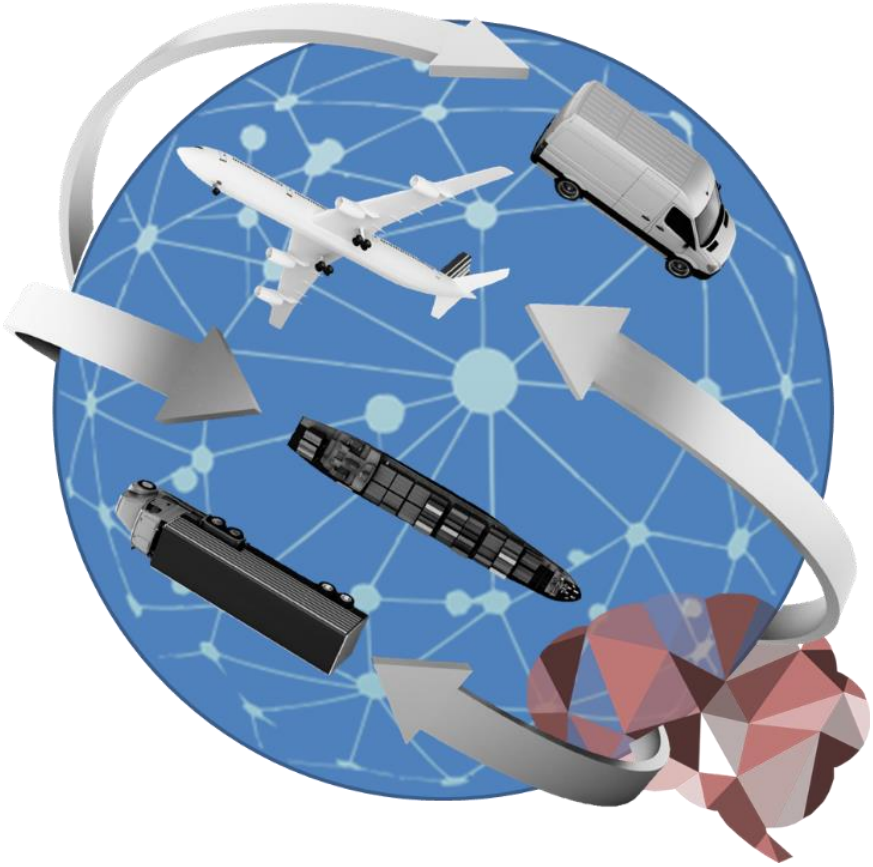
# Sovereign Supply Chains
# &
# Essential Reshoring



Alan G. Dunn, CPIM
&
Nicholas M. Testa, Jr., CPIM-F, CSCP, CLTD, CIRM, Jonah

V30

*"Executives have had an awakening with disruptions associated with COVID. Not only are they realizing that they need to pay much more attention to supply chain risks, but they are realizing that sourcing is a strategic decision. If you don't pay attention to your foreign suppliers and whether they are potential bad trade actors, you are in essence handing the keys to your company over to these suppliers, negatively impacting shareholder value and creating significant risk to your extended supply chain partners."*

Lisa Anderson, LMA Consulting Group, November 1, 2020

*"We can't make penicillin anymore. The last penicillin plant in the United States closed in 2014"*

ABC News, September 12, 2019

*"After years of planning, China now dominates the world's production of new generation batteries that are key to transitioning away from fossil fuels. These new batteries are essential for electric vehicles and most portable consumer electronics such as cell phones and laptops… if current trends continue, most of them will likely use Chinese batteries, a key element for transitioning away from fossil fuels, and most of those batteries will be lithium ion, which are also popular for cellphones and laptops because of their high energy per unit mass relative to other electrical energy storage systems, according to the U.S. Department of Energy."*

VOA News, September 1, 2020

*"While we still design components, (field-programmable gate arrays), (application-specific integrated circuits), and printed circuit cards in the U.S., the majority of fabrication, packaging, testing etc., is done offshore," Ellen Lord, U.S. Under Secretary of Defense for Acquisition and Sustainment said… "We can no longer clearly identify the pedigree of our microelectronics. Therefore, we can no longer ensure that backdoors, malicious code or data exfiltration commands aren't embedded in our code."*

