

NOVEMBER 2018

Trends in Industry

Key Findings and Insights from 2018 CSIS Research

FEATURED REPORTS

Acquisition Trends 2018:

Defense Contract Spending Bounces Back

New Entrants and Small Business Graduation
in the Market for Federal Contracts

Evaluating Consolidation and the Threat of
Monopolies within Industrial Sectors

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Executive Summary: Acquisition Trends 2018: Defense Contract Spending Bounces Back

Project Directors: Rhys McCormick and Andrew P. Hunter

Authors: Rhys McCormick, Samantha Cohen, Gregory Sanders, and Andrew P. Hunter

THE ISSUE:

- **DoD contract obligations increased 13 percent between FY 2015 and FY 2017.** However, growth was not uniform across what DoD procures. Defense products contracting increased 22 percent while defense services contracting grew by 5 percent and defense research and development (R&D) contracting grew by 6 percent.
- **The last two year's defense contracting rebound most benefited the top tier of defense contractors, the Big Five, who have seen a 33 percent growth in defense contract obligations.** Small (10 percent) and Medium (9 percent) vendors experienced more modest growth in defense contract obligations while Large vendors fared the worst, only experiencing a 1 percent increase in defense contract obligations.
- **The rate of effective competition for defense contract obligations, after previously seeming impervious to change, fell to 44 percent in FY 2017** compared to the historical average of 49 percent between FY 2000 and FY 2015.
- **Although defense contracting has rebounded over the past two years, the defense acquisition system currently sits at an inflection point that will likely transform both the acquisition system and its supporting industrial base as DoD shifts its priorities to speed and the 2018 National Defense Strategy's imperatives while also implementing the recent colossal acquisition reforms.**

There have been substantial shifts in the defense acquisition system over the past two years as it begins to rebound after sequestration and the defense drawdown.¹ At a most basic level, defense contract obligations have grown in each of the past two years after a trough in defense contract spending in Fiscal Year (FY) 2015. Beyond topline contract growth, the administration change naturally brings new priorities and policies to the Department of Defense (DoD). For example, the

¹ Portions of this report have been adopted from *Defense Acquisition Trends 2017: A Preliminary Look* first presented at the 15th Annual Acquisition Research Symposium hosted by the Naval Postgraduate School. For the full paper see: Rhys McCormick, Gregory Sanders, and Andrew P. Hunter, "Defense Acquisition Trends 2017: A Preliminary Look," (Monterey, CA: 2018 Naval Postgraduate School Acquisition Research Symposium, May 2018), https://www.researchsymposium.com/conf/app/researchsymposium/unsecured/file/352/SYM-AM-18-075-017_McCormick.pdf.

2018 *National Defense Strategy*'s heavy emphasis on great power competition will influence the types of weapon systems and capabilities DoD develops and purchases going forward.

Shifts in the defense acquisition system have incentivized a variety of changes in the industry that supports it. Mergers and acquisitions (M&A) in the defense sector have increased in the last two years, and at the same time, the corporate strategies pursued by different companies in the industrial base have greatly diversified after an extended period of near-uniform conformity.² While almost every significant player in the defense industry focused on cutting costs and increasing international sales during the downturn, very different strategies have emerged in the current upswing. Some companies have focused on DoD's call for technological innovation, others have focused on capturing increased revenues from existing product lines by expanding into services, while still others have sought to shift out of what they perceive to be low-margin services to focus on integration and high-margin subsystems. But changes within the defense industry have not, as of yet, been matched by changes in who joins the defense industry. There is little to no evidence of recovery from the significant decline in defense contracting participation that resulted from sequestration, and the rate of new entrants into the defense industry remains at extremely low levels.³

This report analyzes the current state of affairs in defense acquisition by combining detailed policy and data analysis to provide a comprehensive overview of the current and future outlook for defense acquisition. The data used in this report is primarily derived from the Federal Procurement Data System (FPDS) and is supplemented with other open-sourced data. This analysis provides critical insights into understanding the current trends in the defense industrial base and the implications of those trends on acquisition policy.

This report discusses our findings on the key issues facing the defense acquisition system in 2018 and are organized into five main sections:

1. DoD Spending in a Budgetary Context
2. What is DoD Buying?
3. Whom is DoD Buying From?
4. How is DoD Buying It?
5. What Are the Defense Components Buying?

DoD Spending in a Budgetary Context

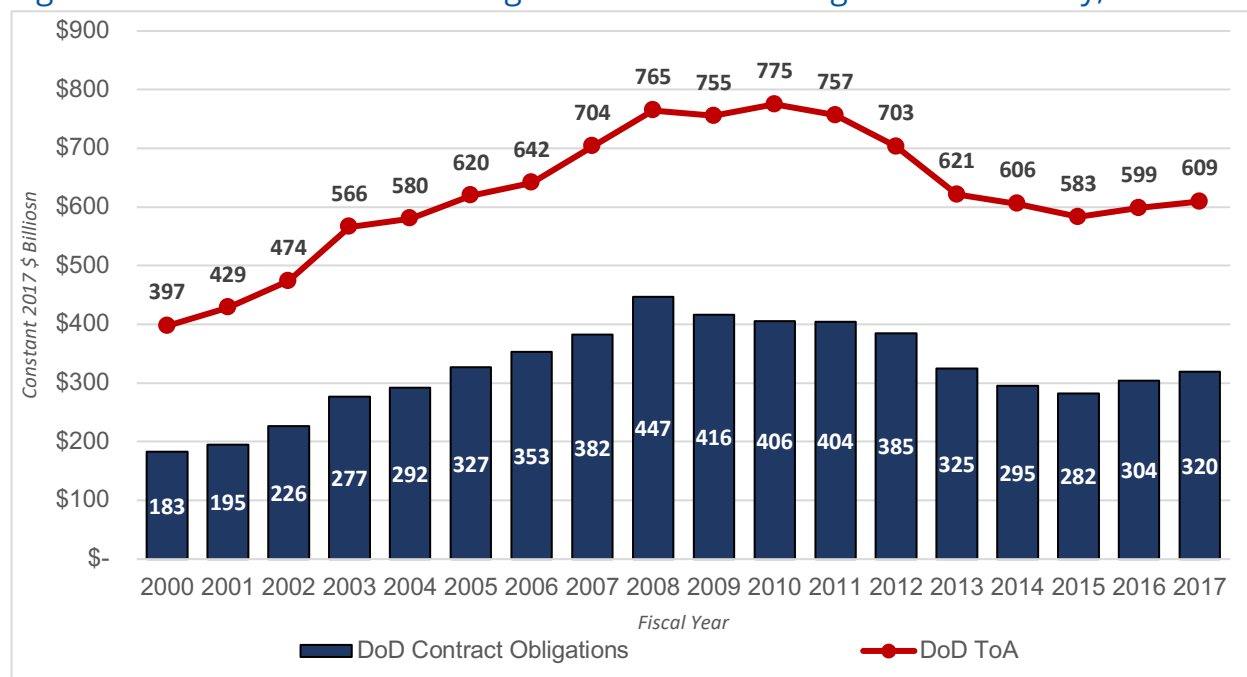
Growth in defense contract obligations has outpaced the growth in DoD Total Obligation Authority (TOA) over the past two years. Between FY 2015 and FY 2017, DD TOA increased from \$582.9 billion to \$609.3 billion, a 5 percent increase. As shown in Figure 1-1, defense contract obligations have grown at over twice the rate, increasing from \$282.5 billion to \$319.8 billion, a 13 percent increase. In FY 2016, defense contract obligations increased by 8 percent but slowed to a 5 percent growth rate in FY 2017. As a share of DoD TOA, defense contract obligations have risen from 48

² PricewaterhouseCoopers, *PWC Deals: Global Aerospace and Defense Deals Insights Year-End 2017*, (PWC: 2018), <https://www.pwc.com/us/en/industrial-products/publications/assets/pwc-aerospace-defense-industry-mergers-acquisitions-q4-2017.pdf>.

³ Rhys McCormick, Andrew P. Hunter, and Gregory Sanders, *Measuring the Impact of Sequestration and the Defense Drawdown on the Defense Industrial Base*, (Washington, DC: Center for Strategic and International Studies, December 2017), https://csis-prod.s3.amazonaws.com/s3fs-public/publication/180111_McCormick_ImpactOfSequestration_Web.pdf?A10C65W9Qkx07ValqYclguCH.7EL3O7W.

percent in FY 2015 to 52 percent in FY 2017, a figure in-line with the recent historical average of defense contracts as a share of DoD TOA (52 percent).

Figure 1-1: Defense Contract Obligations and Total Obligational Authority, 2000-2017



Source: FPDS; Department of Defense, "National Defense Budget Estimates for Fiscal Year 2019 (Green Book)," Office of the Undersecretary of Defense (Comptroller), April 2018; CSIS Analysis

Defense contract obligations increased at a rate of 13 percent, faster than non-defense contract obligations, which increased by a rate of 10 percent between FY 2015 and FY 2017. However, while the defense contracting rebound did not begin until FY 2016, non-defense contract obligations began rebounding in FY 2015. Measuring non-defense contract obligations by first year of rebound (FY 2015) to FY 2017, non-defense contract obligations have increased by 12 percent, a figure closer to the total defense contracting rebound.

