

## Economic Statecraft: Options for Reducing U.S. Overdependence on Chinese-supplied Materials and Medications

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This policy report<sup>1</sup> explains how specific tools of economic statecraft can be applied to reduce risks caused by dependence on People's Republic of China (PRC)-dominated supply chains for critical goods. It offers foundational building blocks for the formulation and implementation of a larger strategy to reduce American vulnerabilities to China.

We have previously argued that it is “Time to Curb America’s Manufacturing Dependency on China.”<sup>2</sup> The present report suggests actionable pathways to facilitate and accelerate manufacturing sector onshoring for those goods most critical to U.S. national and economic security. It explains critical scenarios, identifies key weak points, and suggests 12 potential countermeasures. While employing these tools will be neither easy nor cheap, the coronavirus already reveals the alternative: mounting costs in American economic well-being, strategic resilience, and lives.

From the outset, we want to be crystal clear about a core premise of our thinking: the United States will—and decidedly should—remain closely connected to the global economy. But the corporate quest over the past 25 years to cut supplier costs, with insufficient concern for resilience, has saddled the nation with

gaping strategic vulnerabilities in the supply chains for certain critical materials, medications, and technology inputs. Our analysis describes what it will take to begin reclaiming U.S. security and strategic autonomy in those areas.

Our list prioritizes pressing weaknesses that Beijing would likely exploit to gain leverage against Washington during a crisis, as well as pharmaceutical vulnerabilities that are already adversely affecting Americans’ health. It should therefore be viewed as a “living document” to be updated and revised as events and initial policy formulation and implementation unfold.

### I. CRITICAL SCENARIOS

By “crisis,” we mean serious tensions in which Beijing could attempt to pressure Washington to alter key policies or accept PRC policies. In our view, this situation is likely to manifest within the next five years. The precipitating event could be legal action against senior Chinese officials or politically connected individuals or firms (for instance, coronavirus-related lawsuits or actions akin to the December 2018 detention of Huawei CFO Meng Wanzhou)<sup>3</sup> or even a limited-escalation confrontation between U.S. and PRC forces, particularly in the

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maritime “gray zone.”<sup>4</sup> China’s 2010 rare earth export embargo against Japan after Japan’s Coast Guard detained the captain of a Chinese-flagged fishing boat operating near the Senkaku Islands offers a concrete example of how such a contingency might materialize.<sup>5</sup> A physical encounter between U.S. reconnaissance platforms and Chinese forces like the 2001 EP-3 incident could also trigger supply chain manipulations.<sup>6</sup> Worse yet, in the far-less-likely extreme scenario of a broader kinetic conflict, we would fully expect PRC entities to disrupt and/or maliciously manipulate critical goods supplied to the United States. Supply chain elements located near China could be physically targeted and we would expect PRC forces to attempt cyber-sabotage of key industrial facilities within the United States.

Since the PRC would likely prefer to “win without fighting,” demonstrating and threatening the capability to cause catastrophic supply disruptions may well become an increasing component of its peacetime deterrence efforts. Already, an article in China’s official *Xinhua News* has suggested, “If China retaliates against the United States at this time ... [in part by] announcing strategic control of medical products and prohibiting their export to the United States, the United States will be plunged into the mighty sea of coronavirus.” It specifically emphasized face masks and pharmaceuticals as potent necessities that China could withhold to America’s great harm.<sup>7</sup> Fortunately, America can defend itself and its allies from such strategic blackmail. The following sections show how.

## II. KEY VULNERABILITIES TO ADDRESS

### A. Category 1: “Trusted Source” Inputs for Defense Industrial Base

This section focuses on items that are irreplaceable for maintaining U.S. operational capabilities and for which China plays a sole source, or near-sole source, supply chain role. The list is not exhaustive from a sector-wide perspective. Instead, it emphasizes areas for near-term action to reduce—and ultimately, eliminate—strategic reliance on China for items that are critical

for immediate defense readiness and that could be needed at a larger scale in a future crisis or, in a worst-case scenario, in a potential conflict with China. Because it is unrealistic to onshore production of everything, the focus should instead be on (1) ensuring supplies of irreplaceable inputs, and (2) mitigating the risk that single-point failures or purposeful embargoes jeopardize the readiness and ability of the United States and its allies and partners to sustain peacetime resistance and military operations. While it will require a significant allocation of resources, this is nevertheless a feasible and worthwhile effort, as the defense industrial base underpins the United States’ ability to protect the nation, preserve freedom of action, and keep our partners supporting these efforts.

