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# Private Finance and the Quest to Remake Modern Warfare

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# Executive Summary

Official Washington is all in on promoting a new type of warfare based on military applications of AI and other emerging technologies. This determination was on full display last year when the Biden administration unveiled the “Replicator” initiative, an attempt to develop swarms of high-tech weapons systems at relatively low cost, and in numbers capable of overwhelming any potential adversary.

But the history of so-called miracle weapons offers ample reasons to doubt Replicator’s supposedly transformative potential. Previous innovations, from the “electronic battlefield” in Vietnam to drone warfare in the Global War on Terrorism, did not, in fact, revolutionize war as we know it. Cutting-edge technology is no substitute for sound strategy or a realistic assessment of what military force can achieve.

Unfortunately, so far, at least, these lessons from history have been no match for the boosterism of venture capital (VC) firms that pride themselves on disrupting industries and overturning conventional wisdom. While estimates of total VC funding of emerging military technology vary widely, it is clear that private investments in emerging weapons technologies are large and growing, driven by a handful of major Silicon Valley players, including Peter Thiel’s Founders Fund and Andreessen-Horowitz. Companies backed by these firms, including Palantir, Anduril, and SpaceX, have already landed major contracts for weapons systems that incorporate next-generation technology. These firms and their allies in the Pentagon and Congress are determined to move full speed ahead on the development and deployment of weapons based on AI and other technological innovations, despite many unanswered questions about the costs and risks involved.

While the bulk of Pentagon funding still goes to the “big five” contractors — Lockheed Martin, RTX (formerly Raytheon), Boeing, General Dynamics, and Northrop Grumman — VC-backed startups aspire to become the future of military contracting, and they hope

that AI and other emerging technologies will be their ticket. These startups may prove to be more nimble and innovative than the bloated, top-heavy firms that currently dominate the arms industry, but they should not be allowed to operate with impunity. Congress must establish ground rules that prevent military startups from exploiting the procurement process in ways that pad their bottom lines while providing flawed systems – outcomes that we have seen all too often from their traditional rivals.

What is most important, the rush to profit from emerging military tech cannot be allowed to short-circuit the careful scrutiny and wide-ranging public debate that must precede any move toward a brave new world of autonomous warfare in which human intervention in the kill chain is significantly reduced, if not eliminated.

This brief offers policymakers a framework for ensuring that unsupported promises to “reinvent” warfare don’t exacerbate the cycle of corruption and waste that has all too often plagued the Pentagon’s procurement process, to the detriment of our safety and security.

## Introduction

In late August of last year, Deputy Defense Secretary Kathleen Hicks gave a speech to the National Defense Industrial Association (NDIA) in which she introduced the “Replicator” initiative – a drive to build a new generation of high-tech weapons systems that can be produced and deployed in large quantities, incorporating artificial intelligence (AI) and other cutting-edge technologies. The goal of the initiative is to counter China. Part of the plan will likely be the development of “swarms of drones” that Adm. John Aquilino, head of the U.S. Pacific Command, says should ideally entail a capability to hit “1,000 targets in 24 hours.”<sup>1</sup>

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<sup>1</sup> Kathleen Hicks, “The urgency to innovate,” address to the National Defense Industrial Association, August 28, 2023, <https://www.defense.gov/News/Speeches/Speech/Article/3507156/deputy-secretary-of-defense-kathleen-hicks-keynote-address-the-urgency-to-innov/>; Josh Luckenbaugh, “Replicator initiative looks to swarm through ‘Valley of Death,’” *National Defense*, January 4, 2024, <https://www.nationaldefensemagazine.org/articles/2024/1/4/replicator-initiative-looks-to-swarm-through-valley-of-death>; Patrick Tucker, “Hellscape’: DoD launches massive drone swarm program to counter China,” *Defense One*, August 28, 2023,

Hicks's remarks to the NDIA stood out for several reasons.

The first item of note was the context — Hicks was touting a new generation of weaponry in front of the very contractors who would profit from building them.

The second key element of Hicks' address was its explicit targeting of China and its People's Liberation Army: "We'll counter the PLA's mass with mass of our own, but ours will be harder to plan for, harder to hit, harder to beat."<sup>2</sup>

Whether the development of next-generation high-tech weapons has a deterrent effect or sparks a costly and counterproductive arms race remains to be seen.

The third distinguishing feature of Hicks' remarks was its unshakable faith in the ability of technology to solve a complex political, economic, and strategic challenge. Whether or not the U.S. and China go to war has as much or more to do with skilled diplomacy and open dialogue as it does with fielding yet more "miracle" weapons.

Finally, Hicks is supremely optimistic about the ability of the arms industry to deliver the needed capabilities as advertised, on time, on budget, and in extremely short order. The Pentagon's current high-tech favorite, the F-35 combat aircraft, took 23 years from conception to approval for full-rate production, and still suffers from serious design flaws. While the systems developed as part of the Replicator initiative are meant to be simpler, the idea that the Pentagon and industry can produce large numbers of new systems in 18 months or less, as currently envisioned, strains credulity.

Hicks has suggested that the Replicator initiative will largely be financed by shifting funds within the Pentagon's existing budget.<sup>3</sup> This assertion is also supremely optimistic. The armed services, the big contractors, and many members of Congress are doggedly attached to enormously costly, existing weapons programs because of the

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<https://www.defenseone.com/technology/2023/08/hellscape-dod-launches-massive-drone-swarm-program-counter-china/389797/>.

<sup>2</sup> Hicks, "Urgency to Innovate."

<sup>3</sup> Noah Robertson, "Replicator drone program needs no new money, Hicks says," *Defense News*, September 6, 2023, <https://www.defensenews.com/pentagon/2023/09/06/replicator-drone-program-does-not-require-new-money-hicks-says/>.

profits they provide for arms makers and jobs in the districts of key lawmakers. It will be politically difficult to displace these traditional systems. The solution will almost certainly be to increase the Pentagon's already enormous budget to make room for the new generation of high-tech systems while continuing to fund significant numbers of existing programs.

At the moment, a small group of well-heeled venture capitalists are the primary funders of the next generation of weapon systems. These venture capital firms are placing large bets on defense startup companies in hopes that a few of them will catapult into the top tier of U.S. arms contractors.<sup>4</sup>

But this flood of private funding could result in a rush to develop and deploy AI-controlled weapons and other emerging arms technologies before their risks have been fully assessed or their capabilities have been adequately tested. This paper will look at the potential risks and rewards of private funding of emerging weapons technology, and offer some recommendations on how to regulate private equity's role in defense contracting to prevent further inefficiency, waste, and cost overruns.

## **Part one: The mixed record of “miracle weapons”**

Leaning on technological progress as a pillar of defense strategy is nothing new. From the First World War, to the nuclear arms race of the Cold War, to the “electronic battlefield” in Vietnam, to the “revolution in military affairs” in the 1990s, efforts to win the technology race have taken center stage in U.S. defense planning, with decidedly mixed results.

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<sup>4</sup> Tabby Kinder, “Silicon Valley VCs rush into defence technology startups,” *Financial Times*, June 20, 2023, <https://www.ft.com/content/d50dbbc0-9137-4411-8ac3-8254451e60a7>.

