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Tactics to Strengthen the U.S. Defense Industrial Base with Private Capital

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Tactics to Strengthen the U.S. Defense Industrial Base with Private Capital

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Abstract

Private capital is a major source of research and development and capital investment dollars in the U.S. defense industrial base (DIB). As a strained budget environment limits the Department of Defense's (DoD) ability to capitalize defense supply chains, private capital is one resource available to help fill the gap.

This paper provides a structured assessment of both well-established and emerging tactics the DoD uses to engage private capital—ranging from multi-year procurement to demand aggregation, credit enhancements, and catalytic co-investment. Drawing on interviews with more than 30 stakeholders across government and industry and incorporating detailed case studies, the paper illustrates how these tactics can be deployed individually or in combination to mobilize private capital and strengthen the DIB.

Introduction

Key decisionmakers in the Department of Defense (DoD) have come to view the capital markets as potentially essential stakeholders in enhancing and expanding the defense industrial base (DIB). The 2023 National Defense Industrial Strategy states, "We need to build a modernized industrial ecosystem that includes . . . finance streams, especially private equity and venture capital."

The challenge is certainly urgent: in contrast to the United States, which invests on average about 20% of its gross domestic product (GDP) across its economy each year, China invests 43% of its GDP—capital investment that is used to expand China's industrial base of factories and strategic infrastructure. If the DoD is to successfully engage in great power competition it must draw upon a defense and dual-use industrial base of comparable size to China's. Increased investment by private capital in the DIB may help the United States to keep pace.

Private capital investment in the DIB carries with it a number of distinct benefits. First, private capital is used by DIB companies to invest in research and development, or R&D. While the DoD funds some R&D in federal labs, and indirectly through IR&D reimbursement, many private companies are using private investment dollars to support large amounts of critical R&D that can create new capabilities for the warfighter. Similarly, company capital expenditures ("capex") are used to build new factories, buy machinery, and scale up production. This activity can be critical when the DoD wishes for domestic supply chains and onshoring of critical production.

Private capital is also used to provide an "exit" for existing owners of defense firms who wish to retire, realize a return on their investment, or transfer management of their enterprise. This capital is typically provided during an initial public offering (IPO) or through mergers and

acquisitions (M&A). Capital invested in the M&A process can also assist companies with commercializing their products and services for DoD end users.

DoD supply chains are strengthened when companies have greater access to capital. Well-capitalized companies find it easier to secure funding from reputable, regulated institutions such as commercial banks, which not only support business growth but are also a prerequisite for participation in certain DoD programs. By contrast, companies with limited access to capital are more susceptible to bankruptcy, liquidation, or acquisition by adversarial entities.

Private investors are often experts in growing companies and helping them commercialize their products and services. The DoD often struggles to encourage technology transition, and investors can be a critical part of the commercialization team to achieve this goal.

Since private capital can typically be allocated much more rapidly than government dollars, investor-backed companies can more readily accelerate products and services from research through fielding and production, allowing the government to quickly understand a commercial product's relevance to the warfighter and make necessary modifications to enable sales to DoD end users. Moreover, private capital can help diversify funding streams for companies, allowing them to carry on their work during DoD funding gaps and continuing resolutions.

Private investors can also serve as a critical alternative source of capital for firms whose leadership and business strategies demonstrate strong market potential—factors that may be underemphasized in DoD source selection processes.

As can be seen in Figure 1, the American defense sector already attracts a significant amount of private capital. By most metrics, the venture capital and private equity industries invest a similar amount of capital in the defense industrial base as the largest defense contractors and DoD itself.[1]

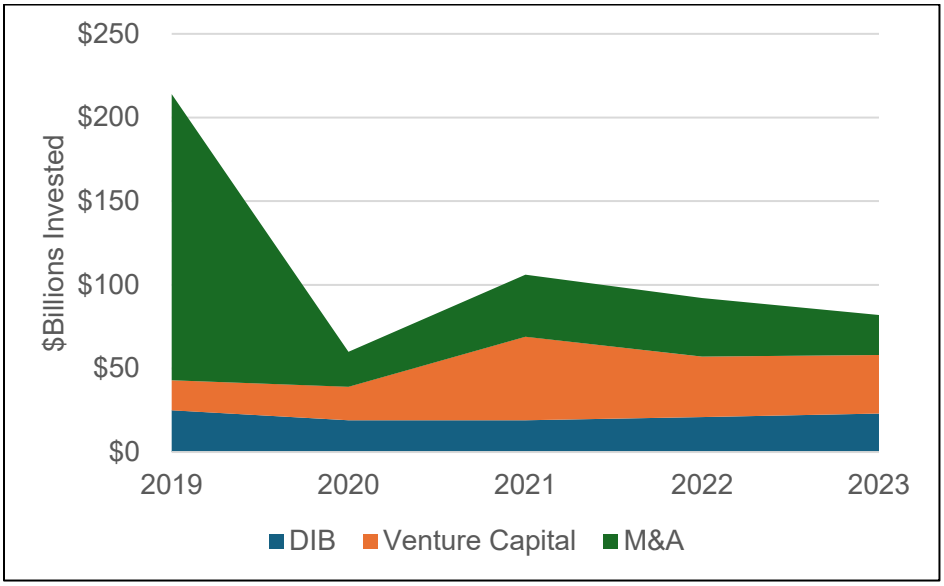

Figure 1. Investment in the U.S. Defense Sector, by Source

[1] It is difficult to present precise, apples-to-apples comparisons for DIB investment among different sources of capital. See the appendix for an explanation of the different sources of capital and how they are measured.

Private capital is drawn into the U.S. defense sector for a variety of reasons: investment returns are relatively stable compared to the commercial sector and defense budgets are growing worldwide. In addition, the DoD uses a range of tactics to engage private capital and encourage investment in the sector.

Methodology

This paper seeks to provide a structured overview of well-established, as well as emerging tactics, that the DoD uses to engage private capital. The findings are based on interviews conducted with more than 30 individuals representing the full range of stakeholders involved in defense investment, including:

- Investors representing multiple asset classes within the capital markets, including private equity, venture capital, commercial banking, and others.
- Investor-backed companies representing multiple defense sub-sectors.
- Government personnel with experience engaging private capital.

When speaking with interviewees, it became evident that there are many different types of tactics for the DoD to engage private capital, addressing different parts of the problem space. Since no one single tactic allows the DoD to significantly increase private capital investment, it may be helpful to view the problem holistically.

This paper proposes a taxonomy that organizes the DoD's private capital engagement tactics into three categories: demand signal enhancement, catalytic capital, and dealmaking capabilities. This framework is intended as a practical tool to help researchers, policymakers and practitioners identify and apply relevant tactics.

1. Demand Signal Enhancement: Refers to tactics that help companies and investors forecast a clearer path to revenue. These include tools that improve visibility into the DoD's purchasing intent—such as memoranda of understanding (MOUs), fixed-price contracts, multi-year procurement authorities, and prize competitions. Each of these mechanisms helps reduce uncertainty about the size, timing, and likelihood of future defense sales, which in turn improves the financial case for investment.
2. Catalytic Capital: Financial tools that reduce risk for private investors by providing early government funding or favorable capital structures. These include co-investment programs, matching funds, loan guarantees, and other credit enhancements administered at the federal, state, or local level. These tactics are designed to "crowd in" private capital by acting as a signal of confidence and reducing downside risk.
3. Dealmaking Capabilities: The organizational tools, skills, and authorities that allow DoD personnel to structure investable transactions. These include the use of flexible contracting authorities like Other Transactions Agreements (OTAs), engaging in matchmaking between companies and investors, training DoD staff in commercial deal structures, and cultural or organizational changes that help the DoD act as a more predictable and responsive customer.