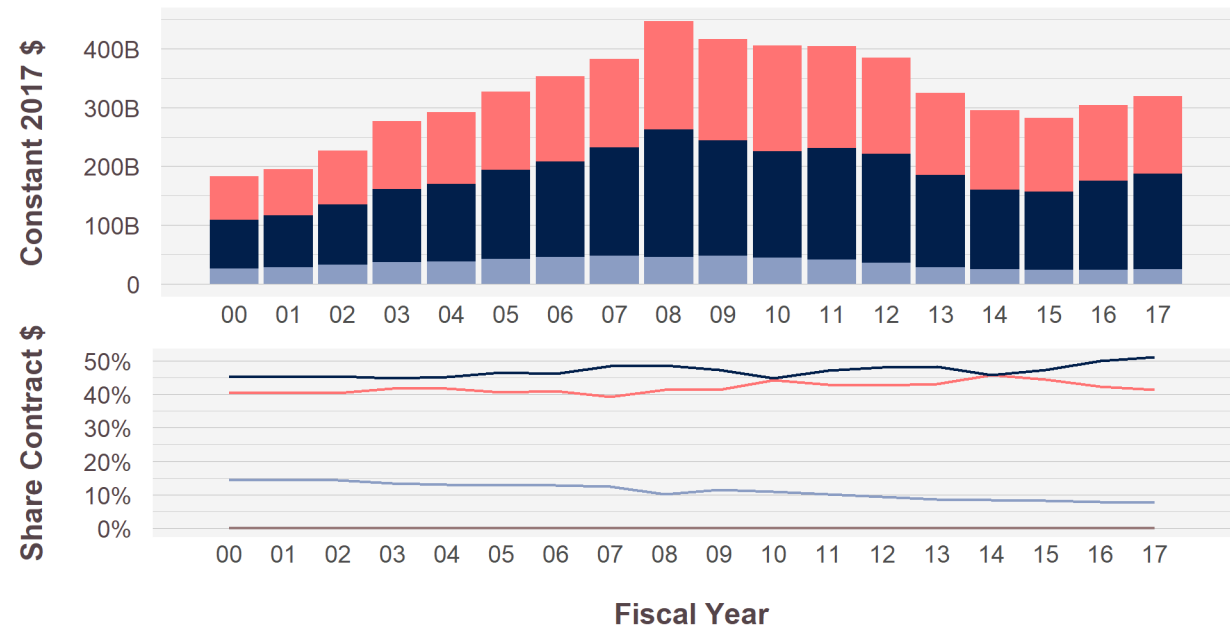
What is DoD Buying?

The defense contracting rebound has not been uniform across what DoD is procuring although it is most concentrated in defense products. As shown in Figure 1-2 on the next page, between FY 2015 and FY 2017, defense products contract obligations increased 22 percent while defense services contracting grew by 5 percent and defense research and development (R&D) contracting grew by 6 percent. As a share of total defense contract obligations, defense products contract obligations rose from 47 percent in FY 2015 to 51 percent in FY 2017 while defense services contract obligations fell from 44 percent to 41 percent and defense R&D contract obligations remained at a steady 8 percent. While this shift in the share of defense contracting spending on

The defense contracting rebound was similarly uneven across the different sectors of the defense

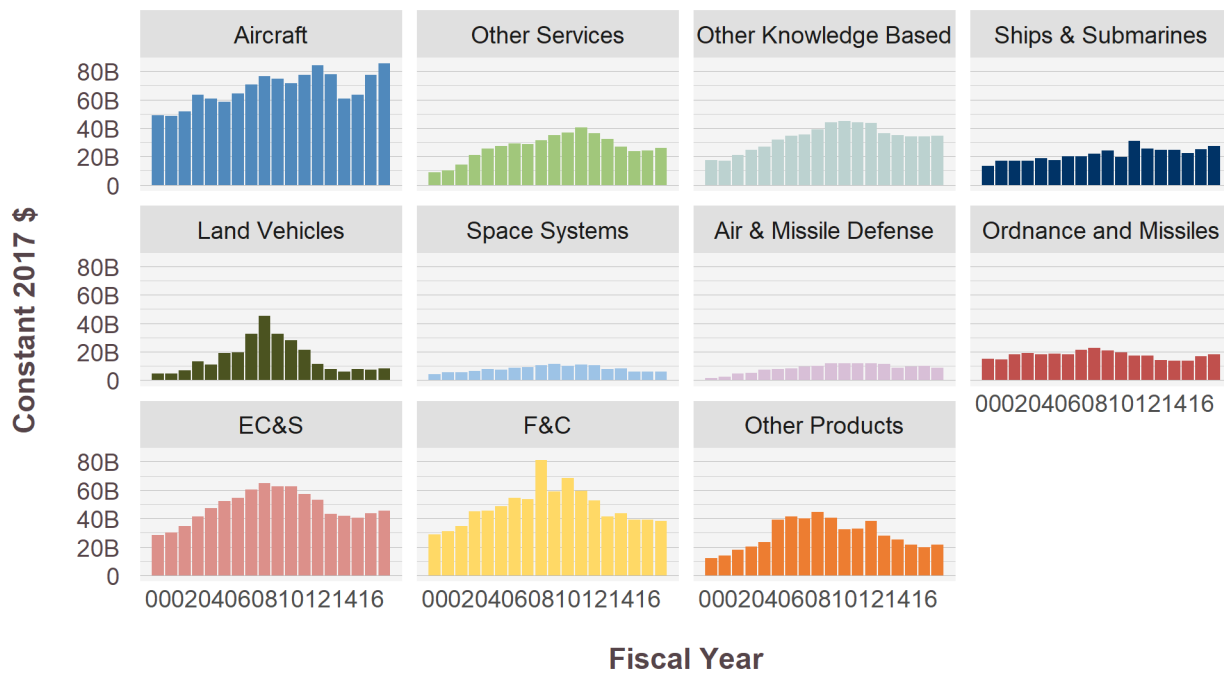
products and services spending may reflect a return to longer term averages, the R&D share of the contract spending remains depressed compared to its long-run average.

Figure 1-2: Defense Contract Obligations by Area, 2000-2017



Source: FPDS; CSIS analysis

Figure 1-3: Defense Contract Obligations by Platform Portfolio, 2000-2017



Source: FPDS; CSIS analysis

The defense contracting rebound was similarly uneven across the different sectors of the defense industrial base. As shown in Figure 1-3 above, contract obligations for some platform portfolios like Aircraft (34 percent), Ordnance & Missiles (32 percent), and Ships & Submarines (22 percent) all increased at rates larger than overall defense contract obligations (13 percent) between FY 2015 and FY 2017. At the same time, other platform portfolios like Air & Missile Defense (-11 percent) and Space Systems (-1 percent) fell despite the defense budget increases. The Land Vehicles platform portfolio, one of the platform portfolios most heavily affected by sequestration and the defense drawdown, started bouncing back in FY 2017 by increasing 10 percent which is double the growth in overall contract obligations that year.

UPDATE ON DOD INNOVATION EFFORTS

The four major defense innovation efforts and offices stood up during the last administration—Defense Innovation Unit Experimental (DIUx), the Strategic Capabilities Office (SCO), the Third Offset Strategy, and the Defense Innovation Board—have all been continued by Secretary Mattis and the new administration to varying degrees.

DIUx has fared best of these efforts, even making the transition to a permanent office last month and dropping the “experimental” designation from its title, becoming simply the Defense Innovation Unit. Beyond dropping the experimental title, over the

After taking the brunt of the R&D cuts during the seven-year trough, System Development & Demonstration (6.5) contract obligations increased 11 percent in FY 2017 but are still less than half of historical average this century.

past two years, DIUx has been extended several new hiring and contracting authorities,⁴ achieved buy-in from the military services and Secretary Mattis and received a \$41 million budget increase in FY 2019.

SCO's fortunes have been more mixed, and the future of the office is still uncertain. The house subcommittee on emerging threats and capabilities proposed eliminating SCO in the FY 2019 National Defense Authorization Act (NDAA), but that provision was later weakened in the final conference report to only require the Secretary of Defense to prepare a report on whether to eliminate the office, transfer its responsibilities elsewhere, or keep it. The recent nomination of Chris Shank as SCO director to replace Dr. Will Roper who left to become Assistant Secretary of the Air Force for Acquisition may indicate that Secretary Mattis intends to recommend keeping SCO in that report.

The term Third Offset itself has fallen out of favor in DoD, but many of its ideas still linger in the National Defense Strategy's reorientation to great power competition and talk of the National Security Innovation Base. The new administration put its own stamp on these ideas when it broadened its list of priority capabilities from Third Offset's, human-machine collaboration and combat teaming, to a list of capabilities ranging from hypersonics to trusted microelectronics.

Conceptualized near the end of the Obama administration, the Defense Innovation Board has continued its work under Secretary Mattis, issuing 16 recommendations in 2017 on how DoD can better access and implement innovation across the department. In 2018, the Defense Innovation Board, responding in part to a requirement in the FY 2018 NDAA, significantly sharpened its focus on software development. First, the Defense Innovation Board issued a set of 10 guiding principles, *Ten Commandments of Software*, and second, a series of metrics for software development that are not simply counting lines of software code as a metric.

IMPLEMENTATION OF THE SPLIT OF UNDERSECRETARY OF DEFENSE FOR ACQUISITION, TECHNOLOGY, AND LOGISTICS

The division of the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD(AT&L)) into the two new offices—Under Secretary of Defense for Research and Engineering (USD(R&E)) and Under Secretary of Defense for Acquisition and Sustainment (USD(A&S))—was made official on February 1, 2018. However, the structure of the two new offices continues to evolve as subordinate offices are renamed, created, and eliminated and carryovers from the previous USD(AT&L) workforce are reassigned or retired. There were several changes made to the implementation plan released July 13, 2018 that differ from and elaborate on the plan previously submitted to Congress on August 1, 2017.

In the USD(R&E) some of these changes included, but are not limited to:

- Making SCO, DIUx, and the Defense Advanced Research Projects Agency (DARPA) report directly to the USD(R&E);
- Creating nine new Assistant Directors for key capabilities like hypersonics and quantum science that report to two new Directors (Research and Engineering; Advanced Capabilities);

⁴ Some of these hiring and contracting authorities include hosting prize competitions, entering into cooperative research and development agreements, and rapid-hiring authorities. These authorities are not novel, but rather an extension of existing DoD authorities to DIUx.

