

Technology Policy Accelerator
ACCELERATING DEFENSE TECH INNOVATION

Venture Capital and National Security

Managing a New Strategic Reserve

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What scale of defense spending is required to keep venture capital funding next-generation warfighter capabilities? Over the past decade, the venture industry has invested more than $40 billion into startup companies that are developing next-generation warfighting capabilities. Whereas many aerospace and defense startups founded between 2000 and 2015 pursued dual-use business models, a new generation of companies has emerged more recently. These companies, of which today there are more than 250, are building for combat power.[1] Although this private capital has accelerated the pace of new capability development, it has also created a financial liability. If these companies are to serve a strategic long-term role in the US defense industrial base, Pentagon spending will have to deliver the revenues required for venture-scale financial returns. In the following analysis we exclude the industry wunderkind Anduril, which has raised more than $10 billion, to focus on the many companies that often stay below the headlines. We estimate that the subset of these other companies that is ultimately successful will require US defense spending of nearly $15 billion annually by 2030 and about $36 billion annually by 2035, compared with an estimated $1.9 billion in prime contracts awarded in FY2026.

Why should the government care whether venture investors earn a return? Venture capital buys capability that the Department of War (Defense, DOW) would otherwise have to fund itself or go without. In early-stage companies, this can lead to tremendous financial leverage, with one government dollar awarded drawing as many as ten private dollars in investment. With this approach, private capital carries much of the early cost and risk, so the department need not write a perfect specification before prototyping begins. And, in contrast to the traditional defense industrial base, these venture-backed companies iterate at commercial speed, which recent conflicts in Ukraine and the Middle East have shown matters in modern warfare. As a class, these companies form a new strategic reserve—privately financed capacity to design, test, and field new systems rapidly. Like any strategic reserve, this one requires consistent upkeep to remain available for when it's needed most. Here, that required investment is the

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minimum amount of DOW business necessary for financially driven private investors to earn expected returns.

This is the second in a series of papers on America's emerging venture-backed defense industrial base. The first tracked adoption: how much these companies have earned from the government and in what form. This paper asks a broader question: Is it enough? Is DOW adoption on track to give investors a reasonable chance of returns consistent with venture capital investment? In the following sections, we develop an answer to this question using three independent methods, whose results broadly agree (see Key Findings). Those sections describe the companies, the requirement, and our methods. After, we describe what the findings mean for Congress and the department. Appendix A details each method in full.

KEY FINDINGS

$1.9 billion in DOW revenue today. The 258 venture-backed companies that build mainly for defense were awarded an estimated $1.9 billion in defense obligations in fiscal year (FY) 2026, about 0.4% of the $429 billion in total that Congress appropriated for DOW research, development, and procurement.*

$14.5 billion a year needed by FY2030 to return investor capital. To give their investors a reasonable chance of a nominal venture-scale return, this cohort would need about $14.5 billion a year, in total, from the DOW by FY2030 and $36 billion by FY2035, assuming venture investment continues at half its record-setting 2026 pace.

65% yearly revenue growth required. Reaching the FY2030 figure would require DOW revenue to these companies to grow by about 65% a year. This is a substantial but achievable figure, given that it is below the 86% a year they have managed since 2023.

Revenue must concentrate in a subset of successful companies. Roughly 10% to 20% of current companies must reach meaningful revenue, $200 million or more a year, to drive compelling exits. The overall group could reach its aggregate requirement without any single company reaching the scale an exit demands. Large production awards that carry a few companies to scale do more for the future prospects of the field than small awards spread uniformly.

Revenue must arrive by the early 2030s. For returns to fit standard venture fund cycles, the revenue requirement climbs most steeply from FY2028 to FY2032, from about $6.9 billion to $22 billion a year in our middle-of-the-road case. Those are the years when many companies need to move from research dollars to substantial procurement awards, so that venture funds can return capital to their limited partners on the timelines they promised.

If public markets value defense technology companies like defense prime contractors, instead of like technology companies, revenue requirements could grow precipitously. Our figures assume public markets and acquirers value successful companies at 10 times revenue. At the 2 times paid for traditional defense primes, the requirement would be meaningfully larger.

*Office of the Under Secretary of War (Comptroller)/Chief Financial Officer, Defense Budget Overview: United States Department of War Fiscal Year 2027 Budget Request (Washington, DC: Department of War, May 2026), A-1, table A-1. FY2026 enacted procurement ($219.2 billion) plus research, development, test, and evaluation ($209.4 billion), including $121.0 billion of mandatory funding from Public Law 119-21.

A NEW STRATEGIC RESERVE

Venture capital suits industries with large markets, where key risks can be retired on modest spending and revenue can scale more rapidly than capital expenditures. National security was not historically a major focus area for venture capital. However, several trends then piqued venture interest in the sector. After the late-2000s financial crisis, the venture industry expanded dramatically, and investors with more capital to deploy began looking beyond familiar market opportunities. First-generation dual-use companies such as SpaceX and Palantir proved the model could succeed on public markets, while organizations like In-Q-Tel and the Defense Innovation Unit built bridges to the startup world and advanced acquisition reform. Ukraine then demonstrated on the battlefield the value of commercial technology and rapid iteration in war.

Venture investors committed about $800 million to aerospace, defense, and space technology companies over 2000–2010 and have committed more than $80 billion since 2020, a hundredfold increase, across hundreds of startups. On average, the companies that produce an operational hardware-based product or service will raise approximately $300 million across a series of financing rounds.[2]

A deeper shift underlies these recent developments. Before 1980, federal research and development (R&D), driven largely by defense, outpaced commercial R&D. By 2022, the latest year with available data, the commercial sector funded $673 billion of R&D to the federal government's $164 billion, a ratio of more than four to one.[3] The result is a vast commercial catalog of sensors, actuators, and processors, the backbone of the consumer electronics boom of the past three decades, that can be applied to any sector. Complete systems can now be integrated, tested, and refined far earlier and with far less investment than before. Over the past two decades, venture-backed startups perfected this low-cost spiral development process while the traditional defense industrial base continued using existing methods to develop exquisite, low-volume systems.

Historically, defense acquisition was not built for this spiral development approach. For most of the postwar era, the government handled conceptual design, trade studies, and requirements internally. It then released a specification for industry to build. Because it bore the full cost from R&D through deployment, the government imposed intense oversight and tolerated little financial risk.

Venture-backed companies bring commercial R&D into defense—and with it a different division of risk. Private investors carry much of the early development cost, so government buyers need not write perfect specifications before building begins. By engaging closely with military end users, these companies understand both the mission and the technology frontier. They pursue "80/20" solutions that solve most of a problem quickly and cheaply; they then raise more capital or partner with a prime to scale. This class of company offers several benefits: products built using bleeding-edge commercial components, engineers experienced in rapid iteration at scale, a red team for strategy (if outsiders can find an approach, adversaries likely can too), public-private risk sharing that stretches taxpayer dollars, and speed, raising millions in weeks rather than waiting on procurement and appropriations cycles.

Early-stage investments are highly uncertain, so investors tranche capital through multiple funding rounds that grow as companies retire risk, each typically funding eighteen to twenty-four months of runway. Small early rounds let investors place many bets, so modest demand signals, often just an interested customer or a single-digit-million contract, can catalyze the first $10 million to $20 million in investment. Early on, one government dollar may draw as many as ten private dollars. As a company scales, the math flips. Once financing rounds reach hundreds of millions of dollars, investors expect billions in committed backlog, or five to ten dollars of future revenue commitments for each new investment

HOW A VENTURE FUND WORKS, IN FOUR NUMBERS

Ten to twelve years. A typical venture fund operates on a ten- to twelve-year fund cycle. Its investors, called limited partners (LPs), are often university endowments, public pension funds, corporations, and wealthy individuals. LPs commit money for the fund's whole life, and the firm's partners decide which companies to back. A fund's vintage is the year it begins investing.

Three times, net of fees. Limited partners expect an annual return upwards of 15% to 20% over the lifetime of the fund. To deliver these results, a venture fund must grow its capital to about 3.5 times the initial commitments. Because its holdings typically cannot be sold easily, the fund is repaid only when companies are acquired or go public.

One to five. Venture returns follow a power law, in which a few winners carry the fund. In a typical fund, just a handful of investments, one to five, "return the fund," with the fund's stake in each worth about 0.5 to 1.5 times the whole fund at exit. Most of the fund's other investments return little or nothing.*

5% to 20%. The stake an early investor typically holds in a company when it exits, after later rounds dilute its ownership. That is why one company must exit at a multibillion-dollar valuation to return a median $500 million fund.

Rounds and leads. Companies raise money in stages, from a seed round through Series A, B, C, and beyond, each larger as risk falls. The investor that sets a round's price and terms, and usually takes the largest stake, is its lead.

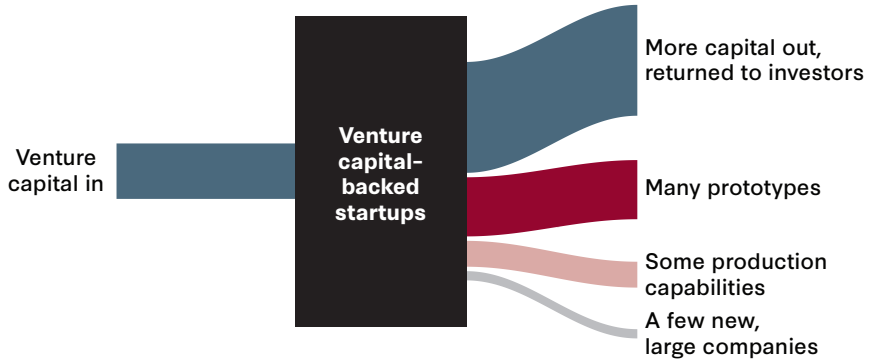
*Dan Berkenstock and Jon Chung, "The Warfighter's Pipeline: A Blueprint for Aligning Defense Acquisition with Venture Capital," Technology Policy Accelerator, Hoover Institution, April 2025.

dollar (see How a Venture Fund Works, in Four Numbers, which sets out the fund economics behind that expectation).

The financial returns from the past decade's surge of venture investment in aerospace and defense, and therefore whether defense is a durable venture category, will become clear in the coming years. Other industries, such as climate technology, have seen similar investment growth and then vanished once returns failed to materialize. Under the right conditions, the US military can forge a durable partnership with entrepreneurs and private capital, one that keeps its warfighting capabilities at the technological frontier. Under the wrong ones, venture investors will move on to other markets. The traditional industrial base would then be left struggling to adopt iteration cycles foreign to its corporate nature.

Figure 1 sketches the sector as a whole. Capital flows in and, if the model works, more flows out, along with many prototypes, some production capabilities, and a few new, large companies.

FIGURE 1 How capital moves through the venture-backed defense sector



Source: Figure by the authors.

PROGRESS OF THE EMERGING VENTURE-BACKED DEFENSE INDUSTRIAL BASE

In our previous paper studying the universe of US-based, venture capital–backed aerospace and defense startup companies, we defined a cohort of 882 startup companies that serves as the starting point for our current analysis.[4] That group includes every US-headquartered company that PitchBook classifies in the aerospace and defense sector and that has raised at least $1 million in an initial venture round since 2000, together with all companies named to the Silicon Valley Defense Group's annual NatSec100 lists. Companies that began venture-backed and later went public remain in our initial group.

Three companies from this list merit special consideration. SpaceX and Palantir began venture-backed, have since gone public, and have outpaced every other company in the sector. Their public valuations serve as benchmarks for what the market can pay for revenue, under favorable conditions, but otherwise we exclude them from the remainder of our analysis. Anduril remains private, but its revenue dwarfs that of every other venture-backed aerospace and defense company. Its size and somewhat unique circumstances make its experience less helpful in discerning the revenue required to justify exits for the rest of the category, so we examine it independently of the others.

The remainder of this paper asks whether purely defense-focused companies can deliver the returns that venture investors expect, so we narrow the cohort further. The companies in this smaller group must be private, venture-backed, and based in the United States. They must also have raised at least $10 million in disclosed seed and venture rounds or have been founded since 2021. Companies that have gone public, been acquired, moved to private equity ownership, or ceased operations are excluded from the present analysis, as are companies supported only by accelerators or angel investors. We also set aside four additional outliers: OpenAI and Databricks, whose combined raised capital of more than $200 billion primarily targets commercial artificial intelligence markets; founder-funded Blue Origin; and Sierra Space, whose $1.4 billion 2021 Series A was the first outside capital for an established, 1,100-person subsidiary of Sierra Nevada Corporation.[5]

We divided the remaining companies into four categories by primary market. Defense-primary companies build for military missions and count the military services and defense agencies as their main customers. Dual-use companies sell products to defense customers but have commercial markets comparable to or larger than defense. Commercial-primary companies sell mainly to businesses or consumers. A fourth group sells to government buyers outside the DOW, such as NASA, the intelligence community, the Department of Homeland Security, or state and local agencies. Space companies are treated as defense-primary unless their business rests on commercial or consumer demand, such as consumer broadband, space tourism, or commercial space stations. We applied the rubric to each company's PitchBook description, industry classification, and DOW contract record using a language model.

TABLE 1 VENTURE CAPITAL RAISED AND DOW OBLIGATIONS EARNED, BY PRIMARY MARKET, $B

	Companies	Investment raised ($B)	DOW obligations ($B)	DOW dollars per dollar raised
Anduril	—	$11.9	$3.3	0.28
Defense-primary companies	258	$29.8	$3.9	0.13
Dual-use companies	81	$22.8	$1.9	0.08
Non-DOW government companies	18	$2.4	$0.0	0.01
Commercial-primary companies	149	$51.4	$0.5	0.01

Note: Nominal dollars. Investment is disclosed seed and venture rounds, and obligations are cumulative DOW obligations.

Source: Table by the authors using data from PitchBook Data Inc. and USAspending.gov, US Department of the Treasury, Bureau of the Fiscal Service.

The resulting subset contains 258 defense-primary companies and eighty-one dual-use companies. See appendix B for the complete lists.[6]

Together, the 258 defense-primary companies have raised $29.8 billion in disclosed venture capital and earned $3.9 billion in cumulative DOW obligations (table 1), while the eighty-one dual-use companies have raised $22.8 billion and earned about $1.9 billion. As a group, the defense-primary companies have earned about $0.13 of defense revenue for each dollar raised. Anduril, the sector's largest bet, which is not included in our cohort, stands at $0.28.

Capital across the field, for both defense-primary and dual-use, is concentrated in a small set of companies. Excluding Anduril, the five largest defense-primary companies have raised $10.6 billion, or 36% of that group's disclosed venture capital, and the five largest dual-use companies have raised $9.0 billion, or 40% of theirs (table 2).