DOD News, August 20, 2020

*"Alarmed at China's stranglehold over supplies of masks, gowns, test kits and other front-line weapons for battling the coronavirus, countries around the world have set up their own factories to cope with this pandemic and outbreaks of the future… China has laid the groundwork to dominate the market for protective and medical supplies for years to come. Factory owners get cheap land, courtesy of the Chinese government. Loans and subsidies are plentiful. Chinese hospitals are often told to buy locally, giving China's suppliers a vast and captive market… Once vaccines emerge, demand will plummet. Factories will close. But Chinese companies are likely to have the lowest costs by far and be best positioned for the next global outbreak."*

New York Times, July 5, 2020

*"New Jersey used to manufacture the world's medicine supply. But today, the majority of ingredients necessary to make your medicine, more than 80%, are sourced from China. U.S. dependence on China for the raw ingredients required to make medicines has become a national security concern."*

Washington Examiner, March 17, 2020

*"When the US and ultimately the rest of the Western world began to engage China, resulting in China finally being allowed into the World Trade Organization in the early 2000s, no one really expected the outcomes we see today. There is no simple disengagement path, given the scope of economic and legal entanglements. This isn't a "trade" we can simply walk away from. But it is also one that, if allowed to continue in its current form, could lead to a loss of personal freedom for Western civilization. It really is that much of an existential question. Doing nothing isn't an especially good option because, like it or not, the world is becoming something quite different than we expected just a few years ago—not just technologically, but geopolitically and socially."*

Forbes, November 12, 2019

For critical intellectual and review contributions, we offer special thanks to…

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**William Lyles III,** a dear friend who can instantaneously determine the tax consequences of virtually any business decision, domestic or foreign. Also, a gentleman of highest integrity and compassion for all those around him. His knowledge of world trade and monetary policy history back to the Roman Empire provides us with tangible historical context for what we see in modern global supplies chains.

# ----- Preface -----

This report has TWO objectives.

1. The **first objective** targets U.S. global trade policy makers who in addition to promoting U.S. exports, also have a responsibility to mitigate critical global supply chain risks to the benefit of the U.S.
2. The **second objective** focuses on mechanisms for U.S. domiciled manufacturers to manage risks in their global supply chains to the benefit of their stakeholders and shareholders.

To achieve both of these equally important objectives, we will focus on the critical need to define and promote *"Sovereign Supply Chains."*

This report hopes to cause U.S. manufacturers, policy makers, regulators and elected officials to change their thinking about how the United States participates in global commerce. We propose that the policy makers and industry leaders collaborate in a new mission to create a *"Tempered National Industrial Policy"* (TNIP) that encourages raw materials, ingredients, components, subassemblies, intermediaries, assemblies, and finished products (*"Critical Supply Chain Resources"*) important to national defense and citizen well-being, to be partially or completely produced in the U.S.

We also propose, short of a TNIP, that U.S. domestic manufacturers and related distribution channels examine their supply chains to identify sources of potentially debilitating disruption and risks originating from foreign actors. Note, we are not talking about a National Industrial Policy of the variety that that 20th century liberal economist John Kenneth Galbraith proposed in his seminal 1967 book, "*The New Industrial State*."[1] Nor are we suggesting the more moderate National Industrial Policy variety described by liberal pro-labor economist Robert Reich in his equally thought-provoking 1983 book, "*The Next American Frontier*."[2] Both of these notable economic thinkers, and scores of supporters proposed industrial policies that would empower the federal government to decide which industries should be encouraged, supported and even subsidized by taxpayers, all in the name of national interests. They focused on policies that would assist government-defined industries to remain globally competitive.

