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Are We in a Defense Tech Bubble?

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Boston Consulting Group

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Read the recent headlines, and you'll know that defense aviation is shifting away from billion-dollar exquisite programs in favor of technologies that are smaller, cheaper, and faster to produce.

These systems have proven their worth in recent conflicts, and defense ministries are adjusting their acquisition models to focus on speed, lowering the barriers to entry. The upstart competitors that produce these platforms have attracted billions in private investment, and some legacy prime contractors are weighing whether to shift capital into this market. Our take? Not just yet.

BCG, collaborating with Vertical Research Partners, an equity research firm, recently analyzed the profit pools for traditional defense aviation platforms and for newer, cheaper solutions. The result shows that while the newer platforms show faster growth than exquisite platforms, their profitability profile is more limited and they carry characteristics that make them less attractive.

Our analysis underscores the need for incumbents and investors to assess the full business implications of these smaller programs, including R&D models and per-unit economics, so they can make an informed decision about whether, how, and where to compete in this market.

The Rapid Rise of Nontraditional Competitors

New, lower-cost aviation solutions offer clear advantages to armed forces, offering far lower unit costs, shorter production times, and a reliance on commercially available technologies. To capitalize on these solutions, governments are adjusting procurement processes in favor of speed. In the US, for example, the Department of War's Other Transaction Authority (OTA) program enables the government to transact with companies outside of traditional contracts, typically for research, prototypes, and production. The program has increased from \$1.8 billion in 2016 to more than \$18 billion in 2025.

Competitors that offer affordable mass and expendable solutions are now starting to work their way up the value chain. (See Exhibit 1.) For example, the US Air Force is developing a Collaborative Combat Aircraft—an uncrewed vehicle that will fly alongside crewed fighter jets—and Anduril and General Atomics were both selected to develop prototypes, beating out prime contractors Lockheed Martin, Northrop Grumman, and Boeing. There is a real question as to whether the core business of incumbents is at risk, particularly if affordable mass players can adapt the production system they have built for speed and apply it to lower-rate production programs. At the same time, primes that want to participate in this market must determine the best approach. Co-invest in funding rounds? Or acquire these technologies over time?

Europe is moving in the same direction, but it faces different dynamics. European conflicts set the tone for lower-cost tech demand, yet the procurement is more fragmented among ministries of defense and countries are focused on rebuilding basic defense capabilities before committing to newer types of defense technologies. Many startups are now targeting this market, often funded in large part by private capital.

Yet while these new solutions are succeeding in conflict, and potentially introducing new tech models to consider, their underlying economics are different from those of established aviation platforms. Most manufacturers of affordable mass and expendable systems are not yet profitable, despite seeing huge demand for their products. As a result, prime contractors now face a capital-allocation dilemma: Do they continue to invest in a stable and profitable business of developing exquisite programs, or do they think about leaning into higher-growth segments? Can they simply buy the most successful startups and offer an attractive exit to the private capital investing in a perilous market? (See “Considerations for Primes and Institutional Investors.”)

EXHIBIT 1

The Three Main Classes of Defense Aviation Technology Have Radically Different Parameters

	 Exquisite systems	 Affordable mass systems	 Expendable systems
Unit economics	>\$10 million	\$100,000 to \$10 million	\$50,000 to \$100,000
Annual volume (units)	<200	200–10,000	>10,000
Lifespan (years)	~20–35+	~1–15	Single-use/mission
Program revenue	\$5 billion+	\$500 million–\$10 billion	\$100 million–\$1 billion
EBIT margin	10%–15%	10%–15%	15%–20%
R&D model	Cost-plus, government-funded	Hybrid of contractor- and government-funded	Primarily contractor-funded
Sustainment scope	Spare parts, depot maintenance, and upgrades	Software upgrades and some hardware replacement	Pre-deployment readiness only
Prime supplier	Traditional players	Neo-primes and defense startups	Defense startups

Source: BCG proprietary aviation-defense market model based on expert interviews.