The advent of defense-primary-focused startups is a relatively new phenomenon. Of the 254 defense-primary companies with a recorded founding year, 179 (70%) were founded in 2021 or later. About 98% of the capital these companies have raised came in 2021 or later, and 74% in 2025 and 2026 alone.

Defense revenue has grown far more slowly than the investment behind it. Figure 2 shows the R&D and product procurement obligations the DOW has made to each group by fiscal year. For the defense-primary group, these rose from about $96 million in FY2020 to $1.0 billion in FY2025, and the first nine months of FY2026 alone exceeded that total by 46% (figure 2a).[7]

TABLE 2 TOP FIVE DEFENSE-PRIMARY AND DUAL-USE COMPANIES BY VENTURE CAPITAL RAISED, $M

	Technology domain	Disclosed venture capital ($M)	DOW obligations ($M)	DOW dollars per venture dollar
Defense-primary				
Shield AI	Robotics and Autonomy	2,810	114	0.04
Saronic	Robotics and Autonomy	2,595	394	0.15
Hadrian	Advanced Manufacturing	2,338	39	0.02
Castelion	Munitions	1,524	346	0.23
Impulse Space	Space	1,333	45	0.03
Dual-use				
Relativity Space	Space	2,384	14	0.01
Stoke Space	Space	2,348	10	0.00
PsiQuantum	Quantum	1,665	217	0.13
Dataminr	AI/ML	1,347	497	0.37
Astranis	Space	1,206	22	0.02

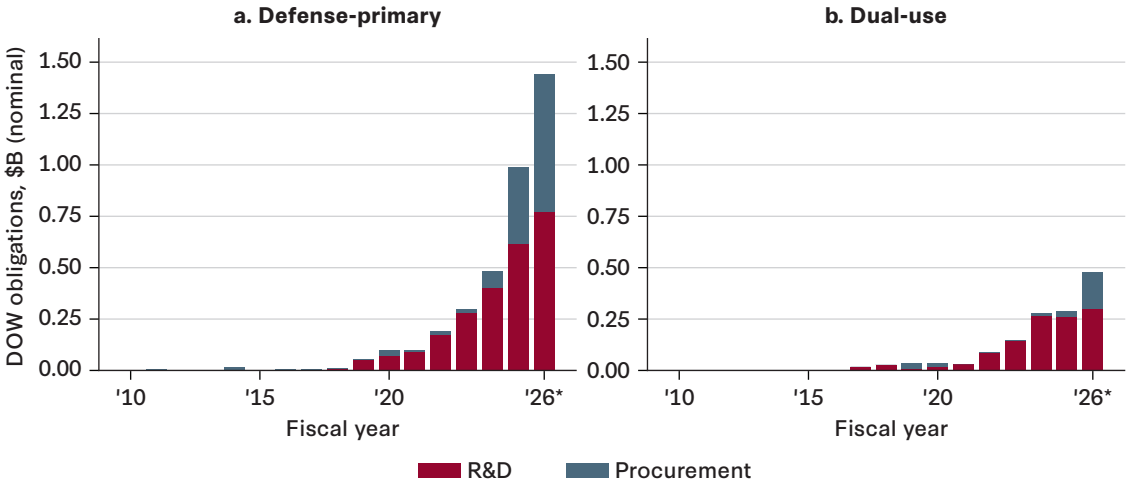
Note: Nominal dollars. Venture capital is disclosed seed and venture rounds. Obligations are cumulative prime awards.

Source: Table by the authors using data from PitchBook Data Inc. and USAspending.gov, US Department of the Treasury, Bureau of the Fiscal Service.

Procurement is a growing share, as compared to R&D, increasing from 17% of the total in FY2024 to 38% in FY2025 and 46% so far in FY2026. Across all years, the group has received about $3.7 billion in DOW research and procurement obligations. The $3.9 billion in table 1 also counts services and other obligations.

There are two important limitations to these figures. First, an obligation is not yet revenue. It records the government's commitment to pay when a contract, order, or option is signed. Outlays follow as the work is delivered. Over several years the two measures generally align, so we use obligations as the measure of DOW revenue, but in any one year they can differ. Second, the public award data we use, from USAspending.gov, record prime awards. This source misses revenue a company earns as a subcontractor to a prime, most classified work, and funds that pass through other transaction consortia, where the consortium manager holds the prime award. For companies that sell mainly through primes, such as component manufacturers, these figures can understate defense revenue substantially.

FIGURE 2 DOW research and development and procurement obligations, by fiscal year, nominal $B



Note: (a) Defense-primary group, excluding Anduril. (b) Dual-use group. Services and launch excluded. FY2026 partial (data through June 2026).

Source: Figure by the authors using data from USAspending.gov, US Department of the Treasury, Bureau of the Fiscal Service; the Federal Procurement Data System; and PitchBook Data Inc.

SPACEX AND PALANTIR: WHAT PUBLIC MARKETS CAN PAY FOR REVENUE

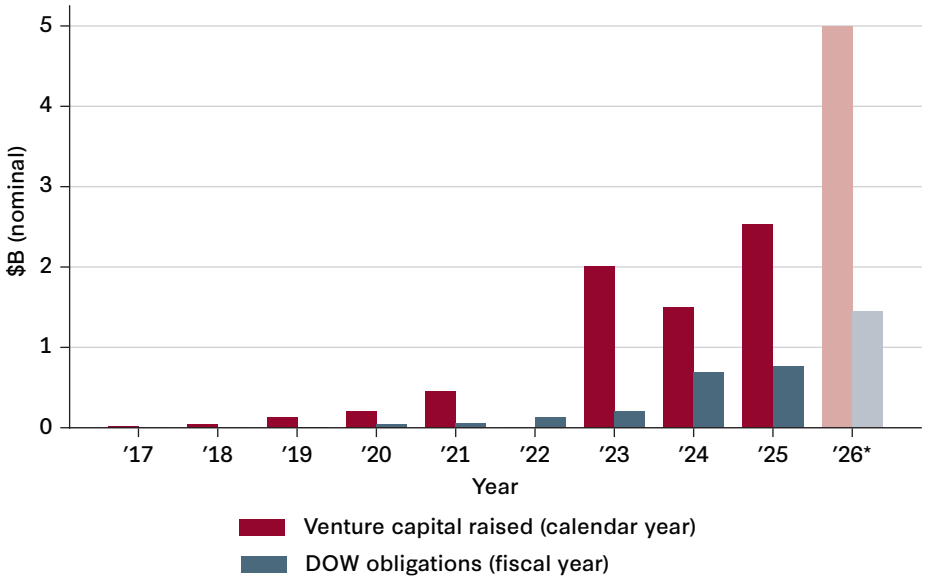
SpaceX and Palantir have already returned their investors' capital. At this point, their public valuations provide value in showing what the market will pay for revenue at scale. SpaceX listed on Nasdaq in June 2026. At its October 14, 2026, closing price, its market value was about $2 trillion, roughly 87 times its $23 billion in trailing twelve-month revenue. That revenue includes SpaceXSI, which SpaceX absorbed in February 2026. About one-fifth of SpaceX's 2025 revenue came from US federal agencies.[8] Palantir's market value on the same date was about $483 billion, roughly 78 times its $6.2 billion in trailing twelve-month revenue, about 40% of which comes from the US federal government.[9] Both multiples sit far above what we expect most successful aerospace and defense companies to justify. They should likely be viewed as exceptions, not the rule, compared to the cohort attempting to follow in their footsteps.

ANDURIL: THE LARGEST AMOUNT OF CAPITAL RAISED—AND STILL AWAITING RETURN

As of the most recent available data, Anduril has raised $11.9 billion across eleven seed and venture rounds since its founding in 2017, $7.5 billion of it in 2025 and 2026 alone (figure 3). Its DOW obligations have grown every year, from $7 million in FY2019 to $760 million in FY2025 and $1,447 million in the first nine months of FY2026. In total the company has earned $3.3 billion in DOW obligations, or about 0.28 contract dollars for every dollar raised.

Unlike SpaceX and Palantir, Anduril is still privately held. In May 2026, it raised $5 billion at a $61 billion valuation, about 28 times the $2.2 billion of revenue it reported for 2025 and about

FIGURE 3 Anduril's venture capital raised and DOW obligations, nominal $B



Note: Disclosed seed and venture capital is shown by calendar year of round and DOW obligations by fiscal year. Data for 2026 are partial (venture rounds through early October 2026, DOW obligations through June 2026).

Source: Figure by the authors using data from USAspending.gov, US Department of the Treasury, Bureau of the Fiscal Service; the Federal Procurement Data System; and PitchBook Data Inc.

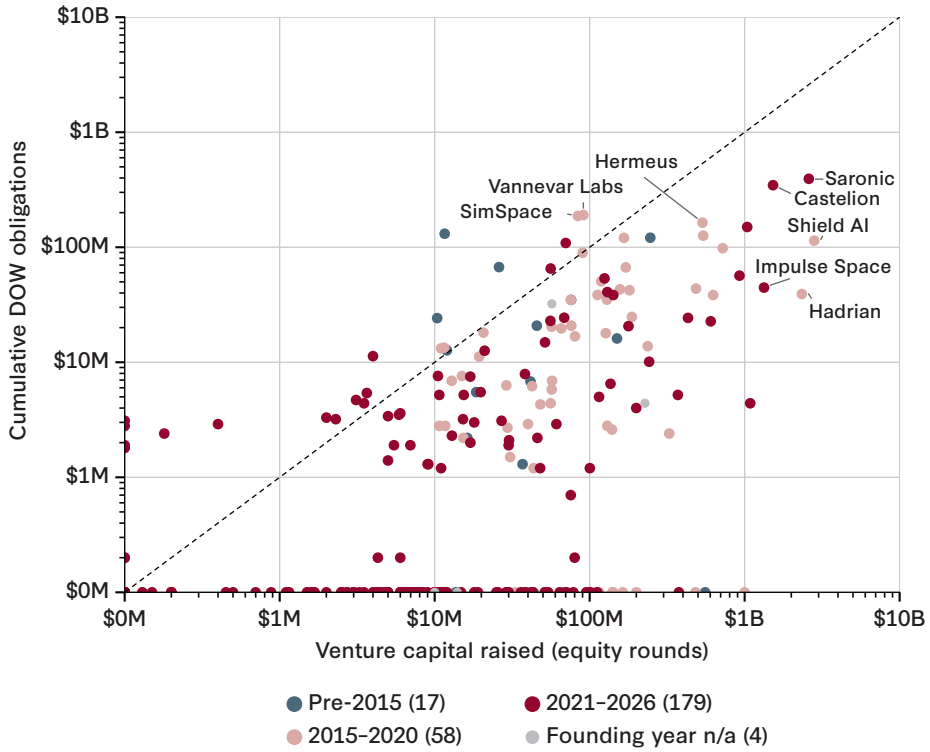
32 times its annualized FY2026 DOW obligations. Private investors are already pricing Anduril closer to SpaceX and Palantir than the primes, on the expectation that its revenue will keep growing rapidly.[10]

THE CAPITAL INVESTED AND THE DOW REVENUE IT HAS CONVERTED

Stepping back from the largest companies to the full defense-primary group, figure 4 sets each company's cumulative DOW obligations against the disclosed venture capital it has raised. Examining this measure shows that most of these companies are still early in the work of producing substantial government revenue per dollar of investment. Many of these companies remain in the initial phase of development, where small government revenues create financial leverage. Soon they will move to the later phase of company growth, where additional investment demands substantial obligations. Only twenty-four of the 258 companies, led by Vannevar Labs, SimSpace, and Ametrine, have earned more in DOW obligations than they have raised in disclosed venture capital.

The ratio is uneven across the group. It varies by technology domain, from about $0.01 per venture dollar in advanced manufacturing to $0.96 in materials, a domain of only six companies (figure 5a). It also rises with the amount of capital a company has raised. About 22% of companies that raised less than $10 million have won at least $1 million in DOW obligations, against 81% of those that raised more than $200 million (figure 5b). Today, more capital raises the odds of a real contract, though not yet at a scale that would satisfy a venture return.

FIGURE 4 Venture capital raised against cumulative DOW obligations (defense-primary companies)



Note: One dot per company, defense-primary group, excluding Anduril. Venture capital is disclosed seed and venture rounds. Obligations are cumulative, all categories, nominal. Both axes are logarithmic, with companies at zero on either measure plotted on the axis. The diagonal marks one contract dollar per venture dollar raised. Dots are colored by founding year. Labels name the five companies with the most capital raised and the five with the most DOW obligations.

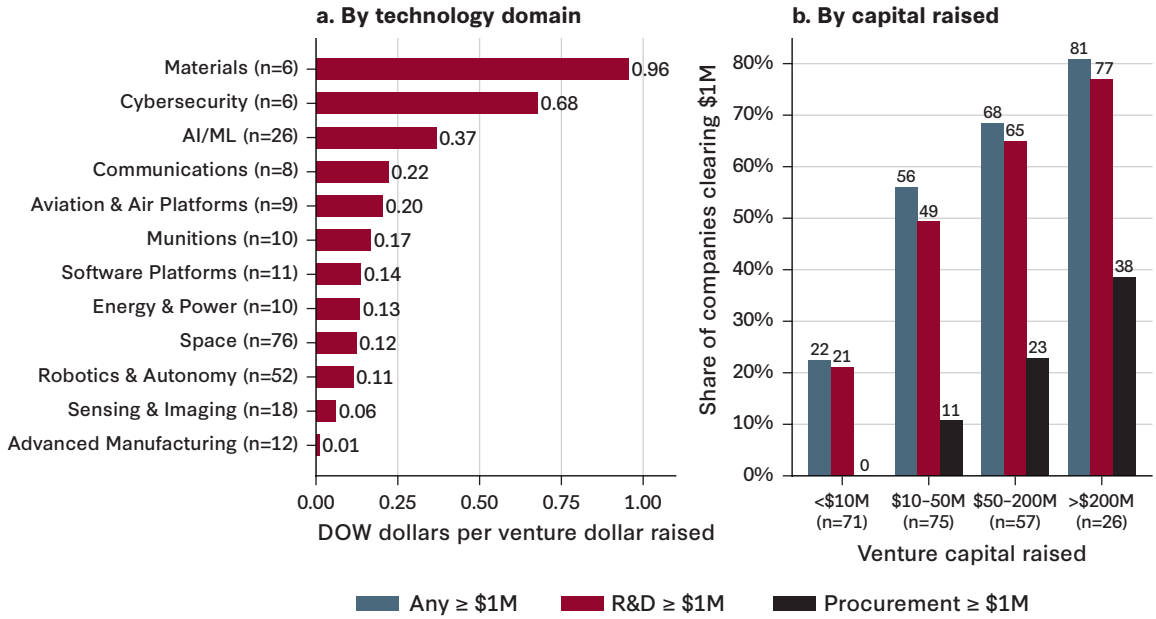
Source: Figure by the authors using data from USAspending.gov, US Department of the Treasury, Bureau of the Fiscal Service; the Federal Procurement Data System; and PitchBook Data Inc.

