was a similar pattern of increased MDA and Navy spending, with contract obligations rising by 141 percent and 62 percent, respectively. Both increases are larger than the average growth (41 percent) in overall defense contract obligations. The shift in the balance between defense components is shaped by platform portfolio trends (see Figure 3)—driven by the 2018 National Defense Strategy, great power competition, and long-planned spending on the F-35 program.

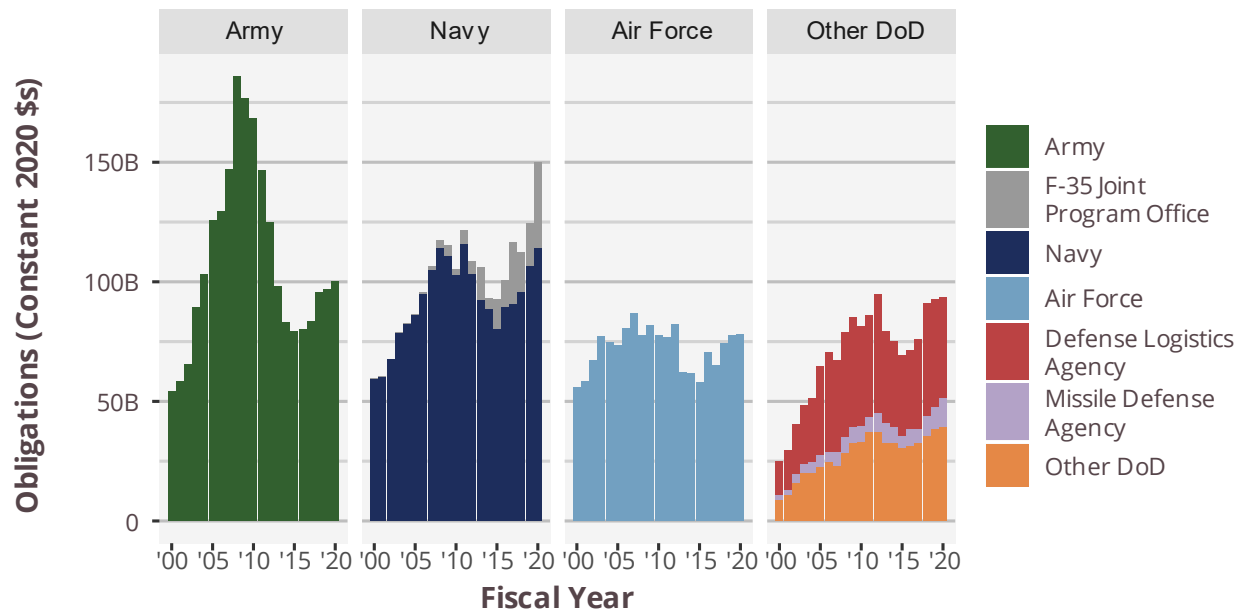
Navy contract obligations grew rapidly from \$124.5 billion in FY 2019 to \$150 billion in FY 2020, a 20 percent increase. This not only reflects a rise in ship and submarine purchases, but also reflects spending on all three variants of the F-35—given that the FPDS classifies the Joint Program Office (JPO) for the F-35 as a naval office. The Navy's share of total defense contract obligations rose from 32 percent to 36 percent from FY 2019 to FY 2020, the highest level of Navy contract activity over the past two decades. Between FY 2015 and FY 2020, Navy contracting grew by 62 percent, more than the 41 percent average for defense contract obligations.

Air Force contract obligations saw steady growth over the past three years after a large upswing in FY 2018. They increased slightly from \$77.4 billion in FY 2019 to \$77.8 billion in FY 2020, a 0.6 percent gain. Over the past five years, the Air Force's contract obligations have increased by 34 percent, which is less than the average increase (41 percent). Its share of total defense obligations declined from 19.8 percent in FY 2019 to 18.5 percent in FY 2020, a 1.3 percent decrease. The Air Force manages a disproportionate share of the classified budget, and thus the true growth rate may be larger due to spending on classified programs such as the B-21 Raider and the Next Generation Air Dominance platform.

Army contract obligations show continuous growth over the past five years. In FY 2020, Army contract obligations increased to \$100 billion from \$97 billion in FY 2019, a 3 percent increase. Over the past five years, Army contracting increased by 26 percent. This comparatively small growth reflects an ongoing shift away from post-September 11 wars, which relied heavily on the Army and Marine Corps, toward a greater emphasis on the Indo-

Pacific Region, where the Army's role is still being decided. Meanwhile, the Army has seen the greatest increase in OTA spending (as shown in Figure 9), which is not included in these contracting numbers.