Note: Group 1 and 2 UAVs (unmanned aerial vehicles) excluded from affordable mass; expendable quantity focuses on expendable air systems; includes Group 1 and 2 UAVs and loitering munitions; revenue ranges are illustrative and not mutually exclusive; certain expendable systems may exceed revenue of smaller affordable mass platforms based on procurement volume; excludes space, counter-UAS (unmanned aerial systems), and broad munitions.

Considerations for Primes and Institutional Investors



Primes and institutional investors weighing whether to participate into a particular profit pool should make that assessment by looking at five factors.

- **Structural Attractiveness.** Is the value pool large enough, in both margin and absolute terms? Where does value concentrate across the lifecycle? How firm is demand for the foreseeable future?
- **Competitive Alignment.** Do the company's current advantages apply to the value drivers in this pool, or does entry require closing a capability gap—whether organically or through acquisition—against competitors with a years-long head start?
- **Operating Model Fit.** Can the company build or acquire a structurally separate unit with the operating model, cost structure, and acquisition cadence needed to compete in the affordable mass and expendable markets while the core business maintains the legacy model?
- **Capital Requirements.** What is the total capital required across R&D, manufacturing scale-up, and working capital? At what volume and demand scenario does the investment break even?
- **Time Horizon.** Over what period will value accrue, and does this timeline remain viable if demand contracts sharply before returns materialize?

Five Key Findings from Our Analysis

We modeled the growth prospects and profit pools of various defense aviation categories and derived five clear insights.

Legacy players will continue to claim the bulk of industry revenue. Legacy primes dominate defense aviation budgets today, and assuming defense budgets hold steady, that scenario will continue through the coming decade. Procurement revenue from exquisite aviation systems comprised about \$65 billion in the US and EU in 2025, compared with roughly \$5 billion for affordable mass systems and just \$55 million for expendable systems.

Looking ahead, the growth prospects for these sectors through 2033 show different trajectories. Exquisite systems are estimated to grow at a compound annual rate of approximately 2% to 3%, while affordable mass will grow at 15% to 20% and expendable systems at 35% to 40%. However, even with that disparity in growth rates, exquisite systems will still comprise more than 80% of the market by 2033, because the newer categories are growing from smaller bases. [\(See Exhibit 2.\)](#)

Profits are more sustainable for exquisite systems.

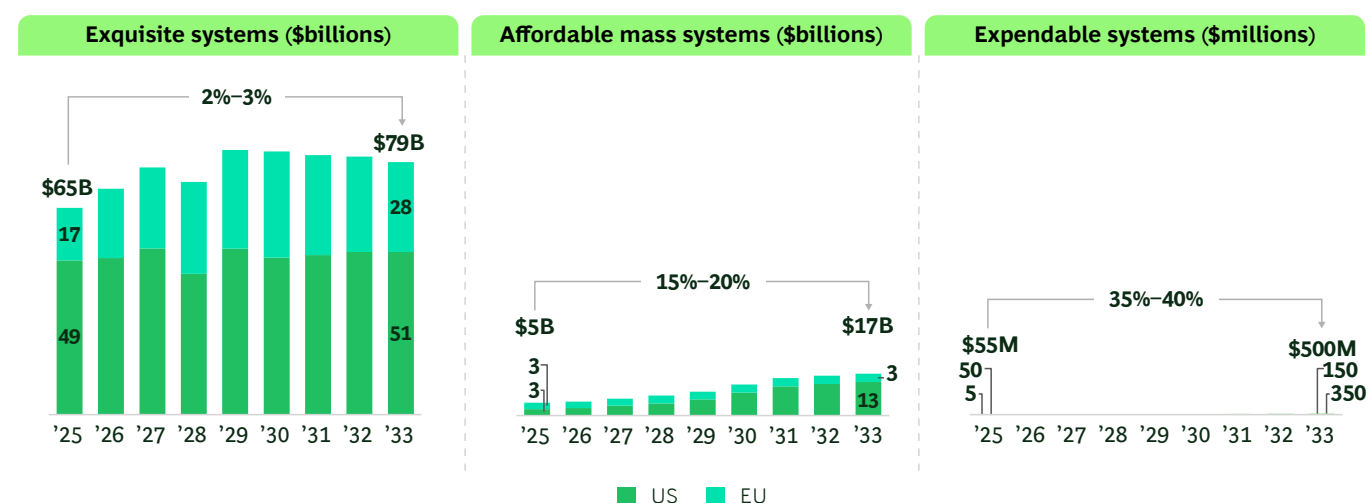
We mapped the contractor-addressable profit pools for two archetypal platforms: the exquisite F/A-18E/F Super Hornet fighter jet and the expendable AeroVironment Switchblade 300 loitering munition. That analysis shows that the shape of profit pools for expendable systems is not just smaller but fundamentally different.

