

Securing Critical Supply Chains

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SECURING Critical Supply Chains

Michael S. Swetnam[†] and Jennifer Buss, PhD

Image credit:
Alex Tallisen

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Strategies for Sovereignty Over Critical Supplies

During times of crisis, such as the COVID-19 pandemic, the significance of securing critical supply chains to uphold national security becomes evident. How can the United States maintain sovereignty and protect its interests when our economy and national security are dependent on external, global supplies of services and products?

We discuss three strategies that the United States can adopt to maintain full sovereignty over critical supply chains:

1. Fully US Controlled Critical Supply Chain
2. MAD-1: Mutually Assured Dependence
3. MAD-2: Mutually Assured Destruction

Full Control

The first strategy for maintaining sovereignty is a fully US controlled critical supply chain. If the United States controls its own critical manufacturing capabilities, then foreign countries cannot threaten leveraging necessities against the United States, nor will they be able to withhold necessities to meet their own demand. This strategy demands national acquisition by any means to own, control, and access all critical services and materials necessary for the full functioning of our economy and security. For example, for our nuclear stockpile, the United States requires full control of all aspects of production and maintenance. Full control usually entails domestic production, but might include alternative sources in which full control is assured.

While this is the most secure strategy, it is also arguably the least stable and most problematic. As technology has become increasingly complex, manufacturers have turned to specialists and subcontractors to narrowly focus on just one area of expertise. This has created a deep tiering of supply chains, where each tier is dependent on the one below it. Visibility into more distant tiers is challenging, making wholesale replacement of supplies at any link in the chain very difficult. Moreover, modern manufacturing of products requires a highly skilled and trained workforce, which the United States lacks in certain critical areas, because operations management has turned into procurement leadership.

The job of taking a product into manufacturing has increasingly turned into one of offshore product sourcing.

A fully controlled US critical supply chain is a potentially attainable goal, and provides the greatest security, but it would require immense investment and effort, and risks isolationism.

MAD-1

The next strategy for maintaining US sovereignty is a plan of mutually assured dependence (MAD-1). Under this strategy, the United States would only allow dependence on another country's critical resources and services if we have commensurate leverage against that country. Within this scenario, the United States would be able to deny a foreign entity access to as critical a set of resources and services as they can deny us.

This strategy is arguably the easiest to implement but is one of the least secure. It is very difficult to achieve a balance of equally weighted dependence, especially because from day to day and month to month, the level of importance of critical resources and services changes. For example, the day-to-day importance of N-95 masks was perceived as lower before COVID-19 than at the height of the pandemic. During other types of crises, wars, or economic downturns, different critical goods become more of a necessity than others. If a foreign entity decides that it is worth it for them to cut the United States off from critical services and resources, despite the losses they will face, then the United States will be left extraordinarily vulnerable. If a country reneged, the only two options would be to accept the reduction in capability, or shift to the next strategy (MAD-2).

MAD-2

The final strategy is a plan of mutually assured destruction (MAD-2). Under this strategy, the United States maintains a large enough and superior enough military force to seriously demand access under threat of war in the event of some foreign entity's wish to deny US access to critical services and resources. The original MAD concept is that each side could assure annihilation of the other side. This version contemplates an overmatch capability, wherein one side can threaten the other side sufficiently enough to deter supply chain disruptions.