THE REQUIRED MARKET

Chaining all of these pieces together points to the conditions required for this venture capital–fueled national security experiment to succeed. If a median venture fund needs a handful of companies worth 50% to 150% of a $500 million fund, an early-stage investor owns about 10% of a company at exit, and the market prices an initial public offering (IPO) at about 10 times annual revenue, then investors need confidence that a successful investment can eventually reach $250 million to $750 million in annual revenue.[11]

The recent trend of startups focusing purely on defense customers puts the burden of this revenue requirement squarely on the Pentagon. Historically, dual-use companies could reach the necessary revenue threshold on a combination of commercial and government sales, with defense as one revenue stream among several. Now, many of the most promising companies are building their capabilities exclusively for US warfighters and intelligence analysts, which

FIGURE 5 DOW contract conversion by technology domain and by capital raised



Note: Defense-primary group, excluding Anduril. (a) Cumulative DOW obligations per dollar of disclosed venture capital, by technology domain (domains with at least five companies). (b) Share of companies with at least $1 million in cumulative DOW obligations (any, R&D, or procurement), by capital raised. Excludes the twenty-nine companies with no disclosed capital.

Source: Figure by the authors using data from USAspending.gov, US Department of the Treasury, Bureau of the Fiscal Service; the Federal Procurement Data System; and PitchBook Data Inc.

makes US government contracts their primary—sometimes their only—path to sustainability. Of the private, venture-backed companies in our analysis that sell to the DOW, 83% of those founded since 2020 build mainly for defense versus 60% of those founded in 2015–2019.

So how much US government revenue does the venture-backed defense sector need to succeed? A naive estimate starts from the 258 defense-primary companies. Suppose one in ten of them, or twenty-six companies, reaches maturity, and each needs $250 million to $750 million in annual revenue. Those winners would need something on the order of $6 billion to $20 billion a year from the DOW, roughly 3 to 10 times the $1.9 billion we estimate the group was awarded in FY2026.

A more refined estimate must account for differences in fund size, the capital each company raises, the revenue multiples public market investors are willing to pay, and whether a company sells only to the US defense budget or also to other government, international, or commercial buyers. We built three separate methods to analyze these factors. Each method approaches the question from a different angle and rests on different data. Table 3 summarizes them, and appendix A sets out each in full (table A1).

TABLE 3 THREE METHODS TO SIZE THE REVENUE REQUIREMENT

	Method 1: Value multiples	Method 2: IPO check	Method 3: Fund-size returns
The question	What should the money already invested be worth by year, assuming investors expect 15% to 25% annual returns, and how much DOW revenue would justify that value?	How much revenue do venture-backed companies typically have when they go public, compared with how much capital they have raised, and what would these companies need to match it?	How large an exit does each company need to repay the fund that led its investment, and how many such exits does the group need?
Strength	Simple, relatively few driving assumptions	Anchored in what real companies have achieved before they listed	Follows the money investor by investor, with the fund clock setting the timing
Weakness	Treats the group as one portfolio and leans on the assumed return and multiple.	Rests on assumed odds of raising each round and the applicability of prior IPO metrics to this sector.	Fund sizes are known for a subset of the leads, and each company either wins outright or returns nothing.

Source: Table by the authors, drawing on the analysis in appendix A.

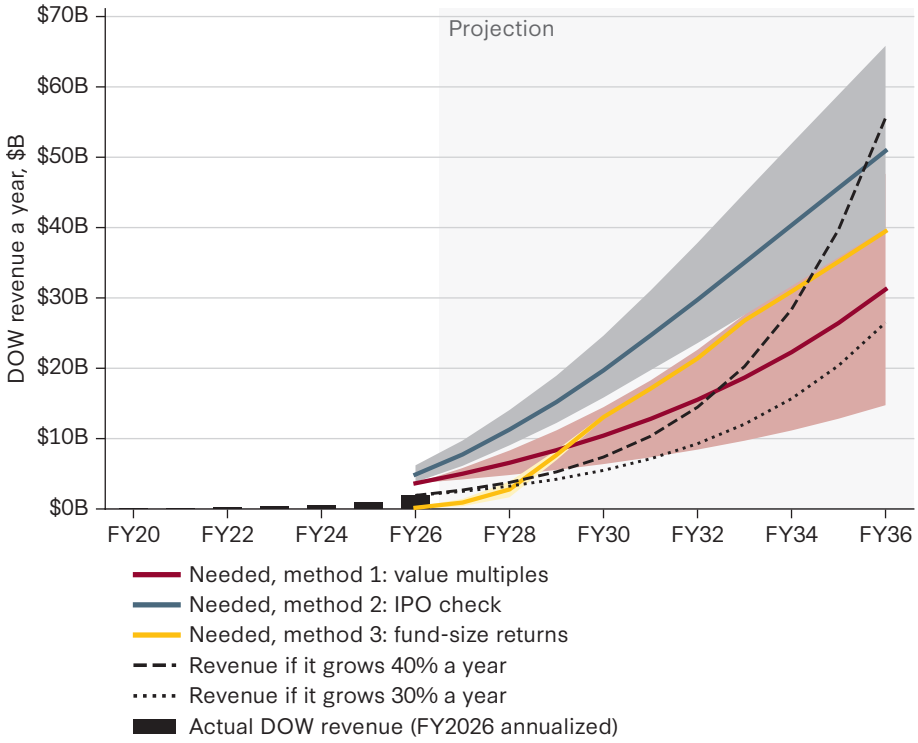
Figure 6 sets the required revenues under each method against what the companies receive today.

Each method gives a low, middle, and high case, which are driven by three separate paths for new venture investment after 2026. In the low case, no new money arrives. In the middle case, it arrives at half the 2026 pace, or about $8 billion a year. In the high case, it arrives at the full 2026 pace, or about $16 billion a year. Table 4 averages the three methods for each case.

In the middle case, the defense-primary companies would need about $14.5 billion a year from the DOW by FY2030 and $36 billion by FY2035, roughly 7 and 19 times the $1.9 billion they are on pace to receive in FY2026. Even with no new investment, the defense-primary companies would need about $12 billion and $28 billion. At the 2026 pace, the figures rise to $17.5 billion and $45 billion. Figure 6 shows how each method's requirement builds year by year. The methods sit closest together around FY2030 and spread after, as their assumptions about new investment and post-exit growth compound.

Do these methods point to plausible revenue scenarios? The group's DOW revenue has grown, on average, 86% a year since 2023. If future growth maintained that pace, revenues would reach $23 billion by FY2030, enough to clear even the high case. That outcome would

FIGURE 6 Annual DOW revenue defense-primary companies need under each method versus what they receive (FY2020–FY2036)



Note: Ten times revenue. Lines show each method's middle case and shaded bands its low to high case. Method 1 at a 15% annual return, from no new investment after 2026 to the 2026 pace. Method 2 from the low to the high odds of raising each round. Method 3 on an eight-year fund clock, from the largest to the smallest plausible lead fund, scaled to the whole group. Columns show actual DOW R&D and procurement obligations, FY2026 annualized. Dashed lines grow the FY2026 figure at 40% and 30% a year. Shaded years are projections. Nominal dollars.

Source: Figure by the authors using data from PitchBook Data Inc.; IPO prospectuses (Form 424B4) and company Form 10-K filings, US Securities and Exchange Commission; and USAspending.gov, US Department of the Treasury, Bureau of the Fiscal Service.

mean the DOW multiplying its purchases from these companies about twelvefold in four years. Reaching the middle case requires average growth of about 65% a year. At 40% a year, revenue would reach about $7.4 billion by FY2030, short of the middle case; at 30% a year, it would reach about $5.5 billion, short of every case's midterm requirement (figure 6).

VALUATION MULTIPLES, A KEY DRIVER

The ratio of valuation to revenue is a key driver across all of our analyses.

The valuations of young companies are typically driven by precedent and competition among investors rather than rigorous financial metrics. As companies approach an exit, investors begin to price them based on business metrics, such as revenue, growth rate, and margins, set by comparable publicly traded companies. The five largest US defense prime contractors

TABLE 4 DOW REVENUE DEFENSE-PRIMARY COMPANIES NEED, BY INVESTMENT SCENARIO ($B A YEAR)

Scenario	New venture investment after 2026	FY2030	FY2035
Low	None	11.8 (6–16)	27.9 (13–36)
Middle	Half the 2026 pace (about $8 billion a year)	14.4 (10–20)	35.7 (26–46)
High	The 2026 pace (about $16 billion a year)	17.4 (13–25)	44.7 (35–59)
Received in FY2026, annualized		1.9	

Source: Table by the authors, drawing on the analysis in appendix A.

trade at 1.6 to 2.7 times trailing revenue. SpaceX trades at about 87 times and Palantir at about 78. It is possible that today's emerging private defense companies reach higher margins and faster growth than the primes, but it is still unclear how public markets will ultimately value this new crop of companies. Figure 7 shows the kinds of public companies, across the broader US economy and within aerospace and defense, that the market prices at a wide range of multiples of revenue.

We use 10 times because it sits between the clearest reference points, the primes on one side and SpaceX and Palantir on the other. Private investors priced Anduril at about 28 times its 2025 revenue in May 2026 on the expectation that its revenue will keep growing rapidly. Among public companies, those priced near 10 times have grown revenue about 21% a year and those near 20 times about 26% annually. We believe most successful aerospace and defense companies can justify 10 to 20 times.[12] Table 5 shows how the middle case changes across the spectrum of valuations paid by public markets. Because it averages the three methods, its row for 10 times revenue matches the middle case in table 4.

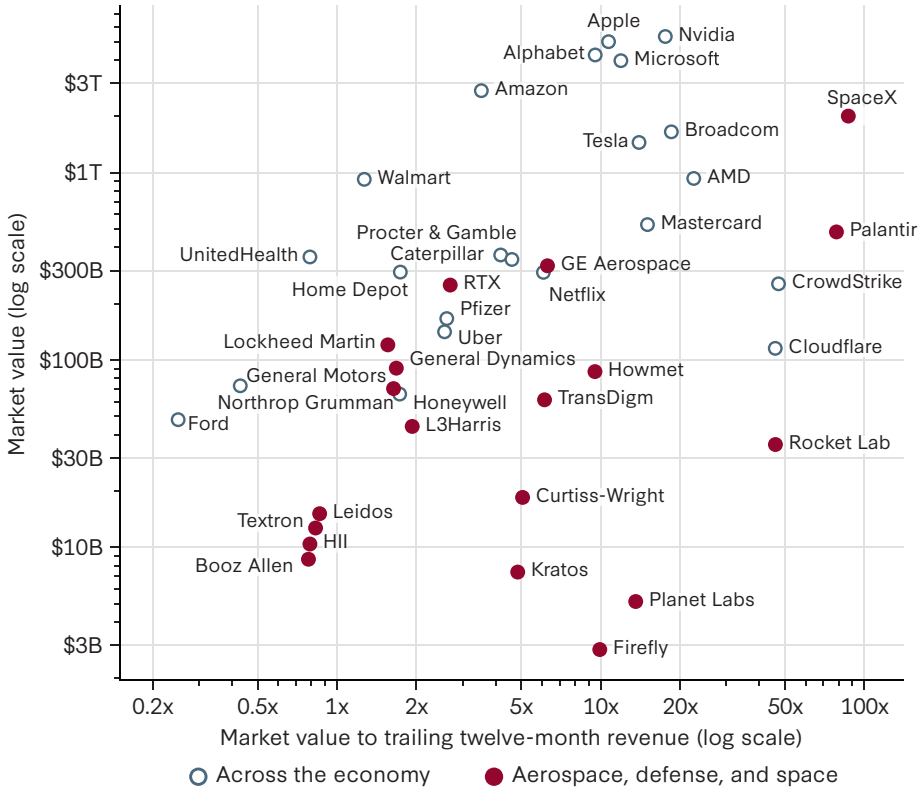
HOW THE THREE METHODS WORK

Method 1. Value Multiples

The first method starts from what investors expect each year's investment to earn, roughly 15% to 25% a year. At those rates, the $30 billion already invested should already have appreciated to be worth between $36 billion and $44 billion today. At 10 times revenue, justifying even the low end would have needed approximately $3.6 billion of DOW revenue in FY2026, nearly twice what the group received.

The future requirement grows as expectations for previously invested capital compound and as new money arrives. With no new investment, the group would need about $6.4 billion a

FIGURE 7 Market value against trailing revenue multiple, selected public companies



Note: Examples chosen for variety across the economy and within aerospace, defense, and space at the October 14, 2026, closing price. Market value of all share classes is divided by revenue for the four most recent reported quarters. Enterprise value would place the primes somewhat higher because of their net debt. Both axes use a log scale.

Source: Figure by the authors using data from company Form 10-K and 10-Q filings, US Securities and Exchange Commission (XBRL financial data) and Yahoo Finance daily closing prices.

year by FY2030. At half the 2026 investment pace, it would need about $10.4 billion, and at the full 2026 pace, about $14.5 billion (figure 8). The method is relatively simple. It relies on fewer varying assumptions than the other models, treating the group as one portfolio and leaning on the assumed return and multiple. Figure 9 shows how the middle case moves with the revenue multiple.

Method 2. The IPO Check

The second method compares the defense-primary companies against forty-eight large venture-backed companies that went public between 2015 and 2025. In its last two years before listing, the median company booked $1.12 of revenue for each dollar it had raised. Today, the defense-primary companies stand at an equivalent measure of only $0.10 (figure 10), and the gap does not seem to be closing as they age. Revenue per dollar raised is roughly flat from companies under five years old to those past ten (figure 11). Only three non-defense companies in the basket went public with ratios below the defense-primary group: Rivian,

TABLE 5 DOW REVENUE THE DEFENSE-PRIMARY COMPANIES NEED AT DIFFERENT REVENUE MULTIPLES

Revenue multiple	Sample public companies trading near this multiple	FY2030 ($ billion)	FY2035 ($ billion)
Two times	Lockheed Martin, Northrop Grumman, General Dynamics	44.7	112.6
Five times	TransDigm, Kratos, Salesforce	21.8	53.8
Ten times (our reference)	Howmet Aerospace, Axon, Microsoft	14.4	35.7
Twenty times	Nvidia, Palo Alto Networks	10.9	28.4
Forty times	Rocket Lab, CrowdStrike	9.5	26.7
Received in FY2026, annualized		1.9	

Note: Average of the three methods in the middle investment scenario (half the 2026 pace): method 1 at a 15% annual return; method 2 at its middle odds, with post-listing growth set by each multiple; and method 3 scaled in proportion to the multiple. Companies are public companies trading nearest each multiple on October 14, 2026 (figure 7).