Missile Defense Agency (MDA) contract obligations rose from \$9.0 billion in FY 2019 to \$12.3 billion in FY 2020, a 37 percent increase, driven in part by FMS of radar units.⁴⁶ After an upswing in FY 2018, in FY 2020 MDA contract obligations reached the highest share of spending in the past two decades (2.9 percent). Over the past five years, MDA contract obligations have risen by 141 percent, a dramatic increase compared to the 41 percent average for overall defense contract obligations. This aligns with the NDS's emphasis on modernizing missile defense, itself a response to the recent successful development of cutting-edge missiles across the globe. Figure 13 shows defense contract obligations by component from FY 2000 to FY 2020.



Source: FPDS and CSIS analysis.

Figure 13. Defense Contract Obligations by Component, 2000–2020

⁴⁶ Matthew Nelson, "Raytheon Technologies Lands \$2.3B FMS Contract for Saudi Arabia Missile Radars; Bryan Rosselli Quoted," *GovCon Wire*, June 29, 2020, <https://www.govconwire.com/2020/06/raytheon-technologies-lands-23b-fms-contract-for-saudi-arabia-missile-radars-bryan-rosselli-quoted/>.

Conclusion

What Is the Big Picture for Defense Contracting?

Increases in the overall defense budget were a prerequisite for the contracting rebound, and defense TOA grew by 4 percent in FY 2020. Strikingly, even the complications introduced by the Covid-19 pandemic did not prevent an 8 percent rise in annual contract obligations. In FY 2020, contracting obligations reached their highest share (nearly 58 percent) of defense TOA in the past two decades.

WHAT IS THE DOD BUYING?

In dollar terms, the largest annual spending increases have been for aircraft (\$13.1 billion), facilities and construction (\$6.9 billion), and ships and submarines (\$6.0 billion). Aircraft growth has been driven by the DoD's largest weapons program, the F-35, which had a long-planned ramp into production. The growth in ship and submarine spending is in large part due to the Navy placing an order for the Virginia-class Block V submarines, with many featuring the Virginia Payload Module. In addition, the growth in obligations for ships and submarines, while not enough to meet fleet-size goals, aligns with a greater focus on the Indo-Pacific region. Increased spending on facilities and construction is driven by a doubling in construction spending over the last five years and is more difficult to account for because it is not tied to a platform portfolio. However, when spending is broken down by state, most of the increase focused on border states—suggesting that spending was tied to construction of the border wall under the Trump administration. Foreign military sales (FMS) have also had an important influence on both F-35 obligations and the five-year 95 percent growth in ordnance and missile obligations.

In keeping with technology modernization priorities, in FY 2020 air and missile defense spending grew by 29 percent and ordnance and missile spending by 7 percent. Contrary to NDS priorities, spending on electronics, communications, and sensors—which includes C4ISR—and on space systems each fell by 2 percent, although spending in classified high-tech contracting may have a very different trajectory, especially in space. Increasing portfolio spending also reflects a response to China's military modernization and renewed great power competition. While the 2018 NDS has influenced defense contract spending, its reach is mostly seen in purchases of major air and sea platforms, and only partially in investments in specific technology priorities that reach across the joint force.

In line with post-2015 trends, product spending has dominated, growing by 11 percent in FY 2020, reaching its highest level of the past two decades. As seen in Figure 8, although

unclassified R&D contract spending fell by 0.4 percent, OTA R&D spending—partially in response to Covid-19—more than made up that gap. As mentioned above with high-tech sectors, classified R&D spending may also be telling a different story not covered in the public data. Regarding spending on services, the FY 2020 increase on facility-related and construction spending (15 percent) is difficult to parse in relationship to the NDS, but the growth in information communication technology spending (11 percent) is in line with its emphasis on C4ISR and cyber defense.

HOW IS THE DOD BUYING IT?

Efforts to reform the acquisition process since 2015—including by establishing the DIU, using OTA agreements, implementing the AAF, issuing proposals through the DIB, and initiatives such as the Air Force’s pitch day—have continued to emphasize flexibility, innovation, and access to commercial technological advances. OTA agreements are a vanguard for the defense acquisition transformation, with defense OTA R&D spending surging 122 percent in FY 2020 while defense R&D contracting slightly decreased by 0.4 percent. The main driver of this jump was the U.S. government’s response to the Covid-19 crisis, but even discounting the Covid-19 bump, the past five years have seen a sustained increase in OTA R&D expenditures, suggesting that OTA agreements have become a rapid-acquisition substitute for some traditional defense R&D activities. This shift is the greatest within the Army, which accounted for 82 percent of OTA spending in FY 2020.