Policies to keep companies and industries *"competitive"* are NOT what we are proposing. Nor are we proposing arbitrary *"make in America"* corporate reshoring directives. We trust free markets to be the final and best arbiter of competition and think it a bad idea to overly involve government in the competitive industrial landscape, especially in global trade matters. We are talking ONLY about industrial policy and corporate directions that can be applied to protect the national defense and support citizen well-being, largely through reshoring initiatives and protective market-based supply chain incentives.


Our mission in support of a proposed reshoring goal, is to provide definition, clarity, context, lessons-learned, and a roadmap to rapidly bring Critical Supply Chain Resources that are currently manufactured abroad, back to U.S. shores. Though it may initially seem that we are primarily speaking to policy makers and non-government organizations (NGOs), we are also speaking to both large and small U.S. manufacturers who seek to manage their global supply chain risks.

# *Part 1*
# *Globalization & the Need for Sovereign Supply Chains*

## ----- Globalization – Friend or Foe? -----

Global supply chains support more than business-to-business (B2B) entities, business-to-consumer (B2C) entities and shareholder interests. They also support sovereign, or national interests. Like it or not, this is an inescapable fact in a sophisticated and interconnected world. It is a world where even a specific product can be manufactured from resources originating from every significantly inhabited continent. This globalization of supply chains, often referred to as outsourcing or offshoring when viewed through a domestic lens, has demonstrably led to a more prosperous world, elevated innumerable global citizens out of poverty, and contributed to a sharing of global wealth never seen before.[3] It has also unfortunately led to exploitation of certain low-skilled global citizens, exploitation of poorer countries' resources, monetary and imperialistic dominance of certain societies (from both within and from outside interests), and wholesale aggression on behalf of sovereign nations to acquire control of natural resources and talent.


Irrespective of whether you think globalization of commerce and supply chains is good or bad for the larger global citizenry, it is clear that globalization has inescapable serious and prolonged consequences. Worse, these consequences cannot naturally solve themselves with time or capital, because each participating nation state has its own unique agenda. The convergence of unique sovereign economic and social models cannot be a stable system, and no amount of political refereeing of the global playing field will stabilize such an unstable system. Differentiated cultures, national beliefs, cultural and tribal values, social and individual rights, laws, property rights, and monetary accomplishments will always result in global supply chains that must be tempered by sovereign interests.

By "*tempered*" we are not just talking about authoritarian and collective nation states. The need to temper free-market globalization also applies to democratic capitalistic nation states. We believe these renewed sovereign interests will be the *"next big thing"* in global supply chain leadership.

A **Sovereign Supply Chain** by definition, is any global supply chain that protects against disproportionate risks to a sovereign state's national defense and/or public well-being. Sovereign Supply Chains are lightly regulated supply chains because the benefits transcend B2B and B2C interests and have consequences to the greater nation state citizenry. While national leaders may not see the supply chain of potato chips as one that creates significant sovereign risks, you can be sure these same leaders will ascribe a much higher risk to missile firing mechanisms and demand a supply chain that cannot be compromised from outside their sovereignty. [4]

Thus, Sovereign Supply Chains become *"global value chains"* to U.S. citizens.

## ----- Sovereignty & Global Supply Chains – Lessons Learned -----

In early 2020, U.S. supply chain professionals learned a significant lesson about the consequences of 50 years of offshoring Critical Supply Chain Resources. In truth, the lesson was always there and has actually become evident in the last 10 years. Global supply chain leaders just chose to ignore it.

Because of its severity, the consequences of the 2020-2021 COVID-19 viral pandemic reminds us that while globalization of supply chains has immense benefits in terms of cost amelioration and market

reach, globalization also comes with risks. These risks are numerous. They include risks to society as a whole, risks to national economies, risks to public health and defense, and even risks to globalization itself. These risks have become more apparent, and probably more acute, as more primary manufacturing enterprises have for more than three decades, shuttered their factories in Canada, U.S., and Mexico, preferring the low labor costs of Asian suppliers, particularly those in the Peoples Republic of China (PRC).