*From the First World War, to the nuclear arms race of the Cold War, to the “electronic battlefield” in Vietnam, to the “revolution in military affairs” in the 1990s, efforts to win the technology race have taken center stage in U.S. defense planning, with decidedly mixed results.*

Innovations in military technology aimed to accomplish two interrelated goals: prevent American casualties and maximize the efficient destruction of the enemy. Ever since the First World War, a “progressive” spirit has informed the American military that aimed to avoid the destruction wrought by total wars. The “father” of the U.S. Air Force, Billy Mitchell, hoped “precision bombing” after World War I would make ground armies obsolete. When World War II nullified that dream, the Cold War arms race revived ideas that intercontinental ballistic missiles and nuclear deterrence could stabilize a “long peace” that would create permanent stability.<sup>5</sup>

Even as the Vietnam War proved this impossible, the United States still tried to employ technology to better defeat its enemies. The Pentagon initiated an intensive research program designed to use high-tech surveillance and communications systems to locate and target Viet Cong fighters in a complex jungle environment. In a 1970 article, *New York Times* military correspondent Drew Middleton underscored the U.S. military’s high expectations for the program:

“Gen. William C. Westmoreland, Army Chief of Staff, believes that the new electronics technology has brought the Army to the threshold of a new concept of

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<sup>5</sup> Marc Clodfelter, *Beneficial Bombing: The Progressive Foundations of American Air Power, 1917–1945* (Lincoln: University of Nebraska, 2010); Colin S. Gray, “Strategic culture as context: The first generation of theory strikes back,” *Review of International Studies* 25, no. 1 (January 1999): 49–69, <http://www.jstor.org/stable/20097575>.

the battlefield that may be as revolutionary in warfare as the introduction of the helicopter or the tank.”<sup>6</sup>

The quest for the “electronic battlefield” did not prompt the revolution predicted by Gen. Westmoreland. The Viet Cong developed a series of relatively simple countermeasures, and the new surveillance and targeting systems did not turn the tide in the war, which ended in a U.S. defeat and withdrawal. The success of the North Vietnamese in evading the U.S. system entailed deploying fake bridges and other decoy measures to evade air strikes coordinated via the electronic battlefield.<sup>7</sup>

The Vietnam War offered a stark lesson in the limits of military technology in a context where terrain, culture, and human factors were decisive. But the quest to cure “Vietnam syndrome” pursued by American military planners revived faith in technology to win asymmetric wars in ways that minimize casualties and generated decisive victories.<sup>8</sup>

The 1991 Persian Gulf War, and the lopsided coalition victory in the conflict, sparked a discussion about whether new technologies would allow the U.S. to avoid ground troops and catastrophes associated with conflicts like Vietnam. Iraqi President Saddam Hussein’s forces were ejected from Kuwait within six weeks, and the country’s air defenses were largely destroyed within the early days of the conflict. The United States’ use of precision munitions, sustained aerial bombing, sophisticated satellite-based communications, and the relatively seamless coordination between air, land, and sea forces reflected a new type of warfare hitherto unseen in global affairs.<sup>9</sup>

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<sup>6</sup> Drew Middleton, “Army is developing battlefield computers and detection devices,” *New York Times*, October 27, 1970, <https://www.nytimes.com/1970/10/27/archives/army-is-developing-battlefield-computers-and-detection-devices.html>.

<sup>7</sup> Andrew Cockburn, *Kill Chain: The Rise of the High-Tech Assassins* (New York: Henry Holt, 2015), 26.

<sup>8</sup> On Vietnam syndrome, see Christian G. Appy, *American Reckoning: The Vietnam War and Our National Identity* (New York: Penguin, 2016).

<sup>9</sup> Richard A. Laquement Jr., “The Gulf War 30 years later: Successes, failures, and blind spots,” *War on the Rocks*, September 9, 2020, <https://warontherocks.com/2020/09/the-gulf-war-30-years-later-successes-failures-and-blind-spots/>.

But upon closer examination, the coalition victory against Hussein’s forces had more to do with the volume of munitions dropped and the relative weakness of the Iraqi armed forces than it did with networked warfare or precision strikes. An extensive analysis of the air war in the 1991 conflict by what was then known as the General Accounting Office (now known as the Government Accountability Office) pointed out that “the claim by DoD and contractors of a one-target, one-bomb capability for laser-guided munitions was not demonstrated in the air campaign, where, on average, 11 tons of guided and 44 tons of unguided munitions were delivered on each successfully destroyed target.”<sup>10</sup>

But the triumphalism that followed the Gulf War overshadowed these details. A year after the war, Pentagon planners wondered whether a “revolution in military affairs (RMA)” was on the horizon.<sup>11</sup> The theory was hatched in the offices of the legendary Pentagon planner Andrew Marshall, and was heartily embraced by George W. Bush’s secretary of defense, Donald Rumsfeld.<sup>12</sup> The idea behind the RMA was that superior information and communications – networked warfare drawing on satellite surveillance and rapid sharing of timely information with battlefield commanders and personnel involved in launching airstrikes – would create a decisive advantage against adversaries lacking such assets, while allowing the United States military to hit more targets and do more damage with fewer weapons platforms.

In the Global War on Terror, high-tech approaches – in this instance based on precision strikes and drone warfare – did not fare much better, particularly in the long wars in Iraq and Afghanistan. U.S. forces were not able to defeat the Taliban

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<sup>10</sup> “Operation Desert Storm: Evaluation of the air campaign,” General Accounting Office, June 12, 1997, <https://www.gao.gov/products/nsiad-97-134>.

<sup>11</sup> Michael E. O’Hanlon, “A retrospective on the so-called revolution in military affairs 2000–2020,” the Brookings Institution, September 2018, <https://www.brookings.edu/articles/a-retrospective-on-the-so-called-revolution-in-military-affairs-2000-2020/>.

<sup>12</sup> Fred Kaplan, “Rumsfeld’s man,” *Slate*, May 6, 2003, <https://slate.com/news-and-politics/2003/05/why-generals-will-fight-the-new-secretary-of-the-army.html>; Peter Munson, “The office of net assessment: Swept away by a revolution in socio-political affairs?,” *War on the Rocks*, November 5, 2013, <https://warontherocks.com/2013/11/the-office-of-net-assessment-swept-away-by-a-revolution-in-socio-political-affairs/>.

after 20 years of fighting, and the result in Iraq was the installation of a sectarian regime that tilted towards Iran and created an environment ripe for the 2014 invasion of the country by ISIS.<sup>13</sup>

Technology is no substitute for strategy, or for a frank assessment of the utility of military force in each situation. And adversaries often develop cheap countermeasures to sophisticated systems, as in the adoption of improvised explosive devices as a weapon that was used to devastating effect against coalition forces in both Iraq and Afghanistan.

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There has been considerable talk of the effectiveness of drones and advanced communications in Ukraine's fight to defend itself against Russia's invasion of that country. But many of the drones being used are merely adaptations of current technology, not major technological breakthroughs. Ukraine's resistance to Russian aggression has relied on Javelin missiles, HIMAR launchers, self-propelled artillery, and armored vehicles, not artificial intelligence. While advanced technology – in terms of guided missiles and sophisticated communications – is present in the Ukraine war, and played an important role in the conflict, these new technologies are not what Ukraine needs the most, nor what is most sought after.<sup>14</sup>

Indeed, the overall character of the Ukraine conflict remains a war of attrition in which conventional weapons are the most critical weapons. As Stephen Biddle has written in *Foreign Affairs*, armies have adapted to the ways technology has changed the nature of warfare since World War II. The same is true in Ukraine, where casualty

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<sup>13</sup> Zack Beauchamp, "Yes, Bush helped create ISIS – and set up the Middle East for a generation of chaos," Vox, June 2, 2015, <https://www.vox.com/2015/6/2/8703059/bush-isis-middle-east>.