- Eliminating the proposed Deputy Assistant Secretary of Defense (DASD) for Experimentation and Prototyping and added a Deputy Director for Development Test and Evaluation (DT&E).

In the USD(A&S), some of these changes and resolution of decisions were left undecided by the August 2017 plan. These undecided decisions included, but are not limited to: making the DASD for Industrial Policy report directly to the USD(A&S), splitting the Manufacturing Technology office from the Industrial Base Policy office and sending it to the USD(R&E), creating a DASD for Services & Business Systems (DASD(S&B)), and eliminating the Assistant Secretary of Defense (ASD) for Energy, Installations, and Environment and rolling those offices into the ASD for Sustainment.

Overall, the latest implementation plan provided a much more clearly defined structure than the original August 2017 plan, but the long-term success of the USD(A&TL) division will remain unknown for some time. The final implementation plan's best decisions were changing DIUx, SCO, and DARPA's reporting, creating the DASD(S&B), and making the DASD (Industrial Policy) a direct USD(A&S) report. The decisions to split manufacturing technology and industrial policy and eliminate the DASD (Experimentation & Prototyping) were more questionable as they weaken sources of real organizational strength. Finally, there are unanswered questions about how these two offices ultimately end up working together given the alignment of duties and authorities. How do the USD(R&E), USD(A&S), and Under Secretary of Defense for Policy work together on establishing and managing international R&D efforts? What is the relationship between the USD(R&E) and the military services? Who will coordinate the funding that DASD(Emerging Capability & Prototyping) used to control? How do the USD(R&E) and USD(A&S) coordinate on common issues like professional workforce development? These are just a few of the questions that will remain unanswered until the offices have had the time to resolve them.

R&D CONTRACTING DURING THE BUDGET DRAWDOWN

As Figure 1-4 on the next page shows, the seven-year trough in major weapon systems development pipeline appears to have bottomed out but does still exist in some stages of R&D and it will still be some time before DoD fully recovers.

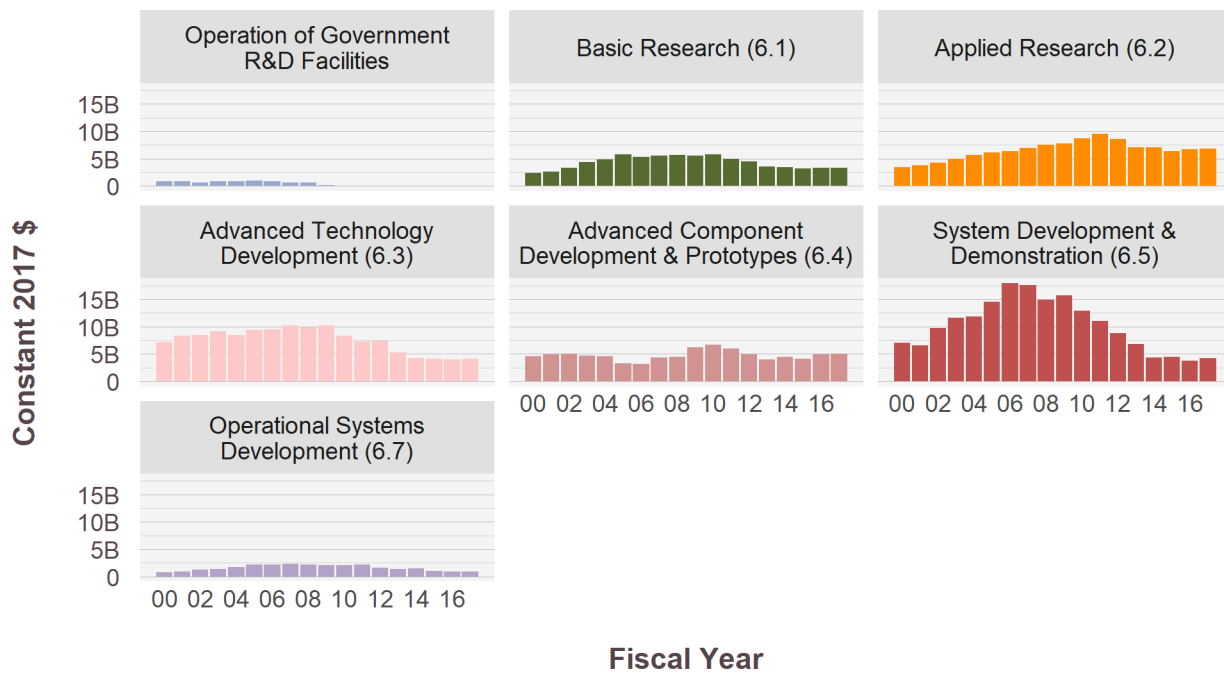
After taking the brunt of the R&D cuts during the seven-year trough, System Development & Demonstration (6.5) contract obligations increased 11 percent in FY 2017 but are still less than half of historical average this century.

Advanced Technology Development (6.3) and Operational Systems Development (6.7) contract obligations have been slower to recover, increasing just 3 percent and 1 percent, respectively, in FY 2017.

DoD Advanced Component Development & Prototypes (6.4) contract obligations surpassed historical averages in FY 2016 and FY 2017. Annual DoD Advanced Component Development & Prototypes (6.4) contract obligation averaged \$4.7 billion this century compared to the \$4.9 billion spent in FY 2016 and 5.1 billion spent in FY 2017.

The two seed-corn categories, Basic Research (6.1) and Applied Research (6.2) were relatively protected during sequestration and the drawdown, but between FY 2015 and FY 2017, Applied Research (6.2) contract obligations increased 8 percent while defense Basic Research (6.1) contract obligations increased 2 percent.

Figure 1-4: Defense R&D Contract Obligations by Stage of R&D, 2000-2017



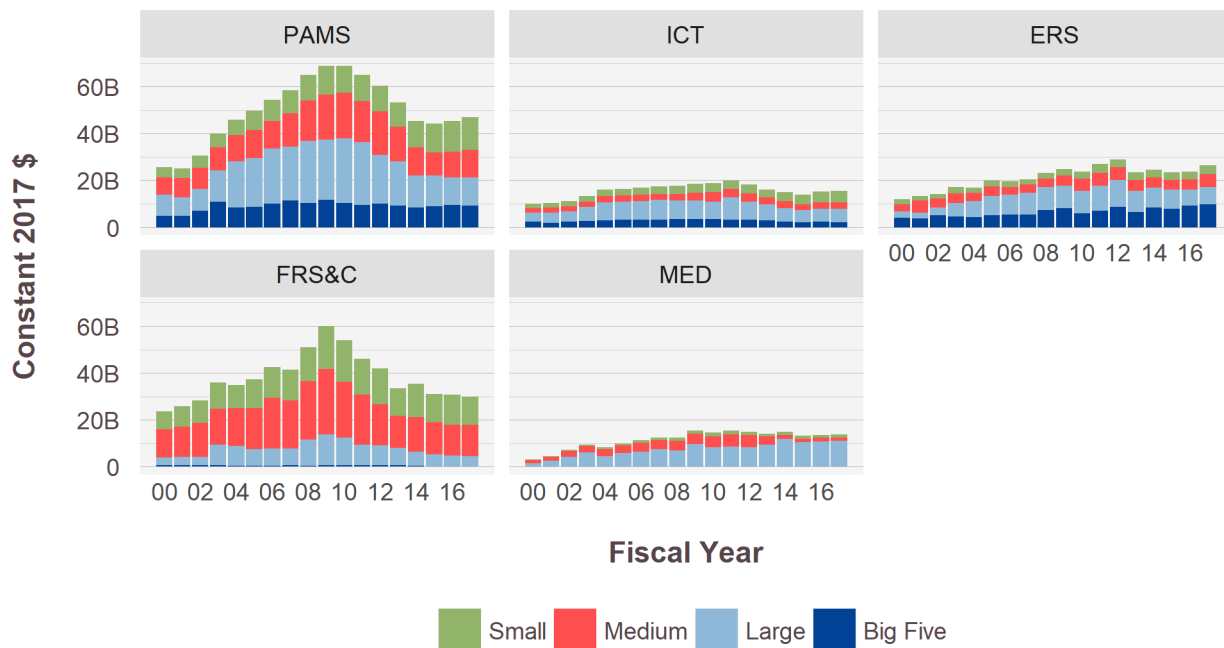
Source: FPDS; CSIS analysis

DEFENSE SERVICES

Although Major Defense Acquisition Programs (MDAP), primarily acquired using product and R&D contracts, draw most of the public attention on defense acquisition, 42 percent of DoD's contracting obligations since FY 2000 went to services. These services vary from maintaining infrastructure and equipment to administrative and medical work. In recent years, defense services contract obligations increased from \$125.5 billion in FY 2015 to \$132.1 billion in FY 2017, a 5 percent increase. As growth in defense services contract obligations has lagged topline growth, defense services have fallen as a share of defense contract obligations from 44 percent in FY 2015 to 41 percent, slightly below historical averages.

In recent years, there have been significant shifts in the defense services trends, shown in Figure 1-5. Small vendors have increased as a share of both Professional, Administrative, and Management Support services (PAMS) contract obligations, and Information and Communications Technology services (ICT) contract obligations. Simultaneously, the Big Five have focused their growth on Equipment-related services (ERS), which covers much of the operations and maintenance work for MDAPs. Services spending is proving resilient despite policy guidance aimed at curtailing services spending across DoD, especially in the Navy. The resilience of services spending is not that shocking, however, when you consider the fact that increasingly aging fleets facing readiness shortfalls leads to higher ERS spending and that medical costs are increasing across the entire U.S. economy, not just DoD.

Figure 1-5: Defense Services Contract Obligations by Size of Vendor, 2000-2017



Source: FPDS; CSIS analysis

How is DoD Buying It?