Exquisite platforms typically derive about half of their lifetime profit from sustainment (over \$10 billion for the Super Hornet across a \$20.3 billion lifetime program). These systems require decades of spare parts support, maintenance, and post-delivery upgrades over their operational lifetime. In contrast, expendable platforms generate nearly all their value through the initial production and purchase. Sustainment after acquisition is typically limited to pre-deployment readiness, software updates, and select few spare parts. [\(See Exhibit 3.\)](#)

The durability of profits from sustainment for traditional primes is significant. Defense spending sees large swings based on wartime demand. In the US, for example, defense budgets fell roughly 37% after the Cold War and 30% to 45% in the drawdowns following operations in Iraq and Afghanistan. Companies that scaled up to meet surge demand were left with stranded capacity and unrecovered R&D. The risk of contracting demand applies today, and it is greater for companies that get the bulk of their profits from volume sales rather than sustainment.

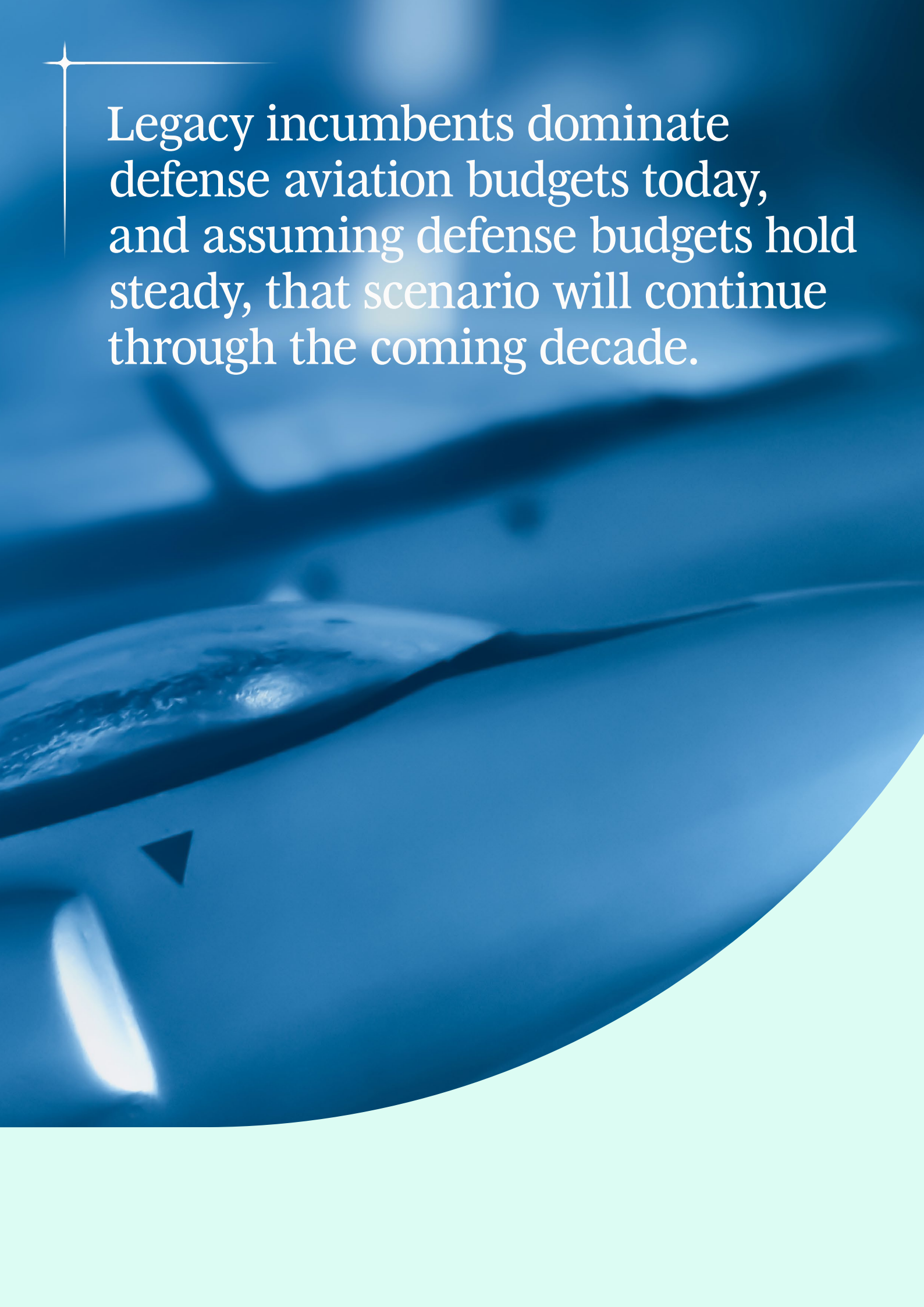
EXHIBIT 2

Smaller Defense Programs Are Growing Fast but Will Comprise Only a Sliver of the Overall Market Through 2033



Sources: BCG proprietary aviation-defense market model based on program-level budget data; company disclosures; expert interviews; and Tamarack Defense data.

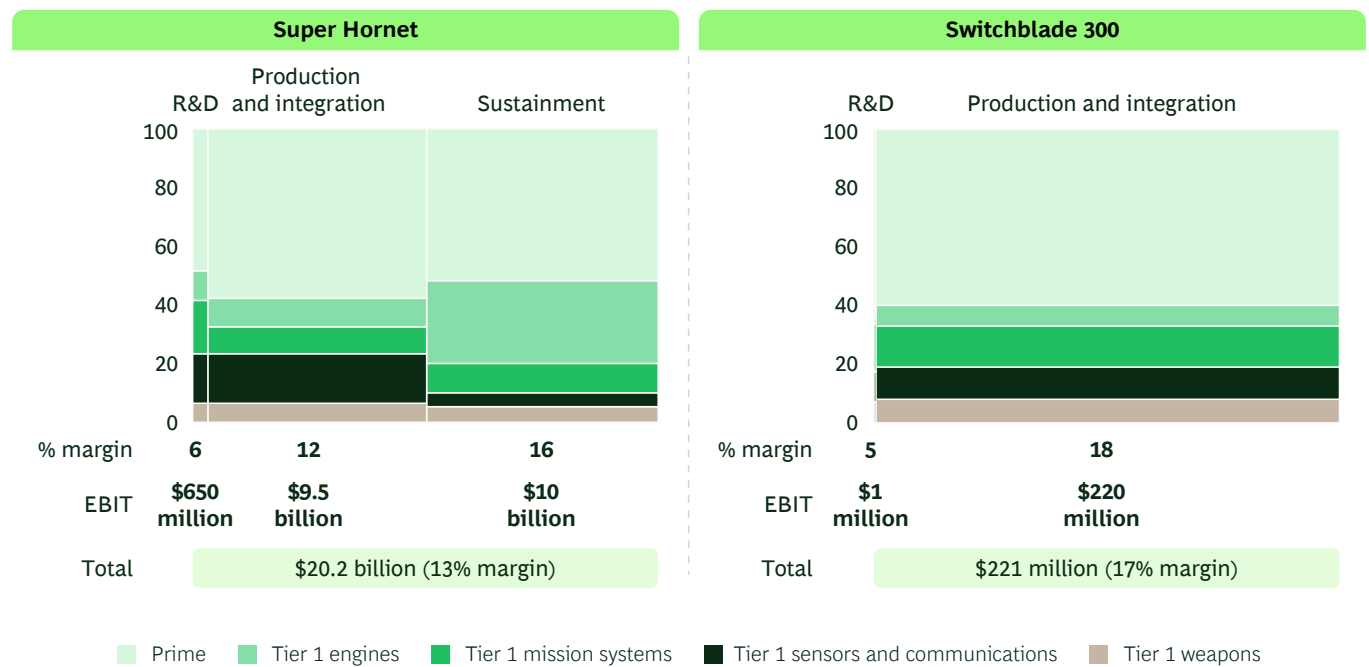
Note: Numbers may not sum due to rounding; Group 1 and 2 UAVs (unmanned aerial vehicles) excluded from affordable mass; expendable quantity focuses on expendable air systems; includes Group 1 and 2 UAS (unmanned aerial systems) and loitering munitions; includes US and European air-system expenditure; excludes space, counter-UAS, broad munitions, and non-addressable government O&S costs such as military manpower and fuel.