### 1. Rare-earth metal refining and permanent magnet production.

America needs comprehensive indigenous capacity to support rare earth metal mining, recycling and reclamation, refining, and permanent magnet production. U.S. industrial actors have considerable experience mining rare earths and making permanent magnets, but these operations came under severe economic pressure in the 1990s as PRC industrial policy began to emphasize the development of China’s rare earth sector.<sup>8</sup> Certain geographies would make particular sense as priority zones for rare earth development activities. Potential areas include those near California’s Mountain Pass rare earth mine, as well as those with mining-focused economies and ample available land (e.g., in Nevada, Utah, or New Mexico), or at or near the Y-12 National Security Complex near Oak Ridge, Tennessee.

On the mining front, two commercial developers—Texas Mineral Resources and USA Rare Earth—report that their Round Top Mountain prospect near El Paso, Texas, could contain an amount of heavy rare earth elements (HREEs) equal to approximately 20 years of current Chinese HREE production.<sup>9</sup> HREEs are particularly important for defense-related activities.<sup>10</sup>

A recent bilateral trade agreement obligates China to purchase U.S.-origin scandium and yttrium.<sup>11</sup> Since these elements constitute only a fraction of the deal's value, but are irreplaceable for certain types of electronics goods production, they should be kept in American hands. One way to do this: give the U.S. government a right of first refusal to any rare earth elements (REEs) from mines or processing facilities that have received federal funding.

The right of first refusal could be coupled with a congressional allocation for minimum basic purchase volumes of strategic minerals, which would help underpin facility operations by providing an assured offtake market. The federal government could also offer domestic producers a cost-plus purchase arrangement to ensure capital recovery and reasonable returns to investors.<sup>12</sup>

For expanding rare earth processing and potentially, recycling activities, Y-12 and its environs would offer physical space; deep competence managing radioactive and other hazardous materials such as lanthanide group metals; security; access to electricity and other key input infrastructure; and a logistically well-linked continental U.S. location. Other national laboratory and nuclear facility sites such as Los Alamos (New Mexico) or Pantex (Texas) would offer similar benefits, as would the area near Urenco's enrichment plant on the Texas-New Mexico border. To that point, locations in West Texas and the Permian Basin are generally remote and have a long history of mining and oil and gas extraction underpinning local employment, which can reduce the risk of NIMBY opposition stalling projects.

## ***2. Other key non-REE mineral inputs that are predominantly produced in and sourced from China.***

These minerals include antimony, cobalt, gallium, germanium, graphite, indium, magnesium, molybdenum, silicon, tantalum, and tungsten.<sup>13</sup> In some cases, they are mined and refined in China. In other instances, ore and concentrates are imported (often from Chinese-owned mines in Africa and elsewhere) and then refined into usable metal at China-based facilities.

Non-REE critical minerals play important—and often, irreplaceable—roles in alloys and other materials used in jet engines, armor, and other critical goods produced by the U.S. defense industrial base. While the absolute quantity consumed each year of the critical minerals is often not large, the abovenamed goods frequently cannot be produced without them. In the event of a supply cutoff, national security goods production must either halt outright, be slowed, and/or cannibalize raw material supplies from the civilian economy at significant cost. Particularly in the event of a protracted “hot” conflict or even a confrontation more akin to the Cold War, PRC entities could impose critical mineral supply restrictions that would threaten to cripple American readiness and ability to produce new military systems to compensate for combat attrition.