Each of these categories plays a distinct role in allowing the DoD to productively engage private capital. These categories are not mutually exclusive—in fact, as the case studies later in this paper demonstrate, they are most effective when used in combination.[2]

[2] It must be noted that the most powerful factors driving investment in the DIB are outside of the DoD's control, such as the overall interest rate and regulations controlling capital markets.

The sections that follow present the specific tactics within each category, describe how they function, where they've been applied, and how they can be combined.

Demand Signal Enhancement

The primary way that the DoD stimulates private investment is by providing a demand signal, since companies and investors will only invest capital if they can be assured that there is a reasonable chance of recouping their investment, plus a profit or "return on investment" (ROI). It's no surprise that 65% of defense industry executives agreed that it is important for the DoD to "provide a clear, consistent demand signal through contract vehicles" (National Defense Industrial Association, 2025). Demand signal is akin to a clear weather forecast for someone embarking on a risky voyage. (See box, "How Investors Evaluate Demand," for more details.) The DoD's demand signal is chiefly, though not exclusively, tied to its role as a buyer of products and services through programs of record, so demand signal enhancement tactics typically involve stakeholders in program executive offices (PEOs), program offices, and end user communities. The DoD has a number of tactics available to signal demand, ranging from highly informal to agreements that are similar to purchase guarantees.

How Investors Evaluate Demand

Professional investors, as well as companies, use a number of rigorous analytical approaches to evaluate demand. Most important to investors is the amount of dollar profits that a given demand signal represents. For example, this can be calculated as the number of anticipated unit sales multiplied by an expected profit margin. Since demand signals must be adjusted for risk and uncertainty, investors must carefully estimate the true likelihood of a future sale. In the commercial technology investment sector, the starting point for a sales forecast is typically called the total addressable market, or TAM.

Reducing the time it takes for a company to obtain sales can also have a very significant impact on the calculated demand signal through a financial mathematical principle known as the time value of money: the value of money that arrives sooner is worth more to investors than money that arrives later, because that money has an opportunity cost (Fernando, 2024). One commonly used formula known as "net-present value" allows investors to compare the financial value of different investments which return money on different timelines. As an illustration, using the net-present value formula, a project that delivers $1 million in 1 year, instead of over 5 years, is worth $290,000 more to the investor, thus justifying that much more investment.

Reports and Rhetoric: Because DoD resourcing decisions are typically made years in advance through the Planning, Programming, Budgeting, and Execution (PPBE) system, demand signals can often be inferred from internal planning documents such as the Future Years Defense Program (FYDP) and the Program Objective Memorandum (POM). However, since these documents are not publicly available, companies and investors must rely on less detailed but related sources. These include agency and service-level reports, public statements from senior defense and military leaders, and official budget documents—such as the President's Budget Request and the annual Defense Appropriations Bill—which collectively provide insight into Programs of Record and other planned research, development, and procurement activities for the current and upcoming fiscal years. Some companies and investors can even gain access to controlled or classified information about defense programs and expected battlefield threats. Documents like the National Defense Strategy are typically less useful since they contain little if any budget information.

This information is extended and reinforced in rhetoric from a range of DoD stakeholders, most notably senior acquisition executives for the services, and others in the programming community, such as PEOs and program office leaders. Multiple constructs are used by the DoD to communicate pre-solicitation information to industry about future demand, such as Advanced Planning Briefings for Industry (APBI), industry days, proposer's days, requests for information (RFIs), and Technical Exchange Meetings. These each represent tactics that acquisition offices use to communicate with industry about intended future solicitations and awards. Although ethical rules about pre-solicitations apply, there is no standardization concerning how these events are carried out and how much information is conveyed to industry.

Unfortunately, it is not typically feasible to derive a useful TAM estimate based on leadership rhetoric and technical and budget information alone. Key information, such as unit sales forecasts and unit prices, is difficult to infer. In addition, due to classification challenges, the DoD is often unable to clearly explain its true demand signal beyond the small circle of individuals who possess security clearances.

DoD personnel are most effective at signaling demand to industry by communicating clear metrics or specifications tied directly to long term strategies that address DoD needs. Some PEOs share detailed strategies that provide companies with critical context for how their technology could be used. For example, the U.S. Navy PEO Digital created a highly detailed, public strategic roadmap containing organizational goals, outcomes sought, and specific metrics targeted (e.g. "reduce network downtime"), as well as an overview of the portfolio of 138 technology offerings overseen by the PEO (Navy Program Executive Office, 2024). In addition, PEO Digital supplies clear criteria that will be used to engage with any company, such as "support 10% of users uniquely in the [Department of the Navy]."

In general, demand signal communicated by DoD rhetoric suffers from a lack of credibility with industry. Especially during times of strategic turbulence, such as during a presidential transition, even seniormost DoD leaders may not have accurate perceptions of future DoD product demand. In addition, information sharing can be plagued by a "tyranny of abundance," whereby companies and investors lack an ability to track the multitude of communication channels that the DoD uses.

Test and Experimentation Events: Test, experimentation, or demonstration events provide venues for companies and investors to receive detailed feedback on their products or prototypes. Most importantly, such events provide an opportunity for stakeholders in the DoD acquisitions and end-user communities to rapidly inform their concepts of operation for using products and services and to refine the requirements that could be used to create a program of record for eventual product sales. In a recent survey of the defense industry on the value of DoD prototyping, respondents ranked "ability to communicate with government customer on requirements" as the most valuable element of a prototyping project, ahead of other elements such as "time to award" (Seraphin and Halcrow, 2025).

For an example of this tactic in action, in Spring 2023, the Joint Fires Network (JFN) initiative was launched by then–INDOPACOM commander Admiral Aquilino to create a C2 capability to coordinate joint fires. In collaboration with the Office of the Secretary of Defense (OSD) Rapid Defense Experimentation Reserve (RDER), a series of demonstration events was launched beginning in December 2023, focused first on modeling and simulation, followed by technical demonstrations, and finally full integration in-theater by April 2024—12 months after project conception (Miles et al., 2024). Rapid iteration within a series of test and experimentation events enabled the companies involved, such as SAIC and Anduril Enterprises,

to deploy products and services quickly and with a high degree of information about product-to-market fit (Pomerleau, 2024).

Personalized feedback from government personnel during test and experimentation events can help companies understand the demand signal for their products and services, allowing them to forecast a more credible TAM and reduce uncertainty about their product-to-market fit.

Memoranda of Understanding: MOUs or Memoranda of Agreement (MOAs) are used by the DoD to add specificity and credibility to demand signals. In simple terms, an MOU serves as a formal handshake, outlining clear paths for future purchases.

Historically, MOUs have been used at different levels of the DoD to create or communicate demand signals for companies or other offices within the DoD (e.g., DARPA).[3] One approach is for an MOU to quantify the DoD market for a product or service in development—such as the platform, program of record, or specific program office which will acquire the product—as well as create a soft commitment for such offices to seek appropriations in the POM and FYDP. The MOU can then be signed by relevant individuals, such as service and agency acquisition leadership, science and technology executives, and other senior leaders.