<sup>14</sup> Gerry Doyle, Anurag Rao, and Vijdan Mohammad Kawoosa, "Shaping the battlefield," Reuters, March 10, 2023, <https://www.reuters.com/graphics/UKRAINE-CRISIS/ARMS/lqvdkoygnpo/>.

rates are comparable to similar conflicts in decades past and technology has failed to break the evolving stalemate between the two countries. “U.S. defense planners should understand that the war in Ukraine does not portend a ‘revolution in military affairs’ of the kind that has often been predicted but somehow never quite arrives,” wrote Biddle.<sup>15</sup>

In addition, a ground war in Ukraine bears little resemblance to what a U.S. conflict with China is likely to look like, so whatever technological advances may have been helpful to Ukraine’s defenses will not necessarily translate to effectiveness in a large-scale superpower confrontation. Given the deflated expectations that innovations in technology would remake the battlefield, the burden of proof for demonstrating that the Replicator initiative will be the key to winning a war with China, or to deterring Beijing from aggression, remains with the advocates of these efforts in the Pentagon and industry.

Any analysis of the value of emerging technologies in the Ukraine war must also take into account the fact that a number of key systems have failed to perform as advertised. For example, an analysis by the *Wall Street Journal* notes that “most small drones from U.S. startups have failed to perform in combat, dashing companies’ hopes that a badge of being battle-tested would bring the startups’ sales and attention.”<sup>16</sup>

The article goes on to describe why the drones have failed: “Made-in-America drones tend to be expensive, glitchy, and hard to repair, said drone company executives, Ukrainians on the front lines, Ukrainian government officials, and former U.S. defense officials.”<sup>17</sup>

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<sup>15</sup> Stephen Biddle, “Back in the trenches,” *Foreign Affairs* 102, no. 5 (September/October 2023), <https://www.foreignaffairs.com/ukraine/back-trenches-technology-warfare>.

<sup>16</sup> Heather Somerville and Brett Forest, “How American drones failed to turn the tide in Ukraine,” *Wall Street Journal*, April 10, 2024, <https://www.wsj.com/world/how-american-drones-failed-to-turn-the-tide-in-ukraine-b0ebbac3>.

<sup>17</sup> Somerville and Forest, “American drones.”

## Part two: Enter Silicon Valley

Faith in military technology during the 21<sup>st</sup> century, and venture capital to finance those technological gains, has its roots in the Pentagon's relationship with Silicon Valley.

During the Cold War, the Department of Defense allocated contracts to Silicon Valley companies to supply parts for intercontinental ballistic missiles. Under President Ronald Reagan, the Pentagon bankrolled computer software companies and other technology to support the Strategic Defense Initiative – nicknamed Star Wars – and other programs under his administration's defense buildup. The entrepreneurial ethos of Silicon Valley sometimes clashed with the slow bureaucracy and red tape of the Pentagon.<sup>18</sup>

Rifts between the Department of Defense and Silicon Valley widened in the post-Cold War period. Consolidation of the defense industry – the creation of the “Big Five”: Boeing, General Dynamics, Lockheed Martin, Northrop Grumman, and Raytheon – and outsourcing of defense production reduced incentives for Silicon Valley to pursue defense contracts. The rise of the internet, and the ability for private companies to access and profit from it, led to new sources of private investment – and in Wall Street exerting greater influence over the industry. The tech bubble of the 1990s also made Silicon Valley eschew the slow pace, lower profits, and bloated bureaucracy associated with military contracting.

Silicon Valley's outlook toward the Pentagon has shifted in recent years. In the post-9/11 era, Silicon Valley eschewed Pentagon contracts for fear of being affiliated with, or contributing to, the “endless wars” in Afghanistan and Iraq.<sup>19</sup> But tech companies are once again receptive to working with the Pentagon. Unlike the war on

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<sup>18</sup> Margaret O'Mara, *Cities of Knowledge: Cold War Science and the Search for the Next Silicon Valley* (Princeton: Princeton University Press, 2005), 108–109; Margaret O'Mara, *The Code: Silicon Valley and the Remaking of America* (New York: Penguin Press, 2019), 241–260.

<sup>19</sup> Douglas MacMillan, “Google won't seek to renew Pentagon contract after internal backlash,” *Wall Street Journal*, June 1, 2018, <https://www.wsj.com/articles/google-wont-seek-to-renew-pentagon-contract-after-internal-backlash-1527888725>.

terror, great-power competition with China is not being waged through two unpopular wars (in Iraq and Afghanistan); competition with China is premised on a race for technological superiority, which is a better fit with the culture of innovation in Silicon Valley. In fact, as one tech leader said recently, “techno-patriotism” now pervades Silicon Valley.<sup>20</sup> This “techno-patriotism” coincides with “techno-futurism” — a belief that technology will rescue the United States from its strategic, economic, and even societal woes.<sup>21</sup>

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Organizations like the Silicon Valley Defense Group (SVDG) — a nonprofit organization that works to establish connections between policymakers and AI developers — reflect the ways that defense tech and venture capital have aligned in this new era of national security. SVDG co-founder James Cross is also a top executive at Franklin Equity Group and Franklin Venture Partners. Cross’ mission: to reinvent the Pentagon’s procurement process to benefit “the traditional Silicon Valley playbook.”<sup>22</sup>

Silicon Valley’s newfound interest in defense contracting has helped the Biden administration mend the relationship between government and the tech sector. Deputy Defense Director Hicks has courted the industry’s support through the Replicator system, which consists of a series of initiatives “to make the most of this comparative

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<sup>20</sup> Reed Albergotti, “Defense tech is having its moment in Silicon Valley,” *Semafor*, January 3, 2024, <https://www.semafor.com/article/01/03/2024/defense-tech-is-having-its-moment-in-silicon-valley>.

<sup>21</sup> Nitasha Tiku and Elizabeth Dwoskin, “How Silicon Valley learned to love America, drones and glory,” *Washington Post*, February 17, 2024, <https://www.washingtonpost.com/technology/2024/02/17/silicon-valley-military-tech-defense-contractors/>.

<sup>22</sup> Marc Vartabedian, “Venture investor on what it takes to succeed in defense tech,” *Wall Street Journal*, March 4, 2024, <https://www.wsj.com/articles/venture-investor-on-what-it-takes-to-succeed-in-defense-tech-fabb4d8b>.

advantage that we think the U.S. has on innovation,” according to Hicks.<sup>23</sup> The Replicator program has two intertwined goals: produce cheaper military equipment that is also equipped with the latest in commercial innovation.<sup>24</sup>

In November 2023, Defense Department officials released their strategy to “harness data, analytics, and AI for the defense, security, and prosperity of the American people and the world,” according to Hicks. The department’s AI strategy aims to streamline the procurement process by removing bureaucratic obstacles for private investment and production, improving data management, and enhancing “warfighting capabilities” of the United States.<sup>25</sup> Given the rapid developments made in AI by the private, commercial tech sector, the Pentagon hopes the industry will become a reliable partner to outpace China as the United States aims to “transform modern warfare.”<sup>26</sup>

Thus far, Silicon Valley has obliged Hicks and the Pentagon’s strategy. In December 2023, Hicks toured companies and met with executives to discuss the “strategic pacing challenge presented by the People’s Republic of China and to ensure the Department is delivering the most cutting-edge technologies to warfighters.”<sup>27</sup> Executives introduced Hicks to autonomous vehicles, AI-equipped satellites, and commercial F-16 simulators. These technologies are made by a variety of companies, five of which now have close to a \$1 billion net worth: ShieldAI, HawkEye 360, Anduril, Palantir, and Epirus. Other firms have not fared as well.