Active pharmaceutical ingredients (API's), COVID-19 test kits, components for security and defense machinery, medical devices, and basic food ingredients have all found their way out of the U.S. and massively into Asian, Southeast Asian, Latin American and Philippine contract or captive manufacturing facilities. This has created enormous supply chain risks in the U.S. Just recently and quite by surprise to the average U.S. citizen, the severity of offshoring consequences became evident when reports surfaced that most pharmaceutical products necessary to fight viral and bacterial infections are NOT made in the U.S. any longer. One must ask, *"How is one to fight a pandemic when one has outsourced most priority health treatment products?"* [5]

This newly recognized risk MUST be addressed, and practically every product-based company in the U.S. MUST participate in how and when it is addressed. *"Sovereign Reshoring"* is bringing priority products with a national interest, back to the U.S. It is going to be an important vehicle to manage global supply chain risks.

A recent example of where national interests WERE NOT appropriately managed occurred during the PRC's threat to withhold critical medical products from the U.S., and to raise prices on other products already in limited supply around the world.[6] These actions by the Chinese can only be interpreted as threats to the sovereignty of the target nations, including the U.S. Some may view this as beyond global trade, perhaps as a hostile act, when viewed against the likely origin of the COVID-19 virus in Wuhan, China.

## ----- Anti-Globalization – NOT! -----

Now, it would be easy for the reader to think the authors are anti-globalists. On the contrary, we believe deeply in the benefits of extended supply chains and global trade because they support free market agendas impacting:

- Nation-state citizens
- Companies that operate within sovereign boundaries
- Governments who are charged with protecting their citizens
- Shareholders of companies that manufacture and distribute goods and services

We like globalization's ability to find better supply sources, as well as new markets for products and services. Globalization has (arguably) raised the standard of living in numerous 2nd and 3rd world countries, where before globalization, their economies' GDPs were mostly flat or declining. Globalization has *"lifted all ships"* and numerous villages, towns and cities across the globe have found

their ways out of poverty as a result of wealthy North American and western European companies buying products from their once poor communities.

But risks come with a global supply base. Indeed, there are many obvious and hidden risks in global supply chains where distances are long, complexities are great, and consequences of unreliable supply can be catastrophic. Part of the complexities include, how one nation's export policies can create unacceptable risks for an importing nation. Furthermore, offshoring products of critical defense needs (think, rare earth minerals) and public well-being does not always serve sovereign interests, even while serving the enterprise ownership interests. Complexities abound when thinking about how a global supply chain can serve both sovereign and free-market masters.

Before diving too deep into mechanisms necessary to solve this *"two-master problem,"* it is important to understand that we are not talking about national self-sufficiency, a public policy that historically leads to national isolationism at some level. Self-sufficiency enables a nation state to be economically independent in all matters of trade. In a purely self-sufficient economy, a country's natural resources and direct labor are used to produce products that satisfy its own consumers' needs and purportedly, improve the sovereign standard of living. National self-sufficiency as a political/economic system promises citizens equality in economic affairs, sovereignty and position amongst other nation states.

The problem with national self-sufficiency is that it never works. It never works because it violates principles of global supply chain efficiency and specialization. An entirely self-sufficient economy, for example, would be one that grows ALL its needed grain, harvests it, mills it, feeds it to cattle and then raises the cattle. This economy would then slaughter the cattle, butcher the cattle, freeze the meat and treat the remaining leather hides to produce automobile seats which are made in a sovereign seat factory supporting a sovereign auto assembly line. It would be a fully integrated supply chain in a circular economy bounded by a singular national border.

There is no economy on earth that can do all of these conversion activities excellently. At best, a nationally self-sufficient supply chain would do some elements excellently, but most would be performed poorly with resultant quality and low-output problems.

In every economy where this has been tested, people became less satisfied with nationally produced goods. Practically speaking, some products cannot be available because nature, along with principles of supply chain efficiency and specialization, do not allow it.[7] Imagine if Alaska declared its independence from the U.S. and set a target to become a self-sufficient economy. While they may have plenty of petroleum and gas for their cars, just where will they get coconuts, bananas and MRI scanners?