The Air Force AFWERX Small Business Innovation Research (SBIR) program has required MOUs be signed to create credible demand signals for small businesses receiving SBIR Phase II awards. Such MOUs are typically signed by representatives of both the acquisition and end-user communities, who can provide commitments that a demand signal exists. Other AFWERX MOU signers can include representatives from government offices that will be essential for enabling the acquisition in practical terms, such as finance, contracting, small business offices, legal, information assurance/cybersecurity, engineering, public affairs, or security (e.g., to supply CAC cards).

MOUs cannot provide legal guarantees to companies and investors, but can instead provide descriptions of credible pathways to acquisition. By the same token, by forcing government personnel to create an acquisition plan in coordination with relevant offices, the act of creating MOUs may increase the probability of eventual transition.

Demand Aggregation: In some situations, the DoD requires products that are similar or the same as those purchased by commercial buyers. In these situations, the DoD can partner with these commercial buyers, to project a larger, aggregated demand signal.

Demand aggregation also enhances demand signals by providing diversification. With diverse paths to product sales, the risk of a total loss is lower for the company. Even when funds are in the POM and FYDP, DoD sales may be blocked by continuing resolutions, changes in priorities, unexpected cuts, or other risks. DoD personnel can therefore diversify and aggregate demand by finding potential additional government buyers, such as other program offices or joint offices. Even if the commitments from those offices are not firm, or are relatively small, the diversity of buyers itself enhances demand signal (Perley, 2024).

[3] Interview with Kathleen Harger, former Deputy Assistant Undersecretary of Defense for Innovation and Technology Transition, December 19, 2024.

Demand Aggregation Case Study: MCEIP Critical Chemicals[4]

Under the DoD's Critical Chemicals Pilot, the Office of Industrial Base Policy (IBP) Manufacturing Capability Expansion and Investment Prioritization (MCEIP) Directorate has leveraged $177 million in private capital to create domestic supply chains for 12 essential chemicals for the DoD. By aggregating its demand signal with U.S. commercial industry buyers, the DoD increased the total addressable market for chemical productors and therefore was able stimulate private capital to invest in new domestic supply facilities for critical chemicals.

This project began with a critical problem for the DoD: many critical chemical supply chains were sourced from companies in high-risk nations. MCEIP addressed this challenge using three tactics:

- Demand Aggregation—working with a commercial chemical company to adapt their chemical engineering approach to produce a critical chemical.
- Commercial Market Adaptation—supporting the certification of a lower-cost, commercially-available material for use in place of an existing, domestically unavailable, and more exacting military specification.
- Process Innovation—developing a modern production process to enable future domestic production for multiple critical chemicals (ACMI Group, 2024).

MCEIP first exhaustively catalogued DoD chemicals demand by convening the DoD Critical Energetic Materials Working Group (CEMWG), comprising experts from the defense laboratories, the acquisition community, joint warfighting, and interagency communities. The group developed an initial list of critical chemicals for which the DoD had potential supply chain vulnerabilities. MCEIP also drew from a list of chemicals restricted from foreign import in the 2023 NDAA, as well as solicitations prepared by the Defense Industrial Base Consortium (DIBC).

In parallel, MCEIP built a network in the relevant commercial chemicals production and buyer communities. At industry associations like the Society of Chemical Manufacturers and Affiliates (SOCMA), MCEIP learned that several large commercial chemical buyers had overlapping supply chain vulnerabilities with the DoD and also wished to shift purchases to U.S. domestic production companies.

Next, working with the American Center for Manufacturing and Innovation (ACMI)—the lead performer on this program—MCEIP conducted workshop events bringing together the industry and government stakeholders involved. Critically, these in-person workshops enabled the chemical production companies to understand the combined commercial and government demand signal, and justify the use of their own private capital to create domestic supply chains for the relevant chemicals.

MCEIP developed a pilot project, launched in July 2022, setting a target of mobilizing $50 million in private capital investment against $5 million in DoD funding (10:1), focused on onshoring eight critical chemicals to U.S. chemical production companies (DoD, 2022). To be selected, the chemical production companies were required to show an investment level of 10:1, private to public, before contract award, with the ability to stimulate additional capital during execution. During execution, MCEIP required monthly reporting on private capital leveraged for the project and prospects on generating new private capital. Production companies were also held to these goals during program management reviews of their work.

[4] Based on interviews with Christopher Zember, Senior Advisor and Portfolio Manager, Manufacturing Capability Expansion Pathfinders

For example, Lacamas Laboratories, a commercial contract manufacturer of high-quality pharmaceutical intermediates and fine chemicals in Portland, Oregon, used a combination of MCEIP funding and private capital to develop a fully domestic supply chain for 1,3,5-Trichlorobenzene (TCB), which is the first domestic U.S. production of this critical chemical in 15 years. Lacamas has since acquired a production facility valued at $110 million to be used to support scaling production of TCB and other critical chemicals for defense and commercial applications (Chemicals Knowledge Hub, 2025).

With successful proofs-of-concept for four chemicals, and validated demand signal from the DoD and commercial buyers, these commercial chemical production companies exceeded the $50 million goal, with $80 million in private investment secured. In September 2023, the program expanded to additional critical chemicals and by January 2025 achieved a remarkable 25:1 leverage ratio, translating to $177 million in private capital to address barriers to domestic production of 12 critical chemicals through a combination of demand aggregation, commercial product adaptation, and process innovation, demonstrating viable domestic sourcing for DoD and commercial market needs (ACMI Group, 2024).

Fixed price contracts: Fixed price contracts, even if budgeted at the same dollar level as cost-plus contracts, can sometimes create a more attractive demand signal for companies and investors. Therefore, switching from a cost-plus to a fixed price contract can sometimes expand the demand signal for a company, without requiring the DoD to obligate more money.

This results from several factors. First, fixed price contracts often raise profit margins for companies, since they can involve lower administrative costs, including tracking of costs and labor hours using a distinct accounting system. Most importantly, if a company is able to reduce its costs significantly below the price of the fixed milestone payments, it can retain any cost savings as profits. A company that is confident in its ability to continuously reduce costs through efficiency gains will prefer fixed price contracts over cost-plus contracts, for which profit potential is limited at a static percentage of costs.

Prizes: Like fixed price contracts, prizes provide a fixed payment to a company in exchange for success criteria. Prizes differ by broadcasting the opportunity to the general public or some subset of companies, such as a cohort of pre-selected companies. If a prize is of sufficient size, it will represent a demand signal that investors and companies can use to justify investing private resources into a project.

The DoD possesses several prize authorities which can be tailored to specific types of projects. Prize awards can be cash or other inducements, such as contract awards (Dunn, 2019).

Multi-Year Appropriations Authority: Funding gaps caused by a lack of appropriated funds are a common cause of reduced demand signal. Congress sometimes chooses to authorize and appropriate funds for multiple years, or until expended. This latter approach, commonly called non-expiring or “no year” funding, alleviates investor and company concerns about funding gaps (Congressional Research Service, 2024). A common source of no-year dollars is the Title III and Defense Production Act program, which can be used if expressly authorized by presidential determination.

