EXECUTIVE SUMMARY

In 2018, the Department of Defense (DoD) released "Assessing and Strengthening the Manufacturing and Defense Industrial Base and Supply Chain Resiliency of the United States" (13806 Report), a report focused on the production risks to critical defense industrial supply chains. The report starkly framed the health of the U.S. defense industrial base (DIB) as key to the readiness of the United States in an age of great-power competition. Despite the 13806 Report's high-resolution snapshot of the defense industrial base's "unprecedented set of challenges," the report did not provide the American public or the defense policy community a publicly available summary measurement of the health and readiness of the defense industrial base or an accessible way of monitoring the DIB's "pulse" and key "vital signs" to track the health of the defense industrial base over time.[1]

To fill this gap, last year, the National Defense Industrial Association (NDIA) published *Vital Signs 2020*, which provided an unclassified summary of the health and readiness of the defense industrial base that was accessible by both the American public and the defense policy community. *Vital Signs 2021* is the second annual installment of our *Vital Signs* publication. In order to provide a comprehensive assessment of the defense industrial base, our procedure involves standardizing and integrating different elements that impact the performance of the defense industrial base and the overall business environment.

Like *Vital Signs 2020, Vital Signs 2021*'s final grade for the health and readiness of the defense industrial base is a "C." While passing, the "C" grade reflects a business environment that is characterized by contrasting areas of concern and confidence. It also reflects the state in which the defense industrial base entered the novel coronavirus (COVID-19) pandemic, which dramatically disrupted the daily lives of every American as well as the flow of American and global commerce. Continued deterioration in industrial security and the availability of skilled labor and materials emerged from the analysis as areas of clear concern. Favorable conditions for competition in the defense contracting market and a rising pre-pandemic demand for defense goods and services reflect growth in the defense budget. NDIA intends *Vital Signs 2021* to be a reference document that sets the conditions for an annual discussion on DIB issues and contributes to the debate about national defense acquisition strategy by offering a common set of indicators—"Vital Signs"—of the defense industrial base partners that give our men and women in uniform an advantage in all warfare domains.

SCORE DETERMINATION

In order to complete *Vital Signs 2021*, we conducted a study of data related to eight conditions that shape the performance of defense contractors: demand, production inputs, innovation, supply chain, competition, industrial security, political and regulatory, and productive capacity and surge readiness. Categorized by factor, we analyzed over 40 publicly available longitudinal statistical indicators, converted each of them into an index score on a scale of 0 to 100, and evaluated three years of scores for each indicator. With the exception of our *Vital Signs 2021* Survey of NDIA members that was fielded in August 2020, our datasets are lagging indicators that were published before the nationwide lockdowns that began in March 2020 at the beginning of the COVID-19 pandemic in the United States. These lagging indicators provide insight into how the defense industrial base entered the pandemic and will give future policymakers a baseline for evaluating the defense industrial base's ability to cope with a crisis.

OVERALL SCORES

Condition	2018	2019	2020	Change, 2018 – 2020
Demand	77	85	93	+16
Production Inputs	68	68	68	0
Innovation	73	70	71	-2
Supply Chain	83	68	77	-6
Competition	89	92	91	+2
Industrial Security	57	56	56	-1
Political & Regulatory	82	76	72	-10
Productive Capacity & Surge Readiness	54	81	66	+12
Overall Health and Readiness	***73***	***75***	***74***	***+1***

Figure 0.1, Source: NDIA

Factor Score Key				
-6 and worse	-1 – -5	0	+1 – +5	+6 and better

AREAS OF CONCERN

Vital Signs 2021 reveals a defense industrial base that entered the COVID-19 pandemic in a weakened state. The final grades are based solely on data from before the COVID-19 pandemic. Six conditions earned composite scores lower than 80, three of which earned scores lower than 70, which we consider failing grades—the same as in last year's report. These scores suggest that the defense industrial base is increasingly struggling to meet the unprecedented challenges it faces. Industrial security scored the lowest among the eight conditions with a 56 for 2020. Industrial security has gained prominence as massive data breaches and brazen acts of economic espionage by state and non-state actors plagued defense contractors and the entire U.S. economy in recent years. To assess industrial security conditions, we analyzed indicators of threats to information security and to intellectual property (IP) rights. The score