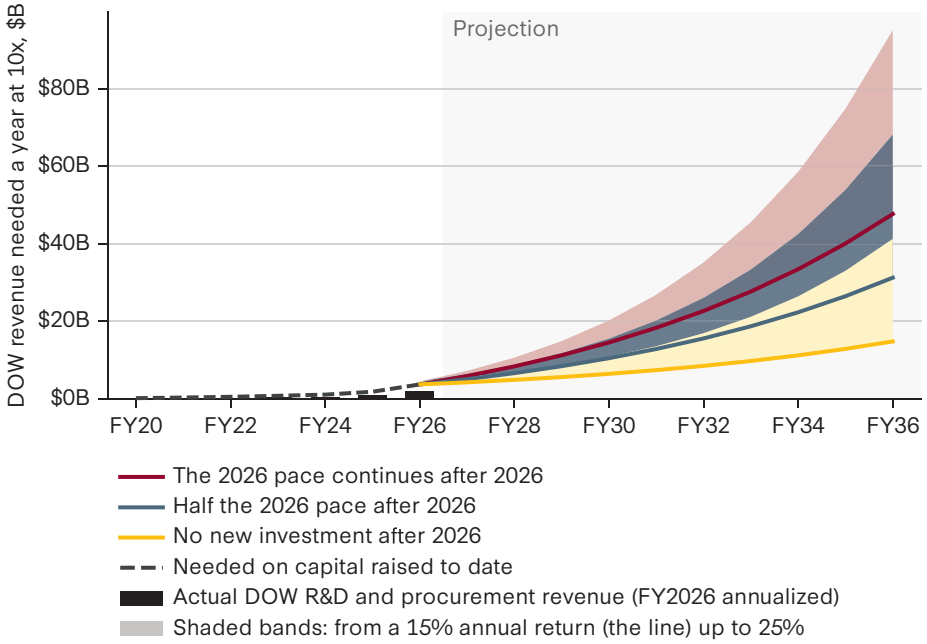
Source: Table by the authors using data from PitchBook Data Inc.; company Form 10-K and 10-Q filings, US Securities and Exchange Commission; and Yahoo Finance daily closing prices.

TuSimple, and BETA Technologies. Each was a capital-intensive vehicle or aircraft developer that listed with little or no revenue. SpaceX, by contrast, booked $2.77 for every venture dollar over its two most recent years before its IPO, in the top quarter of the basket, primarily on the strength of its commercial satellite communications services.

Meeting this ratio is also not necessarily sufficient. The median company in the basket booked about $496 million of revenue in its last year before the IPO, and three in four booked more than $200 million. Only one defense-primary company is on pace for $200 million of DOW revenue in FY2026.

To turn that benchmark into a yearly requirement, we needed to account for the fact that only a small subset of these companies will ultimately be successful. To do so, we simulated the progress of the cohort using a stochastic simulation. During each test, we ran the model 100,000 times, with the odds of each company raising its next round set near published studies of how often startups advance from one funding round to the next. We tested low, middle, and high odds of each round's success. At our middle odds, about 15% of the companies list, and we assume that those that do will earn revenues consistent with the IPO basket's revenue-before-listing ratios. This approach leads to a requirement of about $20 billion a year by FY2030, or $16 billion to $25 billion across our low and high odds (figure A1).

FIGURE 8 DOW revenue the defense-primary group needs at 10 times revenue, by investment scenario (FY2020–FY2036)



Note: Expected value compounds each year's disclosed seed and venture investment at 15% a year from the year it was invested (lines) or 25% (top of each band), divided by 10. After 2026, new investment each year is none, half, or all of the 2026 amount raised through early October. Shaded years are projections. Columns show actual DOW research and development and procurement obligations, FY2026 annualized. Nominal dollars. Excludes Anduril.

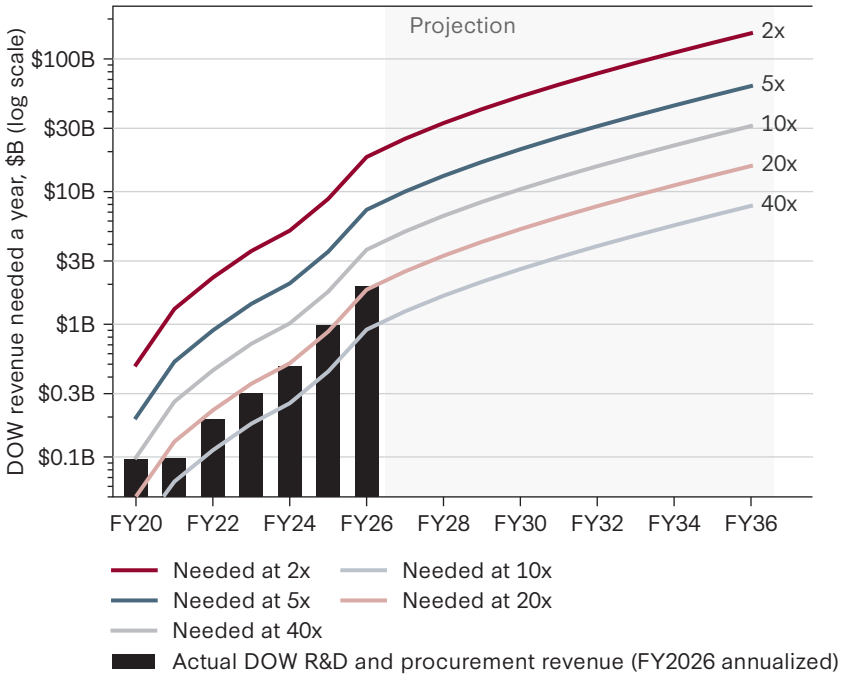
Source: Figure by the authors using data from USAspending.gov, US Department of the Treasury, Bureau of the Fiscal Service; the Federal Procurement Data System; and PitchBook Data Inc.

Method 3. Fund-Size Returns

The third method calculates minimum required returns by following each company's lead investor. As an illustrative example, a $200 million fund that owns 20% of a company needs the company to exit at about a $1 billion valuation to return the fund. This implies a need for about $100 million a year of revenue at a valuation-to-revenue multiple of 10. Applied to the 145 companies whose lead funds we could size, a subset that accounts for 92% of the group's total raised capital, the median company needs $261 million to $351 million a year in DOW revenue to return its lead's fund. None of the analyzed companies meet that bar today.

Like method 2, method 3 is a Monte Carlo simulation, but it is driven by the size of each lead investor's fund rather than by the revenue of earlier IPOs, so the two methods mirror each other. Again, we simulated the group 100,000 times, with each company either reaching the exit that returns its lead's fund or returning nothing, and found that roughly 10% to 20% of companies must succeed. Winners keep growing after they exit, at the same rates as method 2's listed companies. The age of each lead fund also sets a countdown clock, since a fund generally has about ten years from its vintage year to return its investors' capital. If winners

FIGURE 9 DOW revenue the defense-primary group needs at market multiples from 2x to 40x, middle investment scenario (FY2020–FY2036)



Note: Expected value of disclosed seed and venture investment compounded at 15% a year, divided by each multiple. After 2026, new investment each year is half the 2026 amount raised through early October. Shaded years are projections. Columns show actual DOW research and development and procurement obligations, FY2026 annualized. Log scale, nominal dollars. Excludes Anduril.

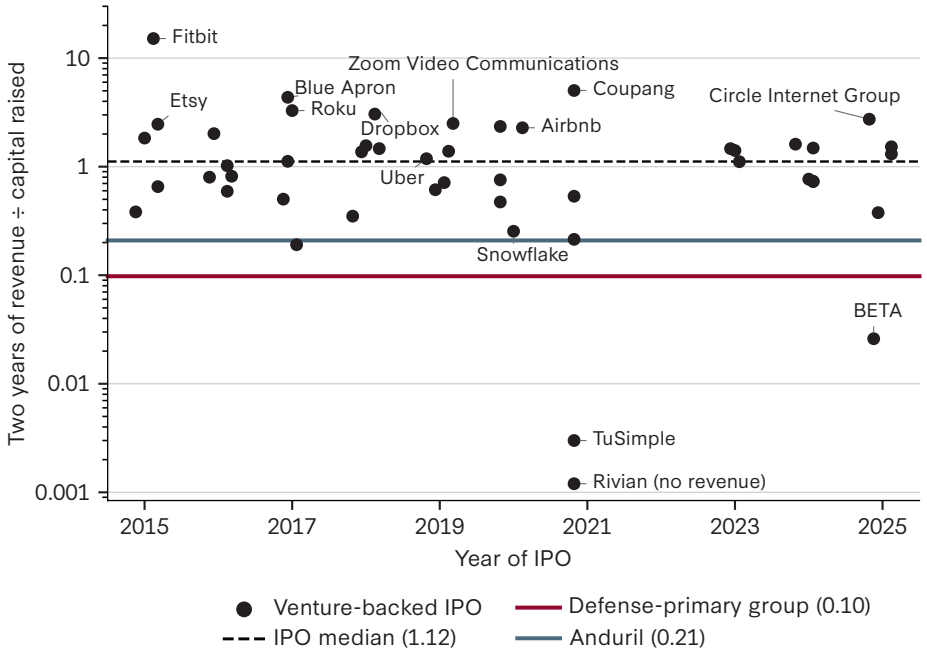
Source: Figure by the authors using data from USAspending.gov, US Department of the Treasury, Bureau of the Fiscal Service; the Federal Procurement Data System; and PitchBook Data Inc.

exit eight years after their lead fund's vintage, most exits will bunch between 2029 and 2031, and the revenue requirement, scaled to the whole group, reaches about $13.1 billion a year by FY2030 (figure A4).

WHAT THIS MEANS FOR CONGRESS AND THE DEPARTMENT

Obviously, the government is under no obligation to guarantee any investor a venture-scale return. Investors choose their bets, and many of these bets will lose capital, as the venture industry always expects. The challenge for Congress and the department is not related to any single company or investor. The country now has a highly capable bench of privately financed defense companies it did not have a decade ago. Although many reasonable readers may argue for adjustments in model parameters, the underlying point remains. Keeping this strategic reserve available will cost the defense budget on a scale that requires substantial growth. Alternatively, awarding less to this emerging cohort would likely result in a far less robust defense industrial base, as private investors move on to other sectors. Four findings bear directly on that choice.

FIGURE 10 Pre-IPO revenue per dollar raised: five largest venture-backed US IPOs (each year 2015–2025)



Note: Revenue in the two fiscal years before the IPO was divided by capital raised from investors between founding and the IPO (forty-eight companies, none in 2022 and three in 2023). Log scale. Rivian reported no revenue and is plotted at the axis floor. Capital is the total consideration paid by existing stockholders in each prospectus. Lines mark the basket median and, on the same basis, the defense-primary group and Anduril, whose ratio is DOW R&D and procurement obligations over FY2025–FY2026 (FY2026 annualized) divided by disclosed venture capital. Excludes biotechnology companies and special-purpose acquisition companies.

Source: Figure by the authors using data from IPO prospectuses (Form 424B4) and EDGAR filing indexes, US Securities and Exchange Commission; USAspending.gov, US Department of the Treasury, Bureau of the Fiscal Service; and PitchBook Data Inc.

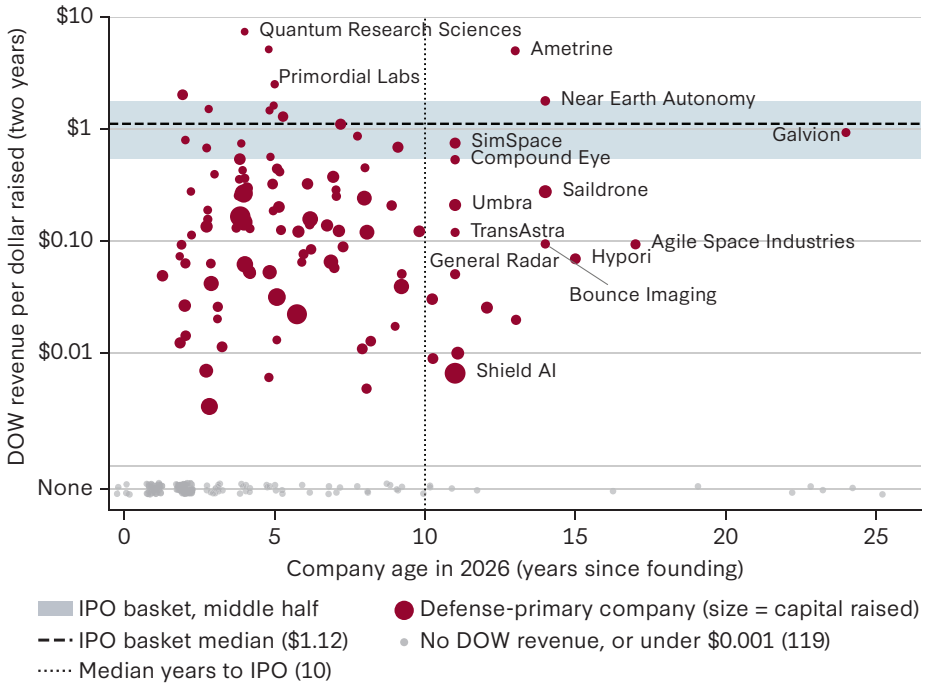
THE NEED IS SMALL AGAINST THE OVERALL BUDGET BUT LARGE AGAINST CURRENT SPENDING

In budget terms, our middle case asks for about $14.5 billion a year by FY2030, roughly 3% of the $429 billion Congress enacted for research, development, and procurement in FY2026. By FY2035, the middle case requirement would reach about 8% of today's accounts. The step is large for these companies but relatively modest for the department's overall budget.

CONCENTRATED, SCALED PRODUCTION REVENUE IS CRITICAL TO SUCCESS

Venture returns come from a small number of companies that grow large. To return the capital behind the group, roughly one company in five to ten must reach an exit that returns its lead investor's fund, which for the median company means about $261 million to $351 million a year of revenue. Today only one defense-primary company is on pace for more than $200 million

FIGURE 11 DOW revenue per dollar raised for defense-primary companies, by company age



Note: Each dot is a defense-primary company. Revenue is DOW R&D and procurement obligations over FY2025 and FY2026 (FY2026 annualized), divided by disclosed seed and venture capital. Log scale. Dot size scales with capital raised. Unlabeled dots are jittered slightly by age so overlapping points show. Labels name companies older than ten years that earn at least $0.05 per dollar raised, plus Shield AI and two younger companies far above the basket. Companies with no DOW revenue, or less than $0.001 per dollar raised, sit on the bottom strip. The dashed line marks the IPO basket median and the band the basket's middle half (figure 10). The dotted line marks the basket's median years from founding to IPO (figure A2). Excludes Anduril and the thirty-three companies without a founding year or disclosed capital.