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<sup>23</sup> “Silicon Valley ties are key to beating China, Pentagon’s No. 2 says in California visit,” Bloomberg, December 14, 2023, <https://www.bloomberg.com/news/articles/2023-12-14/silicon-valley-ties-key-to-beating-china-pentagon-s-no-2-says-in-california>.

<sup>24</sup> President Bill Clinton, “A national security strategy of engagement and enlargement,” July 1994, <https://history.defense.gov/Portals/70/Documents/nss/nss1994.pdf>. See also Michael Brenes, “Abandoning the peace dividend: Bill Clinton and the political economy of defense conversion, 1989–2000” in Daniel Bessner and Michael Brenes, eds., *Rethinking U.S. World Power: Domestic Histories of U.S. Foreign Relations* (Cham, Switzerland: Palgrave MacMillan, 2024), 263–279.

<sup>25</sup> Department of Defense, “Data, analytics, and artificial intelligence adoption strategy,” [https://media.defense.gov/2023/Nov/02/2003333300/-1/-1/1/DOD\\_DATA\\_ANALYTICS\\_AI\\_ADOPTION\\_STRATEGY.PDF](https://media.defense.gov/2023/Nov/02/2003333300/-1/-1/1/DOD_DATA_ANALYTICS_AI_ADOPTION_STRATEGY.PDF).

<sup>26</sup> Tabby Kinder, “How Silicon Valley is helping the Pentagon in the AI arms race,” *Financial Times*, July 31, 2023, <https://www.ft.com/content/2ed278cc-6c3f-4569-b73c-64ad378f3ea8>.

<sup>27</sup> United States Department of Defense, “Readout of Deputy Secretary of Defense Kathleen Hicks’ Visit to Silicon Valley,” press release, December 12, 2023. <https://www.defense.gov/News/Releases/Release/Article/3615717/readout-of-deputy-secretary-of-defense-kathleen-hicks-visit-to-silicon-valley-c/>

Rebellion Defense was once among the top defense tech companies, but it has since lost its status due to mismanagement and unfulfilled promises. Two years after its founding, Rebellion had a \$1 billion valuation – with \$150 million from venture capital – and the backing of Eric Schmidt, former CEO of Google. “There is a new wave of people coming into VC who have the courage and tenacity to support our nation’s defense,” said then Rebellion CEO Chris Lynch in 2021.<sup>28</sup> Lynch, a former Pentagon official under Barack Obama and Donald Trump, bet the future of the company on securing a contract for a “tactical threat awareness tool” that leveraged AI for battlefield operations.<sup>29</sup>

Rebellion took a page out of the playbook of established military contractors: The company invited military officials to tour the company, recruited lobbyists to promote its interests on Capitol Hill, and hired former Pentagon employees to establish credibility. Rebellion veered from tradition when it recruited venture capital to boost the company’s financial portfolio even before it had secured a single contract. For nearly four years, Rebellion kept its doors open on promises of a large government contract to sustain its operations. When it failed to acquire Pentagon funding for its tactical threat awareness tool in 2023, Lynch resigned, with the company’s stability in doubt.<sup>30</sup>

It is tempting to argue that Rebellion’s collapse reflects a better contracting regime. When large defense contractors fail to deliver weapons in a timely fashion, taxpayers pay for the cost overruns and delayed returns. But in the case of Rebellion, which relied upon private equity, its losses were exclusively private.

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<sup>28</sup> Dan Primack, “Exclusive: Rebellion Defense raises \$150 million at \$1 billion valuation,” *Axios*, September 15, 2021, <https://www.axios.com/2021/09/15/rebellion-defense-raises-150-million-billion-valuation>.

<sup>29</sup> “How Rebellion Defense, the \$1 billion military AI startup hyped by Silicon Valley, wound up in a nosedive,” *Forbes*, December 22, 2023, <https://www.forbes.com/sites/davidjeans/2023/12/22/how-rebellion-defense-the-1-billion-military-ai-startup-hyped-by-silicon-valley-wound-up-in-a-nosedive/>.

<sup>30</sup> Lauren C. Williams and Audrey Decker, “Defense business brief: Shakeup at Rebellion Defense; Dubai Air Show preview; Viasat layoffs, and more...” *Defense News*, November 7, 2023, <https://www.defenseone.com/business/2023/11/defense-business-brief-november-06-2023/391824/>; Thomas Brewster, Sarah Emerson, and David Jeans, “How Rebellion Defense, The \$1 billion military AI startup hyped by Silicon Valley, wound up in a nosedive,” *Forbes*, December 22, 2023, <https://www.forbes.com/sites/davidjeans/2023/12/22/how-rebellion-defense-the-1-billion-military-ai-startup-hyped-by-silicon-valley-wound-up-in-a-nosedive/?sh=2118ad84772c>.

Rebellion's fate should be seen as a cautionary tale. It suggests that if private firms were to secure substantial defense contracts, the federal government would be more inclined to bail them out if they faced financial trouble. And private equity's desire to generate quick profits has led the winners of the defense contracting regime to buy out the losers.<sup>31</sup> According to one analyst of the industry, private equity firms buy a company, "and they buy a bunch of smaller companies, and they try to get economies of scale." Private equity firms now account for 47 percent of mergers, as firms with greater means buy out smaller companies that are proprietors of advanced, lucrative technology.<sup>32</sup> This trend creates further consolidation, which could tempt the federal government to bail out defense startups depending upon the size and contractual obligations of the company.

## **Part three: The role of venture capital and private equity in funding a new generation of tech startups**

### **Meet the players**

Few know for sure how much VC money is going into things like military applications of artificial intelligence, but it is in the billions and growing. The *Wall Street Journal* recently estimated that about \$6 billion per year in venture capital funds are flowing into the military and aerospace sector. The *Financial Times* puts the figure much higher, claiming that venture capital invested in defense and weapons technology startups alone rose to \$33 billion in 2022 from about \$16 billion in 2019. Meanwhile, a recent *New York Times*

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<sup>31</sup> Michael Brenes, "How America broke its war machine," *Foreign Affairs*, July 3, 2023, <https://www.foreignaffairs.com/united-states/how-america-broke-its-war-machine>; Caleb Harshberger, "Space startups find cash among defense industry giants (1)," *Bloomberg Government*, June 2, 2023, <https://about.bgov.com/news/space-startups-find-cash-backing-among-defense-contractor-giants/>.  
<sup>32</sup> Sean Carberry, "Private equity fueling growth of defense mergers," *National Defense*, February 27, 2023, <https://www.nationaldefensemagazine.org/articles/2023/2/27/private-equity-fueling-growth-of-defense-mergers>.

piece suggested that \$125 billion in venture capital funding has gone to defense startups in the last four years alone.<sup>33</sup>

The huge divergence in estimates of venture capital funding flowing into the military tech sector shows the lack of transparency in this area. But one thing is clear: The flow of private money into emerging weapons technologies is large and growing.