National self-sufficiency has never worked, never will work and has always resulted in economies becoming poorer.[8] They become poorer because they pay more for products produced in their self-sufficient society than people in free-trade countries pay. When citizens in free-trade countries pay less for a similar product, the countries release capital that can be invested in society-altering products and services. At the same time, the self-sufficient nation state becomes poorer because competing nation states become richer. Cuba, Venezuela, North Korea, and the USSR are examples of the consequences of pursuing national self-sufficiency. Policies in these countries chased the elusiveness of self-sufficiency, usually at the direction of communist-style totalitarian dictators. For all of these countries, the economic and social consequences of policies favoring national self-sufficiency are apparent. Look at Cuba, a small Latin American country located just 105 miles from the U.S. It is a nation stuck in a

self-sufficient 1950s economy with little hope of advancement. Cuba's great paradox is that. in its pursuit to be self-sufficient, it became substantially dependent on other large, mostly totalitarian states for its economic survival. The lesson from Cuba experience is that while sovereign self-sufficiency looks good on paper, macro-economic realities in a globalized supply chain world, make it unworkable.

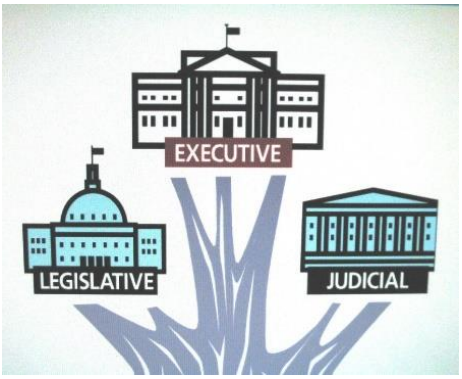
The Sovereign Supply Chains we propose here, ARE NOT nationally self-sufficient supply chains. They are not supply chains within an isolationist hermit kingdom. They are also different than absolute open-border, no-barrier conglomerations of specialty products and services global supply chains.[9] Sovereign global supply chains are supply chains that achieve free-market shareholder value goals without jeopardizing national defense and public well-being interests. Global trade is still very much a part of these supply chains.

Sovereign Supply Chains do however engage government to enforce the means to protect the U.S. in its national defense and its citizen well-being. While most free-market capitalists seek limited government, they all know that zero-government is not possible in any civilized society. It's not a question about whether regulations should or should not be applied in society, it's just a matter of optimizing regulation to ensure a sovereign-protected and fair standard of living.

Government fundamentally exists to do what private enterprise, groups of like-minded individuals, Non-Government Organizations (NGOs) and individual citizens:

- Cannot do
- Will not do, or
- Should not do

For example, individual citizens cannot defend the country against organized invading forces. Likewise, very few citizens would favor armies run by for-profit companies. Companies should not run and control military forces. Finally, the U.S. government will find it nearly impossible to outsource a military requirement as large as the one in the U.S., to any non-government organization. Such organizations simply do not exist and if they did, they probably would not want the contract because of costs, liabilities and a host of unresolvable issues. Thus, only a government organized military can provide for national defense.

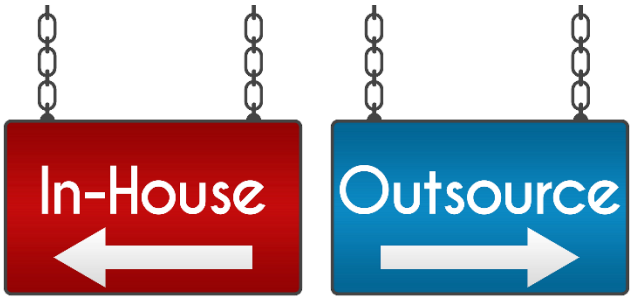



Corporate interests, union interests, NGO interests, importer interests, and consumer interests all have different views on global trade. These disparate views and self-interests are what disqualifies most non-government agencies from setting national trade policies. None have the capacity to set policy that works in the best interest of the U.S. as a whole. None can or should implement cross-border trade policy. Only a government that is protective of national defense and the totality of citizen well-being should do this.