Source: Figure by the authors using data from IPO prospectuses (Form 424B4), US Securities and Exchange Commission; USAspending.gov, US Department of the Treasury, Bureau of the Fiscal Service; and PitchBook Data Inc.

a year from the DOW, and many have no significant DOW obligations on record. The group could reach its aggregate revenue requirement through many small awards while no company reaches the scale an exit requires. For appropriators, that means small prototype awards spread across hundreds of companies will not sustain the reserve. Production awards that carry the strongest performers to scale will.

THE GROWTH NEEDED IS AGGRESSIVE BUT PRECEDENTED

Reaching our middle case by FY2030 would require that DOW revenue to these companies grow about 65% a year. Since 2023, it has grown an average of 86% a year, and procurement has risen from 17% of the total in FY2024 to 46% so far in FY2026 (figure 2). Sustaining that pace for four more years is therefore feasible but demanding, because, in real terms, it compounds on a larger base each year.

THE REVENUE REQUIREMENT LANDS IN THE NEXT BUDGET CYCLE

The revenue requirement climbs most steeply from FY2028 to FY2032, from about $6.9 billion to $22 billion a year in the middle case. Those are the five years of the Future Years Defense Program (FYDP) that the department will submit with its FY2028 budget request in early 2027. Much of that money needs to be allocated to procurement rather than to research, development, test, and evaluation (RDT&E), because production is where companies earn revenue at the scale an exit requires.[13]

Table 6 sets out what has to go right for a healthy outcome, separating the levers that Congress and the department control. Overall, no single development closes the gap.

In general, we see three factors that would support a positive outcome. First, public markets keep paying well above 10 times revenue for defense growth, as they do for SpaceX and Palantir, lowering the revenue requirement roughly in proportion. Second, a small share of companies, on the order of 10% to 20%, win production programs large enough to lead them to exits that return their investors' funds. Third, the DOW buys at scale while investors level off, continuing to support the cohort but adopting more of a wait-and-see approach. Although this final approach would close the revenue requirement gap, it would not come free of consequence. One of the key benefits of this sector of the emerging defense industrial base is that new companies are constantly being created, giving them the ability to start fresh with the latest and greatest commercial subcomponents. Slowing overall investment to only support existing companies would limit the department's ability to rely on a stream of new companies as scouts at the technological frontier (see What Congress and the Department Should Do, which sets out the approach that would best balance competing requirements to provide the best opportunity for a successful result).

THE LONG GAME

The 258 private, venture-backed companies that build mainly for defense have raised about $30 billion and, we estimate, were awarded about $1.9 billion in FY2026 DOW R&D and procurement obligations. By each of our three measures, that is a fraction of what the capital behind them requires—today, tomorrow, and for the foreseeable future. In our middle case, giving that capital a reasonable chance of a basic venture return would require on the order of $14.5 billion a year from the DOW by FY2030 and $36 billion by FY2035.

The long-term prospects of this sector remain intriguing but uncertain. The companies are young, procurement is a growing share of what they are earning, and a handful of production programs could change the picture quickly. However, companies and investors alike face time pressure, as venture funds must return capital to their investors. Nearly three-quarters of this capital raised by this cohort was invested in 2025 and 2026, so investment outcomes will only become clear over the next decade. By then, either DOW revenue will have grown severalfold and reached the companies closest to fielding capability, and public investors will be paying far more for these companies than they pay the primes, or the investors who seeded this sector will have begun to look elsewhere.

TABLE 6 WHAT HAS TO GO RIGHT AND WHO CONTROLS IT

Bet	Good outcome for the cohort	Bad outcome for the cohort
Within reach of Congress and the department		
DOW buys at scale.	DOW research and procurement revenue to the group keeps growing near its recent 86% a year and reaches about $23 billion a year by FY2030.	Growth slows to a still-strong 30% a year, and revenue reaches only about $5.5 billion by FY2030, short of every case's revenue requirement.
Revenue concentrates in the companies that can win.	Production awards concentrate in companies large enough to reach the median bar of $261 million to $351 million a year each needs to return its lead's fund.	Revenue spreads thinly. The group could approach its total while no company reaches the scale needed for a meaningful exit. The best-placed company receives an estimated $331 million in FY2026 DOW obligations.
Revenue arrives in time.	Revenue reaches companies before they need to list or their lead funds come due, in the FY2028–FY2032 defense program.	Revenue arrives late for the thirty-one companies already past the ten-year IPO clock.
Outside their direct control		
Markets pay technology-company multiples for defense revenue.	Winners are valued at 10 to 20 times revenue or more. In the middle case, method 1 needs about $10.4 billion a year by FY2030 at 10 times and $5.2 billion at 20 times.	Winners are valued like the primes, near 2 times revenue. The middle case rises to about $52 billion a year by FY2030.
Enough companies win.	At least 11% to 18% of companies reach exits that return their leads' funds, and the capital comes back 3.5 times.	Fewer do, and the capital falls short of investor expectations.
Other customers share the load.	Allied militaries, other federal agencies, and commercial buyers carry part of the requirement, as they do for dual-use companies.	The DOW is the only customer, and every dollar must come from its research and procurement accounts.

Source: Table by the authors, drawing on the analysis in appendix A.

WHAT CONGRESS AND THE DEPARTMENT SHOULD DO

Buy at production scale from the companies that are proven. The department should concentrate production awards in companies whose products have proven themselves in prototype, rather than spreading small awards across many. A few companies reaching scale will do more to keep private capital in defense than many that stay small.

Program the move from research to procurement now. The department should build procurement funding for its most promising prototypes into the FY2028–FY2032 defense program so that companies that successfully demonstrate useful prototypes do not have to wait an entire budget cycle for a new procurement line. The Joint Acceleration Reserve proposed in the FY2027 budget request, a top-line reserve to help fund programs moving from development to procurement, could be a start. It should be sized to the FY2028–FY2032 requirement estimated here.*

Give the department room to move money as prototypes succeed. Congress should take up the recommendations of the Commission on Planning, Programming, Budgeting, and Execution (PPBE) Reform to let a program move funds between its research and procurement accounts during the transition to production and to permit select new starts and higher production rates under a continuing resolution when the program is in the budget request. Portfolio acquisition executives, created by the FY2026 National Defense Authorization Act, manage portfolios of programs but cannot move money between appropriations.†

Measure progress. Congress should ask the department to report each year what it obligates to venture-backed companies, by appropriation and by company, including subcontracts where they can be traced. The prime-award data available today, which this paper relies on, miss subcontracts and most classified work.

*Office of the Under Secretary of War (Comptroller)/Chief Financial Officer, Defense Budget Overview: United States Department of War Fiscal Year 2027 Budget Request (Washington, DC: Department of War, May 2026), 5–6.

†US Department of War, *Commission on Planning, Programming, Budgeting, and Execution Reform, Final Report* (Arlington, VA: Commission on PPBE, March 6, 2024), 81–82 (recommendation 9) and 92 (recommendation 14). National Defense Authorization Act for Fiscal Year 2026, Public Law 119-60, sec. 1802, 139 Stat. 1225 (2025).

Venture capital can be patient, but it is not charity. The figures this paper derives are, in the end, the upkeep required on a new strategic reserve. They represent the price of keeping private capital in the game and, with it, a defense industrial base that iterates at the speed of the commercial frontier. Paying that price, or choosing not to, is a decision the department and Congress will make over the next few budget cycles, whether or not they make it deliberately.

APPENDIX A. THE THREE METHODS IN FULL

This appendix sets out the methods in full, including modeling choices and assumptions. Table A1 compares the three.

TABLE A1 THE THREE METHODS IN DETAIL

	Method 1: Value multiples	Method 2: IPO check	Method 3: Fund-size returns
The question	What should the money already invested be worth by year, assuming investors expect 15% to 25% annual returns, and how much DOW revenue would justify that value?	How much revenue do venture-backed companies usually have when they go public, compared with how much they have raised, and what would these companies need to match it?	How large an exit does each company need to return the fund that led its investment, and how many such exits does the group need?
How it works	Grow each year's investment at the 15% to 25% a year investors expect; then divide that value by 10, the revenue multiple we assume public markets pay.	Measure revenue per dollar raised for 48 recent venture-backed IPOs. Simulate each company raising its next rounds, listing or failing, and growing after it lists.	Match each lead investor to its fund and estimate its stake at exit; find the exit, and thus the revenue, that returns that fund. Simulate how many companies must succeed.
Main data	Venture investment by year (PitchBook)	IPO prospectuses and annual reports (SEC); venture rounds (PitchBook)	Lead investors and fund sizes (PitchBook)
New investment assumed	Three scenarios: no additional investment, half the 2026 pace (about $8 billion a year), or the 2026 pace (about $16 billion a year).	Successful companies keep raising as they advance, about $27 billion more at the middle odds ($18 billion to $38 billion).	Later rounds dilute each lead's stake through Series D, but the return target counts only the $27 billion raised to date by the 145 companies with identifiable lead funds (92% of the group's $29.8 billion).
Strength	Simple, relatively few driving assumptions	Anchored in what real companies have achieved before they listed	Follows the money investor by investor, with the fund clock setting the timing
Weakness	Treats the group as one portfolio and leans on the assumed return and multiple.	Rests on assumed odds of raising each round and the applicability of prior IPO metrics to this sector.	Fund sizes are known for a subset of the leads, and each company either wins outright or returns nothing.
DOW revenue needed per year by FY2030, at 10 times revenue	$6.4 billion to $14.5 billion	$15.8 billion to $25 billion	About $13.1 billion on an eight-year fund clock; on a ten-year clock, delayed by about two years

Source: Table by the authors, drawing on the analysis in methods 1 through 3.

METHOD 1. VALUE MULTIPLES: THE EXPECTED VALUE OF CAPITAL AGAINST DOW REVENUE

The first method starts from investors' basic capital return expectations. Regardless of individual company outcomes, limited partners expect each year's investment to grow at roughly 15% to 25% a year over the life of the funds in which they invest. If the $30 billion already invested in the defense-primary companies grew at those rates from the year each dollar arrived, it would need to be worth roughly $36 billion to $44 billion already, and those expectations would continue to compound. Public markets value companies like these using multiples of their business metrics. Here, we use a market capitalization to trailing-twelve-month revenue ratio of 10 as our reference. At that multiple, justifying even the low end of investor expectations would have taken about $3.6 billion of DOW revenue in FY2026, nearly twice the $1.9 billion we estimate the group received.

The requirement grows from there, because the value investors expect keeps compounding and because new money is likely to keep arriving. Looking forward requires an assumption about that new investment, so we project three paths for new capital after 2026. With no new investment, the group would need about $6.4 billion a year from the DOW by FY2030 and $12.8 billion by FY2035. At half the 2026 pace, about $8 billion a year, it would need about $10.4 billion and $26 billion. At the full 2026 pace, about $16 billion a year, it would need about $14.5 billion and $40 billion (figure 8). These figures use the low end of the expected return. At 25% a year, they run higher, about $15.5 billion by FY2030 in the middle case.[14]

The market-capitalization-to-trailing-revenue ratio of 10 is itself a driving assumption. Turned around, the question becomes this: How much revenue would justify the same value at the multiples public markets actually pay, from about 2 times for the primes to 40 times or more for the fastest-growing technology companies (figure 7). Today, the group's expected value is 19 to 23 times its annualized FY2026 DOW revenue, near or above the top of the 10 to 20 times we believe most successful aerospace and defense companies can justify. Figure 9 carries the middle case forward at each multiple. If public markets valued the winners like the primes, at 2 times, the group would need about $52 billion a year by FY2030. At 20 times, it would need about $5.2 billion and even at 40 times about $2.6 billion.

METHOD 2. THE IPO CHECK: REVENUE BEFORE LISTING AGAINST CAPITAL RAISED

The second method asks a different question: How much revenue do venture-backed companies usually have by the time they go public, and how far are the defense-primary companies from that mark? The largest venture-backed companies to list over the past decade had typically booked about $1.12 of revenue over their last two years as private companies for each dollar of invested capital. The defense-primary companies stand at a comparative metric of about $0.10 today. If the companies that eventually list are to match our industry benchmark, using our middle assumptions, the successful subset of the group would need, on average across our simulated trials, about $20 billion a year of DOW revenue by FY2030.

To set the benchmark, we assembled a basket of the five largest venture-backed IPOs in each year from 2015 through 2025, ranked by the size of the offering and leaving out biotechnology companies and special-purpose acquisition companies. The basket contains forty-eight companies (appendix table B1). For each, we compare its revenue over the two fiscal years before the IPO with the capital it raised from investors before the offering. Over those two years, the median company booked $1.12 of revenue for every dollar raised (figure 10).[15]

Today, the current defense-primary cohort sits well below that figure. Over FY2025 and FY2026 (annualized), the defense-primary group earned about $2.9 billion in DOW research and development and procurement obligations against $30 billion raised, $0.10 for each dollar. Only three non-defense companies in the IPO basket went public with ratios below the defense-primary group: Rivian, TuSimple, and BETA Technologies, each a capital-intensive vehicle or aircraft developer that listed with little or no revenue. SpaceX, by contrast, booked $2.77 for every venture dollar over its two most recent years before its IPO, in the top quarter of the basket, primarily on the strength of its commercial satellite communications services.

Note that this basket holds companies that reached the public market, so it describes success, not the average outcome. The defense figures also count only DOW research and procurement obligations, so commercial, international, and other government sales could supply additional revenue. Even so, the gap is wide.[16] Meeting this ratio is also not necessarily sufficient. The median company in the basket booked about $496 million of revenue in its last year before the IPO, and three in four booked more than $200 million. Only one defense-primary company was on pace for $200 million of DOW revenue in FY2026. A listing also returns capital only if public investors pay more than the private rounds did, and many venture exits are acquisitions rather than listings, where valuation may be driven by strategic, versus financial, value to the acquirer.

Also, the trend lines are not necessarily going in the right direction. In a healthy ecosystem, companies would climb toward the basket's benchmark revenue-to-capital ratio as they approach the ten-year median age at which its companies listed. The defense-primary ratio is roughly flat with age, at about $0.12 for every dollar raised among companies under five years old, $0.09 at five to seven years, $0.06 at eight to eleven, and $0.14 at twelve and older (figure 11).