Advance Procurement: Advance procurement contracting authority allows the DoD to provide funds to companies for major components before delivery of final products for which the appropriation exists. Advanced procurement must be authorized for a procurement program in statute. Per DoD 7000.14-R, advance procurement can be justified either for products with long lead times, or for situations where buying in bulk can bring down unit costs (referred to as

Economic Order Quantity procurement). Advance procurement decreases uncertainty to companies and investors. By providing government dollars more quickly, advance procurement also enhances demand signal through the time value of money principle.

Multi-Year Procurement: Multi-year procurement is a contracting tactic provided by Congressional statute and is typically tied to specific programs of record (Multiyear Contracts: Acquisition of Property, 2020). Specifically, multi-year procurement provides a planned set of product purchases for up to five years. While each year of payments under the contract depends upon annual appropriations from Congress, a cash payment "cancellation ceiling" is provided to compensate companies in the case of government deferral from its procurement obligation. Multi-year procurement is one of the strongest demand signals that the DoD can create. Under current processes, multi-year procurement is complex to implement and must be tied to programs of record and meet specific requirements as defined in statute and regulations, including: substantial savings (the typical benchmark is at least 10%), stable end-user requirement, stable product design, and enhancement of national security (Defense Acquisition University, 2025).

Securitization of Leases: Guaranteed, or near-guaranteed, revenue streams for statutorily qualifying large and reliable projects allow companies to raise capital at very attractive terms. For example, the DoD regularly procures facilities, housing, or solar energy installations using long-term leases authorized under 10 U.S.C. § 2667 (Enhanced Use Leases), 10 U.S.C. § 2871–2885 (Military Housing Privatization Initiative), or agreements structured through Energy Savings Performance Contracts.

These lease and performance contracts provide highly secure, legally enforceable demand signal from the DoD—payment guarantees that may extend for 25 years, or even beyond 50 years in some circumstances. Companies are therefore able to finance the capital expenditure for these projects with bonds, typically the lowest cost form of financing available to companies.

In sum, demand signals are essential for private capital to invest in the DIB, and stronger signals can induce more investment. A range of tactics exist to provide demand signals of varying strength. Many of these tactics are only available in highly specified circumstances, defined by a combination of law, regulation and policy, and require express permission from a range of DoD and external stakeholders, including Congress and the president. Demand signal is often blocked by frictions such as classification challenges and an overwhelming or contradictory information contained in DoD forecasting documentation.

Catalytic Capital

In addition to stimulating investment with demand signals, the DoD can also financially incentivize companies to raise investment capital during the R&D and capital expenditure stages. Through the use of catalytic capital, the DoD acts as an initial or "anchor" investor by providing early funding that triggers private investors to contribute their own capital to support a project or company. A diverse array of government stakeholders can typically be involved in contributing catalytic capital, including RDT&E funders or dedicated entities such as the Office of Strategic Capital (OSC).

Investment Capital as Pre-award Criteria: The DoD employs a range of mechanisms during the source selection and pre-award phases that, directly or indirectly, incentivize private investment. The DoD sometimes uses investor participation as selection criteria for award: programs such as AFWERX sometimes score proposals more highly when private investors

have invested in the proposing company, as indicated in letters of intent or capitalization tables[5] that can be provided as part of proposal packages.

In addition to influencing evaluation criteria, private investment and financial strength can also factor into pre-award responsibility determinations, where contracting officers assess whether offerors possess adequate financial resources to perform.

The DoD's systems for assessing the financial health of companies, such as DCMA financial capability reviews, and contracting officer required financial reviews, further incentivize companies to pursue financial stability, to include securing private capital. For example, DFARS 232.072 (2025) requires contracting officers obtain financial information from companies, such as balance sheets and income statements to "perform a financial review" of contactors.

Federal, State, and Local Credit Programs: The federal government administers a number of credit programs that provide catalytic capital to "crowd in," or catalyze the entry of private capital into targeted companies or projects. There are a range of tools, usually called "credit enhancements," that can fall under this heading, including:

- Direct loans to qualifying companies, sometimes at subsidized or reduced interest rates.
- Loan guarantees for qualifying projects or companies.
- Subsidies to investment funds which invest in qualifying domains.

Agencies such as the U.S. Development Finance Corporation, the Small Business Administration, the departments of Energy and Commerce, and others have each launched federal credit programs, which use one or more federal credit enhancements (Murphy et al., 2024).

To trigger engagement with a project or company, these government programs typically require a large majority of project funds to be derived from private capital. Letters of intent or other conditional commitments are provided by the private co-investors, which are then triggered when the government delivers its capital infusion. Proposal selection criteria may ask companies to demonstrate that every other source of private capital was exhausted before the government was approached. This tactic has been used extensively by the Department of Commerce semiconductor fabrication facility loan program and the Department of Energy Loan Program Office. State and local governments, and economic development agencies, also frequently provide similar credit enhancements, frequently projects that create jobs in a particular locale.

The DoD's OSC, established in late 2022, has authority to provide a variety of credit enhancements, such as direct loans to companies and loan guarantees for qualifying investment funds focused on qualifying technology domains (DoD, 2025). OSC began taking applications for its unique "accrual debenture" loan guarantee tool, providing subsidized debt to small business investment companies (SBICs), which in turn invest in qualifying technology companies. The first cohort is expected to catalyze investments of more than $4 billion into more than 1,700 small businesses. Most recently, OSC received "more than 200 applications totaling $8.9 billion in financing requests" for its direct loan program ("equipment financing"); the program currently has lending capacity of $984 million (DoD, 2025).

Companies planning R&D or capital investments can review the criteria associated with the various federal, state, and local credit programs to determine if they can apply for catalytic capital from one or more programs. In many instances, credit enhancements can be layered,

[5] Also known as "cap tables," these internal company documents track equity ownership and can help the government infer how much private capital a company has raised over time.

bringing together catalytic capital from the federal, state, and local level alongside private capital.

Investment Matching: A powerful way to incentivize the investment of private capital in the DIB is to directly match private investment dollars with government dollars: in other words, paying companies to raise private capital. Investment matching functions similarly to matching charity donations: the government promises to put dollars into a project or company at a set ratio against every dollar committed by private investors. In practice, this arrangement can be carried out in a variety of ways.

Investment Matching Case Study: AFWERX STRATFI

In this example, the DoD directly catalyzed the investment of $27 million of private capital into X-Bow Systems, a New Mexico solid rocket company, to advance "rapidly produced, low-cost solid rocket motors (SRMs) using X-Bow's proprietary advanced manufacturing technology and culminate in a flight test series" (X-Bow, 2023).

This arrangement was facilitated by the now well-established Air Force Strategic Financing, or STRATFI, program and carried out by the AFWERX office overseeing the Air Force SBIR program. Under STRATFI, for approved topic areas, Air Force SBIR dollars of up to $15 million, combined with up to $15 million Air Force non-SBIR dollars (for a total government-dollar cap of $30 million), can be matched against private investment dollars flowing into private companies. This 1:1 dollar match, up to $30 million, provides a strong financial incentive to raise private capital and contribute it to a company.

The Air Force limits STRATFI awards to companies which have proposed R&D projects of relevance to a list of approved Air Force SBIR topics. Moreover, awards are limited to companies which have secured an MOU from a DoD acquisition office (such as a PEO) and end user, pledging to purchase and use final products and services if the development stage of the project proves successful.