REFORMING THE DEFENSE ACQUISITION SYSTEM

Priorities for acquisition reform are undergoing a major shift. In the first half of this decade, cost control was the major imperative for most acquisition reform efforts. Today, however, the predominate push from both DoD leadership and Congress is for greater speed in defense acquisition and to put a halt to the erosion of DoD's technical edge over competitors. This shift manifests itself in a range of acquisition reform efforts currently underway. Examples include: the delegation of milestone decision authority to the military services, the FY 2018 NDAA's focus on reforming software acquisition and establishing an online marketplace for commercial technology purchases, the Joint Enterprise Defense Infrastructure (JEDI) Cloud effort, the emerging recommendations of the Section 809 panel, and new policy priorities like increasing DoD's usage of Other Transaction Authority (OTA) to spur innovation.

The acquisition reforms in the FY 2018 NDAA were more targeted than the sweeping changes in the FY 2016 and FY 2017 NDAA where the latter aimed to shift DoD's priorities from focusing on cost controls during the 2008 to 2014 cost control era to speeding up acquisition processes making by removing decision-making steps. The most controversial provisions of the NDAA were the House Armed Services Committee's proposal to create a singular online DoD marketplace and the Senate Armed Services Committee's creation of a range of new DoD software development requirements, although both were scaled back in the final bill. The DoD online marketplace was expanded to include multiple, government-wide marketplaces, but their creation was delayed by

two years. Meanwhile, the DoD software requirements were weakened from strict requirements to preferences for DoD to obtain technical data to the maximum extent possible.⁵

Congress focus on information technology-related acquisition issues is likely to be a continuing theme. DoD's request to vendors for bids on a commercial-solutions JEDI Cloud contract operated by a single vendor has come under intense scrutiny by industry, but DoD has stuck with its single-vendor offering plan in the final JEDI request for proposal. However, Congress has restricted DoD's JEDI funding by 15 percent in the FY 2019 NDAA until DoD delivers a report to Congress providing a detailed JEDI acquisition strategy and justification.⁶

The Section 809 Advisory Panel on Streamlining and Codifying Acquisition Regulation created in the FY 2016 NDAA has issued two of three planned volumes of recommendations for streamlining acquisition most focused on obtaining better access to commercial technologies for DoD. Some of these recommendations were included in the FY 2019 NDAA, and the full recommendations will likely be a source of debate throughout the FY 2020 NDAA process.

Finally, DoD usage of OTA's has increased in recent years, particularly under the new administration.⁷ DoD OTAs obligations have increased 195 percent between FY 2015 and FY 2017 after Congress included several statutory changes in the FY 2015 and FY 2016 NDAAs to incentivize their usage. However, despite just recently giving DoD the authority to transition prototypes to full-rate production under an OTA, Congress has already started pushing back on OTAs. The final FY 2019 NDAA created new DoD OTA reporting requirements, while House FY 2019 Defense appropriations bill requires DoD to notify Congress within 30 days if it intends to award a follow-on contract. This provision, however, may be stripped out of the final defense appropriations bill in negotiations with the Senate repeating the fate of similar OTA statutes in the FY 2019 NDAA conference.⁸

Priorities for acquisition reform are undergoing a major shift. In the first half of this decade, cost control was the major imperative . . . Today, however, the predominate push . . . is for greater speed . . . and halting the erosion of DoD's technical

PERFORMANCE OF THE DEFENSE ACQUISITION SYSTEM

While it is straightforward to describe policies, new acquisition approaches, inputs—such as trends in contract spending—determining outputs, like acquisition system performance, require patience. Past CSIS research has found that major reforms often take two years to show notable

⁵ National Defense Authorization Act for Fiscal Year 2018, Public Law 115-91, 115th Congress, Sec. 2439, (2017), <https://www.congress.gov/115/plaws/publ91/PLAW-115publ91.pdf>.

⁶ John S. McCain National Defense Authorization Act for Fiscal Year 2019, H.R. 5515, 115th Congress, Sec. 1064, (2018), <https://www.congress.gov/115/bills/hr5515/BILLS-115hr5515enr.pdf>.

⁷ OTAs are an acquisition mechanism intended for DoD to access innovation outside of the traditional acquisition system through prototyping. The benefit of OTAs is that they are neither contracts, grants, or cooperative agreements without being subjected to the Federal Acquisition Regulations, Defense Federal Acquisition Regulations, or other statutes, policies, and regulations.

⁸ Committee on Appropriations, Department of Defense Appropriations Bill, 2019, H.R. Rep. No. 115-769, at 10, (2018), <https://www.congress.gov/115/crpt/hrpt769/CRPT-115hrpt769.pdf>.

affects.⁹ As a result, evaluations of the performance of the system primarily tell us about the effects of the final years of the Better Buying Power initiative rather than give us insight into the new administration's policies.

Based on reporting from the Government Accountability Office (GAO) and the Defense-Industrial Initiative Group's (DIIG) own analysis of contracting outcomes, it appears that the last round of acquisition reform achieved its primary goal of reducing cost growth. The GAO found that congressional and executive reform efforts could be tied to programs better staying within cost targets, although new progress was tapering off. More meaningfully, this finding could not just be attributed to more conservative cost estimation, which could obscure performance stagnation where cost growth was reduced, but underlying costs were not. The GAO also observed a new crop of programs that are comparably more affordable than their predecessors indicating that Better Buying Power did generate increased program affordability in absolute terms.¹⁰

Sadly, the DoD's series of reports on the performance of the defense acquisition system have not been continued by the new administration, but DIIG was able to replicate the findings asserted in these reports on decreases in cost growth with our own analysis of contract level outcomes. The results were not uniformly good as the past two years of data include some spikes in terminations and ceiling breaches, but overall the trend has been positive.

Finally, acquisition reform requires tradeoffs and measuring acquisition performance in terms other than cost can throw this into stark relief. The GAO caveated their good news findings on cost by noting that schedule growth continues to mount. A RAND study on cost and schedule estimation found that further improvements in estimation may be hard as many popular theories about what drive these phenomenon fail to effectively predict cost growth.¹¹ However, the Institute for Defense Analysis has found support for the idea that schedule estimating is bad because schedules are often based on external deadlines and not a realistic look at past cycle time for similar program in a series of reports.¹² Regardless of who is right on this question, the challenges of schedule estimation casts a fog over attempts by reformers to achieve a faster acquisition process.

COMPETITION FOR DEFENSE CONTRACTS

Up until recent years, DoD's overall rate of effective competition had seemed impervious to change despite policy guidance and changes in what DoD purchased, as shown in Figure 1-6 below. However, there has been a sharp decline in the rate of effective competition for defense contract obligations over the past two years. The share of contract obligations awarded after effective competition fell to 44 percent in FY 2017 compared to the historical average of 49 percent between FY 2000 and FY 2015.

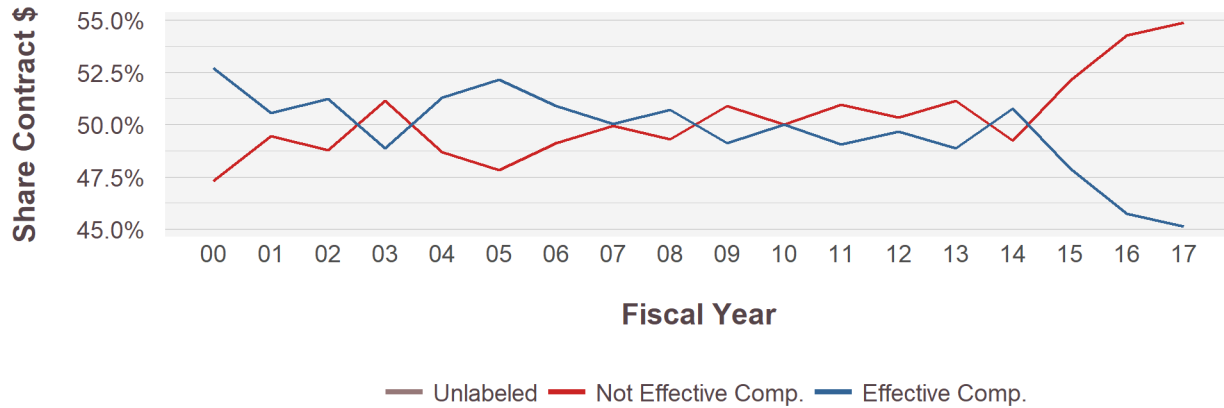
⁹ Rhys McCormick, Samantha Cohen, and Maura Rose McQuade, *Measuring the Outcomes of Acquisition Reform by Major DoD Components*, (Washington, DC: Center for Strategic and International Studies, 2015), https://csis-prod.s3.amazonaws.com/s3fs-public/legacy_files/files/publication/150930_McCormick_MeasuringOutcomesAcquisitionReform_Web.pdf.

¹⁰ Government Accountability Office, *Weapon System Annual Assessment: Knowledge Gaps Pose Risks to Sustaining Recent Positive Trends*, (Washington, DC: GAO, 2018), p. 2, <https://www.gao.gov/products/GAO-18-360SP>.

¹¹ Thomas Light, et al, *Quantifying Cost and Schedule Uncertainty for MDAPs*, (Santa Monica, California: RAND Corporation, 2017), p. 44, https://www.rand.org/pubs/research_reports/RR1723.html.

¹² David M. Tate, *Acquisition Cycle Time: Defining the Problem*, (Alexandria, Virginia: Institute for Defense Analyses, 2016), p. 6, https://www.ida.org/idamedia/Corporate/Files/Publications/IDA_Documents/CARD/2016/D-5762.ashx.

