

Testimony of Christian Brose
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Hearing of the Future of Defense Task Force
“Supercharging the Innovation Base”
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Chairman Moulton, Ranking Member Banks, members of the Task Force: It is an honor to appear before you today, and I am grateful for the opportunity.

To address the question you have posed—how to supercharge the innovation base—we need to start with the bigger questions that your task force is considering: To what end? Why does it matter? What are the stakes?

Put simply, America has been building a military for three decades based on assumptions that are being overturned—overturned by the deliberate strategies of our competitors, primarily China, and by the ongoing information technology revolution. To be successful, militaries must be able to understand the battlespace, make good decisions, and take relevant actions—what our military calls “closing the kill chain.” How our military does this today is relatively slow, overly manual, undynamic, inflexible, and difficult to scale. In part, this is because we have built a military that is overly dependent upon small numbers of large, exquisite, expensive, heavily manned, and hard to replace things that struggle to share information effectively, if at all.

To succeed, we will need a very different kind of military. This will require us to prioritize networks over platforms. Those networks must be highly dynamic, distributed, re-composable, self-healing, and intelligent. And those platforms must be far larger in number, smaller in size, lower in cost, and highly autonomous. The core metric of success will be our people’s ability to turn vast amounts of information into understanding, generate decisions, and take actions—and do it all so much better, faster, and at such larger scales than our competitors that we shatter their ability to keep up. In short, our competitive advantage will be all about command and control. And the technologies that will enable this advantage will be less hardware-defined than software-defined, such as artificial intelligence, autonomy, edge computing, and mesh networking.

When it comes to our defense innovation base, however, here is our predicament: Most of the people and companies that are most expert in the kinds of emerging technologies that the US military needs are not currently doing defense work, while traditional defense companies, despite their remarkable people and expertise, are not at the forefront of these emerging technologies.

The question, then, is how to realign our innovation base. I have come to believe that we in Washington are overthinking this problem. Ultimately it comes down to one thing: incentives.

Consider the scale of this problem:

When the Cold War ended, there were 107 major defense firms. By the end of the 1990s, there were five. And since, the middle tier of our defense sector has been systematically hollowed out, bought up by larger companies or driven out of business altogether. At the same time, the

defense sector has not been attracting and retaining new companies: From 2001 to 2016, of new companies that sought to work for the US government, 40 percent were gone after three years, more than half were gone after five years, and nearly 80 percent were gone after ten years.

Indeed, since the end of the Cold War, in every technology sector in America, from consumer electronics and new media to financial technology and biotechnology, there have been more than one hundred startups that have grown to be valued at more than \$1 billion, what investors call “unicorns.” In the national security sector, there have only been two: SpaceX and Palantir.

This did not just happen. It was the result of incentives—some conscious, some unconscious—that Washington has created. We have spent increasingly larger shares of the defense budget sustaining old things instead of buying new things. We have allowed military “requirements” to become a barrier to new ideas and capabilities that our defense establishment did not invent. We have optimized our acquisition system not for speed to fielding the best available technology, but for compliance, cost accounting, and ease of administration. We have locked ourselves into defense budgets that are programmed years in advance, leaving little flexibility to bring in new capabilities and non-traditional companies during current fiscal years. And most detrimentally, we have carved up what little money we have spent on research and development into lots of small contracts for lots of small companies that rarely make it across the “valley of death,” become large-scale military programs, and enable new companies to grow.

This is why so many of America’s best technologists and investors have turned away from defense. It is not because they are unpatriotic. It is because they have not believed they could fully realize their talents, build successful companies, and make large returns on investments by working in defense. And three decades of empirical evidence suggest they were not wrong.

Defense will never be a free market, but it is still governed by incentives. To supercharge the innovation base, we have to create different incentives, and we can. But the US government must recognize its proper role in this innovation ecosystem. Innovative companies do not need the US government to try to play venture capitalist. America has plenty of money. Indeed, the amount of private capital in our nation dwarfs the defense budget many times over. This money is not ideological. It will flow to what it perceives to be good investments. America also has plenty of innovators and engineers who would be willing to work for our military. More of them will want to do it if they perceive it to be a path to fulfillment, success, and wealth. They do not need US defense agencies to try to turn themselves into tech startups or software development factories.

Innovative companies that are doing defense work need one thing more than any other from the US government: revenue. They need real contracts for the best capabilities they are building. Not tiny, one-time awards for science projects that sound good in government press releases but never get fielded, transitioned, and scaled into programs of record, but the kind of recurring revenue that comes from building and shipping products to more and more customers.

If the Department of Defense and Congress value AI-enabled capabilities, autonomous systems, small drones, and other emerging technologies, you have to buy more of them. This will enable the companies that are doing this work to do more of it, grow, attract more engineering talent, develop new technologies, and raise many times their current value in private capital that is just

sitting on the sidelines looking for good things to do. And as more of those investors come to see defense as a viable business model, they will direct more of their considerable resources toward founding and growing new innovative companies that want to work for the US military.

Not all of those bets will succeed, but the ones that do will be huge winners. And their success will attract even more engineers, companies, and investors into the defense innovation base, enabling it to grow larger, more vibrant, and more competitive. It can and must be a virtuous circle, but it all comes back to the US government creating the right incentives.

This is starting to change, but just barely. At present, two things are simultaneously true: Thanks to the many reforms and new authorities that Congress has given the Department of Defense, it has never been easier for new, innovative companies to get small contracts to work for the US military. But it has never been harder for those companies to transition their good work, displace established but less capable programs of record, and win large-scale procurement contracts.

Ultimately, the way to supercharge the defense innovation base is simple, really: buy more of what that innovation base is building right now. It is supply and demand. The most important thing the US government can do is create greater demand. It has to clearly define our most important operational problems. Hold regular, fair, and open competitions to determine what capabilities and concepts work better than others. Pick winners. Do not try to make a thousand flowers bloom. Concentrate our limited government resources in smaller numbers of larger bets on the most promising capabilities that our nation's innovation base is producing. Ultimately, our goal should be a future defense innovation base that is not comprised of five \$100 billion companies, whichever they may be, but dozens of viable, multibillion-dollar companies.

Getting from the military we have to the military we need will be daunting. But it can be done. We have the people, the technology, and enough money. But we have to get the incentives right. And we have to move with a sense of urgency, which I applaud this task force in working to create. Our entire business model of national defense is being disrupted. We are like Blockbuster Video amid the rise of Apple, Netflix, and Amazon. We have to adapt, and quickly, or we will be overtaken. And that means losing our ability to deter war, if not losing a war altogether.