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A Strategic Approach to Defense Investment

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The National Defense Strategy (NDS) issues an urgent call to action to a community—the National Security Innovation Base—that has never been called out so explicitly before. The strategy calls upon the National Security Innovation Base to gear up for a "long-term strategic competition" with nations like China and Russia and assigns it the task of maintaining the Department of Defense's (DoD) technological advantage, an advantage that is currently being "contested in every domain." Significantly, the strategy states that the accelerating pace and increasingly commercial nature of technological advancement will require the National Security Innovation Base to adopt "changes to industry culture, investment sources, and protection."

The strategy's diagnosis of the global strategic environment is, I believe, quite correct, and that compels those of us who consider ourselves part of the National Security Innovation Base to grapple with what it means to take on this task. For many, this will mean simply that they must pursue innovation to the best of their ability. For a select few, such as Michael Griffin, the new under secretary of defense for research and engineering (USD R&E), and the national security leadership in Congress, the task is more complex. They are called upon to develop and implement a strategic approach to defense investment that delivers on the NDS's challenge. In large part, this task is the reason the USD R&E position was created in the FY 2017 National Defense Authorization Act.

While the NDS defines the ends sought in a strategic approach to defense investment, the National Security Innovation Base must provide the ways. Since National Security Innovation Base is a new term in defense argot, it pays to discuss briefly what it means. Past defense strategies have mentioned the importance of the defense industrial base, often thought of as the traditional defense industry and exemplified by the top five defense contractors: Lockheed Martin, Boeing, Northrop Grumman, General Dynamics, and Raytheon. Former secretary of defense Ash Carter insisted on the need to expand DoD's understanding of the

industrial base to include high-tech firms in Silicon Valley, Boston, and Austin. The concept of the National Security Industrial Base captures both these sectors and includes the research and development (R&D) community. The R&D community is a broad range of academic research centers, tech enthusiasts pursuing challenge prizes, and others engaged in the early stages of R&D that feed new technologies into both the traditional defense and commercial tech sectors. The significant expansion in scope represented in the National Security Innovation Base compared to the traditional concept of the defense industrial base is important, and it has major implications for the U.S. government's pursuit of a strategic approach to defense investment.

When the United States developed its approach to defense investment in the Cold War, the federal government was the primary provider of R&D funding to all elements of the National Security Innovation Base. When the Cold War ended, however, this relationship was already radically shifting, and today, the bulk of funding supporting the National Security Innovation Base comes from private-sector sources. In fact, the United States was somewhat behind the rest of the world in making this shift, and as a result, most other countries have pursued increasing integration of their defense investment with their commercial industry even as most of the largest U.S. defense companies specialized in defense. In the case of China, there is little to no significant separation between many of its main defense and commercial companies in most high-technology fields, and China has stressed the importance of military-civil integration in its technology planning. The NDS tells us that the United States will have to change its culture to leverage the entire National Security Innovation Base in order to stay ahead in a fast moving and highly competitive world that has already transitioned to a new defense business model.

The strategy also makes clear which technologies are likely to reshape the character of future military operations—advanced computing, big data analytics, artificial intelligence, autonomy, robotics, directed energy, hypersonics, and biotechnology. While there are some things to quibble with on this list, it represents the development of something close to a consensus on technology areas of focus going forward. And while there are likely to be important technology developments not on this list that arise in the coming years, it is a useful guide for the dialogue between DoD and the National Security Innovation Base on how to focus defense investment. This dialogue is needed to influence the private-sector leadership and R&D funding that will be pushing forward these key technologies. Unfortunately, DoD has no effective mechanism to carry out such a dialogue today. Developing one will be a critical task for Under Secretary

Griffin. Traditional defense industry is eager to have this dialogue. After a period in which the major defense companies were all forced by circumstances to follow one strategy, namely to cut costs aggressively to ensure profitability as revenues declined, there is now a range of diverse business strategies emerging in order to capitalize on growth. Getting nontraditional companies and international partners and allies to participate in this dialogue is likely to be trickier but achievable and absolutely necessary.

This shift toward private-sector leadership changes some of the need for DoD's R&D funding, but it doesn't eliminate it. DoD funding remains essential for early stage science and technology, which doesn't present a commercially viable near-term return on investment, and for Defense Advanced Research Agency (DARPA) hard problems, where the fundamental breakthroughs required may not appear likely enough to stimulate significant private investment. It is also critical for technologies where the military application is likely to precede the civilian application so that military investment is required to take early stage R&D and develop it into an operational weapon system. Hypersonics and directed energy seem to be likely candidates for this kind of investment. In addition, R&D funding will be required to incorporate technologies matured in the private sector onto complex military platforms such as the B-21 bomber. Another key need for R&D funding will be prototyping, especially for the purpose of experimenting with new concepts of operations and testing commercially developed technologies in simulated operational environments. And because China is seeking to dominate elements of the supply chain essential to the key technologies identified in the NDS, DoD should invest in ensuring access to critical items by researching new materials, developing alternative sources of supply, and certifying alternatives to any critical supply chain items that are at high risk of being restricted by a potential adversary.

Given the important roles that defense investment needs to play to support the NDS, how well does the defense budget resource these objectives? The answer is that the budget is making progress toward resourcing these investment objectives but very unevenly. With the completion of the FY 2018 Consolidated Appropriations Act and the submission of the FY 2019 President's Budget Request at the levels agreed to in the recent Bipartisan Budget Agreement of 2018, relative budget clarity has now emerged from a two-year period of total confusion. This allows us to assess how defense investment has fared in a two-year period of substantially increased spending for defense. The procurement accounts in FY 2017, the last year of the Obama administration, totaled $119.7 billion, and the research, development, test, and evaluation (RDTE) accounts totaled $71.9 billion. The final FY 2018 Consolidated Appropriations Act provided a major increase

to $144.3 billion for procurement and $89.2 billion for RDTE. The FY 2019 budget request for procurement stays level at $144.3 billion, while the request for RDTE increases modestly to $92.4 billion. Funding for science and technology spending across the military services is only modestly higher than FY 2017.

The largest increase by far in defense investment spending is in the procurement of weapon systems coming off current production lines. In the Army in particular, the increased investment spending goes largely to the purchase of upgraded versions of weapon systems, such as the Abrams tank and Bradley Fighting Vehicle, designed in past decades. The Army had little choice in this because the last 16 years yielded very few successful next generation Army weapons ready to move forward. The Air Force budget leans significantly farther toward the future with robust purchases of advanced F-35 fighters and KC-46 tankers, as well as substantial R&D investments in designing a new bomber, a new intercontinental ballistic missile, and a new cruise missile. The Air Force also worked to increase its spending on space. The Navy stands in relative balance between the approaches of its sister services with purchases of many new advanced ships, aircraft, and weapons, but also purchases of several systems that have been in the inventory for decades—the F/A-18, for example.

While the infusion of new defense resources in FY 2018 and FY 2019 provides a significant opportunity to make the defense investments required to support the NDS, the way this infusion is being spent only partially answers the call. This fact was foreshadowed by Deputy Secretary of Defense Patrick Shanahan, who predicted that the FY 2020 budget would represent the full flowering of the new strategy in the budget. As a result, traditional defense industry is receiving the lion's share of the budget increase. Nontraditional suppliers and the research community have not yet tapped into the new fount of investment. The great question for the Department of Defense, however, is whether the window of budget opportunity closes before it can get its investment aligned with its strategy.

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