From a Benchmark to a Yearly Requirement

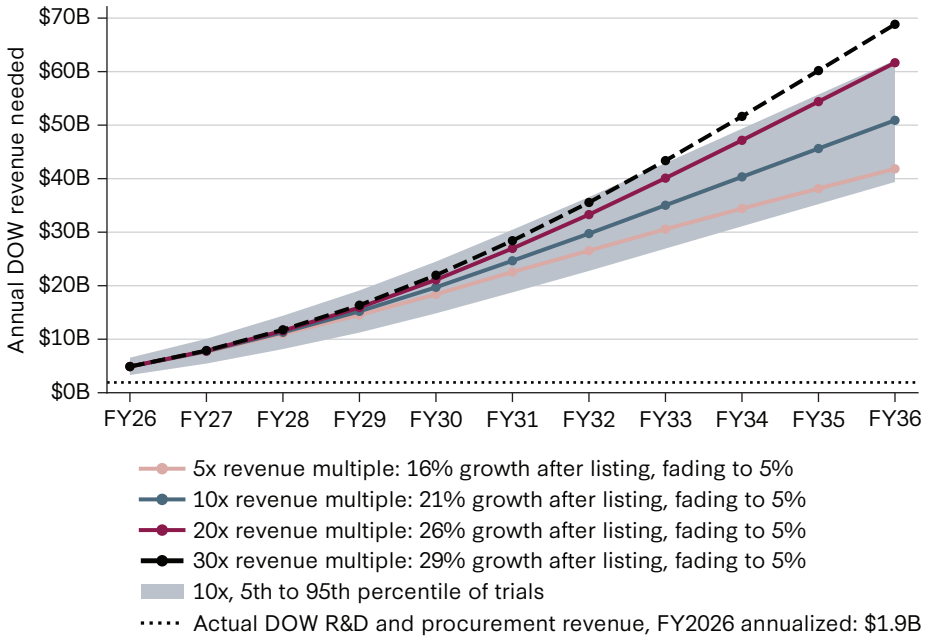
A benchmark alone does not say how much revenue the group needs each year, because the companies will list at different times, not all of them will list, and those that do will first raise more money. To turn the benchmark into a yearly requirement, we simulated the companies' paths 100,000 times. Each company starts at the furthest funding round it has reached and, at each step, either raises its next round or fails. Most are early on that path. The median company is three years old, and 171 of the 254 have raised no more than a Series A. A company that reaches Series D or later then lists, with odds of 75%, ten years after its founding; this is the basket's median. In its two years before listing, it earns the basket's $1.12 of revenue for

every dollar it has raised by then. After listing, its revenue keeps growing, faster for companies valued at higher multiples, as it has for public companies.

The odds of raising each round are our assumptions, set near published studies of how often startups advance, and we test a low, middle, and high set. The middle odds imply that about 37 of the 254 companies list, or 15% of the group, and the low and high sets imply that about 26 and 52 list, respectively. The odds, the listing schedule, and the growth assumptions are provided in tables A2 to A4.

At the middle odds and 10 times revenue, the group needs on average about $20 billion of DOW revenue in FY2030 (figure A1), roughly 10 times the $1.9 billion it received in FY2026, annualized. Because the companies that succeed differ from one trial to the next, the figure varies, and in nine trials in ten it falls between $15 billion and $25 billion. The low and high odds put the average at about $16 billion and $25 billion. The requirement keeps rising as listed companies continue to need to demonstrate post-IPO growth, to about $51 billion in FY2036.

FIGURE A1 Estimate of needed DOW revenue for the defense-primary group



Note: Mean of 100,000 trials at the middle odds in table A2. Each company either raises its next round, adding the group's median round for that stage, or fails. A company at Series D or later lists with odds of 75%. Listing comes ten years after founding, with overdue companies spread over 2027–2030. In the two fiscal years before listing, a company earns the basket's revenue per dollar raised on its capital at listing, and each earlier year needs half the next. After listing, revenue grows at the rate fitted to each multiple from public companies' annual reports, fading linearly to 5% over ten years. The band spans the 5th to 95th percentile of trials at 10x. The dotted line shows actual obligations, FY2026 annualized. Nominal dollars. Excludes Anduril and the four companies without a founding year.

Source: Figure by the authors using data from PitchBook Data Inc.; IPO prospectuses (Form 424B4) and company Form 10-K filings, US Securities and Exchange Commission; Yahoo Finance daily closing prices; and USAspending.gov, US Department of the Treasury, Bureau of the Fiscal Service.

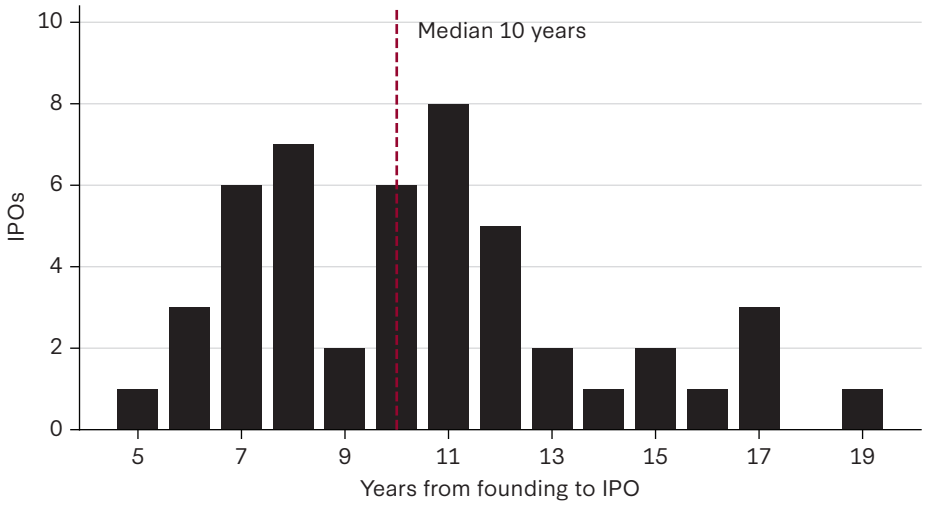
Method 2 Details: The Listing Simulation

The median company in the IPO basket went public ten years after its founding, and half did so between eight and twelve years (figure A2). We assume that a company that lists does so ten years after its founding and, in the two fiscal years before listing, earns $1.12 of DOW revenue for every dollar it has raised by then, 40% in the earlier year and 60% in the year before the IPO, with each previous year generating half as much revenue as the one after it. Thirty-one companies accounting for $5.4 billion in invested capital are already older than ten years. We spread their listings evenly over 2027 through 2030, oldest first.

Today, the median defense-primary company is three years old, and 156 of the 254 are under five years old (figure A3a). Twenty are within two years of the median age at public listing, and thirty-one have reached or passed it. Today's group has grown from twenty-six companies with a venture round at the end of 2018 to 258 in 2026 (figure A3b). In 2026, eighty-five had raised no more than a seed round and eighty-nine no more than a Series A, while eighteen had reached Series C and thirteen Series D or later. The simulation starts each company from its current stage.

In each of 100,000 trials, a company either raises its next round or fails, one stage at a time, until it lists after a Series D financing. This undercounts total required revenues as many companies continue to raise additional growth capital beyond a Series D. Each simulated future round adds the median round for that stage across the defense-primary group—$20 million at Series A, $70 million at Series B, $170 million at Series C, and $359 million at Series D or later. A company at Series D or later then lists with odds of 75%. Table A2 sets out the odds of raising each next round. Compounded, the middle odds give a seed company about a

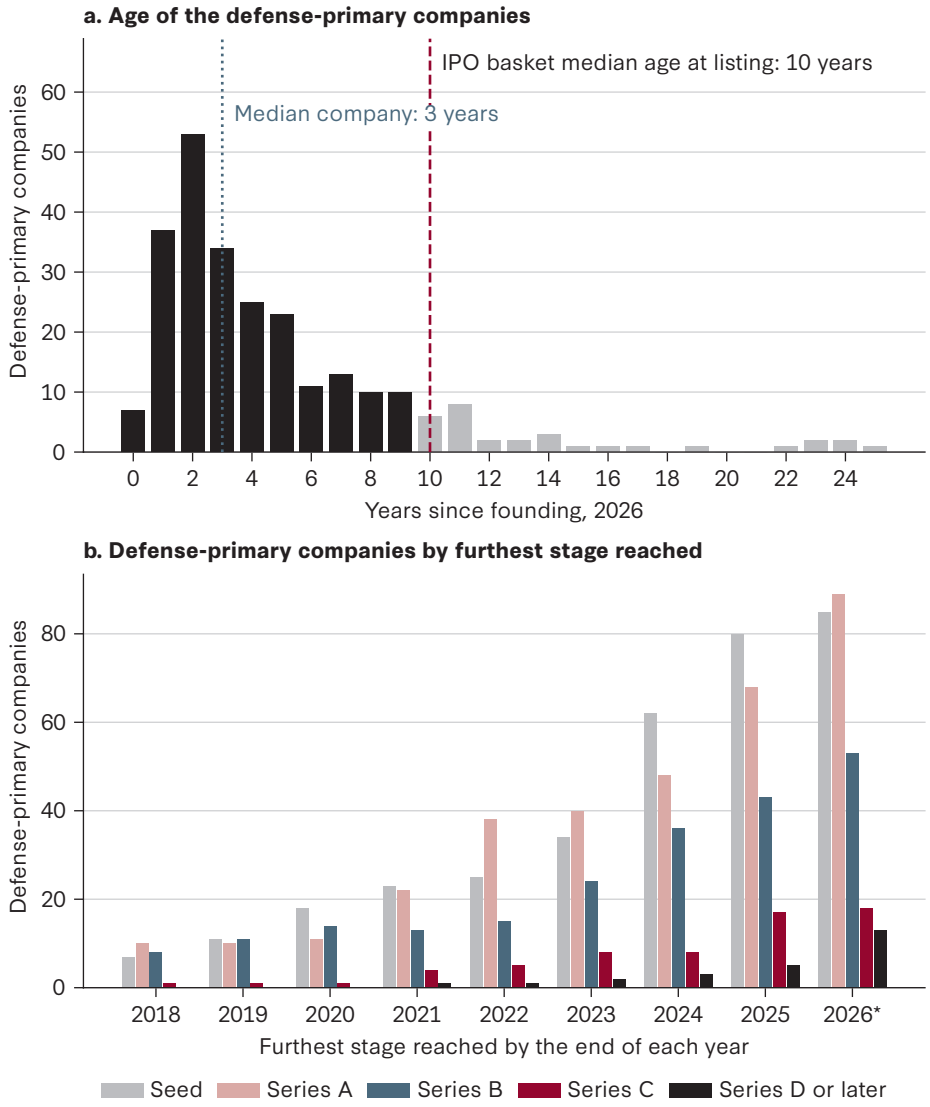
FIGURE A2 Years from founding to IPO, five largest venture-backed US IPOs each year (2015–2025)



Note: The forty-eight companies in figure 10, from each prospectus's statement of when the business began. The dashed line marks the median.

Source: Figure by the authors using data from IPO prospectuses (Form 424B4), US Securities and Exchange Commission.

FIGURE A3 Age and furthest funding stage of the defense-primary companies



Note: (a) Years since founding in 2026. Lighter bars are companies at or past the IPO basket's median age at listing (figure A2). Excludes the four companies without a founding year. (b) Companies by the furthest venture stage reached by the end of each calendar year. A round without a series label counts at the stage of PitchBook's broader deal type (seed, early-stage, or later-stage venture). The year 2026 runs through mid-October. Companies are those in today's group, so companies that failed earlier are not shown. Excludes Anduril.

Source: Figure by the authors using data from PitchBook Data Inc.

2.8% chance of listing and a Series C company a 37.5% chance (table A3). The low and high sets change the expected listings mostly among the companies still at seed and Series A (table A4).

We assume that post-IPO revenue growth depends on how the market prices a company. Since public markets often value rapidly growing companies at higher multiples, we fit

TABLE A2 ASSUMED ODDS OF RAISING THE NEXT ROUND, BY STAGE

Step	Low	Middle	High
Seed to Series A	20%	30%	40%
Series A to Series B	40%	50%	60%
Series B to Series C	40%	50%	60%
Series C to Series D	40%	50%	60%
Series D or later to listing	75%	75%	75%

Note: Odds are the authors' assumptions. A company that fails to raise its next round, or to list, earns no revenue in the model.

Source: Table by the authors.

TABLE A3 CHANCE OF LISTING AT THE MIDDLE ODDS, BY FURTHEST STAGE REACHED

Furthest stage reached	Companies	Capital raised ($B)	Chance of listing	Expected listings
Seed	83	0.6	2.8%	2.3
Series A	88	2.5	9.4%	8.2
Series B	52	4.7	18.8%	9.8
Series C	18	7.5	37.5%	6.8
Series D or later	13	14.2	75%	9.8
Total	254	29.4		36.8 (15%)

Note: Chance of listing compounds the middle odds in table A2 from each company's furthest stage. Expected listings is number of companies times that chance. Stage is either the furthest labeled round in PitchBook or PitchBook's broader deal type where no round carries a series label. Excludes four companies without a founding year.

Source: Table by the authors using data from PitchBook Data Inc.

three-year revenue growth against the revenue multiple for the seventy-two public companies behind figure 7, using their annual reports. Companies priced at higher multiples have grown faster, though the fit is loose (correlation 0.48). The fit implies growth of about 16% a year at 5 times revenue, 21% at 10 times, 26% at 20 times, and 29% at 30 times. Each company that lists grows at its multiple's rate, fading linearly to 5% a year over ten years, a dynamic we assume as companies mature.

TABLE A4 EXPECTED LISTINGS AT EACH SET OF ODDS, BY FURTHEST STAGE REACHED

Furthest stage reached	Low	Middle	High
Seed	0.8	2.3	5.4
Series A	4.2	8.2	14.3
Series B	6.2	9.8	14.0
Series C	5.4	6.8	8.1
Series D or later	9.8	9.8	9.8
Total	26.4 (10%)	36.8 (15%)	51.5 (20%)

Note: Number of expected listings compounds each set of odds in table A2 from each company's furthest stage.

Source: Table by the authors using data from PitchBook Data Inc.

METHOD 3. RETURN EXPECTATIONS BY FUND SIZE

The third method follows the money investor by investor. The fund that leads a round usually sets its price and takes the largest stake, so the size of that fund shapes the exit a company must reach for the fund to meet its target.