*The huge divergence in estimates of venture capital funding flowing into the military tech sector shows the lack of transparency in this area. But one thing is clear: The flow of private money into emerging weapons technologies is large and growing.*

The surge in VC investment in emerging arms technology is being spearheaded by a handful of firms and individuals. Two of the most important players are the Founders Fund, started by Peter Thiel, who is also the co-founder of PayPal and the arms technology firm Palantir; and Andreessen Horowitz, whose “American Dynamism Fund” invests in notable emerging tech firms like Anduril and Shield AI.

Some VC investors have become virtual evangelists for pouring private money into next-generation weapons projects. A case in point is a May 2023 *Wall Street Journal* op-ed by Katherine Boyle and David Ulevitch of Andreessen Horowitz entitled “Venture capitalists should bet on America.” They are not speaking of investing in America in general, but in American arms companies.

Boyle and Ulevitch have a “let the private sector do it” approach to funding emerging weapons technology, dismissing U.S. government efforts while noting that “many of

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<sup>33</sup> Eric Lipton, “New spin on a revolving door: Pentagon officials turned venture capitalists,” *New York Times*, December 30, 2023, <https://www.nytimes.com/2023/12/30/us/politics/pentagon-venture-capitalists.html>.

those initiatives are unnecessary, because venture capital is better able to assess talent and risk as companies form and grow.”<sup>34</sup>

Boyle and Ulevitch have applauded the growth of VC investment in rising arms companies:

“The two largest venture capital fund-raises of the past year,” they wrote, “SpaceX and Anduril – are American aerospace and defense companies building solutions for the Pentagon. That would have been unthinkable only a few years ago.”<sup>35</sup>

Some people think of Elon Musk’s SpaceX as primarily a space launch company, but the role of its Starlink system in ensuring internet access to the Ukrainian military in its fight against Russia’s invasion has highlighted its importance in the military sphere. And now SpaceX is slated to design systems exclusively intended for military use. Last year the company received its first military contract, for “StarShield,” which is described as a “military-specific version of Starlink,” its worldwide internet satellite network.<sup>36</sup> In the context of great-power competition with China, where the United States wants to become the leader of a revived “space race,” companies like SpaceX – and figures like Musk – have become essential.<sup>37</sup>

Anduril, another up-and-coming emerging tech firm, started with seed money from Peter Thiel’s Founders Fund, has also generated a fair amount of controversy in its brief lifespan. Anduril was founded in 2017 by Palmer Luckey, a 31-year-old tech executive whose previous venture was the creation of the Oculus virtual reality headset. The company first came to widespread public attention when it won a contract for Project Maven, an initiative aimed at using artificial intelligence to improve drone targeting. The

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<sup>34</sup> Katherine Boyle and David Ulevitch, “Venture capitalists should bet on America,” *Wall Street Journal*, May 8, 2023, <https://www.wsj.com/articles/venture-capitalists-should-bet-on-america-musk-startup-spacex-pentagon-innovation-9ae22c1b>.

<sup>35</sup> Boyle and Ulevitch, “Venture capitalists.”

<sup>36</sup> Michael Sheetz, “SpaceX wins first Pentagon contract for StarShield, its satellite network for military use,” CNBC, September 27, 2023, <https://www.cnbc.com/2023/09/27/spacex-wins-first-pentagon-contract-for-starshield.html>.

<sup>37</sup> Micah Maidenberg and Drew FitzGerald, “Musk’s SpaceX forges tighter links with U.S. spy and military agencies,” *Wall Street Journal*, February 20, 2024, <https://www.wsj.com/tech/musks-spacex-forges-tighter-links-with-u-s-spy-and-military-agencies-512399bd>.

project had generated heated backlash in 2018 when it was learned that Google was working on it. The revelation prompted dozens of resignations as well as a letter to Google management signed by 4,000 company employees that said, “We believe that Google should not be in the business of war” and demanded the development of “a clear policy stating that neither Google nor its contractors will ever build warfare technology.”<sup>38</sup>

The protests had an effect. Google announced that it would not renew its Project Maven contract, and announced AI principles that asserted that the company “will not design or deploy AI” for weapons.<sup>39</sup> But as Roberto González has noted in this path breaking book, *War Virtually*, “Google’s commitment to canceling its Project Maven work was too good to be entirely true.” The company assured the Pentagon that it would continue to support the program with its “off-the-shelf, Google Cloud Platform ... to support some workloads.” So when Anduril took over a leading role in Project Maven, it had Google’s tacit support and technological backing.<sup>40</sup>

Anduril’s other military products include the AI-driven Ghost surveillance drone, which has been used by Ukraine in its war against Russia’s invasion; Dive-LD, an autonomous underwater surveillance vehicle; and an autonomous counterdrone system, among others. Its biggest contract to date is a \$1 billion deal with the U.S. Special Operations Command to head up its anti-drone effort.<sup>41</sup> Anduril also provides sensor towers used

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<sup>38</sup> Kate Conger, “Google employees resign in protest against Pentagon contract,” *Gizmodo*, May 14, 2018, <https://gizmodo.com/google-employees-resign-in-protest-against-pentagon-con-1825729300>. The quote is from the petition itself, text available here: <https://static01.nyt.com/files/2018/technology/googleletter.pdf>

<sup>39</sup> Kate Conger, “Google plans not to renew its contract for Project Maven, a controversial Pentagon drone AI imaging program,” *Gizmodo*, June 1, 2018, <https://gizmodo.com/google-plans-not-to-renew-its-contract-for-project-mave-1826488620>.

<sup>40</sup> Roberto González, *War Virtually: The Quest to Automate Conflict, Militarize Data, and Predict the Future* (University of California Press, 2022), 65–66.

<sup>41</sup> Andrew Eversden, “Anduril nets biggest DoD contract to date: Signifier or outlier for defense startups?,” *Breaking Defense*, January 24, 2022, <https://breakingdefense.com/2022/01/anduril-nets-biggest-dod-contract-to-date-signifier-or-outlier-for-defense-start-ups/>.

by the U.S. Customs and Border Patrol to build a “virtual wall” on the U.S.-Mexico border.

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Anduril’s mission statement is entitled “Rebooting the Arsenal of Democracy,” and it lays down a challenge to traditional weapons makers like Boeing and Lockheed Martin, which it views as a species of industrial dinosaur whose time has passed. Anduril’s slogan aligns with the Biden administration’s goal of being an “arsenal of democracy” to countries like Ukraine. As Anduril exclaimed in its mission statement:

“Since World War II, America and its allies’ lead in military technology has been the pivotal factor in preventing World War III. Today, that technological lead is in jeopardy. The incumbent defense companies are unable to build the technology we need to affirm our technological lead.”<sup>43</sup>

The document elaborates on what it sees as the overriding flaws of the large weapons firms:

“Why can’t the existing companies simply do better? ... Tomorrow’s weapons — autonomous systems, cyberweapons and defenses, networked systems, and more — are enabled through software, while these companies specialize in hardware. ... And the software engineering talent who can build faster than our adversaries resides in the commercial sector, not at large defense primes.”<sup>44</sup>

In addition to SpaceX and Anduril, the other most successful tech startup of recent years has been Peter Thiel’s company Palantir. The company describes itself as producing “AI-enabled technology to deter and defend.” The company has been harshly criticized for supplying technology used in the Trump administration’s immigrant

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<sup>42</sup> Hilary Beaumont, “‘Never sleeps, never even blinks’: The hi-tech Anduril towers along the US border,” *The Guardian*, September 16, 2022, <https://www.theguardian.com/us-news/2022/sep/16/anduril-towers-surveillance-us-mexico-border-migrants>.