Figure 1-6: Level of Competition for Defense Contract Obligations, 2000-2017

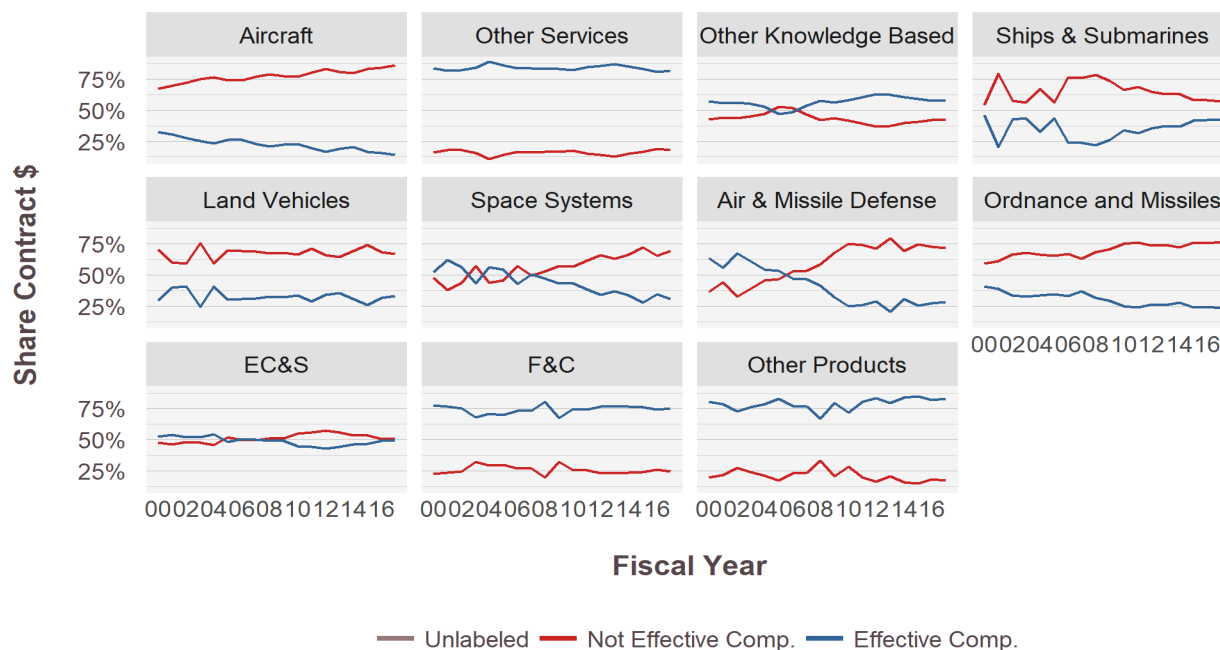


Source: FPDS; CSIS analysis

Although the overall rate of effective competition for defense contract obligations declined sharply, the data show that the declines were largely concentrated in a limited number of platform portfolios as shown in Figure 1-7. DoD's overall decline in effective competition is being heavily driven by the trends in the Aircraft platform portfolio. Aircraft, already one of the least competitive sectors, became even more non-competitive during the defense contracting rebound. As Aircraft obligations increased 34 percent between FY 2015 and FY 2017, the rate of effective competition fell from 16.7 percent to 13.9 percent. The only other platforms experiencing sizable decline in the rate of effective competition were "Other Products," "Other Services," and "Other Knowledge Based."

Simultaneously, the rate of effective competition increased in a number of platform portfolios that are commonly thought of to be non-competitive, but those gains did not offset the Aircraft trends. For example, the rate of effective competition for Ships & Submarines contract obligations increased from 41.9 percent in FY 2015 to 42.9 percent in FY 2017.

Figure 1-7: Defense Contract Obligations by Platform Portfolio by Level of Competition, 2000-2017



Source: FPDS; CSIS analysis

From Whom is DoD Buying?

The last two year's defense contracting rebound most benefited the Big Five, but Small and Medium vendors have also benefited, while Large vendors fared the worst.

Big Five defense contract obligations far outpaced the topline growth in defense contract obligations, where Big Five defense contract obligations increased by 33 percent between FY 2015 and FY 2017, resulting in their share of defense contract obligations increasing from 30 percent to 35 percent. Big Five contract obligations grew more than twice the overall rate in all three categories—products (43 percent), services (10 percent), and R&D (12 percent).

Large vendors contract obligations 1 percent between FY 2015 and FY 2017, falling as a share of defense contract obligations from 31 percent to 27 percent. Large vendors' contract obligations increased in products (6 percent) but declined in services (-4 percent) and R&D (16 percent).

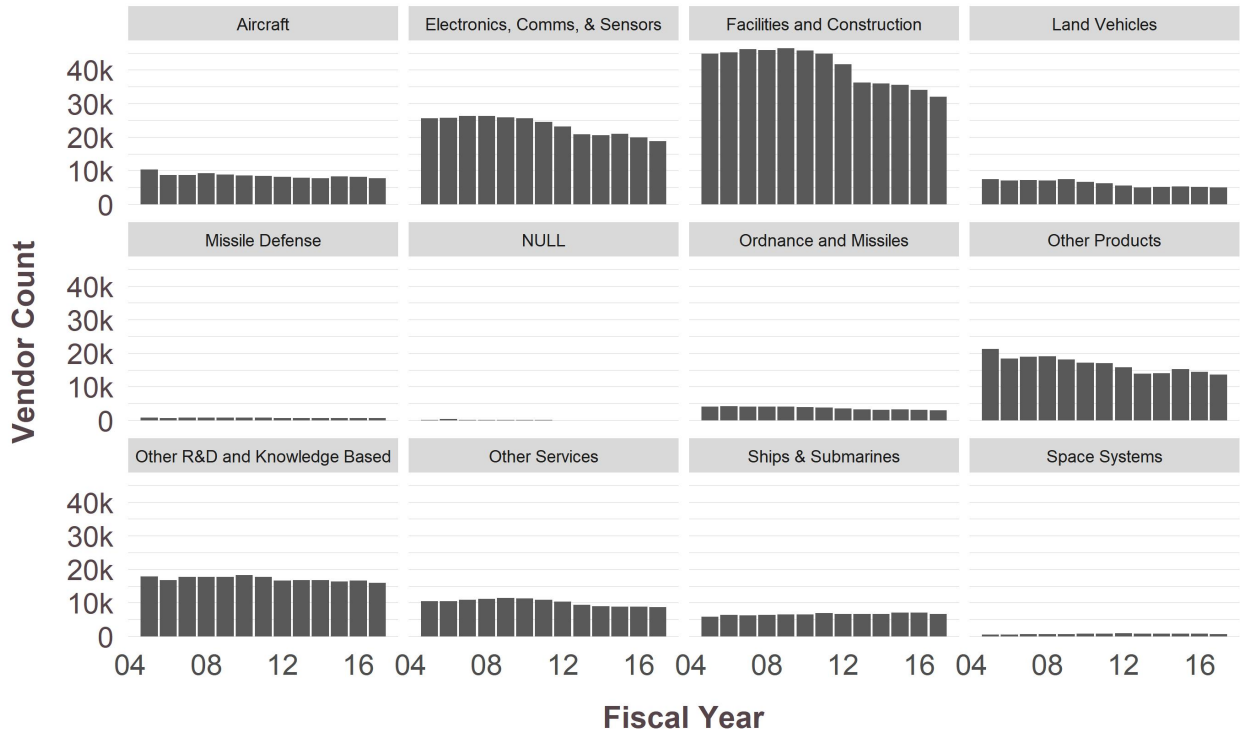
Small (10 percent) and Medium (9 percent) vendors grew at nearly equivalent rates between FY 2015 and FY 2017. Both categories all increased in products, services, and R&D, but Small vendors' R&D growth (14 percent) outpaced their growth in services (9 percent) and products (9 percent), while Medium vendors' services growth (11 percent) outpaced products (8 percent) and services (7 percent).

VENDOR COUNT

Figure 1-8 shows that despite defense contract obligations increasing by 13 percent between FY 2015 and FY 2017, the number of unique prime vendors doing business with DoD declined by 9

percent. The continuing decline in total prime vendors is of potential concern, especially given the emphasis in the National Security Strategy and the National Defense Strategy on strengthening the industrial base and expanding access to a broader swath of potential suppliers in the National Security Innovation Base. It is also important to note that the dynamics in industry are different today than they were during the defense drawdown. The largest contract obligations increases have gone to procuring legacy weapon systems in the Aircraft, Ships & Submarines, and Ordnance & Missiles platform portfolios, significantly limiting the pool of potential prime vendors. Given these platform portfolio's more limited prime vendor base, the trends in the lower tiers of the supply chain are of more interest regarding the health of the industrial base. Unfortunately, the subcontracting data available from the Federal Funding Accountability and Transparency Act Subaward Reporting System (FSRS) is unreliable limiting its analytical use. Additionally, there has been a large uptick in M&A activity across the broader economy in recent years, but especially in the aerospace and defense sector, which can also serve to put downward pressure on vendor counts.¹³

Figure 1-8: DoD Vendor Count by Platform Portfolio, 2005-2017



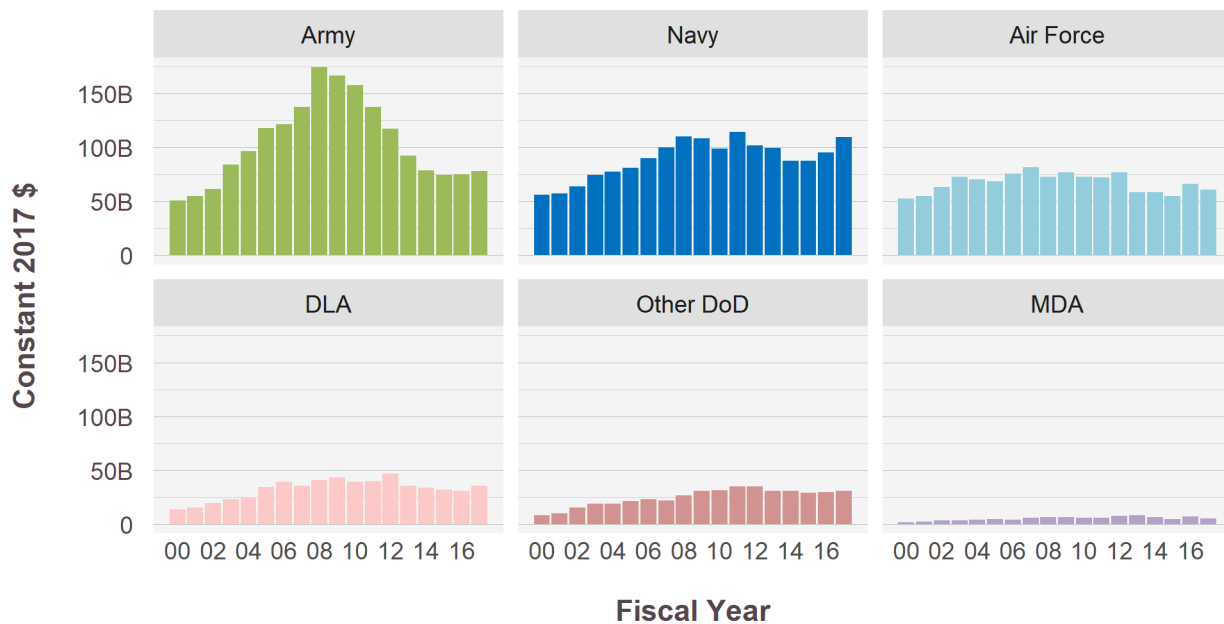
Source: FPDS; CSIS analysis

What are the Defense Components Buying?