While the rise in OTA usage has been largely encouraged by policymakers, the FY 2015–2020 period has also seen a decrease in the share of competed obligations, a key metric for efforts to maintain a competitive environment. Nearly 50 percent of obligations went to contracts awarded without competition, the highest share over the past two decades. Some of this is explained by foreign military sales, where any competition would take place on the recipient end, but this trend highlights the importance of reform efforts such as modular open system approaches, which seek to enable competition at the subsystem or component level even when there is only one supplier for the platform.

FROM WHOM IS THE DOD BUYING?

While acquisition reform efforts have called for an expanded industrial base with more participation by non-traditional vendors and commercial providers, the recent growth period has also been one of consolidation for traditional defense-industrial contractors. Obligations to the Big Five vendors grew by 21 percent in FY 2020, rising to their highest level of the past two decades. During this period, the share of total obligations going to the Big Five vendors increased by 6 percentage points to 36 percent. At the same time, the total number of vendors in the contracting base declined, dropping by 10 percent from FY 2019 to FY 2020. On the other hand, the Big Five vendors play a smaller role in OTA-funded projects. If OTAs for R&D mature into major projects with a smaller role for “nontraditional significant participation,” that may act against this consolidation trend in traditional contracting or plant the seed for potential future merger and acquisition activity, depending in part on the regulatory response.

WHAT ARE THE DEFENSE COMPONENTS BUYING?

Among the Armed Services, the Navy has seen the greatest growth in spending, which increased by 20 percent from FY 2019 to FY 2020 and by 62 percent since FY 2015. This is partially explained by FPDS treating the Navy as the purchasing service for all F-35 obligations, as well as by an increase in ship and submarine spending. Among the other defense agencies, the MDA stands out with 37 percent spending growth in FY 2020, rising to 2.9 percent of DoD contract obligations, its highest share in the past two decades. The Air Force and the Army experienced slower growth, increasing by 0.6 percent and 3 percent, respectively. The Air Force may be seeing more growth in the classified domain, but overall changes in spending patterns appear to reflect a growing strategic emphasis on the Indo-Pacific region.

Final Thoughts

The contracting rebound over the past half decade has indeed coincided with a transformation of the defense acquisition system. FY 2020 may prove to be a peak year for defense contract obligations, but even if the dramatic growth ends, the shifts during this period—which reflect markedly different priorities than when focus was on the wars in Iraq and Afghanistan—will have lasting implications. Although FY 2021 is a presidential transition year, many of these same drivers, including a focus on countering China, are carrying over into the Biden administration.

There are a few key questions to ask going forward: Will the high rate of spending on products be sustained, or will the new administration's concerns about legacy platforms change buying patterns? Will the Air Force and Navy follow in the Army's footsteps by increasing their use of OTA contracts? Will the Biden administration's skepticism regarding defense consolidation translate into changes to vendor size, count, and competition? And, in a time of renewed attention to supply chains and a consolidating industrial base, what will be the role of commercial industry and allied industrial bases?

Finally, as the acquisition system changes, so too must the measures analysts use to observe it. Present reporting tools—including some FPDS fields and the Selected Acquisition Reports as a whole—are well-suited to tracking major defense acquisition programs. But as the AAF matures and OTA agreements play a larger role in the R&D process, analysts and policymakers will need to evolve new approaches and create reporting and oversight mechanisms appropriate to those tools.

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Gregory Sanders is deputy director for research and fellow with the Defense-Industrial Initiatives Group at the Center for Strategic and International Studies (CSIS), where he manages a research team that analyzes data on U.S. government contract spending and other budget and acquisition issues. He employs data visualization and other ways to use complex data collections to create succinct and innovative tables, charts, and maps. His recent research focuses on contract spending by major government departments, contingency contracting in Iraq and Afghanistan, and European and Asian defense budgets. This work requires management of data from a variety of databases, most notably the Federal Procurement Database System, and extensive cross-referencing of multiple budget data sources. In support of these goals, he employs SQL Server, as well as the statistical programming language R. Sanders holds an MA in international studies from the University of Denver and a BA in government and politics, as well as a BS in computer science, from the University of Maryland.

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