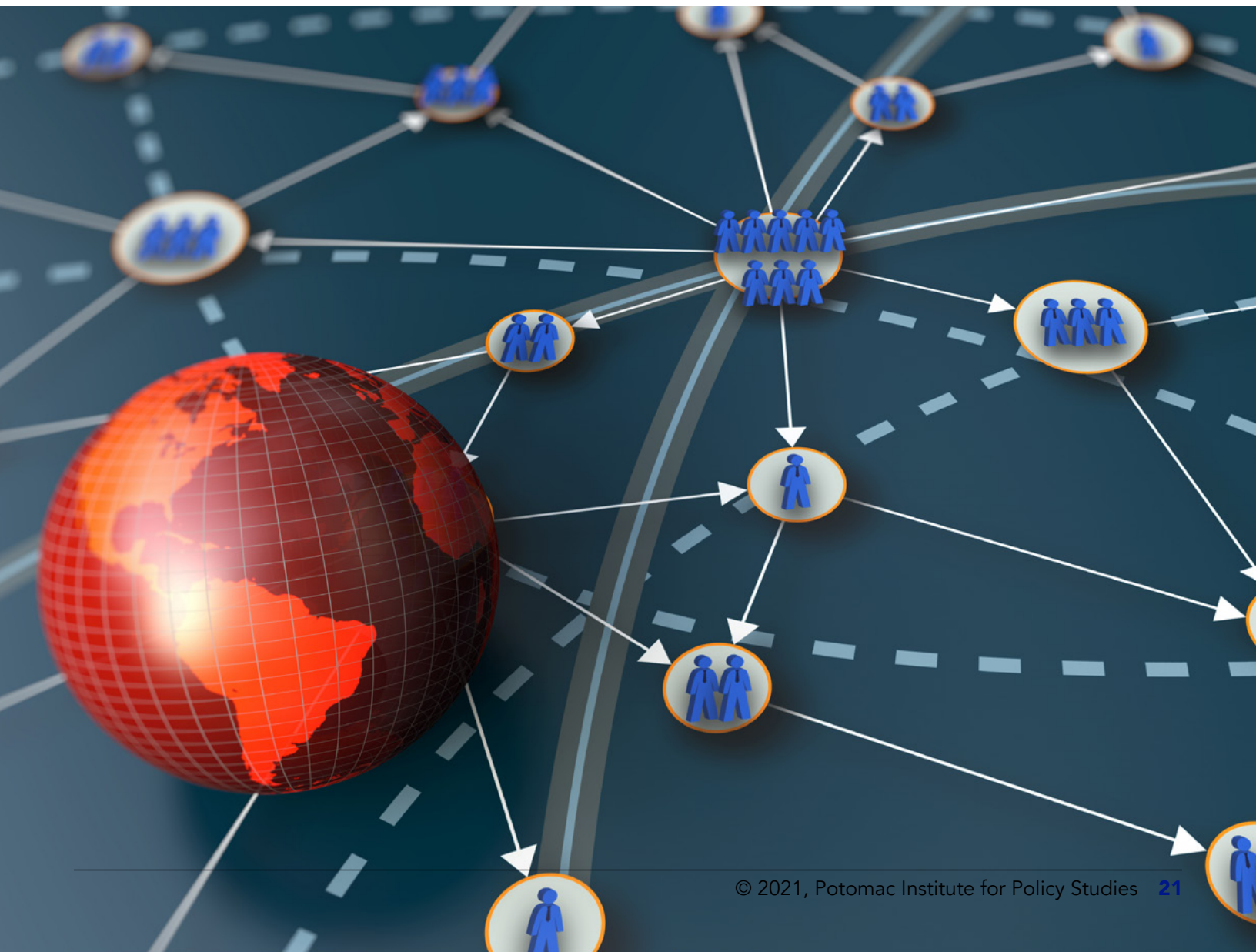
This strategy is fairly secure but requires a good deal of investment and effort. The United States already invests significantly more money and effort in its military compared to any other entity, but as Vietnam and Afghanistan have demonstrated, a superior military force by no means ensures easy or straightforward influence over other entities. Wars are risky, controversial, complex, incredibly costly, expend political capital and international prestige, and can devolve into a stalemate. Especially when dealing with a country from which we need critical resources, products, or services, the United States would have to be careful that when waging war or threatening destruction, that we do not threaten the very supply chain or critical infrastructure on which we rely. Moreover, this strategy would mean that in times of crisis when there is desperate competition for limited resources, we would have to make foreign entities decide between giving up critical resources that they need or face destruction.

What is Critical in Full Control?

Each strategy has its benefits and downfalls, but ultimately, the United States will be in the most secure national security position if we have fully US controlled critical infrastructure. Creating this supply chain will not only increase national security, but will also enable increased investment into the US labor force and economy.

The question to consider now is, what should the United States consider critical infrastructure? The following five areas are suggested as components of critical infrastructure.

Critical Resources and Materials: Commodities necessary for building critical capabilities, including oil, iron ore, rare earth elements, etc.



Manufacturing Base that Can Scale Up and Adapt

Production: A manufacturing base that consists of domestic factories that can respond to urgent needs. This component of critical infrastructure entails the understanding of the technology required to build vital products at scale, and to adapt manufacturing to assemble vital products—for example, the ability of a car manufacturing plant to build ventilators. This capability requires the knowledge and skill to build complex things at scale. The process of adapting and scaling production includes setting up the supply chain for raw materials; designing an assembly process with the appropriate tooling and fixtures, building, or securing test equipment; establishing testing and quality procedures; and working through materials handling and staffing.

Skilled, Trained, Prepared Workforce: It is critical to have a skilled, trained, and prepared workforce that is ready to address a critical infrastructure challenge. This requires vast amounts of education, training, experience, and a culture that values those possessing critical skills. Creating such a workforce is likely to involve significant time and planning investments.

Specialized Manufacturing Capabilities: There are certain highly specialized manufacturing capabilities that are extraordinarily challenging to create from scratch. In times of need, the United States relies heavily on these specialized capabilities, such as microelectronics, bio-medical supplies and services, and space-related technologies, which must be sufficiently developed domestically.



Strategic Inventory Reserves: Critical infrastructure includes reserves of critical products or materials that the United States cannot readily access or securely manufacture indefinitely. Given their focus on overall equipment effectiveness metrics, manufacturing plant managers are reluctant to install excess capacity. This means that factories are sized to handle the expected demand, with minimal surge capacity. The result is that when we experience a supply shock or sudden disruption in raw materials, components, or product supply, there is little buffer inventory available to absorb that shock. The United States had a buffer inventory of masks in a strategic stockpile, which was depleted during the H1N1 outbreak and never properly replenished. The United States should not even need to stockpile masks, as we should instead develop the capability to scale up their

production. However, for products and materials where it is difficult to have secure control over the entire supply chain, strategic inventories that get promptly replenished should be considered a necessary component of critical infrastructure.

Conclusion

Of the strategies considered here, full US control of critical infrastructure supply chains is the recommended option. It will be necessary, however, to carefully discern which elements are truly critical. Achieving this strategy will require significant investment and effort, as the components of the critical infrastructure are currently inadequate. Restructuring to address the critical components, as described above, will take bold ideas and bold initiatives.