## ***3. Logic and memory chips, capacitors, magnets, printed circuit boards, and other critical electronics hardware.***

China is pursuing electronics hardware production dominance. It already hosts more than half of global printed circuit board production.<sup>14</sup> Given the risk of hardware exploits, U.S.-produced military platforms should use physical inputs created in supply chains that are either (a) U.S.-domiciled; or (b) domiciled in a close ally such as Canada, Japan, or South Korea. Supply chain managers must credibly certify that PRC nationals and agents have been prevented from accessing such facilities and that PRC-origin components have not been incorporated in the manufacturing process.<sup>15</sup> There should be particularly stringent electronics component and systems sourcing requirements for hardware and software that are incorporated into critical national infrastructure (i.e., communications, power generation and transmission, oil and gas pipelines and processing plants, transport, water and waste water treatment, etc.). The U.S. government is already acting on a limited basis to protect against equipment from Huawei and certain security camera vendors (e.g., Hikvision),<sup>16</sup> but to our knowledge has not yet launched comprehensive efforts to (a) prevent private actors from using PRC-origin goods in the critical infrastructure

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space, and (b) compel them to take corrective action to remove such items that may already be installed.

#### **4. Enhanced cybersecurity for firms providing inputs to U.S. defense programs**

Ongoing, sophisticated PRC cyber espionage poses a massive challenge. This is particularly true for smaller firms that are critical defense manufacturing input suppliers, but that may lack sufficient resources to repel state-sponsored cyberattacks and information theft attempts. A Bureau of Industry and Security assessment finds that (a) out of 9,000 “classified contract facilities,” the 6,650 small facilities surveyed lagged medium and large firms across a broad range of 20 cybersecurity measures; and (b) “fewer than half of the small firms had cybersecurity measures in place.”<sup>17</sup>

#### **5. Establish strict baseline cloud computing security standards to which all U.S. government service providers and vendors and their managed service providers must adhere.**

In recent years, at least two major hacks suspected of being linked to PRC individuals and groups have compromised IT systems at numerous multinational corporations.<sup>18</sup> The CloudHopper exploit used managed service providers including IBM and Hewlett Packard Enterprise to access client firms in a diverse range of industries, including finance, electronics, medical equipment, biotechnology, automotive, mining, and oil and gas exploration.<sup>19</sup> While the APT41<sup>20</sup> and CloudHopper attacks appeared to emphasize commercial espionage, such penetration capabilities could—if they are not already—be turned to obtaining sensitive national security information both directly from the U.S. government and from contractors.

#### **B. Category 2: Life-critical Items for U.S. Military and Civilians, as well as Allied Countries<sup>21</sup>**

“Life-critical” items are those that, if blocked or manipulated by an adversary during a crisis or conflict, could immediately put American lives at risk on the home front and thus pressure the United States. For

instance, in a sufficiently exigent situation (e.g., a Taiwan scenario), America could potentially subject China to various types of financial or raw materials supply blockades.<sup>22</sup> Yet in response, China could block supplies of medicines and other medical goods, without which Americans would suffer potentially massive mortality and morbidity. Reinforcing the potential threat, a Tsinghua University economics professor who formerly advised China’s central bank noted at the 2019 National People’s Conference that “We are at the mercy of others when it comes to computer chips, but we are the world’s largest exporter of raw materials for vitamins and antibiotics ... Should we reduce the exports, the medical systems of some Western countries will not run well.”<sup>23</sup>

Dependence on China for key medications is direct in some cases, indirect in others. Shifting production of the final formulations to countries such as India is not a viable solution; experts estimate that Indian manufacturers obtain 80% of their active pharmaceutical ingredients (APIs) from China.<sup>24</sup> Even more so than with the aforementioned defense base inputs, commercial dynamics make complete medical products indigenization unrealistic, and prioritization essential. Nevertheless, onshoring efforts are both beneficial and realistic. Consider, for example, the fact that only a very limited percentage of a medication’s cost typically stems from its actual production. Relative priority of materials and products may be determined in part by tracing which are needed for the most critical medical processes.