<sup>43</sup> Anduril Industries, “Rebooting the arsenal of democracy: Anduril mission document,” Anduril blog, June 6, 2022, <https://blog.anduril.com/rebooting-the-arsenal-of-democracy-anduril-mission-document-67fdbf442799>.

<sup>44</sup> Anduril Industries, “Rebooting the arsenal.”

deportation program.<sup>45</sup> Its biggest known military contract to date is for work on the Army's version of the Digital Common Ground System, which integrates intelligence data from hundreds of sources and makes it accessible to military personnel down to the battalion level.<sup>46</sup>

Palantir's ambitions go well beyond its work for the Army – it has contracts with the Air Force, Navy, Marines, Special Operations Command, “other defense agencies,” and the Department of Veterans Affairs.<sup>47</sup> In a filing with the Securities and Exchange Commission, Palantir said it wants to supply “the central operating system for all U.S. defense programs.”<sup>48</sup>

The question now is whether firms like SpaceX, Anduril, and Palantir are the exceptions, or whether other emerging military tech startups can earn major Pentagon contracts and become significant military suppliers. Startup firms and the venture capital firms that fund them have complained that the Pentagon is talking a good game on emerging technologies while it continues to throw the bulk of its funding at major contractors like Raytheon (now known as RTX) and Lockheed Martin.<sup>49</sup>

VC-funded firms have a range of incentives that distinguish them from the “Big Five.” Primary among them is their desire to make the Department of Defense more innovative and responsive to technology. This has been their consistent refrain, which has endeared them to figures like Hicks. The presumption among VC-funded firms is that the major contractors are sluggish, slow to innovate, and hung up by cost overruns. VC-funded firms therefore often possess an ideological dedication – an almost

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<sup>45</sup> Marisa Franco, “Palantir filed to go public. The firm's unethical technology should horrify us,” *The Guardian*, September 4, 2020,

<https://www.theguardian.com/commentisfree/2020/sep/04/palantir-ipo-ice-immigration-trump-administration>.

<sup>46</sup> U.S. Department of Defense, Director of Operational Test and Evaluation, “Distributed common ground system – Army (DCGS-A) Capability Drop 2 (CD2),” accessed February 11, 2024,

<https://www.dote.osd.mil/Portals/97/pub/reports/FY2022/army/2022dcgs-a.pdf>.

<sup>47</sup> Andrew Eversden, “Palantir wants to be ‘central operating system’ for all US defense programs,” 4ISRNET, September 30, 2020,

<https://www.c4isrnet.com/industry/2020/09/30/palantir-wants-to-be-the-central-operating-system-for-all-us-defense-programs/>.

<sup>48</sup> Eversden, “Palantir wants to be.”

<sup>49</sup> Tabby Kinder, “How Silicon Valley is helping the Pentagon in the AI arms race,” *Financial Times*, July 31, 2023, <https://www.ft.com/content/2ed278cc-6c3f-4569-b73c-64ad378f3ea8>.

missionary zeal – to innovation above all else, including manufacturing and production of weapons en masse. This has translated to cheaper weapons produced on a quicker scale, a selling point for VC-funded firms over the Big Five. Unable to secure a major deal from the Pentagon, VC-funded firms depend upon smaller contracts that keep the lights on.<sup>50</sup>

VC-funded firms do not yet have the capacity to produce weapons on the scale of the Big Five – and they purposely eschew the overhead and liabilities of larger firms. Most defense startups are committed to defense technology that appeals to the Pentagon but that remains untested and, at times, prone to failure. Self-imposed pressure to out-innovate the Big Five has led to clumsy, “underdeveloped” technology that has failed on the battlefield. As the *Wall Street Journal* reported, drones produced by defense startups have yielded less than the desired results when deployed against Russians in Ukraine. These “drones tend to be expensive, glitchy and hard to repair,” according to multiple sources, forcing the Ukrainians to turn to more reliable Chinese-made drones.<sup>51</sup>

It remains to be seen how many firms will follow the paths of Palantir, Anduril, and SpaceX to become significant Pentagon contractors. But as that battle plays out, it’s not too early to consider how these new firms should be regulated, and whether and how the technologies they are producing fit into a realistic, forward-looking defense strategy.

## Part four: Defense consolidation and the battle for funding

As noted above, despite various Pentagon initiatives to support innovative tech firms to enter the military sector, the bulk of Pentagon funding still goes to the Top Five

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<sup>50</sup> Roberto J. González, “How Big Tech and Silicon Valley are transforming the military-industrial complex,” Costs of War Project, Brown University, April 17, 2024, <https://watson.brown.edu/costsofwar/files/cow/imce/papers/2023/2024/Silicon%20Valley%20MIC.pdf>.

<sup>51</sup> Heather Somerville and Brett Forrest, “How American drones failed to turn the tide in Ukraine,” *Wall Street Journal*, April 10, 2024, <https://www.wsj.com/world/how-american-drones-failed-to-turn-the-tide-in-ukraine-b0ebbac3>; William Hartung, “Getting past the hype on emerging military technologies is a life and death issue,” *Forbes*, April 19, 2024, <https://www.forbes.com/sites/williamhartung/2024/04/19/getting-past-the-hype-on-emerging-military-technologies-is-a-life-and-death-issue/>.

contractors — Lockheed Martin, RTX (formerly known as Raytheon), Boeing, General Dynamics, and Northrop Grumman. These five firms routinely split well over \$100 billion per year in taxpayer dollars.<sup>52</sup> The question is whether these big firms can continue their dominance as Pentagon spending moves towards next-generation systems.

How will the tensions between startups and the arms industry behemoths play out? Will the Big Five continue to drain funds from innovation in favor of legacy weapons that pad their bottom lines and provide revenue to the districts and states of key members of Congress? Will the Big Five simply absorb new tech firms as they emerge? Or will the Pentagon budget, already soaring towards \$1 trillion per year, be increased to feed both sectors?

The creation of the current group of military mega-firms is largely a result of the post-Cold War consolidation of the arms sector. The defense merger boom of the 1990s was spurred on by Pentagon leaders like Clinton administration Deputy Defense Secretary William Perry and arms executives like Norman Augustine, who engineered the Lockheed–Martin Marietta merger and went on to head the merged entity, Lockheed Martin.<sup>53</sup>

The logic behind the merger push was the fact that reductions in Pentagon spending at the end of the Cold War called for a smaller defense industry, and so the best way to downsize the industry’s production capabilities and overhead was to let industry leaders make the reductions in the context of consolidation into fewer, larger firms. It was also claimed that reductions in overhead costs resulting from mergers would ultimately reduce weapons costs to the Pentagon and the taxpayer.<sup>54</sup> There is no evidence that such savings ever materialized, but what did occur was the creation of giant

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<sup>52</sup> Congressional Research Service, “Defense primer: Department of Defense contractors,” January 17, 2023, updated May 22, 2024, <https://crsreports.congress.gov/product/pdf/IF/IF10600>.