Since its STRATFI award, X-Bow has been selected to deliver solid rocket engines to multiple services as well as development contracts for the Mk 72 booster and Mk 104 dual-thrust solid rocket engines. In 2024, X-Bow received contracts totaling $60 million to advance energetics readiness at Naval Surface Warfare Center Indian Head Division (NSWC IHD; PR Newswire, 2024). X-Bow has also gone on to raise another $70 million in private capital to further advance its technology. (X-Bow, 2024)

The Air Force STRATFI program, discussed in the case study above, publicizes clear criteria and thresholds for companies and investors to meet to receive a pre-specified amount of government matching dollars, up to a cap. Because the terms of the investment match are transparent and allow no negotiation, STRATFI has proven to be a highly scalable program. In just one year, AFWERX used this construct to leverage $332 million of private capital against $606 million government funds and the program has continued to grow since then (AFWERX, 2023). Similarly, the other transactions carried out for prototyping require a pre-set one third of project resources to be contributed (provided by the company) in many circumstances (10 USC 4022).

Investment matching can also be conducted on a case-by-case basis. In the case study below, DoD dollars catalyzed a very large capital investment from a wide range of non-DoD stakeholders. This arrangement involved the sequenced injection of DoD capital alongside up to nine independent stakeholders. Unlike a typical acquisition plan, where proposals differ on concretely differentiated variables such as technical capability and price, an investment

matching arrangement requires complex communication and negotiation at all stages of the acquisition process.

Investment Matching Case Study: e-VAC

This case study concerns the creation of a $550 million advanced magnets production facility, triggered by only $94.1 million in DoD dollars, constituting 17% of the total, or a 5:1 ratio of private capital combined with DoD dollars.

In September 2023, the DoD's Office of Industrial Base Policy (IBP) awarded $94.1 million to Vacuumschmelze (VAC) a leading manufacturer of rare earth permanent magnets, to partially assist with the establishment of a large American manufacturing facility ("e-VAC") to ". . . acquire and install manufacturing equipment, operationalize technical infrastructure, and engineer production lines" (DoD, 2023). The magnet production facility will produce Neodymium Iron Boron (NdFeB) rare earth permanent magnets, a critical component of many defense products, such as high-performance engines and communications equipment.

The process began with an NDAA provision requiring the DoD develop a "mine-to-magnet" supply chain free from covered nations. This created a credible DoD demand signal for an onshore magnet production facility. IBP created a funding announcement for onshore magnet production, requiring at least 1:1 (50%) project cost share. VAC submitted a white paper which included contingent commitments from private investors. The award was ultimately made via an Other Transactions Agreement using no-year (non-expiring) Title III dollars.

Since the facility, which is located in Sumter County, South Carolina, is expected to create 300 jobs, state and local governments provided additional financial incentives, including job development credits, plus a total of $15 million in state grants to assist the county with site preparation, road improvements, water and wastewater improvements (South Carolina Department of Commerce, 2023). In addition, the Department of Energy provided a Qualifying Advanced Energy Project Tax Credit ("Section 48c") in March 2024, of $111.9 million. By reducing e-VAC's future taxes, this credit functions similarly in financial terms to a cash grant or co-investment for the facility.

Finally, a strong commercial demand signal was provided by General Motors (GM), which provided a binding MOU to e-VAC, agreeing to purchase magnets from the facility to supply GM's growing fleet of electric vehicles, such as the Chevrolet Silverado and Cadillac Lyriq, for purchases of at least 10 years (Onstad, 2023).

This combination of government catalytic co-investment, and commercial demand signal, was sufficient to unlock significant private capital investment: VAC's private equity owner, Ara Partners, announced that $335 million in private capital had successfully been raised to complete the construction of the facility, which is expected to begin production in fall of 2025 (Ara Partners, 2024). Representatives at Ara Partners remarked that they "are grateful for the support from our local and state governments and the federal initiatives that have made this project possible, and we extend our sincere thanks to General Motors for being a key partner in this endeavor" (2024).

Government Equity Investing: A less common approach to injecting catalytic capital is for the government to buy company stock in the manner of a venture capitalist or other equity investor. This approach is not normally authorized and must be expressly authorized by Congress. Among the most established programs of this type are the intelligence community's

IQT and the U.S. Army's OnPoint programs (now defunct), each of which was executed by a non-profit corporation at arms-length from the government. These types of programs typically participate in investment syndicates during equity investments, meaning that the government capital is joined in the investment by additional non-government sources of capital (e.g., private venture capital firms). In these programs, if companies are successful, the government receives a return as any other equity investor would, allowing this capital to be used for other investments.

Because Other Transactions Authority (OTA) provides flexibility in resource sharing, certain Other Transactions have also been structured to return capital to the government. For example, in the DoD's very first (1990) Other Transaction, DARPA awarded $4 million to Gazelle Microcircuits to develop high-speed gallium arsenide (GaAs). DARPA's funds were used for the "development, design, production engineering, and working capital to develop and bring to market high-speed data communication GaAs components, electronic modules or subsystems, and application development tools." In return, DARPA retained "access to research and development results; certain rights in data patents; and in the case of technology developments that resulted in commercially marketable products, a fair return on its investment and discounts for government purchases of such products" (Dunn, 2018).

To summarize, DoD funding used as catalytic capital can be a powerful tactic to "crowd in" private capital to strategic companies and projects. Catalytic capital can be a challenging tactic to deploy because it depends on the DoD understanding a number of variables:

- A company's true availability of capital. Companies have an incentive to downplay the availability of capital to secure DoD catalytic capital, which may come at more favorable terms (e.g., no-cost, in the case of investment matching).
- The technical feasibility and likelihood of recouping the catalytic capital. The DoD should reserve catalytic capital for projects that are likely to succeed and, if appropriate, repay the government, especially if the catalytic capital was a loan or equity investment.
- How much capital is likely to flow into a company or project if DoD catalytic capital is provided. Typically this must be validated by follow-up milestones holding companies accountable to their commitments to provide or raise capital.
- The sequencing and coordination of capital injection from multiple public and private stakeholders. The successful deployment of catalytic capital often involves layering funding and credit enhancements across federal, state, and local levels, which can be complex to coordinate due to differing application timelines, eligibility criteria, and oversight requirements.

Catalytic capital is more likely to succeed in tandem with other tactics, such as demand signal enhancement. Investors will not contribute capital into a company or project without a credible demand signal, and stronger demand signals can induce more private investment and therefore require fewer government investment dollars to catalyze them.

Dealmaking Capabilities

For the DoD, the process of engaging private capital, while beneficial, introduces risks and complexities. There are few established processes that can be followed that will reliably lead to strong private capital investment in the DIB. Engaging capital requires creativity and sophistication on the part of government personnel. For this reason, a number of dealmaking capabilities are essential to ensuring that the DoD engages private capital effectively.

Private Capital Ecosystem Development Programs: The DoD has instituted a number of formal as well as informal matchmaking and ecosystem development programs, such as the AFWERX Project Vanguard program, the OASD IBP Office of Industry Engagement, and

the National Security Innovation Network, that can facilitate interactions between government personnel, defense companies, and the investment community. Many private sector venues of this type also exist.

By reducing transaction costs, these programs make it easier for defense companies and investors to become aware of each other, and therefore catalyze an investment. In addition, DoD personnel can often provide critical subject-matter expertise to investors and companies to help justify the deployment of capital. Lacking relevant technical expertise in many defense-relevant technology domains, awareness of DoD supply chain risks, or access to controlled or classified programmatic and threats information, investors often struggle to understand investment opportunities, and are thus deterred from investing. Face-to-face communications can also help investors and companies to more deeply understand the demand signals that have already been provided by the DoD (e.g., advanced planning briefings).