#### **1. Antibiotics.**

Chinese firms now command an estimated 97% of the U.S. marketplace for antibiotics.<sup>25</sup> In the acute threat scenario, a cutoff of these ubiquitous medications—which treat tens of millions of infections annually and are also used routinely in surgeries and other procedures—would paralyze the U.S. health care system and cause massive fatalities. It would also allow the PRC to potentially divide the United States from its allies/partners by forcing them to choose between assisting Washington when it approaches them for

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support and acquiescing to Beijing's threats to their own antibiotics access. Antibiotics manufacturing concentrated in China (and India) also creates a long-term hazard since the facilities' poor wastewater treatment and resultant emission of antibiotics residues into local waterways catalyze the evolution of multi-drug-resistant bacteria that threaten global health.<sup>26</sup> Greater U.S.-based manufacturing of antibiotics in facilities held to stricter environmental standards could offer a global good by helping to reduce antibiotic resistance.

## **2. Anti-hypertensives, insulin/anti-diabetic drugs, anti-depressants, anticonvulsants, statins, anesthetics, and analgesics.**

Widely consumed throughout the United States, these medication classes are either acutely life-critical (anesthetics, anticonvulsants, and anti-diabetic medications), or through contamination by accident or design, could chronically degrade tens of millions of Americans' health.<sup>27</sup> To give a sense of scale, lisinopril (anti-hypertensive) and atorvastatin (cholesterol-lowering) were each prescribed more than 100 million times in the United States during 2017.<sup>28</sup>

## **3. Other widely prescribed medications.**

For other widely prescribed medications, such as blood thinners and anti-asthmatics, all suppliers of imported medicines must certify that their products do not contain PRC-origin APIs and were not manufactured in a facility owned or controlled by a PRC-domiciled or -owned entity. If they are unable to do so, creating trusted source production facilities for those medications would then receive expedited consideration.

## **4. Medical devices.**

Health care apparatuses in facilities that serve U.S. military personnel and members of the executive, legislative, and judicial branches with critical responsibilities should not incorporate PRC-origin components or software due to the risk of hacks such as those described above for circuit boards and other hardware. We recommend an audit of major U.S. hospitals post-coronavirus

to ascertain the degree to which medical devices with meaningful levels of PRC-origin content have penetrated the U.S. health care system. Moving forward, hospital systems receiving more than \$1 million annually in federal grants or funding should certify that life-critical medical systems purchased from 2021 onward are sourced from supply chains free of PRC-domiciled or owned entities.

Established pharmaceutical research and development hubs with excellent real-time distribution infrastructure such as Greater Boston, New York-New Jersey, and Indianapolis would offer logical locations in which to build critical medicine production facilities.

## **III. POLICY TOOLS AND APPROACHES TO REPATRIATE PRODUCTION OF SECURITY-CRITICAL GOODS**

The following are 12 ideas regarding how the federal government might incentivize capable actors to onshore important supply chain elements while minimizing moves to "pick winners" and other interference in the market economy.

### **A. Improve Strategic Situational Awareness**

*Option 1: Create a national strategic mineral and critical medication inventory reporting system with a structure similar to the Energy Information Administration (EIA)'s weekly petroleum inventory data reporting.*

This would help prioritize measures to avoid bottlenecks regarding supplies of critical resources. Given the importance of REEs to the production of critical military systems, the Department of Defense (DoD) should track REE use in all major U.S. military systems on a monthly basis—something neither it nor its contractors do thoroughly at present. For tracking REE and strategic mineral inventories more broadly, the U.S. Geological Survey (USGS) would be a logical lead entity, given its established expertise in mining and minerals. Preexisting legislative initiatives such as the Critical Minerals Policy Act of 2013 lend support to utilizing USGS capabilities.<sup>29</sup>

Such inventory reporting should also be conducted for critical medications and electronics hardware inputs. Overall, the inventory reporting system should be simpler to develop, implement, and operate than the EIA's energy reporting system. The EIA must regularly obtain data from thousands of firms, while the strategic sectors on which this analysis focuses are typically dominated by 20 or fewer firms with major U.S. operations. We recommend that Congress use the core concepts expounded upon in the Federal Energy Administration Act of 1974 as starting template for creating the legislation that would empower the executive branch to regularly collect such data from critical industry sector participants on a mandatory basis.<sup>30</sup> Readers should note that we are not advocating for the EIA to have another task added to its already full plate. Rather, we believe that many parts of the EIA's data collection and reporting system, and the legal authorities underpinning it, offer useful starting points for building similar architectures that would enhance the U.S. government's strategic situational awareness with regard to key minerals and medications.