<sup>53</sup> John Mintz, “How a dinner led to a feeding frenzy,” *Washington Post*, July 4, 1997, <https://www.washingtonpost.com/archive/business/1997/07/04/how-a-dinner-led-to-a-feeding-frenzy/13961ba2-5908-4992-8335-c3c087cdebc6/>; William D. Hartung, “St. Augustine’s Rules: Norman Augustine and the future of the American defense industry,” *World Policy Journal* 13, no. 2 (Summer 1996), <https://www.jstor.org/stable/40209478>.

<sup>54</sup> Lawrence J. Korb, “Merger mania: Should the Pentagon pay for defense industry restructuring?,” Brookings Institution, June 1, 1996, <https://www.brookings.edu/articles/merger-mania-should-the-pentagon-pay-for-defense-industry-restructuring/>.

military-industrial firms with immense lobbying clout and bargaining power relative to the Pentagon and the U.S. government writ large.

The legacy of the 1990s merger boom is an arms industry that is extremely concentrated, costly, and inflexible – issues that have raised concerns in the context of the need to supply large quantities of weapons to Ukraine for its war against Russian occupation.<sup>55</sup> While there were over 50 major contractors in the 1980s and early 1990s, there are essentially five now (the firms listed above).<sup>56</sup> The five are responsible for the production of almost every weapons system and communications device purchased by the Pentagon: combat ships, submarines, fighter planes, air-to-air and air-to-ground missiles, precision-guided bombs, armored vehicles, missile defense systems, intercontinental ballistic missiles, nuclear-armed bombers, military communications satellites, and more.<sup>57</sup>

There are concerns that the big firms are more interested and able to produce big-ticket weapons platforms like aircraft carriers, ballistic missiles, and combat aircraft than in developing next-generation technologies. Rhetoric aside, today's largest contractors and their allies in Congress have a vested interest in funding current programs at the expense of researching and developing new systems because of the billions in revenue and hundreds of thousands of jobs tied to them. Even so, the Big Five contractors are trying to participate in the development of next-generation weapons by building unpiloted vehicles (air-, sea-, and land-based), buying up cybersecurity firms, and establishing their own in-house venture capital funds designed to get them in on the

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<sup>55</sup> Steff Chávez, Alexandra Heal, Ian Bott, Sam Joiner, Sam Learner, Irene de la Torre Arenas, and Veronika Samborska, "How arming Ukraine is stretching the US defence industry," *Financial Times*, January 31, 2023, <https://iq.ft.com/us-defence-industry/>; Marcus Weisgerber, "Hicks warns against 'extreme consolidation' in defense industry," *Defense One*, February 2, 2021, <https://www.defenseone.com/business/2021/02/hicks-warns-against-extreme-consolidation-defense-industry/171811/>.

<sup>56</sup> U.S. Department of Defense, "State of competition within the defense industrial base," Office of the Undersecretary of Defense for Acquisition and Sustainment, February 2022, <https://media.defense.gov/2022/Feb/15/2002939087/-1/-1/1/STATE-OF-COMPETITION-WITHIN-THE-DEFENSE-INDUSTRIAL-BASE.PDF>.

<sup>57</sup> Information on which companies produce which kinds of weapons systems comes from company websites and the Office of the Undersecretary of Defense (Comptroller), "Program Acquisition Costs by Weapon System," March 2023, [https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2024/FY2024\\_Weapons.pdf](https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2024/FY2024_Weapons.pdf).

ground floor of the tech revolution. But newer firms like Palantir and Anduril, along with the venture capital firms that fund them, believe that they can do a better job at innovation, and that they can “disrupt” current patterns of arms development and procurement to the point that they can rival or exceed Lockheed Martin and its cohorts within the next decade or so.<sup>58</sup>

To make their case for easier access to Pentagon funding, the new tech and venture capital firms have hired dozens of former military officials as advisers, board members, and executives. As Eric Lipton of the *New York Times* noted in a piece documenting this new phenomenon, it represents “a new path through the revolving door that has always connected the Defense Department and the military contracting business” that poses risks that decisions on investing in new defense technologies will be distorted by conflicts-of-interest: “the close ties between venture capital firms and Defense Department decision makers have also put a new twist on long-running questions about industry access and influence at a time when the Pentagon is under pressure to rethink how it allocates its huge procurement budget.”<sup>59</sup>

Due to a loophole in current law, ex-military officers who go to work for venture capital firms that invest heavily in emerging defense tech are not considered lobbyists, and are therefore exempt from restrictions on lobbying their former offices or reporting on their activities.<sup>60</sup> As noted above, a major agenda item of the emerging tech lobby is to simplify the Pentagon acquisition process to make it easier for startup firms to compete with their much-larger rivals. Simplifying the process to foster greater competition is one thing, but reducing vetting to the point where contractors have free rein with minimal oversight is another. The latter outcome would be more likely to produce price gouging, poor performance, and production delays than capable weapons systems at a

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<sup>58</sup> Adrian Wooldridge, “The old military-industrial complex won’t win a new Cold War,” Bloomberg, November 28, 2023, <https://www.bloomberg.com/opinion/articles/2023-11-28/the-old-military-industrial-complex-won-t-win-a-new-cold-war-with-china>.

<sup>59</sup> Lipton, “New spin.”

<sup>60</sup> Lipton, “New spin.”

reasonable price. It is therefore imperative to carefully scrutinize industry proposals to streamline the weapons-buying process.

*Simplifying the process to foster greater competition is one thing, but reducing vetting to the point where contractors have free rein with minimal oversight is another.*

In addition to a less rigorous review process, the venture capital firms and the defense tech startups they are financing seek a large infusion of new federal funding into the development of emerging technologies like AI-driven weapons, targeting, and communications systems.<sup>61</sup>

## **Part five: The bottom line – what is to be done?**

As contractors and the finance sector place big bets on the next generation of military technology, whether through startups or larger firms, how will their economic interests intersect with the need to make a careful assessment of how these weapons mesh with the development of effective, relevant defense and national security strategies? This section will focus on potential reforms that can curb the influence of the firms and individuals that stand to profit most from a surge in high-tech weapons development to clear the way for a more objective process for shaping U.S. defense strategy and spending.

Venture capital-backed startups aspire to become the future of defense contracting – and they offer some improvements to an inefficient industry dominated by a handful of defense contractors. But these companies cannot operate with impunity. Congress cannot allow defense startups (in their nascent or developed stages) to exploit the

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<sup>61</sup> Anduril Industries, “Rebooting the arsenal.”

procurement process in ways that secure their profits at the expense of taxpayer dollars.

First, the United States needs to be clear-eyed about the limits of high-tech and AI in transforming America's national security strategy. The United States cannot do everything; it cannot be a technological superpower that deters China, quells conflicts in Europe, and supports allies in the Global South on equal terms.<sup>62</sup> Indeed, a fixation on artificial intelligence and high-tech weaponry fails to reflect the current national security priorities of the United States. President Biden has called the war in Ukraine "a threat to the peace and stability of the world, to democratic values we hold dear, to freedom itself."<sup>63</sup> But as we discussed earlier, the war in Ukraine has highlighted the need for basic weaponry – ammunition, anti-aircraft missiles – more than innovative weaponry powered by artificial intelligence. A myopic focus on AI and revolutionizing warfare will obscure the most pressing national security interests of the United States and its allies.