As shown in Figure 1-9 below, defense contract obligations increased in each major DoD component between FY 2015 and FY 2017. However, the trends within each of the major DoD components differed significantly.

¹³ Greg Roumeliotis and Pamela Barbaglia, "Global mergers and acquisitions reach record high in first quarter," *Reuters*, March 30, 2018, <https://www.reuters.com/article/us-deals-review/global-mergers-and-acquisitions-reach-record-high-in-first-quarter-idUSKBN1H60EC>.

Figure 1-9: Defense Contract Obligations by Component, 2000-2017



Source: FPDS; CSIS analysis

ARMY

Army contract obligations increased 5 percent between FY 2015 and FY 2017, primarily in products (13 percent), with only minimal growth in R&D (2 percent) and no growth in services (0 percent). Army Aircraft (20 percent) and Ordnance & Missiles (74 percent) contract obligations increased the most amongst platform portfolios while Facilities & Construction (-5 percent) and Air & Missile Defense (-40 percent) declined the most. In the last two years, the rate of effective competition for Army contract obligations decreased from 51.2 percent to 49.5 percent. Finally, General Atomics replaced United Technologies (UTC) in the Ten Army vendors in FY 2017 given UTC's fall from the fourth largest Army vendor in FY 2015 to outside the Top 100 post-selling Sikorsky to Lockheed Martin

NAVY

Navy contract obligations increased 25 percent between FY 2015 and FY 2017, primarily in products (38 percent), with more modest growth in R&D (5 percent) and services (6 percent). Navy Aircraft contract obligations increased 58 percent between FY 2015 and FY 2017 compared to the 21 percent in Navy Ships & Submarines contract obligations. The rate of effective competition for all Navy contract obligations declined from 34 percent in FY 2015 to 31 percent in FY 2017, but in-particular it plummeted in Navy R&D falling from 49.1 percent to 40.5 percent. Finally, there were no changes in vendors comprising the Top Ten Navy vendors by contract obligations between FY 2015 and FY 2017, but Huntington Ingalls Incorporated rose from seventh in FY 2015 to third in FY 2017, its highest ranking since Northrop Grumman spun off its shipbuilding sectors to form Huntington Ingalls in 2011.

AIR FORCE

Air Force contract obligations increased 11 percent between FY 2015 and FY 2017 but whipsawed between a 22 percent increase in FY 2016 and 9 percent decrease in FY 2017. Air Force services and R&D were relatively unaffected by the topline whipsaw, but Air Force products went from a 54 percent increase in FY 2016 to a 28 percent decrease in FY 2017. The whipsaw also only primarily affected the Aircraft platform portfolio, which increased 33 percent in FY 2016 but decreased 18 percent in FY 2017. During a period when overall DoD effective competition sharply declined, the Air Force's overall rate of effective competition increase is somewhat surprising given the Air Force's historically low levels of effective competition. Notably, the Air Force increased its rate of effective competition from products from 19 percent to 28 percent and slightly reversed the previous trend of declining competition for services. Finally, Small vendors rose as a share of Air Force contract obligations from 15.6 percent in FY 2016 to 17.8 percent in FY 2017.

Final Thoughts

The defense acquisition system currently sits at an inflection point that will likely transform the defense acquisition system and supporting defense industrial base over the next 10 to 20 years. Defense contracting has rebounded these past two years, but there are unanswered questions about continued defense budget growth and the long-term effects of the last few years' acquisition reform efforts. Furthermore, the current administration's decisions on balancing competing readiness and modernization priorities will inform U.S. force construct planning for the next 30 years. Cumulatively, these decisions will inform the likely transformation of the U.S. defense acquisition system.

Defense acquisition reform efforts may have slowed down last year compared to the past few years, but the efforts in Congress to fundamentally restructure the defense acquisition system are the biggest changes to the defense acquisition system since the changes post-Packard Commission and Goldwater Nichols. Compared to the 1990s streamlining emphasis and the 2008–2014 cost control era, the recent Congressional reforms seek to fundamentally change DoD's program management and decision-making structures for developing and procuring MDAPs.¹⁴ The division of USD(AT&L) and delegation of greater acquisition decision-making authority to the military services could fundamentally alter which capabilities DoD develops and procures, while the recent program management changes designed to divorce many technology development efforts from platform development efforts could spur the end of MDAPs as we have known them.¹⁵ Whether these changes ultimately accomplish Congress' goals to speed up defense acquisition and spur technological advancement will not be known until the years to come, but whether or not these reforms accomplish those, they will transform the nature of the defense acquisition system.

DoD's current challenge to balance competing readiness and modernization priorities as well as to include finding the proper balance within DoD's modernization investment portfolio will reverberate in U.S. force construct planning for the next 30 years only further compounding the likely forthcoming transformation of the defense acquisition system. The contract data show that during the defense contracting rebound, DoD has prioritized more immediate and longer-term

¹⁴ Andrew P. Hunter, "The Cycles of Defense Acquisition Reform and What Comes Next," *Texas A&M Journal of Property Law*, (2018: Forthcoming).

¹⁵ Andrew P. Hunter, *Moving Away from Traditional Major Defense Acquisition Program Structure*, (Washington, DC: Center for Strategic and International Studies, 2016), https://csis-prod.s3.amazonaws.com/s3fs-public/publication/160902_Moving_Away_Traditional_Major_Defense_Acquisition.pdf.

(10–15 years) challenges over more intermediate-term challenges in the next 5 to 10 years given the recent large increases in products contract obligations and composition of its R&D portfolio balanced towards Basic (6.1) and Applied (6.2) research. This balancing act only becomes more challenging in the coming years as DoD seeks to increase investments in emerging technologies like hypersonics and access to innovations from non-traditional suppliers while simultaneously seeking to prevent parts of the current force that are sitting at inflection points, like the F-18 inventory, from tipping over and entering a death spiral.

Any of these issues by themselves would likely transform the defense acquisition system, but combined, they could bring some of the most radical changes to the modern defense acquisition system since its inception at the end of World War II. Whether such radical change accomplishes what the reformers set out to achieve will not be answered in the immediate future, but today's decisions will inform the trajectory of this transformation for the years to come. When making the difficult decisions about how to implement the recent reforms or choose between competing investment priorities, decisionmakers need to be continually vigilant for data demonstrating shifts in acquisition so that today's decisions will positively inform the transformation of the defense acquisition systems for the decades to come.

Executive Summary: New Entrants and Small Business Graduation in the Market for Federal Contracts

Project Director: Andrew P. Hunter

Lead Author: Samantha Cohen

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With an approximately four trillion-dollar budget, the U.S. government has the ability to influence the U.S. economy through its fiscal policies, where in 2017 the U.S. economy's GDP was just over 18 trillion dollars. When spending on acquisitions, for instance, federal agencies are obligated by law to set aside prime contract obligations to groups based on a variety of socioeconomic classifications such as size, demographics, and geographic location. Moreover, federal agencies such as the Department of Defense (DoD) have realized the importance of attracting new businesses to the federal contracting arena to maintain competitive markets and encourage innovative activity. Due to unique market characteristics such as highly regulatory contracting environments, long and uncertain budgeting processes, and, in some cases, non-competitive markets, the motivation for set aside programs and new business outreach efforts is apparent, but their efficacy is uncertain. Efficacy can be assessed in multiple ways, but one basic and important measure is the extent to which new entrants remain in the market. This paper studies new entrants to the federal contracting arena by calculating survival rates for businesses new to working with all federal agencies and the DoD specifically over time. These survival rates are compared between small and non-small new entrants to investigate how set aside policies work in practice.

The existing body of literature focusing on new entrant survival rates has identified various firm-level, industry-level, and macroeconomic-level characteristics that impact a new entrant's ability to survive post-entry. One of the most prominent findings from this body of literature is that size impacts a new entrants' ability to survive where non-small firms have higher survival rates than their small competitors. While this body of literature covers a wide range of industrial sectors, it tends to exclude focusing on new entrants in the federal procurement arena. The unique dataset used in this study breaks new ground on understanding the dynamics of new entrants contracting with the federal government.