### **B. Leverage Our Alliances**

*Option 2: Coordinate with neighbors, allies, and partners. Japan just allocated USD \$2.2 billion of its own stimulus package to help shift supply chains from China.*

Of this, 23.5 billion yen (USD \$21.9 million) is earmarked for corporations moving production to countries other than Japan.<sup>31</sup> Such a commitment from a key ally offers new opportunities for collaboration and exchange, particularly when it may make sense to site certain assets in Japan (since the Japanese stimulus funds appear geared toward re-onshoring in Japan itself). On the rare earths front, Lynas Corporation of Australia has its Mt. Weld deposit (one of the world's largest) in full commercial development.<sup>32</sup> And Japanese firms are major producers and consumers of important rare earth-containing electronic items. Both countries are treaty allies that have already been subjected to Chinese geoeconomic pressure, and will almost certainly face it repeatedly in the future.

The United States should work with these allies and others, such as Five Eyes (FVEY)<sup>33</sup> countries, to provide financial incentives such as subsidized storage to encourage commercial REE users to hold larger inventories.<sup>34</sup> Here an initial “FGJK Framework”—F (FVEY + France) + G (Germany) + J (Japan) and ideally K (South Korea)—is promising; and it could be readily expanded with other like-minded allies and partners—such as other NATO countries, Israel, and Singapore—provided that they are willing and able to embrace and uphold high standards. Policymakers would need to determine what a “minimum acceptable” level of stored REEs is, perhaps six months' worth of consumption. The U.S. government should consider financially supporting such stockpiling efforts. Several federal offices and/or agencies could potentially lead this effort.

For critical pharmaceutical production lines, it is essential that the United States leverage the strong cross-border trade and industrial facility networks it shares with Canada and Mexico. Not only would such an approach comport with the past quarter-century of NAFTA and USMCA trade relations, it would also share costs and help ensure that each country has the highest quality medications in normal times and adequate supplies during future emergencies.

### **C. Leverage the U.S. Government's World-leading Purchasing Power**

*Option 3: Use federal procurement to incentivize accelerated supply chain shifts.*

The U.S. government deploys military hard power more comprehensively and capably than any other nation in human history. At its best, U.S. government diplomacy, as well as societal interactions, draw on a cultural soft power unmatched in attractiveness and innovation. Yet a third unparalleled U.S. attribute—unrivaled government purchasing power—has gone comparatively unused. It is time to leverage the federal government's status as the world's largest buyer. America's world-leading government health care spending can be used to incentivize and insist on secure supply chains (e.g., for medications determined

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to be the most important). Requirements should include a combination of domestic, hemispheric, and closely allied onshoring, as well as potential participation by abovementioned allied nations' companies. The requirements should emphasize that production of both APIs and final medications occur outside of PRC territory and in facilities completely free from operational or financial control by PRC-based or affiliated entities. Furthermore, these trusted procurement entities must be owned or controlled by business and financial entities (governments, industrial state-owned enterprises, private investors, pension funds, venture capital and private equity firms, etc.) that are not listed in the *National Security Strategy* or other U.S. strategic guiding documents as competitors or adversaries.

#### **D. Leverage Existing Private Sector Capacity**

*Option 4: Establish a detailed set of guidelines to advise private sector firms and support their efforts to source and stockpile rare earths and other strategic metals more resiliently.*

Free markets are generally the best solution, but the REE market is disproportionately small in physical volume and financial value (only ~\$2 billion to ~\$3 billion annual global gross revenue from sales of raw materials) and disproportionately strategic. Significant price fluctuations have driven key sources out of business or into serious financial distress, e.g., the previous incarnation of the Mountain Pass mine referenced earlier in this analysis—and may do so again absent government support. We therefore believe that for certain irreplaceable inputs such as REEs and other low-volume but non-fungible strategic value inputs, it is appropriate to have a higher level of government guidance for sourcing and stockpiling practices. To date, Washington's level of engagement with the issue has proven insufficient to deliver the needed results.