# *Part 2*
# *History of Relevant Trade Regulations & Outsourcing*

## ----- The History of U.S. Offshoring -----

Before venturing into solutions to this massive offshoring predicament that needs to be at least partially reversed, it would be wise to understand how the U.S. got itself into this situation. It would also be wise to identify how many of its Critical Supply Chain Resources, once produced on its own shores, are now produced in other lands.




Manufacturing companies who moved production from North American factories to contract factories in far-off lands, made those decisions with the best of intentions. Most were looking for cost reductions that Low-Cost Regions (LCR's) could provide. But offshoring motivations go far beyond simple direct labor cost opportunities. Additional important reasons that were included in offshoring decisions from the early1970s to present included:

- The quest for lower energy costs
- Access to raw materials
- Lower taxes
- Less government regulation and intervention
- Lower real estate acquisition costs
- Access to needed talent
- Access to new markets

Unfortunately, many of these decisions, well intentioned as they may have been, often resulted in higher supply chain risks and higher costs when measured on a Total Cost of Ownership (TCO) basis. It is likely that the majority of decisions to send production offshore included fundamental analyses of incremental freight and handling expenses. It is also a fact that more than 70% of outsourcing decisions *(according to the 2010 Manufacturing Executive Institute analysis on offshoring between 1975 and 2005),* failed to include several of the following tangible and intangible factors:

- **Tangible Factors:**
  - Costs of incremental material handling.
  - Costs of additional inbound quality management activities.
  - Weighted Average Cost of Capital (WACC) of inventory sitting on the seas for 2 to 4 weeks per shipment.
  - Synthetic Free-on-Board (FOB) costs.
  - Additional supplier performance and risk assessment costs.
  - Long-term environmental management costs.
  - Site-relocation (from domestic shores to foreign shores) transference costs.
  - Additional inventory safety stocks to compensate for longer lead times and transit times.
- **Intangible Factors:**
  - Risk associated with local political probabilities including, asset seizers, ambiguous rules, nationalization of enterprises, foreign corrupt practices, etc.

- New competitor entry into markets resulting from lowering of market entry barriers. Offshoring by new competitors can harm existing companies whose legacy costs (domestic, property, plant and equipment) cannot compete with offshore alternatives. [x]
- Reduction in employee loyalty. If employees know that their jobs can be outsourced to less-expensive overseas labor, their loyalty to their current employer erodes, leading to reductions in productivity.
- Transference Costs. These include all the costs a *"community"* bears when a factory closes down and moves jobs offshores. In many European countries (and in particular, Germany), transference costs associated with a dislocation of jobs are calculated and assessed to the company. Thus, in Europe, these may be considered legitimate tangible costs. However, in the U.S., costs incurred by a community (including unemployment benefits, poverty ameliorating expenditures, secondary job losses, reductions in real estate values, etc.) are generally borne by the community that loses the jobs. Because these are difficult to quantify, U.S. economist often treat them as intangible factors.

In other words, most analytics supporting transferring production to foreign lands were based on a fundamentally flawed approach. We're talking about an approach that was admitted to by most offshoring decision makers even as they made the decisions. So why did they knowingly make those flawed decisions?


According to Shoshanah Cohen, Director of Stanford's Global Supply Chain Management Forum, the answer is quite simple and demonstrates additional complexities in global supply chains. She opined, *"Measurements of Procurement Managers' performance are mostly skewed toward lowest incremental price, or lowest landed cost. And while these same sophisticated executives know that TCO is a better metric of economic efficiency, they also know how their 'bread is buttered.' They are more than willing to achieve performance against an over-simplified metric that is easier to achieve."*

One thing we know from our nearly 100 years of combined supply chain experience is… you get what you measure, and you institutionalize what you reward. Don't blame the procurement professionals. Blame the leaders who established metrics that mostly ignored known-risks and were not adaptable to unknown-risks.