Data and Methodology

The study team utilizes publicly available contracting data from the Federal Procurement Data System (FPDS) to track new entrants from 2001–2016. Six analytical samples of new entrants

entering the federal contracting arena as prime contractors each year from 2001–2006 are observed and tracked through 2016. The study team tracks entrants, exits, growth, industry participation, and contract obligations at the firm level throughout this observation period. By tracking this information, the study team can calculate survival rates, graduation rates, and what proportion of contract obligations goes to firms that exit, what proportion goes to those that survive, and what proportion goes to those that graduate from small business status. Furthermore, these results are calculated for new entrants working with all federal agencies and with the DoD uniquely. Finally, the ability to differentiate between small and non-small new entrants allows the study team to draw conclusions related to federal set aside programs.

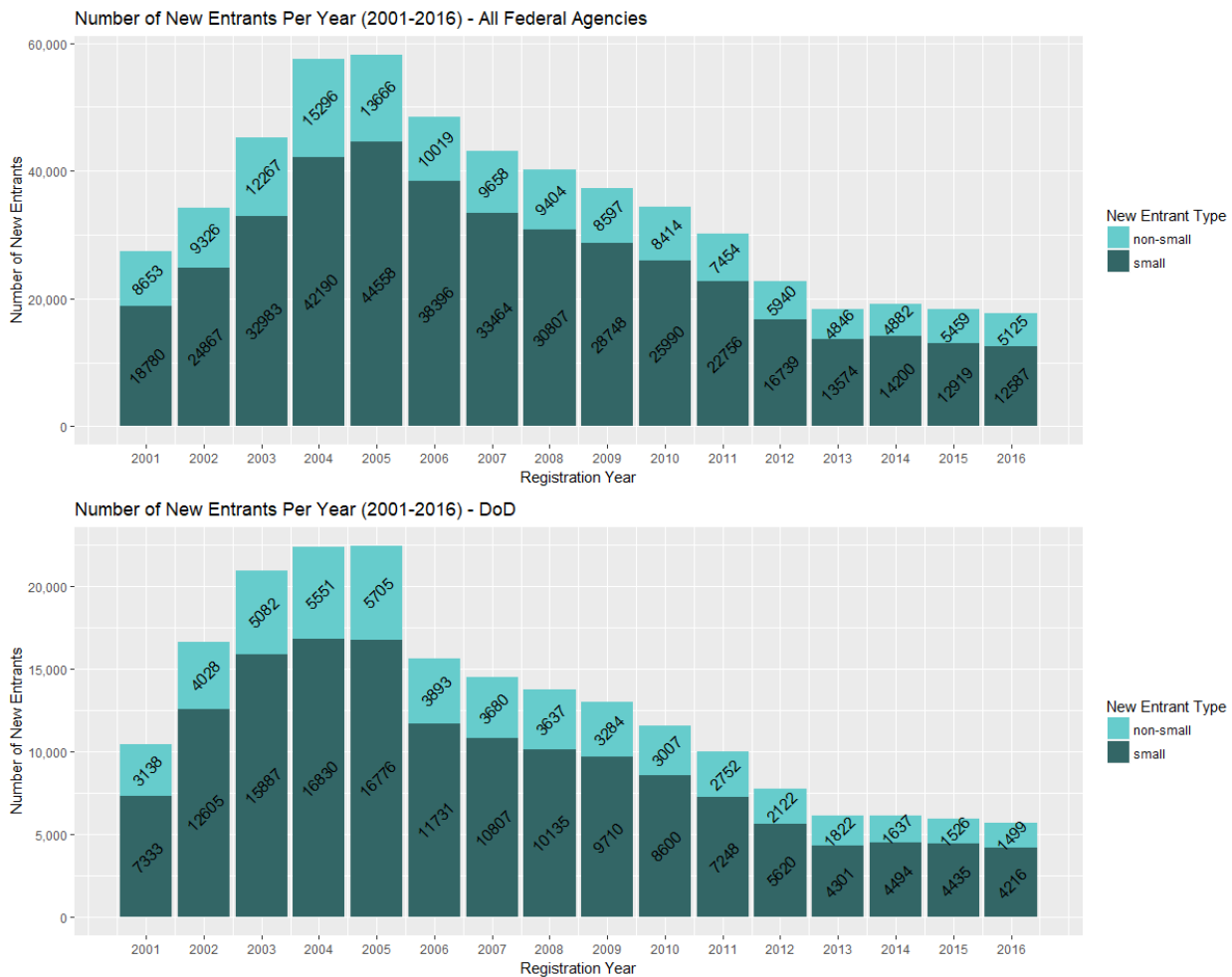
Results

NEW ENTRANT COUNTS

The data shows that the count of new vendors entering the federal contracting arena as prime contractors from 2001–2016 varies, as can be seen in Figure 2–1.¹⁶ 2001–2006 exhibits a buildup of new vendors; however, the counts of new entrants in the federal contracting arena from 2007–2013 dramatically decreases. Since 2013, the number of vendors entering the federal arena has remained relatively low and constant. The buildup of new entrants occurs simultaneously with the beginning years of U.S. military operations in Iraq and Afghanistan, during which the DoD had a higher demand for procurements. Furthermore, DoD expenditures grew at a higher rate than total federal expenditures during this time, further signaling that the DoD's growing demand for procurements during this time period could be influencing the rise of new entrants in the federal contracting arena.

¹⁶ For the purposes of this report, a new entrant is an entity described with a Dunsnumber that has not previously been employed during the study period. This can capture new starting organizations, new work sites for existing organizations, and even long-established organizations making their first foray into federal contracting.

Figure 2-1: Number of New Entrants Per Year, 2001-2016



Source: FPDS; CSIS analysis

Interestingly, the fall of new entrants in the federal contracting arena begins in 2006, two years before the financial crisis, before the peak in overseas contingency operations, and while federal expenditures continued to grow. Starting in 2012, however, the fall in new entrants could likely be linked to the Budget Control Act of 2011 and the resulting decline in federal and DoD contract spending. The Obama administration made various efforts to promote small businesses and new entrants through policies such as the 2011 QuickPay initiative and the creation of the Defense Innovation Unit Experimental (DIUx) in 2015. While the number of new entrants has not risen since the inception of these initiatives, the DoD continues to emphasize wooing non-traditional vendors today, which will make it interesting to track the counts of new entrants through the upcoming years.

SURVIVAL AND GRADUATION RATES

The survival rates show that around 40 percent of new entrants exit the market for federal contracts after three years, around 60 percent after five years, and only about one-fifth of new entrants remain in the federal contracting arena after 10 years. These survival rates are fairly consistent with the results from other studies that calculate the survival rates of new entrants in other sectors of the economy and/or at different time periods.

This paper differs from the existing body of literature in its finding that small new entrants exhibit higher rates of survival in some of the samples and years studied. Small business new entrants exhibit higher survival rates than their non-small competitors when contracting across all federal agencies for the 2001, 2002, 2003, and 2004 samples. In 2005, small new entrants only have higher survival rates after three years, and non-small new entrants survive at higher rates

for the other survival rates examined (e.g., 5-year, 10-year, and 2016 survival rates). These differences between small and non-small new entrants are all statistically different from zero, indicating that there could be a systematic variation between small and non-small businesses' ability to sustain themselves as vendors in the federal contracting arena.

Conversely, small new entrants in the market for DoD contracts specifically perform better than their non-small competitors in 2004 and 2005. The data from 2002 and 2003 show that non-small new entrants have higher survival rates when working with the DoD than their small competitors and the data from the other years observed are not significantly different from zero. This could indicate that there are unique characteristics associated with the market for DoD contracts that make it harder for small businesses to survive, even with small business set aside programs. These characteristics could be related to the fact that the DoD contracts with highly concentrated industries that are not as inviting to small new vendors, such as those supplying weapons systems.

Although these results suggest that small businesses tend to have higher survival rates than their non-small competitors across all federal agencies, the low graduation rates of small businesses that survived for 10 years rings alarm bells over the efficacy of small business set aside programs. Across the samples from 2001 to 2006, the graduation rates of small businesses consistently decrease. While in 2001, around 16–19 percent of small businesses that survive 10 years graduate from small business status, in 2006, around 6–8 percent of small businesses that survive 10 years graduate from small business status. This could imply that small businesses face a perverse incentive regarding their business model where since they have safety nets when they remain small, they could be avoiding normal business growth trajectories to maintain the advantages associated with small business status. Additionally, the decline in graduation rates from the 2001 sample to the 2006 sample aligns with the era of sequestration which could indicate that the downward trend for graduation is connected to the plunging government contract spending during this time.

The fall of new entrants in the federal contracting arena begins in 2006, two years before the financial crisis, before the peak in overseas contingency operations, and while federal expenditures continued to grow.

Discussion and Conclusions

With the large focus on small businesses through set aside programs, the market for federal contracts can look favorable to small new entrants in comparison to their non-small competitors, and this is reflected in the survival rates calculated in this study. When comparing these results to the graduation rates, however, the efficacy of these set aside programs is less certain. Only between 6–19 percent of small businesses that entered the market for federal contracts and also survived 10 years graduate from small business status during this study's observation periods. Policymakers should reevaluate their small business set aside programs as these programs could be creating perverse incentives for small businesses that are contracting with the federal government. Their focus should pivot towards helping small businesses survive simultaneously with growth. Furthermore, policymakers should consider ways to attract new entrants back to the market for federal contracts. The recent counts of low numbers of new vendors entering the federal contracting arena is especially concerning for the DoD given that they have emphasized innovation and non-traditional contracting as crucial aspects of the National Defense Strategy.¹⁷

The findings of this report show ample potential for future work on the success of new entrants and small businesses in federal contracting. For instance, as federal acquisition changes in response to shifting strategic guidance, it will be important to maintain market awareness of the demand and supply in the federal contracting market. This awareness is needed to shape acquisition policy to maximize efficiency for both vendors participating in the market and to support federal agencies looking to acquire innovative and affordable solutions. Moreover, it would be interesting to compare survival rates between different set aside programs. While this paper's exclusive focus on small and non-small new entrants sheds light on small business set aside policies, the analysis does not parse out the effects from those policies specifically focusing on other socioeconomic characteristics such as demographics and geographic location.