1 Department of Defense, "Assessing and Strengthening the Manufacturing and Defense Industrial Base and Supply Chain Resiliency of the United States," Report to President Donald J. Trump by the Interagency Task Force in Fulfillment of Executive Order 13806, September 2018. https://media.defense.gov/2018/Oct/05/2002048904/-1/-1/1/ASSESSING-AND-STRENGTHENING-THE-MANUFACTURING-AND%20 DEFENSE-INDUSTRIAL-BASE-AND-SUPPLY-CHAIN-RESILIENCY.PDF

incorporates MITRE's annual average of the threat severity of new cyber vulnerabilities, which improved slightly from our 2018 score of 17 to a similarly dismal score of 18 in 2020. In contrast, threats to IP rights scored an all-time high of 89 for 2020 as the number of new Federal Bureau of Investigation (FBI) investigations into IP rights violations declined to 47 as part of a steady decline since reaching an all-time high of 235 in 2011. Defense industry production inputs also scored poorly in 2020 with a score of 68, a steady score since 2018. Major production inputs include the skilled labor, intermediate goods and services, and raw materials used to manufacture or develop end-products and services for DoD consumption. Our estimate of the size of the defense industry workforce, currently about 1.1 million people, falls substantially below its mid-1980s peak size of 3.2 million. The indicators for security clearance processing also contributed to the low overall score for production inputs as on-boarding backlogs continue to persist.

AREAS OF CONFIDENCE

The competitive environment and the state of demand for defense goods and services are areas of confidence. Over the past few years, DoD has averaged about 701,000 prime contracts each year and had over $394 billion in prime contract obligations in 2019, according to an analysis conducted by our research partner, Govini, a decision science company. An analysis of the top 100 publicly traded DoD contractors produced a competition score of 91 for 2020. Several high-scoring indicators drove the strength of market competition conditions, including the low level of market concentration of total contract award dollars, the relatively low share of total contract award dollars received by foreign contractors, and the high level of capital expenditures in the defense industrial base. Additionally, the defense industrial base earned a score of 77 for profitability for 2020 based on a new methodology for this edition of our annual report. Demand for defense goods and services received a score of 93 for 2020, which is a 16-point increase over the 2018 score. This high score for demand is a result of the recent increase in contract obligations issued by DoD. Total contract obligations issued by DoD grew from $329 billion in Fiscal Year (FY) 2017 to $394 billion in FY19, marking a 20% increase. Foreign military sales (FMS) also grew by nearly 20% over the same time period.

OTHER TAKEAWAYS

Innovation conditions within the defense industrial base received a score of 71 for 2020, two points down from its 2018 score. Notably, the U.S. share of global investment in research and development (R&D) was only 28%, which is down from a peak of 38% in 2001.

Scores also dropped for political and regulatory conditions. In early 2020 before the pandemic took hold, the percentage of Americans that thought the United States was spending "too little" on national defense was nearly half as many as in 2018, the largest two-year drop since 1983, which may indicate a decrease in the American public's appetite for major increases in defense spending.

Acquisition reform and budget stability, two of NDIA's strategic priorities, continue to be top of mind for the defense industrial base. In our *Vital Signs* Survey, when asked about the most important thing that the government can do to help the defense industrial base, respondents said that streamlining the acquisition process (35.3%) and budget stability (31.7%) were the most important. When asked what conditions would limit their firms' willingness or ability to devote larger amounts of productive capacity to military production, 47.8% of our respondents said that uncertain prospects of continuing volumes of business were a moderate deterrent while 41.5% of respondents said that the burden of government paperwork was a moderate deterrent. Both findings underscore the continued importance of reforming and streamlining the acquisition process and of the need for budget stability.

CAN THE DEFENSE INDUSTRIAL BASE MEET SURGE DEMAND DURING A CRISIS?

The capacity of the defense industrial base to grow its output and fulfill a surge in military demand stands as a key test of its health and readiness. Productive capacity and surge readiness earned a score of 66 for 2020, a 15-point decrease since 2019. Declines in output efficiency contributed to this downward trend. Importantly, this score is not based upon an economy undergoing a full mobilization to war like in World War II. Instead, the productive capacity and surge readiness condition is baselined against the defense buildup that began under the Carter Administration and that accelerated throughout the Reagan Administration. The Carter-Reagan buildup involved a 31% surge in DoD expenditures.

The health and readiness of the defense industrial base pose a challenge to the defense acquisitions community. With the growing expectation for the defense industrial base to meet the challenges faced during an era of great-power competition, *Vital Signs 2021* highlights several hurdles that the DIB must overcome when emerging from the COVID-19 pandemic. The overall defense industrial base's health and readiness grade of "C" suggests a satisfactory ability to meet current industrial requirements. We hope that *Vital Signs 2021* will help to inform the discussion that leads to an improved overall grade for *Vital Signs 2022* and beyond.