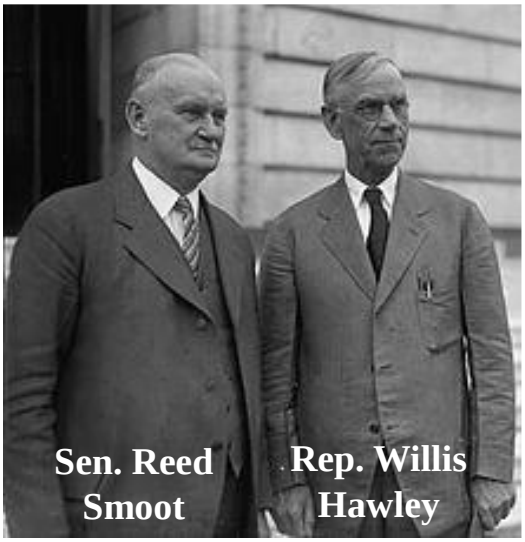
## ----- Historical Analogs in Sovereign Supply Chains -----

While the term *"Sovereign Supply Chains"* may be an unfamiliar term to supply chain professionals, to politicians and regulators it is not a new concept. Indeed, nation-states have emphasized supply chain principles supporting Sovereign Supply Chains for as long as nations have existed. Throughout history, wars, economic depressions and even major economic recessions have led to increases in protectionism, while peace and prosperity have tended to encourage free trade.

Governments have always been interested in Sovereign Supply Chains, in one form or another. Whether through legislative actions or judicial orders, the U.S. itself has demonstrated an appreciation of sovereignty in its supply chains in SEVEN different, albeit sometimes inappropriate ways:

1. **Tariffs on Imports.** Normally, these only lead to retaliation from foreign nations, at some level. A notable example occurred after WWI. In 1930, Congress passed the broad sweeping Smoot-Hawley Tariff Act to protect U.S. farmers from European agricultural imports. While U.S farmers were suffering from Dust Bowl consequences, European farmers were ramping up agricultural production that was hugely damaged in WWI.[10]

   Smoot Hawley's excessively high tariffs resulted in enormous tariff retaliation from Canada, France and Great Britain. Virtually all scholars studying trade matters today present solid evidence that Smoot-Hawley extended the severity of the Great Depression. Locking out global imports entirely, has dreadful consequences irrespective of original intentions.




2. **Subsidization of Producers.** Governments in virtually all industrial nations, frequently subsidize specific industries to compete in global markets. Subsidies usually take the form of tax credits, other taxing provisions, loans and even direct payments. Sometimes these go dramatically wrong as in the case of the 2011 failure of Solyndra, a U.S. government supported photovoltaic products manufacturer.[11]

   According to David Boaz at the Cato Institute in his August 2015 paper, *"Solyndra: A Case Study in Green Energy, Cronyism and the Failure of Central Planning,"* the story of this high-technology company had *"all the hallmarks of government decision making, including:*

   - *officials spending other people's money with little incentive to spend it prudently,*
   - *political pressure to make decisions without proper vetting,*
   - *the substitution of political judgment for the judgments of millions of investors,*
   - *the enthusiastic embrace of fads like "green energy,"*
   - *political officials ignoring warnings from civil servants,*
   - *crony capitalism,*
   - *close connections between politicians and the companies that benefit from government allocation of capital,*
   - *the appearance - at least - of favors for political supporters,*
   - *…and the kind of promiscuous spending that has delivered us $18 trillion in national debt."*

   The most significant lesson-learned from this debacle is that direct subsidization of <u>specific</u> producers is dangerous, in that it allows a non-market-driven government organization to make market-based decisions. Though this has occasionally worked, it is the cronyism that often sub-optimizes the original intent.

This is not to say that some, well-thought-out government intervention is wrong. The Small Business Administration (SBA) and similar organizations have indeed offered incentives that for all intents and purposes, looks like a specific producer subsidy, especially to foreign competitors. The difference is that the SBA constructs *"plans"* that are offered to targeted business communities… NOT specific companies. They don't seek out specific companies, nor do they allow lobbying from companies outside their strict application, evaluation and approval processes. These subsidy mechanisms seem to effectively dissuade cronyism.