#### **E. Financing Additional Strategic Production Capacity**

*Option 5: Use “forgivable debt.”*

Provide preferential federal loans to finance the construction of key plant facilities and upfront workforce training. A project's operator would pay no interest for the first two years of its operation, then a preferential interest rate (e.g., LIBOR + 50 basis points). If within a pre-negotiated time frame the facility met certain capacity and/or productivity metrics, debt could be forgiven.

*Option 6: Provide “assured payback” to private import project developers.*

Initial investments would be made with private capital, but if a mutually established minimum annual production rate were not met within five years, federal funds could be used to compensate the developers for the difference between actual returns and the minimum return negotiated at the project's inception.

*Option 7: Federally supported buyouts of PRC-ownership interests in key supply chain facilities located in the United States.*

Some PRC-domiciled entities maintain manufacturing operations in North America. For example, Humanwell, a large pharmaceutical producer traded on the Shanghai Stock Exchange, owns production facilities in Puerto Rico and South Carolina.<sup>35</sup> On the strategic materials side, Leshan Shenghe Rare Earth Co. Ltd. owns a non-voting minority interest in California's Mountain Pass rare earth mine.<sup>36</sup>

Bringing certain existing critical-sector facilities under the ownership and control of U.S.-domiciled firms makes strategic sense. Yet it is also in America's long-term economic interest to maintain its attractiveness as an investment destination that operates by clear and fair legal principles. Accordingly, the U.S. government should consider federally supported acquisitions of U.S.-based strategic supply chain facilities owned by, or materially invested in, by PRC entities. In some instances, the assets may be wholly owned; in others, the PRC entity may hold a minority interest.

**America's world-leading government health care spending can be used to incentivize and insist on secure supply chains.**

In select cases, once such holdings are identified, they should be purchased at a fair market price. In some instances, allowing PRC entities to retain passive financial stakes that yield them income on capital, but do not confer any control over, or any material insights into, facility operations might also be an appropriate solution for reconciling investor private property rights with broader American national security interests. In some cases, it might be best to appoint a trustee to hold the stake on behalf of the PRC investor and disburse dividends or other income.

***Option 8: Immediately reduce the prevalence of Chinese risk capital in America's medical and technology sectors.***

Investments that position PRC persons and entities to extract and exfiltrate cutting-edge technologies are clearly detrimental to American strategic interests. Many U.S.-based tech startups are already rejecting or reducing infusions of capital from PRC-based investors.<sup>37</sup> To incentivize recalcitrant firms to reduce (and eventually eliminate) any PRC-origin investments that would provide control, board seats, access to technology, and other strategic information, the U.S. government should make disclosure of all investors a prerequisite to obtaining government contracts.

This information could be stored in a confidential registry and updated on a quarterly basis. Furthermore, firms developing certain key technologies such as AI applications, quantum computing, autonomous vehicles, robotics, and advanced biomedical compounds, devices, and treatments that are U.S.-domiciled or wish to sell into the U.S. market should be prohibited from accepting any PRC-origin investment that provides sensitive knowledge exfiltration opportunities or operational control.

To facilitate monitoring and enforcement, the Treasury and Commerce Departments should develop and maintain a database of PRC state-owned firms (especially those with defense sector connections) and all of their known subsidiaries and affiliates. This will

be a substantial but richly revealing undertaking. PRC entities frequently mask state ownership and involvement in national defense activities under multiple layers, with publicly traded subsidiary companies that are controlled by key state-owned enterprises.<sup>38</sup>

***Option 9: Provide direct U.S. government financing for construction of new strategic manufacturing capacity or augmentation of existing facilities. The DoD would be the logistical lead agency given its strategic interests, conflict planning and readiness competencies, and budgetary resources.***

Designed to displace PRC-origin supplies and ensure availability during crisis periods, the federal financing would reimburse firms for additional labor and operating costs. This can be done for pharmaceutical, high-tech hardware, and key defense inputs.

Spare capacity physically adjacent to existing manufacturing facilities should be created where possible. Such infrastructure could be held in an LLC in which the 10 largest providers of materiel and platforms to DoD each maintain a membership interest. The entity would help keep the costs of maintaining spare capacity “off the books” of any single firm.