M&A Regulatory Environment: One of the main ways that companies return capital to investors is by being acquired or merged into another company, at which time cash is usually paid to existing shareholders. Therefore, a healthy and predictable M&A market is a major stimulus for investment in the defense industrial base.

For an example of how this works in practice, consider Oshkosh's acquisition of Pratt Miller. After its founding in 1989, Pratt Miller grew into a world-class advanced vehicle research center. When Oshkosh paid $115 million to acquire the company in 2021, the capital was used to pay Pratt Miller's shareholders in exchange for the company, which was then folded into Oshkosh, serving as an internal "Skunk Works" for the defense company (Yu, 2024).

DoD OASD IBP is charged with collaborating with the Federal Trade Commission (FTC) and Department of Justice (DOJ) as part of the Premerger Notification and Merger Review Process under the Hart-Scott-Rodino Antitrust Improvements Act (Federal Trade Commission, 2025). The DoD's role in this process is to assess and provide feedback on potential national security and defense industrial base implications of M&A transactions in the defense sector. The FTC and DOJ use this input to determine whether enforcement actions are required, such as blocking a merger, demanding divestures, or other remedies. PEOs and program offices may provide technical consultation as part of this process.

While not a direct regulator, DoD leadership can play an important advisory role in shaping M&A activity in the defense sector by monitoring industry investment trends and clearly communicating its priorities to companies, investors, and the regulatory community.

A notable example of this influence was demonstrated by the now-famous "last supper" dinner meeting, when former Deputy Secretary of Defense William Perry announced his wish for greater defense industry consolidation through M&A to cope with declining defense budgets; industry responded with a historic uptick in defense M&A investment activity (Mintz, 1997). Conversely, then-Secretary Ash Carter and then–Assistant Secretary for Acquisition, Technology and Logistics Frank Kendall signaled caution about the increase in industry concentration due to M&A throughout the early 2010s (Clark, 2015).

Being a Good Customer: As discussed above, when the DoD can reduce uncertainty, delay, and lower transaction costs, investors and companies perceive future DoD cash flows as larger, and therefore more attractive investment targets. At the same time, the warfighter receives goods and services closer to the speed of relevance. There are several tactics the DoD can use to mitigate delay and uncertainty, making itself a more appealing customer.

Transactions carried out under OTA are not subject to the Federal Acquisition Regulations and other related and derivative DoD regulatory requirements imposed on government grants and contracts. There are several distinct OTAs, including advanced

research, procurement for experimental purposes, and prototyping OTAs, as well as prize authority. OTAs result in reduced administrative cost, such as FAR-based prescribed competitive procedures, burdensome Cost Accounting Standards (CAS) accounting practices, and Bayh-Dole prescribed IP regimes.

Since approval authority under OTAs can be delegated to the most relevant government stakeholders, such as program managers or innovation offices, decision-making can be significantly faster than under FAR-based contracts, which typically require formal legal and compliance reviews. OTAs also allow for faster and more flexible payment structures, including options like advance payments, that are often restricted under the FAR. Last, prototyping OTAs allow for direct-to-production contracts, greatly reducing potential time and uncertainty associated with transitioning to a procurement stage.

Another useful approach is FAR Part 12—Acquisition of Commercial Products and Commercial Services—which is designed to provide a streamlined contracting process for commercial items. Compared to FAR Part 15, FAR Part 12 involves a simpler solicitation, pricing, and contracting process. Since this approach was designed to pay companies on near-commercial terms, such as fixed-price contracts, companies are responsible for using their own capital to support production and delivery.

The newly-implemented adaptive acquisition framework (AAF) provides a range of new acquisition pathways that allow qualifying programs to speed through traditional acquisition checkpoints companies to traverse the acquisition process much more quickly than what had been the default Acquisition Category system that was previously central to DoD 5000 (GAO, 2024). Pathways such as the Middle Tier of Acquisition and Software Acquisition allow for rapid prototyping, rapid fielding, and iterative delivery of products and services—each of which can allow companies to get products into production more quickly, unlike the traditional path to a program of record which can take seven years or longer.

The payment terms of government contracts can also have a significant effect on the ability of companies to raise capital. Many commercial lenders and investors are used to investing in companies that receive regular, subscription-based payments from commercial customers. Therefore, companies whose government contracts have lengthy or irregular milestone schedules are often ineligible to borrow from regulated lenders, such as retail and commercial banks, forcing them to turn to unregulated lending markets which may offer less favorable lending terms, such as higher interest rates or less access to financial services.

Training and Culture: When the DoD engages private capital, it relies on specific DoD personnel to assemble investable deals for companies, using a variety of appropriate tactics, which may vary depending on the nature of the project. Negotiating with investors and investor-backed companies requires a deep understanding of the typical business practices in the financial services industry, types of investment capital, legal aspects of investing, commercial accounting practices, and financial concepts like the time value of money.

Training and education programs, such as those available at the Dwight D. Eisenhower School for National Security and Resource Strategy or Defense Acquisition University, can help the DoD workforce understand commercial business practices, including private investment.

The DoD has also used rotation programs to embed government personnel into investment companies or government innovation offices such as the Defense Innovation Unit, where they can absorb knowledge about innovative tactics for engaging private capital. Many DoD innovation offices have chosen to physically embed their entire teams into hubs of commercial innovation, such as commercial startup accelerator facilities, giving government personnel informal exposure to investors and investor-backed companies (Shah, 2024). In

some offices, the DoD has adopted relevant hiring practices: offices such as the Office of Strategic Capital have deliberately sought personnel with experience working in financial services.[6]

Beyond specific knowledge and skills, successfully engaging private capital requires empowering individuals with a unique mindset—one that is focused on creatively using government resources to create win-win transactions with industry. For such individuals to flourish inside the government, they must be embedded in an organizational culture that is comfortable articulating why a particular transaction will be profitable to a company, instead of viewing company profit as something to be avoided. Creating attractive investment opportunities in the DIB can take a great amount of time and labor, making it critical for organizational incentives to be established that prioritize private capital engagement.

Data and Information Technology Tools: For DoD personnel to effectively engage private capital, they must also be equipped with the appropriate tools to navigate the financial services and commercial technology industries. A range of information technology (IT) tools can play a supporting role, including:

- Market intelligence tools to track trends in the private investment markets, such as fundraising/investment trends, mergers and acquisitions trends, and real-time financial data (e.g., interest rates, valuations data).
- Financial modeling tools to assist with valuation analysis, comparables analysis, and benchmarking of deal terms.
- Industry analysis focused on tracking trends in specific global and commercial market segments, strategic positioning and technology strength of specific companies, and innovation tracking (e.g., using patent data or company announcements).
- Regulatory tracking and analysis tools to interpret the complex and evolving regulatory environment in the investment sector.
- Supply chain risk analysis platforms to assist with due diligence and risk analysis, including assessment of adversarial capital.
- Customer relationship management (CRM) tools to assist with tracking the large volume of stakeholders that can be involved in investment dealmaking.