Congressional officials interested in defense acquisition reform have in recent years targeted large military contractors. "Massive consolidation in the defense industry has stifled competition and innovation, raised costs, and increased corporate capture of the Pentagon," said Senator Elizabeth Warren's advisers in 2019.<sup>64</sup> In the past year, Warren has led a bipartisan push to end price gouging and "financial mismanagement" among defense contractors. In calling for greater reform of the defense acquisition process, her concerns have been underscored by reports from the Government Accountability Office that show that "the DOD had failed to implement a comprehensive approach to combat

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<sup>62</sup> Stephen Wertheim, "Why America can't have it all," *Foreign Affairs*, February 14, 2024, <https://www.foreignaffairs.com/united-states/why-america-cant-have-it-all>.

<sup>63</sup> The White House, "Remarks by President Biden on supporting Ukraine, defending democratic Values, and taking action to address global challenges, Vilnius, Lithuania," July 12, 2023, <https://www.whitehouse.gov/briefing-room/speeches-remarks/2023/07/12/remarks-by-president-biden-on-supporting-ukraine-defending-democratic-values-and-taking-action-to-address-global-challenges-vilnius-lithuania/>.

<sup>64</sup> Lachlan Markay, "Before Elizabeth Warren took on defense contractors, she cozied up to some of the biggest ones," *Daily Beast*, September 12, 2019, <https://www.thedailybeast.com/elizabeth-warren-turns-on-the-defense-industry-she-once-courted>.

department-wide fraud, despite regularly awarding contracts worth hundreds of billions of dollars.”<sup>65</sup>

Congress must build upon these bipartisan efforts to ensure that venture capital–supported defense startups deliver on their contracts in a timely fashion and without massive cost overruns.

Congress should establish a revamped Office of Technology Assessment (OTA) that could provide oversight of the industry and ensure that Silicon Valley startups do not manufacture promises that cannot be delivered. Disbanded in 1995 – a victim of Newt Gingrich’s “Contract for America,” the ongoing privatization of the defense industry, and an antigovernment ethos – the OTA provided nonpartisan recommendations for safeguarding privacy, and for preventing abuses of the technology that infringed upon civil liberties and national security interests.<sup>66</sup> The existential debate over the dangers and possibilities of AI demands the reinstatement of agencies like OTA that could work to protect taxpayers and national security interests at the same time – while helping to expedite the proper and safe use of technology in a national security context.<sup>67</sup>

There also needs to be greater transparency in terms of where Silicon Valley companies are obtaining their investments. Private equity firms are not required to publish annual reports or disclose their profits. As more venture capital pours into defense startups, it is sure to become more reliant on foreign investment. Saudi Arabia’s recent announcement that it plans to invest \$40 billion in AI, a potential partnership with Andreessen Horowitz, is the latest case in point.<sup>68</sup> Given Andreessen Horowitz’s significant investments in defense startups, it is likely that at least some of the Saudi funds will subsidize emerging military technologies. This possibility should be subjected

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<sup>65</sup> “Sanders, Braun, Grassley, Warren, Wyden send letter to Secretary of Defense urging investigation of price gouging by U.S. defense contractors,” *Bernie Sanders for Vermont*, May 25, 2023, <https://www.sanders.senate.gov/press-releases/news-sanders-braun-grassley-warren-wyden-send-letter-to-secretary-of-defense-urging-investigation-of-price-gouging-by-u-s-defense-contractors/>.

<sup>66</sup> Darrell M. West, “It is time to restore the US office of technology assessment,” Brookings Institution, February 10, 2021, <https://www.brookings.edu/articles/it-is-time-to-restore-the-us-office-of-technology-assessment/>.

<sup>67</sup> González, “How Big Tech.”

<sup>68</sup> Maureen Farrell and Rob Copeland, “Saudi Arabia plans \$40 billion push into artificial intelligence,” *New York Times*, March 19, 2024, <https://www.nytimes.com/2024/03/19/business/saudi-arabia-investment-artificial-intelligence.html>.

to serious scrutiny. Companies should not be allowed to accept capital from sources that may operate against the interests of the United States. In a parallel effort, Senators Warren and Charles Grassley have introduced legislation that aims to establish ethical guidelines on retired military officials' affiliations with defense contracting to end "the corrupting influence of the revolving door between senior national security officials and foreign governments."<sup>69</sup> Similar measures should be taken to force venture capital startups to disclose their donors. Currently, "Congress can legislate organization and process, but it cannot ensure sound practice."<sup>70</sup> This must change within the overall defense acquisition process, but especially when it comes to private defense startups.

In this vein, Congress must work to close the revolving door between senior government officials and military contractors. This is not a new problem. But with defense startups growing in number, and enticing military and political leaders, it will be exacerbated in an era of "big tech." Republican Representative Mike Gallagher recently announced that he was joining Peter Thiel's Palantir after resigning from Congress. This is while Gallagher promotes belligerent views on China in mainstream outlets like *Foreign Affairs*, arguing that the United States is in the throes of a "New Cold War" with China that must be won by "rapidly increasing U.S. defense capabilities to achieve unmistakable qualitative advantages over Beijing."<sup>71</sup> Gallagher is but one example where economic and ideological incentives coincide within the "iron triangle." But lawmakers like Senator Warren and Representative Pramila Jayapal have also fought back against the Pentagon revolving door, and are well-positioned to regulate the revolving door between Silicon Valley and the federal government.<sup>72</sup>

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<sup>69</sup> "Grassley, Warren call for DoD transparency on former U.S. military personnel working for foreign governments," *Chuck Grassley*, April 25, 2023, <https://www.grassley.senate.gov/news/news-releases/grassley-warren-call-for-dod-transparency-on-former-us-military-personnel-working-for-foreign-governments>.

<sup>70</sup> Peter Levine, *Defense Management Reform: How to Make the Pentagon Work Better and Cost Less* (Stanford: Stanford University Press, 2020), 133.

<sup>71</sup> David Jeans and Alex Konrad, "China hawk Rep. Mike Gallagher is taking a job at Palantir," *Forbes*, March 22, 2024, <https://www.forbes.com/sites/davidjeans/2024/03/22/china-hawk-rep-mike-gallagher-is-taking-a-job-at-palantir/>; Matt Pottinger and Mike Gallagher, "No substitute for victory," *Foreign Affairs*, 103, no. 3 (May/June 2024), <https://www.foreignaffairs.com/united-states/no-substitute-victory-pottinger-gallagher>.

<sup>72</sup> Lipton, "New spin"; Ana Swanson, "Democrats question semiconductor program's ties to Wall St.," *New York Times*, January 10, 2024, <https://www.nytimes.com/2024/01/10/us/politics/semiconductor-chips-wall-street-biden.html>.

It will be up to interested members of Congress, working with the administration, to craft specific proposals and regulations to manage the role of private money in the development of emerging military technologies, including ensuring that their growing political clout doesn't distort policy outcomes. By working to achieve better transparency, oversight, and regulation of defense startups dependent upon venture capital, Congress can ensure that the reinvention of modern warfare does not exacerbate the pattern of corruption, misconduct, and waste that has been so endemic in the defense contracting system.

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