The DoD and other relevant agencies (most likely, Commerce) should provide financial incentives for resilient flexibility among strategic goods suppliers. For instance, do U.S.-based semiconductor fabrication plants possess sufficient aggregate capacity to supply U.S. logic and memory chip needs in an emergency that disrupts supplies of such chips imported from Asia (for instance, by PRC coercive activities or even more aggressive operations against Taiwan)? Key suppliers such as Intel should be required to maintain “warm” (i.e., rapidly usable) reserve capacity at their U.S. facilities for such contingencies.

We recommend making a given firm's expenditures on surge facility readiness fully tax-deductible. To ensure the human capital base to run the facilities is maintained, the federal government should consider underwriting workers' base salary and benefits such that during any downward



departure from a pre-agreed revenue and profitability index point, the DoD would step in to help compensate the firm for the cost difference of those designated employees. The purpose: to ensure workforce continuity through periods of economic volatility and to incentivize workers to remain in such positions for the long-term after acquiring the requisite skills and training.

Production lines and equipment would need to be kept in a state of surge availability, and to manufacture a minimum quantity of goods annually to ensure plant and worker readiness. The DoD would also likely need to mobilize the facilities for surges on a random basis in order to reduce adversaries' ability to use facility activity as an indicator of U.S. strategic intentions.

Surge capacity at pharmaceutical facilities should be benchmarked to emergency demand levels. The U.S. government likely does not have the full dataset now, given that it remains in the middle of the coronavirus pandemic, but as the contagion recedes the government will have a more reliable set of metrics to assess demand for key medicines during a true crisis situation.

Surge capacity at hardware- and platform-focused facilities should be based upon anticipated losses and expenditures in a conflict with a near-peer competitor. Key items of interest would be components and final assembly capacity for military-only systems whose replacements would not be available off the shelf from the domestic civilian sector or whose provision would be imperiled by having PRC-based or -owned entities in the supply chain.

These includes key inputs for frontline military air and maritime systems, high-performance jet engines, precision-guided munitions, and frontier technologies like hypersonics. Certain infrastructure—such as damage repair for large surface combatants and submarines—might need to be forward-located in close allies such as Japan proximate to prospective combat theaters.

***Option 10: Establish federally chartered risk-sharing cooperative structures for financing, building, and operating strategic production facilities that may offer lower financial returns, but are critical assets to help ensure the United States can avoid strategic blackmail and prevail in any future great power conflicts.***

Sen. Marco Rubio (R-FL) already champions this approach, and in July 2019 introduced S.2093 (RE-Coop 21st Century Manufacturing Act).<sup>39</sup>

***Option 11: Offer tax-exempt “Freedom Bonds.”***

These could be sold to help finance investment in the defense industrial base and enhance public awareness and support of the shift in key supply chains from the PRC.

***Option 12: Establish special Wuhan Coronavirus Compensation Fund.***

A portion of any damages collected by the U.S. government from PRC entities pursuant to coronavirus-related lawsuits and enforcement actions would be deposited. Any such funds could be earmarked to support the abovementioned strategic supply chain financing options.

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## ENDNOTES

1. This report is based solely on the authors' personal views and not the positions of any organizations with which they are affiliated. It is designed to offer potential policy ideas, not advocate for specific private sector outcomes. Neither author has a financial stake involved, or any conflict of interest pertaining to the subjects discussed. Contact information: [gabe.collins@rice.edu](mailto:gabe.collins@rice.edu) and [andrew\\_erickson@fas.harvard.edu](mailto:andrew_erickson@fas.harvard.edu).

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domestically and bans exports, the United States will fall into a coronavirus epidemic hell.” (美国的药物绝大部分也是依靠进口...90%以上的美国进口药物都和中国有关。言下之意, 这个时候只要中国宣布药品尽量满足国内而禁止出口, 美国将会陷入新冠肺炎疫情的地狱。). Source: “理直气壮, 世界应该感谢中国” [It is Only Right and Just That the World Should Thank China], 新华网 [Xinhua News], March 4, 2020, [http://www.xinhuanet.com/2020-03/04/c\\_1125660473.htm](http://www.xinhuanet.com/2020-03/04/c_1125660473.htm).

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