We applied that test to the defense-primary companies. PitchBook's deal records flag the lead investor, or co-leads, for 360 of the 629 completed seed and venture rounds of the group. We matched each venture lead to the fund it most likely invested from, estimated the stake it holds at exit after later rounds dilute it, and found the exit, and so the annual revenue, that returns its fund. A single exit has to satisfy every lead, so a company's requirement is set by its most demanding investor requirement.[17]

Many of the venture funds leading these investments are small to midsized. Across the 316 lead positions we could size, the median lead fund falls between $178 million and $245 million, depending on which fund plausibly made the investment, and even on the largest plausible fund, 50% came from funds under $250 million (figure A5). Fund size rises with the stage, from roughly $100 million to $150 million for the median seed lead to $800 million to $1.2 billion for the median Series C lead.[18]

Across the 145 companies we could test, which hold 92% of the group's capital, the median company needs $261 million to $351 million a year in DOW revenue to return its lead's fund, an amount inside the $250 million to $750 million estimate earlier in this paper. None of the 145 companies meets its requirement today. The largest requirements, several billion dollars a year for companies such as Onebrief and Saronic, come from growth rounds in which a fund of several billion dollars bought a small slice of the company, so we rely on the median company rather than the extremes.

Not every company has to, or should even be expected to, succeed for the overall cohort to meet the return criteria. So again, we simulated the group 100,000 times at each success rate, with every company either reaching the exit that returns its lead's fund or returning nothing. A fund must earn about 3.5 times its committed capital to give its own investors 3 times their money after fees. On these terms, the group reaches that return when 11% to 18% of companies reach a fund-returning exit, or about one success in every six to ten companies.[19] The share needed rises with the stage, from about 4%–6% of the companies whose latest venture-led round was a seed round to 18%–29% of those at Series D or later (table A5), because large later rounds put far more capital behind each company while the lead funds are not proportionally larger.

These figures track the 145 companies whose rounds have identifiable lead funds. They hold $27 billion, or 92% of the $29.8 billion the whole group has raised. At 10 times revenue, returning 3.5 times the $27 billion these companies have raised through 2026 takes about $13.7 billion a year of DOW revenue across the winners at the time they exit, as compared to the roughly $1.5 billion the same companies receive in FY2026. If public markets value the winners at 20 times revenue, that figure halves. At 2 times, it rises fivefold, to about $69 billion a year.

The fund that led each round also sets a countdown clock. A venture fund generally has a ten-year target date, from the year it begins investing, to return its investors' money. We date each company's exit by the fund behind its most demanding lead position and assume the winners exit eight years after that fund's vintage and ten years at the latest. We spread the fifteen companies whose lead fund is already past its eighth year evenly over 2027 through 2030, oldest first. Each winner needs its exit revenue from the fiscal year before it exits. As in method 2, its revenue keeps growing after the exit, at the rate fitted to public companies at 10 times revenue, or about 21% a year, fading to 5% over ten years.

TABLE A5 SHARE OF COMPANIES THAT MUST SUCCEED, BY LATEST VENTURE-LED STAGE

Latest stage led by a sized venture fund	Companies	Capital raised ($B)	Must succeed for a 3.5x return
Seed	57	1.1	4%–6%
Series A	48	6.8	12%–21%
Series B	23	5.6	12%–19%
Series C	9	4.5	16%–21%
Series D and later	8	9.4	18%–29%

Note: The same Monte Carlo model as the group result, with 100,000 trials per success rate on a 1% grid, run on each stage group alone. Ranges run from the largest to the smallest plausible lead fund. The Series C and later groups are small, so their rates move in larger steps. Nominal dollars. Excludes Anduril.

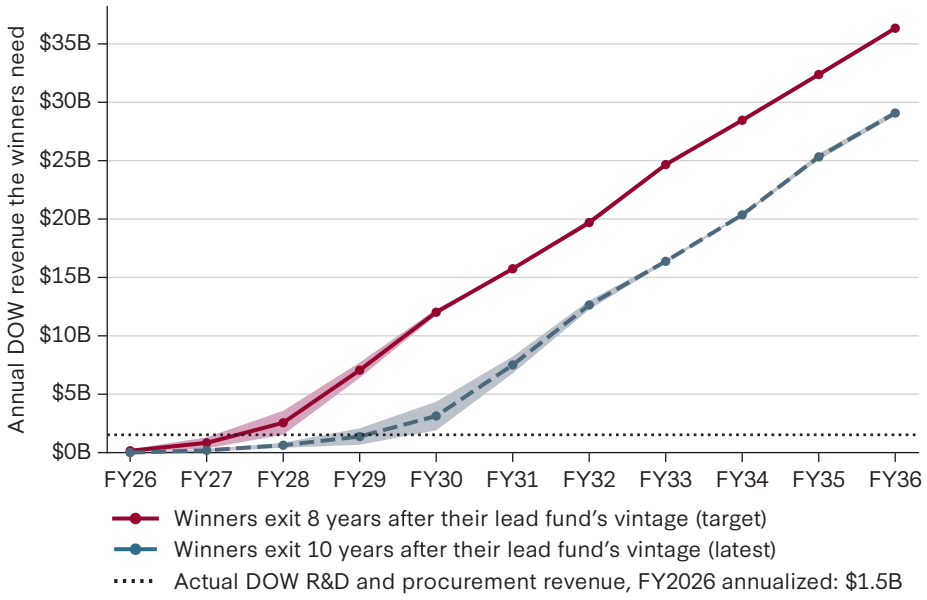
Source: Table by the authors using data from PitchBook Data Inc. and USAspending.gov, US Department of the Treasury, Bureau of the Fiscal Service.

Because most of the lead funds behind these companies are recent, the exits bunch together. On the eight-year clock, 84 of the 145 companies would exit between 2029 and 2031 (figure A4). The winners would then need about $2.6 billion a year of DOW revenue in FY2028, $12.0 billion in FY2030, $19.7 billion in FY2032, and about $36 billion by FY2036 as the winners keep growing. Giving every fund its full ten years shifts the path about two years later, to about $3.1 billion in FY2030 and $12.6 billion in FY2032. Either way, the requirement climbs steeply within the next five to seven years.

Method 3 Details: Lead Investors, Their Funds, and the Share That Must Succeed

Of the 495 lead positions, 80% belong to venture capital firms and another 7% to growth equity firms and corporate venture arms (figure A5a). Corporations such as Lockheed Martin, Northrop Grumman, and L3Harris led nineteen, and banks, buyout firms, asset managers, and individuals another thirty-one. Investors outside venture capital lead more often as companies grow, from 7% of seed leads to 29% of leads in Series D and later. Leadership is spread widely. In all, 281 investors led at least one round, and the ten most active investors account for 16% of lead positions. Fund sizes are shown in figure A5b.

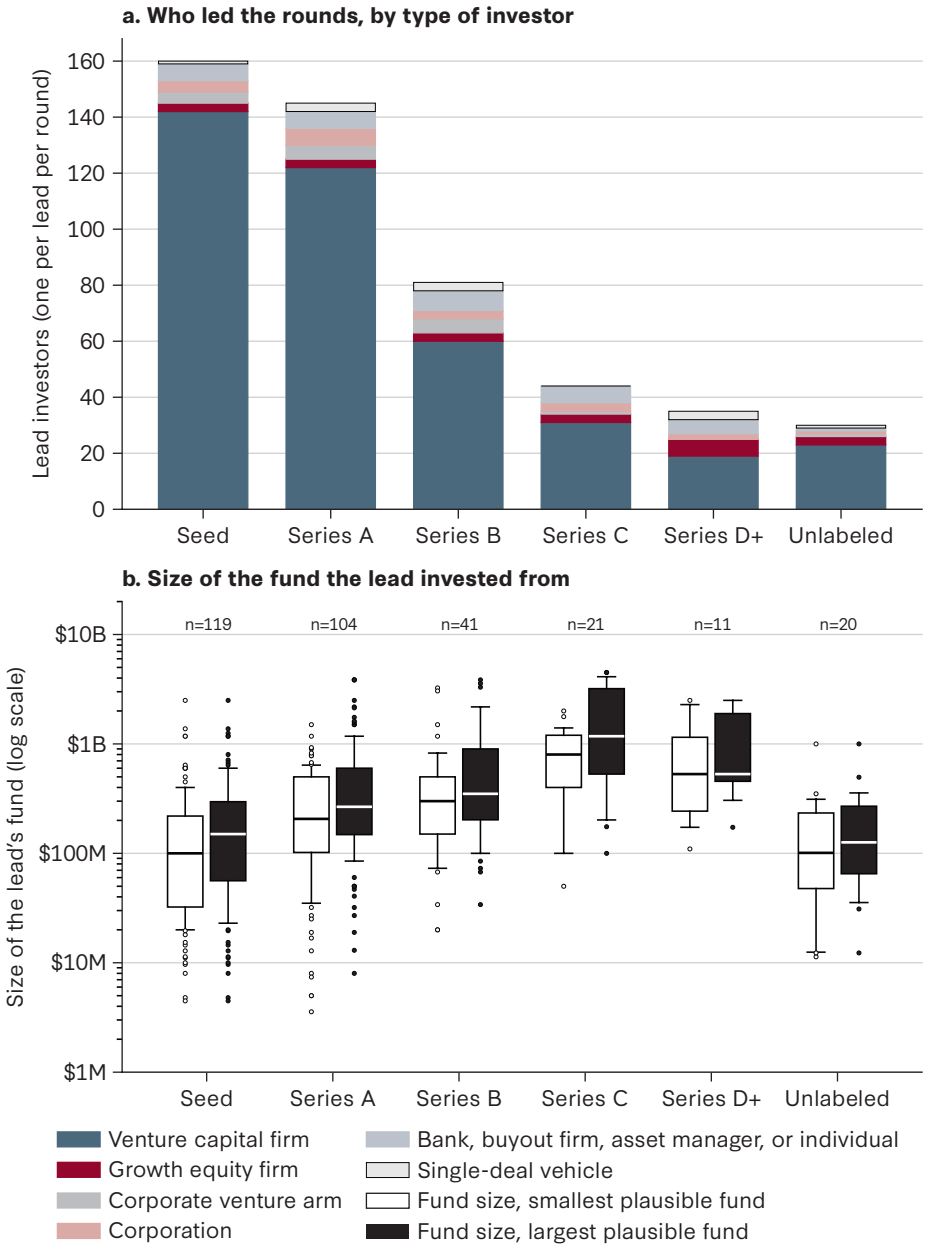
FIGURE A4 DOW revenue the winners need by fiscal year, on the fund clock



Note: Companies with a return-the-fund requirement (145 defense-primary companies). Each line is the median of 100,000 trials at the success rate that returns the companies' capital 3.5 times, with winners valued at 10 times revenue and investors holding about 70% of each winner at exit. The band around each line spans the smallest to the largest plausible lead fund. Each winner exits a set number of years after the vintage of its most demanding lead's fund, needs its exit revenue from the fiscal year before, and grows afterward as listed companies do in method 2. Exits already past due are spread over 2027 through 2030. Lead stakes are diluted by the remaining rounds through Series D, but the return target counts only capital raised through 2026. The dotted line marks the same companies' DOW research and development and procurement revenue, FY2026 annualized ($1.5 billion for the 145 defense-primary companies with a return-the-fund requirement).

Source: Figure by the authors using data from PitchBook Data Inc. and USAspending.gov, US Department of the Treasury, Bureau of the Fiscal Service.

FIGURE A5 Lead investors and lead fund sizes in defense-primary rounds, by stage



Note: (a) Lead investors in the 360 completed seed and venture rounds of the defense-primary group with a lead recorded, by type of investor and stage. Each lead counts once per round, so co-led rounds count every lead. (b) Size of the fund each venture lead invested from, by stage, where a size is known. Log scale. Hollow boxes use the smallest and filled boxes the largest plausible fund, chosen from the fund PitchBook names, the firm's defense-themed fund, or its main funds raised in the four years before the round. Boxes span the middle half and whiskers the 10th to 90th percentiles. Excludes Anduril.

Source: Figure by the authors using data from PitchBook Data Inc.

TABLE A6 RETURN-THE-FUND REQUIREMENT BY STAGE OF THE LEAD'S ROUND

Stage of lead's round	Lead positions	Lead's stake at exit	Lead fund ($M)	Annual revenue needed ($M)
Seed	119	10.2%	100–150	147–185
Series A	104	14.2%	206–266	241–294
Series B	41	6.5%	300–350	307–469
Series C	21	7.1%	800–1,176	848–1,050

Source: Table by the authors using data from PitchBook Data Inc.

After dilution, we estimate the median lead holds 7% to 14% of the company at exit, so the size of the lead's fund largely sets the requirement (table A6). To return a fund of the median size, a company led at seed needs an exit of about $1.5 billion to $1.8 billion, or $147 million to $185 million in annual revenue, and a company led at Series A about $241 million to $294 million. Across the companies we could test, the middle half need from about $117 million to $1.0 billion a year.

Grouping the companies by their latest venture-led funding round, the seed-stage group needs only about 4%–6% of its companies to succeed for its capital to come back 3.5 times, because those companies have raised little and a single winner returns much of their capital. The group whose latest venture-led round was a Series D or later needs 18%–29% (table A5). Most of the money sits in these later-stage companies.

APPENDIX B. THE IPO BASKET AND THE COMPANIES

Method 2 compares the defense-primary companies with the forty-eight venture-backed companies in table B1, which lists the five largest venture-backed US IPOs in each year from 2015 through 2025 by offering size, excluding biotechnology companies and special purpose acquisition companies. None is in the defense cohort.