Legacy incumbents dominate defense aviation budgets today, and assuming defense budgets hold steady, that scenario will continue through the coming decade.

EXHIBIT 3

Defense Air Systems Profit Pool



Sources: BCG proprietary profit pool analysis based on program-level budget data/reports (2012 Selected Acquisition Report, GAO, DSCA); company disclosures; industry benchmarks (*Aviation Week MRO*); expert interviews; and Tamarack Defense data.

Note: Includes historical and projected future sustainment expenditure across full program life cycle; reflects contractor-addressable industry EBIT across US and European air-system expenditure; excludes space, counter-UAS, broad munitions, and non-addressable government O&S costs such as military manpower and fuel; UAS = unmanned aerial systems; UAV = unmanned aerial vehicle.

Longer supply chains foster stability. The distribution of profits along the supply chain varies as well. In exquisite programs, Tier 1 suppliers—particularly suppliers of major components like engines, mission and communication systems, and sensors—can capture 40% to 50% of lifecycle profits independently of the platform prime. What legacy primes retain, however, is decades of supply chain qualification, production experience, and familiarity with the compliance and certification requirements that government contracts demand.

Expendable programs have shallower supply chains, with value focused on owning the intellectual property behind a given platform and being the sole source of its production. The companies that sell these systems capture a larger share of a structurally smaller pool, but most currently lack the qualified suppliers and experience with compliance and certification that would help them win larger and more complex contracts.

R&D risks shift to new entrants. New defense solutions flip the risk-reward equation for R&D. Traditional programs often use government-funded development and negotiated fee structures. These cap the potential upside but also reduce the capital at risk for primes during development. (However, the risk allocation varies significantly by contract type.)

In contrast, affordable mass and expendable contractors largely fund their own R&D, often with the aid of venture or private capital, and thus bear the bulk of the financial risk. If they develop a winning idea, they own the IP and become the sole-source provider of an in-demand platform, but they face an existential risk if the idea does not pan out.

Long-term relationships create stability during peacetime.

Primes continue to hold a customer relationship even during peacetime, due to sustainment and training needs on platforms. They often have permanent posts at customer bases. There is no similar precedent for new defense technology players unless the technology applies to non-defense missions like border patrol or critical infrastructure security. However, these tend to be different government customers than military. As a result, primes' revenue in this area is far less volatile and reliant on growing defense budgets.