¹⁷ Department of Defense, "Summary of the 2018 National Defense Strategy of the United States of America," 2018, <https://www.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf>.

Executive Summary: Evaluating Consolidation and the Threat of Monopolies within Industrial Sectors

Project Director: Andrew P. Hunter

Authors: Gregory Sanders and Zach Huitink

In recent years, economists and policymakers have expressed heightened concern over industrial concentration and the potential for monopolies in a number of sectors of the U.S. economy, ranging from retail trade and manufacturing to finance and utilities. These concerns extend to the U.S. defense industry, which the nation depends upon to equip its military with a wide array of mission-essential goods and services. Growing concentration may hinder competition, reduce the availability of key supplies and equipment, and diminish vendors' incentives for innovation and performance in government contracts. On the other hand, concentration may also enable better contractor performance through economies of scale and learning curves, and there is considerable debate within the economics literature as to the benefits and costs of the present level of concentration in the U.S. economy. Over two decades ago, the end of the Cold War and subsequent defense drawdown prompted policymakers to encourage consolidation. Even today in many defense markets around the world, countries encourage consolidation in the hopes of enhancing the international competitiveness of their industry.

To evaluate the urgency of concerns about concentration, this study analyzes the relationship between concentration, competition, and performance outcomes in a large sample of U.S. federal contract transactions that were signed by the Department of Defense (DOD) between 2008 and 2015. Specifically, the study tests whether and to what extent growing concentration in different industries directly influences contract performance, as well as indirectly influences performance through reducing competition. For analysis purposes, the study considers two types of contract performance markers: first, whether a contract breaches its initial cost ceiling, and second, whether it experiences a partial or complete termination. In this way, the study extends upon prior research by considering multiple dimensions of performance. It also contributes to prior research by analyzing the relationships between concentration, competition, and performance outcomes at the level of individual contracts rather than at higher levels (e.g., programs), which have already been given significant attention in previous studies.

The study uses the Herfindahl-Hirschman index approach to examine concentration at two levels, 82 broad subsectors and 973 detailed industries. This approach is used by some parts of the U.S. economic census and by the U.S. Department of Justice when evaluating the effects of mergers

and acquisitions. Controlling for a variety of performance-related factors, including contract size, duration, pricing mechanism, purchasing organization, and select industry characteristics, the study tests three hypotheses:

- H1: Industrial concentration leads to changes in contract performance
- H2: Increasing (decreasing) industrial concentration leads to decreasing (increasing) competition
- H3: Decreasing (increasing) competition makes poor contract performance more (less) likely

The study finds mixed support for H_1 : when all else is held equal, subsector concentration correlates with greater rates of termination. A two standard deviation shift in subsector concentration is associated with a 28 percent rise in terminations. However, subsector concentration has no significant association with ceiling breaches. Subsector concentration also correlates with a fewer offers received, all else equal. A two standard deviation increase in subsector concentration is associated with 13 percent fewer offers.¹⁸ This result supports H_2 , although the study team had expected a greater strength of relationship between the two. The results on concentration are in accord with the theory that consolidation can shrink the vendor pool and cause challenges due reduced contractor incentive to perform lest they be replaced. That said, the absence of a relationship on ceiling breaches suggests that this reduction in incentives does not increase the risk of cost overruns and thus that the greater number of terminations are happening for other reasons.¹⁹

Contrary to H_3 , competition is associated with higher rates of termination, and only single offer competition is significantly associated with lower rates of cost ceiling breaches (correlating with a 12 lower rate of ceiling breach occurrence). The contrast between the results for industrial concentration and competition suggest that competition is not just a channel for industrial concentration but can operate independently, for better or worse. The association of single-offer competition with fewer ceiling breaches is consistent with competition incentivizing vendors to reduce cost, while at the same time multi-offer competition motivating some vendors to make aggressive bids that cannot be fulfilled. The increased likelihood of terminations for competition is contrary to initial expectations but could be explained by a mix of aggressive bidding and vendor lock, in which the government may not be as able to replace incumbent vendors due to a lack of alternatives.

These results point to the idea that big picture concentration matters when seeking to understanding the risk of contract termination, especially in defense-centric subsectors where monopsony plays a greater role and a larger outside market is not available. In the ongoing debate in the literature on the risks and benefits of concentration in the present U.S. context, the findings on termination are consistent with the warning bells rung by recent economic literature.

¹⁸ The number of offers output variable is transformed logarithmically. A contract that was not competed is treated as having one offer.

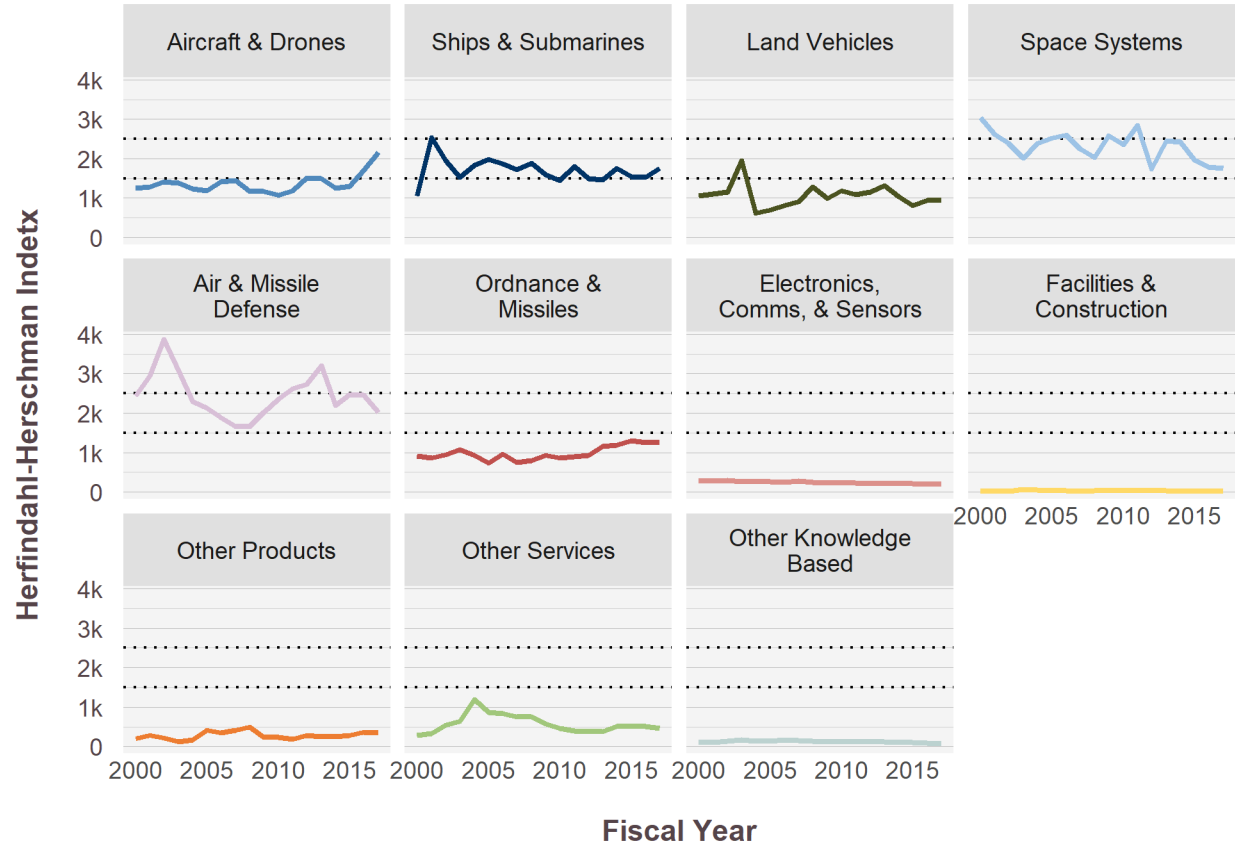
¹⁹ The continuous input measures, including subsector concentration, were transformed logarithmically, recentered around their mean, and then scaled so that a one unit change in the variable corresponded to a two standard deviation shift in the logged variable. The mean for subsector concentration was a Herfindahl-Hirschman index value of 1,128 which would correspond to a subsector with low consolidation using the Department of Justice measures. A two standard deviation increase results in a subsector Herfindahl-Hirschman index value of 2,811 which by the Department of Justice measures corresponds to a subsector that is highly concentrated.

This result also suggests that those monitoring the health of the industrial base might benefit from systematic tracking of higher-level indicators such as those used in this paper. The results on competition suggest that its mechanisms deserve additional study, especially as the number of offers grows. The possibility of aggressive bidding shaping ceiling breach and termination results is entirely consistent with competition resulting in lower prices. However, contracting officers may benefit from understanding the baseline risk, not just for their industry but also for their office and for weighing whether their situation suggests risk tolerance in pursuit of savings or conservatism in source selection. The study team hopes the results will be of use to future researchers and practitioners and has made available the underlying data and models.

These results point to the idea that big picture concentration matters when seeking to understanding the risk of contract termination, especially in defense-centric subsectors where monopsony plays a greater role and a larger outside market is not available

Finally, as a demonstration of one means of monitoring the rate of industrial concentration, the study team has calculated the Herfindahl-Hirschman index for each of the platform portfolios used in other Defense-Industrial Initiatives Group research, shown in Figure 3-1. The two dashed lines illustrate the Department of Justice's general borders for a moderately consolidated market (index values between 1,500 and 2,500). The story varies from portfolio to portfolio, with rising concentration in Aircraft and Drones as well as Ordnance and Missiles but falling in recent years in Missile Defense and Space Systems. This study cannot breakout whether these changes are caused by consolidation policy, major project choices, and larger market conditions. Nonetheless, the differences and dynamism underline the value of monitoring concentrations in major segments of the defense industrial base.

Figure 3-1: Industrial Concentration in Defense Platform Portfolios



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