TABLE B1 THE IPO BASKET

Company	IPO year	Years from founding	Capital raised ($M)	Revenue, two years before IPO ($M)	Revenue per dollar raised
Etsy	2015	10	130	321	2.46
Fitbit	2015	8	67	1,016	15.15
Pure Storage	2015	6	566	217	0.38
Square	2015	6	765	1,403	1.83
Sunrun	2015	8	386	253	0.66
Coupa Software	2016	10	165	134	0.82
Nutanix	2016	7	340	686	2.02
Quantenna Communications	2016	11	188	151	0.80
Twilio	2016	8	250	256	1.02
iRhythm Technologies	2016	10	98	58	0.59
Blue Apron	2017	5	261	1,136	4.36
Cloudera	2017	9	850	427	0.50
MuleSoft	2017	11	266	298	1.12
Roku	2017	15	219	718	3.29
Snap	2017	7	2,427	463	0.19
Bloom Energy	2018	17	1,671	584	0.35
DocuSign	2018	15	577	900	1.56
Dropbox	2018	11	640	1,952	3.05
GreenSky	2018	12	430	590	1.37
Pluralsight	2018	14	204	299	1.47
Lyft	2019	12	5,248	3,216	0.61
Peloton	2019	7	973	1,350	1.39
Pinterest	2019	11	1,722	1,229	0.71

Continued

TABLE B1 THE IPO BASKET (*continued*)

Company	IPO year	Years from founding	Capital raised ($M)	Revenue, two years before IPO ($M)	Revenue per dollar raised
Uber	2019	10	16,218	19,202	1.18
Zoom Video Communications	2019	8	193	482	2.50
Airbnb	2020	12	3,706	8,457	2.28
ContextLogic (Wish)	2020	10	1,546	3,629	2.35
DoorDash	2020	7	2,485	1,176	0.47
Snowflake	2020	8	1,423	361	0.25
Unity Software	2020	16	1,220	922	0.76
Coupang	2021	11	3,625	18,241	5.03
Oscar Health	2021	9	1,782	951	0.53
Rivian Automotive	2021	12	10,700	0	0.00
Robinhood Markets	2021	8	5,766	1,236	0.21
TuSimple	2021	6	849	3	0.00
Cava Group	2023	17	726	1,064	1.47
Instacart (Maplebear)	2023	11	3,114	4,385	1.41
Klaviyo	2023	11	687	763	1.11
Astera Labs	2024	7	255	196	0.77
Ibotta	2024	13	357	531	1.49
Reddit	2024	19	2,018	1,471	0.73
Rubrik	2024	11	762	1,228	1.61
ServiceTitan	2024	17	1,477	1,082	0.73
BETA Technologies	2025	7	1,172	30	0.03
Circle Internet Group	2025	12	1,142	3,126	2.74
CoreWeave	2025	8	1,636	2,144	1.31
Figma	2025	13	823	1,254	1.52
Navan	2025	10	2,490	939	0.38

Note: Nominal dollars. Capital raised is the total consideration paid by existing stockholders as reported in each prospectus. Revenue is the sum of the two fiscal years before the IPO. Years from founding use each prospectus's statement of when the business began.

Source: Table by the authors using IPO prospectuses (Form 424B4) and EDGAR filing indexes, US Securities and Exchange Commission.

DEFENSE-PRIMARY COMPANIES

9 Mothers
Aalyria
Abyss Defense
Advanced Manufacturing Company of America
Aegilys
Aeon
Aethero
Agile Space Industries
Albacore
Albedo
Allen Control Systems
Ametrine
AndrenaM
Antares
Antaris
AnySignal
Apex
Apex
Apolink
Argo Space
Arinna
Array Labs
Askari Defense
Aspect Aerospace
Asymm
Atlas Motion
Aurelius Systems
Auriga
Auterion
Aventra
Axta Space
Azora
Basalt Tech
Bavovna
Benchmark Space Systems
Blackstar Orbital
Blue Water Autonomy
Bohr Systems
Bone
Bounce Imaging
Bravo Ordnance
Cambium
Camden Space
Castelion
Cequra
CesiumAstro
CHAOS
Chariot Defense
Code Metal
Cognitive Space
ColliMate Space
Compound Eye
Continuum Space Systems
CX2
Darkhive
DarkSaber Labs
DeepNight
Defense Unicorns
Defiant Space
Delta Black
Deterrence
Diffraqtion
Distributed Spectrum
Dunedain
Edge
Epirus
Extellis
F-ADA
Firehawk Aerospace
Firestorm
Fortastra
Fortem Technologies
Forterra
FPF Defense
Fulcrum Autonomy
Furientis
Galadyne
Galvion
Gander Robotics
General Galactic
General Hypersonics
General Radar
Gentle Weapons
Gimbal Space
GridAero
Gulf Coast Tactical
Hadrian
HavocAI
Hawthorn Aero
Heaviside Industries
Hermeus
Heven AeroTech
Hidden Level
Hop Aero
Hypori
Impulse Space
Integrate
Inversion
iSEE
Isengard Industries
Juno Propulsion
K2 Space
Kapta Space
Katalyst
Kilsar
Larx
LeoLabs
Liminal Industries
Little Place Labs
Lodestar
Loft Orbital
Long Wall
Longshot Space Technologies
Lux Aeterna
Mach Industries
Manifest Space
Mantis Space
Mara
Maritime Operations Group
MatrixSpace
Matter Intelligence
Melagen Labs
Morph Systems
Morpheus Space
mPower Technology
Muon Space
Near Earth Autonomy
Neon Aero
Neros
Nidus
Noah Labs
NODA AI
Northwood Space

NovaLink Space
Nuview
Observable Space
Onebrief
Orama Technologies
ORB Aerospace
Orbit Fab
Orbital Ops
Orion Edge Group
ORKID
Otter Aerospace
Overland AI
Partager
Performance Drone Works
Perseus Defense
Phenix Space
Pheratech Systems
Phoenix Semiconductor
Picogrid
Pilgrim
Portal Aircraft
Portal Space Systems
Poseidon Aerospace
Primer
Primordial Labs
Prioria
Proteus Space
Pryzm
Purple Rhombus
Pyrrhus Aeronautics
Pytho
Quantum Research Sciences
Quindar
Radian Aerospace
Ramon.Space
Ravee Optics
Reax
RED 6
Rendezvous Robotics
Reveal Technology
Revolution Space
Rhea Space Activity
Rivet
Rune Technologies
Saildrone
Samara Aerospace
Sandtable
Saronic
Satlyt
Schemata
Scout AI
Scout Space
Seagate Space
Seasats
Seawright Industries
Second Front
Senra Systems
Shield AI
Shift5
Shifters AI
SimSpace
Singularity
Skapion
Sky Spy
SKYDEX
Skydweller Aero
Slingshot Aerospace
Source Energy Company
Space Kinetic
SpaceBilt
Spacedock
Spaceium
Spargo Space
Spear AI
SpiderOak
SplashOne Robotics
SQUID3 Space
Star Catcher
Starfish Space
Starling
Supply Energetics
Surtr Defense Systems
Swan
Swarm Aero
Swarmbotics AI
Teralink
ThayerMahan
Thermopylae Aerospace
Theseus
Thor Dynamics
Tiberius Aerospace
Titan Dynamics
TransAstra
Traysar Industries
TRL11
True Anomaly
TUNL
TurbineOne
Turion Space
Twin Prime
Tycho.AI
Type 1 Compute
Umbra
Union
USCT
Valinor Enterprises
Vanguard Defense
Vannevar Labs
Vantage Robotics
Vatn Systems
Vaya Space
Vector
Velontra
Venus Aerospace
Viridian Space
Virtualitics
Wardstone
Watchtower Labs
Wild West Systems
X-Bow Systems
Xplore
Zealot
Zeno Power
Zeromark
Zulu Pods

Note: The 258 defense-primary companies analyzed in this paper. Names as recorded by PitchBook.

Source: Table by the authors using data from PitchBook Data Inc.

DUAL-USE COMPANIES

Accrete	Electra.aero	Radiant Nuclear
Adjoint	Elroy Air	Radical
Aerolane	EnCharge AI	Reach Power
Airco	Enigma Aerospace	REGENT Craft
Akash Systems	Fabri	Relativity Space
Applied Intuition	Federated Wireless	Reliable Robotics
Armada	Fenix Space	SandboxAQ
ARMR Sciences	Gecko Robotics	Sea Machines
AscendArc	GITAI	Sionex
AspenNav	H3X	Skydio
Astranis	HStar Space Transport	Skyryse
Astro Mechanica	ICON	SkySafe
Asylon	JetZero	Skyways
Atom Computing	Kayhan Space	Solideon
Beacon AI	Kymeta	Sophia Space
Beyond Reach Labs	LEAP	SpinLaunch
Blue Laser Fusion	Lonestar Data Holdings	Stoke Space
Cape	Lyten	Strider
CORONAL	M2 Foundry	Sunlight Aerospace
Cowboy Space	Machina Labs	TeraDAR
Dataminr	Navion Energy	ThinkOrbital
Deployable Energy	Nominal	Tsecond
Ditto	Odys Aviation	Varda Space Industries
Divergent	Phantom	VerdeGo Aero
E-Space	Psionic	Vulcan Elements
Eclipse Space	PsiQuantum	Xona
Ecoatoms	Radia	Zenith Aerospace

Note: The 81 dual-use companies. Names as recorded by PitchBook.

Source: Table by the authors using data from PitchBook Data Inc.

NOTES

1. The count is the 258 defense-primary companies whose progress this paper measures. It leaves out companies that have gone public, been acquired, or ceased operations, including SpaceX and Palantir, and companies founded before 2021 that have raised less than $10 million in disclosed venture rounds. Anduril is examined on its own, and the eighty-one dual-use companies are counted separately. Four outliers are also set aside: OpenAI, Databricks, Blue Origin, and Sierra Space. The section on the cohort sets out each criterion.

2. Dan Berkenstock and Jon Chung, "The Warfighter's Pipeline: A Blueprint for Aligning Defense Acquisition with Venture Capital," Technology Policy Accelerator, Hoover Institution, April 2025.

3. National Center for Science and Engineering Statistics (NCSES), *National Patterns of R&D Resources: 2023–24 Data Update*, NSF 26-313 (Alexandria, VA: US National Science Foundation, 2026), table 6, "US R&D Expenditures, by Source of Funds and Performer: 1953–2024," current dollars.

4. Dan Berkenstock, Maggie Gray, and Walter J. Manuel, "From Venture Capital to the Arsenal: Assessing Pentagon Spending on America's Emerging Defense Companies," Technology Policy Accelerator, Hoover Institution, November 2026.

5. Sierra Space, "Sierra Space Secures $1.4 Billion Series A Capital Raise," press release, November 19, 2021.

6. How the numbers fit: The paper's base is the 258 defense-primary companies, which have raised about $30 billion ($29.8 billion) in disclosed seed and venture capital and are on pace for $1.9 billion in DOW research and development and procurement obligations in FY2026. Some analyses use a subset. Method 2 and the age figures use the 254 companies with a recorded founding year ($29.4 billion). Method 3 tests the 145 companies whose lead investors' funds could be sized, which hold $27 billion, or 92% of the capital, and scales its results to the whole group. Cumulative DOW obligations are $3.9 billion across all categories and $3.7 billion for research and development and procurement alone. The $80 billion of venture investment since 2020 covers the whole aerospace, defense, and space technology sector, not only these companies.

7. Annual FY2026 figures in this paper extend the nine months observed (October 2025 through June 2026) in a straight line, which likely understates the full year. In FY2023–FY2025, the same months held only 43% to 60% of the defense-primary group's full-year research and development and procurement obligations rather than the 75% a straight line assumes. Scaled by the average of those years (53%), the group's FY2026 obligations would be about $2.7 billion, versus the $1.9 billion on the straight-line basis, and the three years give a range of $2.4 billion to $3.3 billion. We use the straight-line figure throughout as the conservative base. The complete FY2026 data should be published in early 2027.

8. Space Exploration Technologies Corp., Form S-1 Registration Statement (May 20, 2026) and Form 10-Q for the quarter ended June 30, 2026 (August 4, 2026), US Securities and Exchange Commission. Market value is all classes of common stock outstanding on July 28, 2026, at the Nasdaq closing price of $152.16 on October 14, 2026. Trailing revenue is full-year 2025 revenue less the first half of 2025 plus the first half of 2026.

9. Palantir Technologies Inc., Form 10-K for fiscal year 2025 (February 17, 2026) and Form 10-Q for the quarter ended June 30, 2026 (August 4, 2026), US Securities and Exchange Commission. Market value is all classes of common stock outstanding on July 27, 2026, at the Nasdaq closing price of $200.97 on October 14, 2026. Trailing revenue is calculated as for SpaceX. US government customers provided $1.5 billion of Palantir's $3.6 billion in revenue in the six months ended June 30, 2026, or about 42% (Form 10-Q, segment information and results of operations).

10. Julie Bort, "Anduril Raises $5B, Doubles Valuation to $61B," TechCrunch, May 13, 2026, https://techcrunch.com/2026/05/13/anduril-raises-5b-doubles-valuation-to-61b/. PitchBook records the same Series H round, $5.0 billion at a $61.0 billion post-money valuation, dated May 13, 2026.

11. Berkenstock and Chung, "The Warfighter's Pipeline."

12. Growth rates are from a fit of three-year revenue growth against the revenue multiple for the seventy-two public companies in figure 7 (appendix A, method 2 details).

13. US Department of War, *Commission on Planning, Programming, Budgeting, and Execution Reform, Final Report* (Arlington, VA: Commission on PPBE, March 6, 2024), 74.

14. These projections cover the 258 defense-primary companies. Adding the eighty-one dual-use companies, with a quarter of their required revenue assigned to the DOW, would raise the middle case by about $1.9 billion a year in FY2030. The 2026 capital used for each scenario is the amount raised through early October, which understates the full year.

15. We classified each large offering from its own prospectus, filed with the Securities and Exchange Commission, as venture backed or not, setting aside buyouts, corporate spin-offs, and partnerships. Venture-backed offerings of $100 million or more were scarce after 2021. There were none in 2022 and three in 2023. Capital raised is the total that existing stockholders paid for their shares. Securities rules require every company to report at least two years of revenue in its prospectus, so two years is the common window.

16. On an apples-to-apples comparison, using FY2024 and FY2025 revenue against capital raised through 2025, before the large 2026 rounds, the defense-primary group stands at $0.11, still about a tenth of the basket median.

17. PitchBook specifically names the fund for 128 of the 434 venture lead positions. For the rest, we take the firm's main funds raised in the four years up to the round whose focus fits the stage and include the smallest and largest of them, setting a range. Where a firm runs a defense-themed fund whose timing fits, such as Andreessen Horowitz's American Dynamism funds, we assign the round to it. We leave out vehicles raised for a single deal. The test assumes the lead buys the whole round, split evenly among co-leads, at

the share of the company that US venture rounds have sold on average since 2020 (from about 25% at seed to 15% at Series D), that each later round through Series D dilutes the lead by 20%, that each lead position must return its fund exactly once, and that the exit is priced at ten times annual revenue. Other investors usually join the round, so the first assumption overstates most leads' stakes and understates the exit required. Table A5 gives the results by stage.

18. We set aside fourteen positions where the fund that PitchBook links to the lead is smaller than the lead's own share of the round, a sign that another vehicle wrote the check or that PitchBook records only a first close. PitchBook records no size for some funds, and thirty-three lead positions belong to firms for which PitchBook lists no funds at all, such as RTX Ventures and Moore Strategic Ventures.

19. Investors as a group hold about 70% of each winner at exit, the share left after selling the US average stake in each round from seed through Series D. The 145 companies we could test hold $27.4 billion of the $29.8 billion raised (92%), with a median raise of $43 million against $5 million for the others, for which PitchBook does not record a lead investor or the size of the lead's fund. They hold too little capital to move the group's return much either way. The results do not change at the precision we report when the trials are rerun with different random draws.



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