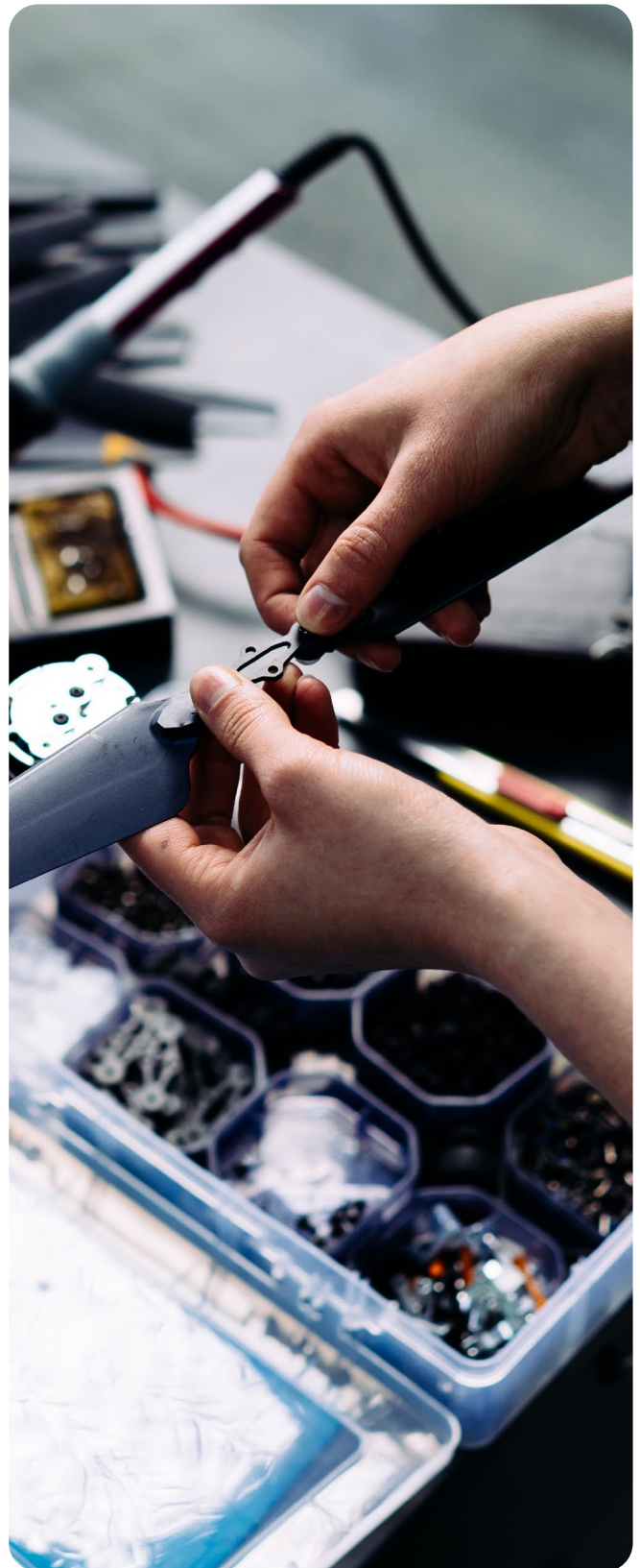
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The Value of a Portfolio Approach

For primes that want to compete in the affordable mass and expendable markets, the right approach may be to consider them as part of an overall portfolio that supplements the core business rather than overshadowing it. Specifically, these companies can consider six measures:

- **Get faster and more flexible in how you go to market.** Build up your bid capability and gain direct access to nontraditional acquisition channels, such as the US's OTA.
- **Apply an ecosystem strategy.** Use partnerships, minority investments, and acquisitions to access innovation more quickly—without committing the time and organizational resources to develop it internally.
- **Rethink how you allocate R&D resources.** When developing lower-cost programs, consider accepting more upfront risk in exchange for IP ownership and a larger share of margin pools.
- **Segregate business units with different operating models.** Ring-fence affordable mass and expendable businesses with their own P&L. That will help large players with significant overhead compete on price with smaller competitors.
- **Shift to software-native production.** Build agile software and hardware upgrades within long-cycle programs.
- **Compete for emerging-markets business.** With IP ownership, affordable mass and expendable markets offer more attractive opportunities for non-defense sales.

Exquisite platforms will likely remain the dominant source of profits in the defense industry for the foreseeable future, but incumbents should understand the threat that comes from newer competitors and less-expensive solutions. The question in front of the defense industry is to find strike the balance between legacy platforms and tapping into growth from affordable mass and expendable solutions. The battlefield solution will require both. Winners will understand where long-duration aviation economics still dominate, where faster-cycle autonomy economics are emerging, and where profitable growth will ultimately accrue between the two.



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