These tools are routinely used by companies and investors, and many DoD personnel do have access to some tools that offer similar functionality, especially industry analyst platforms, CRM tools, and supply chain risk management (SCRM) tools. In particular, SCRM has been an area of increased investment by the DoD since the 2020 COVID pandemic disrupted global and DoD supply chains. Market intelligence tools like PitchBook and CrunchBase are in widespread use in the investment industry, providing analysis on technology companies and the broader investment environment; in recent years, many of these tools have added data on the defense technology industry.

Federally-funded research and development centers and open-source intelligence offices, such as the Air Force Office of Commercial and Economic Analysis, often provide analysis to help DoD personnel understand specific technology domains. The DoD also acquires a large volume of very detailed data on private companies from a variety of sources, such as Hart-Scott-Rodino M&A reviews, and financial data sharing under DFARS 232.072, but this data is often fragmented and difficult to access.

[6] For example, in one job listing OSC sought "[e]xperience serving as a credit or risk officer in a reputed financial institution, dealing with highly complex and large-scale (multimillion or billion-dollar) transactions . . . [and] developing credit risk models, which may include corporate finance, asset-based lending, and/or project finance transactions" (DoD, 2023).

A number of programs, such as the AFWERX Project Vanguard program, the OASD IBP Office of Industry Engagement, and the National Security Innovation Network, have directly engaged segments of the private investor community, providing channels by which the DoD can learn about trends in the investment industry and directly engage.

Certain DoD offices also make use of commercial or homegrown market intelligence systems to monitor relevant investment and technology markets. Recently, the OSC has focused on creating an analytical toolkit focused on understanding investment, corporate, and technological trends that is "panoramic in scale," yet with "pinpoint accuracy" (DoD, 2025). The approach uses a set of homegrown analytical tools, such as network analysis, corporate finance analysis, capital flow mapping, and IP licensing mapping, in combination with data collected from RFIs and structured interviews in "key global financial centers—including, New York, Silicon Valley, Boston, Dallas, London, Dubai, Tokyo, Singapore, and Sydney—and contested markets in South East Asia, South America, and Africa."

IT tools can be useful for DoD personnel charged with executing specific programs by helping them understand relevant trends and analyze specific companies and investors. There may be opportunities to widen the availability of tools that already exist, or have been procured, through a federated model. If the DoD adopts goals or metrics relating to private capital, then market intelligence or dashboarding tools may be required for leadership to track those goals.

Leadership: As is the case for many innovative acquisition practices, the actions of DoD leadership play a critical role when the DoD engages private capital. As discussed above, demand signal in the form of rhetoric from DoD senior leaders is more meaningful if it is perceived as credible and consistent.

As has been seen in the case studies, a DoD process for engaging capital often requires many years of preparation, along with consistent messaging to investors and companies. Because there is high turnover among DoD leaders, who in turn have much discretion over program design, it is easy for leaders to deter private investment by making unexpected changes.

Engaging private capital usually involves forming coalitions of stakeholders both inside and outside the government. Within government, separate institutions may be responsible for creating demand signal, providing catalytic capital, and executing contracts. These activities must be carefully orchestrated to ensure they reinforce each other, and leadership is essential to conducting this orchestration. Senior leaders provide strategic direction, secure buy-in across government, and use their convening power to maintain and grow stakeholder coalitions. At the highest level, leaders may also be called upon to clearly explain novel business processes to Congress, the president, and interagency stakeholders to gain necessary approvals or resources. Leadership can also create incentives for cultural change when necessary, deliberately rewarding employees who successfully engage private capital.

Conclusion

The DoD possesses a wide and varied array of tactics for engaging private capital that can be powerful when combined wisely. None of these tactics will, on its own, unlock enough private capital to solve the DoD's budgetary challenges, but together they can make a difference. As seen in the case studies, when appropriate tactics are used in concert, a significant amount of private capital can be brought to bear to solve the DoD's most pressing challenges.

Appendix: Calculating Private Investment in the Defense Industrial Base

DIB Contractors

One of the largest sources of private capital investment in the DIB is defense contractors, which regularly conduct R&D and capex investments to support their work with DoD. Since the majority of DoD contract dollars flow to recipients that are publicly traded companies, R&D and capex trends among those companies is available in the filings they provide to the SEC.

Year	2023	2022	2021	2020	2019
DIB	$23B	$21B	$19B	$19B	$25B

For this analysis, the methodology used in the National Defense Industrial Association's Vital Signs report (2025) was used. For each year, the 20 largest publicly traded US defense firms were identified. Companies which received a majority of revenue from non-DoD sources (e.g. healthcare companies) were excluded. The total R&D and capital expenditure of those 20 companies was summed for each year.

M&A

Flowing from both strategic acquirers and private equity funds, M&A transactions are one of the major sources of private capital investment in the DIB. However, it is challenging to calculate an exact, or even approximate value for the amount of dollars invested in these transactions in any given year. Disclosure requirements for private transactions are inconsistent, and most transactions are not required to be reported to the public or government regulators.

Market analysts use a variety of methods to track the amount of M&A activity in a given industry. In certain situations, such as when a transaction may have a material impact on a public company, public announcements are required, or made voluntarily. In other instances, transaction data can be inferred from related public filing data.

For M&A transactions above $1B, investment data tends to be easier to collect. Data on M&A activity in the US aerospace and defense sector, supplied by Capstone Partners (2024), an investment bank, is shown in the table below.

Year	2023	2022	2021	2020	2019
M&A	$24B	$35B	$37B	$21B	$171B

This data does not include transactions below $1B, which tend to constitute the large majority of M&A transactions, so it is probable that the total dollars invested in aerospace and defense are substantially higher.

It should also be noted that for a given M&A transaction the purchase price may not strongly correspond to the amount of capital that company will invest in the future. In most instances, the dollars paid in M&A are used to pay shareholders of the company as part of the purchase. M&A transaction volume does provide an indication of the amount of private capital active in the industry, and potentially available to support new capex or R&D.

Venture Capital

Venture capital is typically invested by limited partnerships in small business or startups with high growth potential. Because venture capital typically targets rapid growth, much of the money invested into companies tends to be used for activities that DoD would consider RDT&E

or capital expenditure, although funds could be used by companies for any other purpose, such as sales or management costs.

Although venture investments are typically private transactions, and therefore not required to be made public, in actuality both venture firms and companies receiving venture investment tend to publicize their transactions, making the data publicly available, if not comprehensive. The data used in this paper was provided by PitchBook (2024), a market intelligence service.

Year	2023	2022	2021	2020	2019
Venture Capital	$35B	$36B	$50B	$20B	$18B

It should be noted that these dollar numbers account are inclusive of investments by venture capital in any company deemed by PitchBook to have potential defense applications, including dual-use technologies like AI.

References

ACMI Group. (2024, February 8). *ACMI awarded contract extension on successful critical chemical pilot program* [Press release]. https://acmigroup.com/2024/02/08/acmi-awarded-contract-extension-on-successful-critical-chemical-pilot-program/

AFWERX. (2023). *2023 annual report*. https://afwerx.com/wp-content/uploads/AFWERX_2023-Annual-Report-Final_CLEARED_AFRL-2024-4054_WEB.pdf

Ara Partners. (2024, September 6). *Ara Partners secures $335 million of non-recourse financing for permanent magnet manufacturing facility.* https://www.arapartners.com/news/ara-partners-secures-335-million-of-non-recourse-financing-for-permanent-magnet-manufacturing-facility/

Authority of the Department of Defense to carry out certain prototype projects, 10 U.S. Code 4022 (d) (C). (2015). https://uscode.house.gov/view.xhtml?req=granuleid:USC-prelim-title10-section3501&num=0&edition=prelim

Capstone Partners. (2024). *Sector fundamentals strengthen while M&A activity declines.* https://www.capstonepartners.com/insights/report-annual-aerospace-and-defense-ma-activity-and-outlook/

Chemicals Knowledge Hub. (2025, January 15). *Lacamas Laboratories purchases Albany fine chemicals facility.* https://www.chemicalsknowledgehub.com/news/lacamas-laboratories-purchases-albany-fine-chemicals-facility/

Clark C. (2015, October 2). *Whoa, Lockheed & Co.! Kendall urges congress to protect innovation*. Breaking Defense. https://breakingdefense.com/2015/10/whoa-lockheed-co-kendall-urges-congress-to-protect-innovation/

Congressional Research Service. (2024, June 7). *Appropriations duration of availability: One-year, multi-year, and no-year funds.* https://www.congress.gov/crs-product/R48087

Defense Acquisition University. (2025). *Acquipedia: Multiyear procurement.* https://www.dau.edu/acquipedia-article/multiyear-procurement

DoD. (2022, August 29). *Defense department launches innovative manufacturing pilot program* [Press release]. https://www.defense.gov/News/Releases/Release/Article/3143134/defense-department-launches-innovative-manufacturing-pilot-program/

DoD. (2023, September 19). *Department of Defense enters an agreement to expand domestic manufacturing to strengthen U.S. supply chains for rare earth magnets*. https://www.defense.gov/News/Releases/Release/Article/3529874/department-of-defense-enters-an-agreement-to-expand-domestic-manufacturing-to-s/

DoD. (2023). *Supervisory loan specialist* [Archived job posting]. https://www.usajobs.gov/job/805507900

DoD. (2024, September 27). Notice of funding availability—Covered technology categories-equipment financing. *Federal Register, 89*(188), 79271–79278. https://www.govinfo.gov/content/pkg/FR-2024-09-27/pdf/2024-22229.pdf

DoD. (2025, January 2). *Investment strategy for the Office of Strategic Capital.* https://media.defense.gov/2025/Jan/02/2003623435/-1/-1/1/FY25-INVESTMENT-STRATEGY-FOR-OFFICE-OF-STRATEGIC-CAPITAL.PDF

DoD. (2025, April 1). *Office of Strategic Capital receives $8.9 billion in financing requests for first domestic manufacturing loan program* [Press release]. https://www.defense.gov/News/Releases/Release/Article/3143134/defense-department-launches-innovative-manufacturing-pilot-program/

Dunn, R. (2019a, September 18). *Prize authority—from prize to what?*. Strategic Institute for Innovation in Government Contracting. https://strategicinstitute.org/other-transactions/prize-authority/

Dunn, R. (2019b, September 12). *Origins and evolution of other transactions—Part 3.* Strategic Institute for Innovation in Government Contracting. https://strategicinstitute.org/other-transactions/origins-evolution-transactions-part-3/

Federal Trade Commission. (2025). *Premerger notification and the merger review process.* https://www.ftc.gov/advice-guidance/competition-guidance/guide-antitrust-laws/mergers/premerger-notification-merger-review-process

Fernando, J. (2024, August 21). *Time value of money: What it is and how it works*. Investopedia. https://www.investopedia.com/terms/t/timevalueofmoney.asp

GAO. (2024, December). *Military departments should take steps to facilitate speed and innovation.* https://www.gao.gov/products/gao-25-107003

Javaheri, A. (2024). *Vertical snapshot: Defense tech update*. PitchBook. https://pitchbook.com/news/reports/2024-vertical-snapshot-defense-tech-update

Maranda, J. (2023, May 3). *X-Bow lands $60M in funding to support its rocket, aerospace technology*. New Mexico Inno. https://www.bizjournals.com/albuquerque/inno/stories/news/2023/05/03/x-bow-lands-jolt-of-funding-to-mature-tech.html

Miles, W., Seraphin, A., Clark, B. (2024, November). *The value of experimentation, not demonstration.*

Mintz, J. (1997, July 3). How a dinner led to a feeding frenzy: With cuts on the way, defense executives were told to combine, conquer at “last supper” in ’93. *Washington Post*. https://www.washingtonpost.com/archive/business/1997/07/04/how-a-dinner-led-to-a-feeding-frenzy/13961ba2-5908-4992-8335-c3c087cdebc6/

Multiyear Contracts: Acquisition of Property, 10 U.S. Code § 3501. (2021). https://uscode.house.gov/view.xhtml?req=granuleid:USC-prelim-title10-section3501&num=0&edition=prelim

Murphy, E. L., Cook, C., Harding, E., Sanders, G., Velazquez, N., Dickson, J., & Sockwell, M. (2024, November 21). *Alternative funding mechanisms in Review*. CSIS. https://www.csis.org/analysis/alternative-funding-mechanisms-review

National Defense Industrial Association. (2025). *Vital signs 2025*. https://www.ndia.org/-/media/sites/ndia/policy/vital-signs/2025/vitalsign_2025_final.pdf?download=1?download=1

Onstad, E. (2023, January 30). *Germany's Vacuumschmelze agrees binding deal with GM on magnet factory.* Reuters. https://www.reuters.com/markets/commodities/germanys-vacuumschmelze-agrees-binding-deal-with-gm-magnet-factory-2023-01-30/

Perley, C. (2024). *Performance report*. Army Applications Laboratory. https://aal.army/assets/files/pdf/aal-performance-report.pdf

Pomerleau, M. (2024, July 19). *Joint force, international partners, contractors test command and control capabilities in Pacific exercise.* DefenseScoop.

PR Newswire. (2024, December 3). *U.S. Navy selects X-Bow Systems to modernize and automate energetics industrial base.* https://www.prnewswire.com/news-releases/us-navy-selects-x-bow-systems-to-modernize-and-automate-energetics-industrial-base-302321127.html

PR Newswire. (2024, July 10). *X-Bow raises more than $70 million Series B to accelerate expansion of hypersonic and solid rocket motor technologies.* https://www.prnewswire.com/news-releases/x-bow-raises-more-than-70-million-series-b-to-accelerate-expansion-of-hypersonic-and-solid-rocket-motor-technologies-302193599.html

Required Financial Reviews, DFARS 232.072. (2025). https://www.acquisition.gov/dfars/232.072-financial-responsibility-contractors.

Seraphin, A., and Halcrow, S. (2025). *From breakthroughs to the battlefield: Best practices for tapping into the power of prototyping.*

Shah, R. M. (2024). *Unit X: How the Pentagon and Silicon Valley are transforming the future of war*. Scribner.

South Carolina Department of Commerce. (2023, December 13). *E-Vac Magnetics to build first U.S. facility in Sumter County*. https://www.sccommerce.com/news/e-vac-magnetics-build-first-us-facility-sumter-county

U.S. Navy Program Executive Office. (2024). *Industry engagement overview*. https://www.peodigital.navy.mil/Industry/

X-Bow Systems. (2023, April 26). *X-Bow Systems announces selection for $60 million STRATFI award* [Press release]. https://www.prnewswire.com/news-releases/x-bow-systems-announces-selection-for-60-million-stratfi-award-301808692.html

Yu, K. (2024, June 1). *Mergers, acquisitions vital for defense innovation.*

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