Finally, in the Americas today, governments commonly use farm subsidies that allow producers to lower their prices to consumers, with the government picking up the difference. This allows farmers to market their products overseas to buyers who are always willing to pay less for foreign products than for their domestic counterparts. In a sense, subsidies are like a micro-dollar-devaluation, limited to specific companies or industries.

Subsidies are a perfect example of an incentive within a Sovereign Supply Chain. In order to protect domestic food production (a commodity group of national interest), governments pay farmers to align their self-interests with sovereign interests. The SBA does the same, understanding how small business proliferate innovation and employment.

3. **Subsidization of Actions.** Another tool of Sovereign Supply Chains is when governments pay companies NOT to make products in order to control supply and increase market prices. An example is seen in the Agricultural Adjustment Act of 1933 where Congress sought to pay farmers and ranchers to NOT grow crops and raise cattle.[12] The reported reason for this was that farmers needed to rest their fields from decades of over-production and allow the fields to self-replenish soil nutrients.

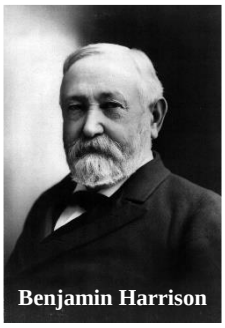
   Government was intervening for a sovereign interest in future efficient food production. Unfortunately, the Act also resulted in higher food prices during the Great Depression. The value of this Act to the country's long-term well-being can surely be argued, but the poor timing of the Act's implementation cannot. Increasing food prices in the middle of a Great Economic Depression with more than 25% of Americans out of work? What were they thinking?


   We observe numerous examples of the government subsidizing for action. Virtually all the benefits provided by governments, both at state and federal levels to reduce greenhouse gas emissions, are effectively subsidization of (or more precisely, *"for"*) government desired actions. Subsidizing companies to offer products and services, or withholding any product or service are examples of government benefits promised for specific trade actions.

4. **Use of Import Quotas.** A fourth method of protecting supply chains is for governments to impose import quotas. No matter how a foreign company sets its international pricing, it cannot ship goods into a region whose customs agents will bar its entry. Quotas can be either explicit, or indirect through extremely high tariffs.

   Probably no politician used indirect import quotas to protect domestic agriculture and manufacturing more than did William McKinley. His protectionist views surrounding the need to assist America's producers accelerated during his tenure as Chairman of the House Ways & Means Committee, during Benjamin Harrison's presidency (1889-1893). With President Harrison's approval, McKinley crafted a wide and detailed list of tariffs, encompassing more

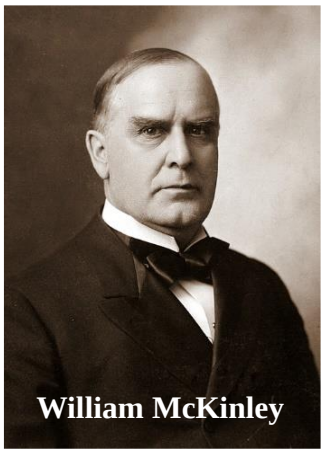
than 4,000 unique commodities. Among the *"McKinley Tariffs,"* were tariffs (really indirect quotas) that were set so high that they effectively stopped importation of certain items altogether, much like a quota. These included wool products, chinaware, stockings, linens, high-grade cotton, cotton knits and all iron and steel products. This was a critical point in American trade history because it established high tariffs as a *"backdoor"* quota system.


**Benjamin Harrison**

But the story of the use of quotas and tariffs does not stop with Chairman McKinley's America-First stance. After a couple of years of tariff enforcement, McKinley observed that America's agricultural and industrial output was exceeding American market needs, causing business leaders to reduce outputs. In just a few short years, the tariffs indirectly caused shortages that would be solved by domestic productivity investments. This in turn, would result in domestic surpluses looking for markets. McKinley correctly concluded that his previous protectionist regulations would soon impede future expansion of U.S. goods into foreign markets. His prior *"solution"* became the new *"problem."*

Once elected President in 1897, now President William McKinley sought input from industry groups, scholars and other trade advisors. This resulted in a new doctrine designed to encourage bi-directional foreign trade where domestic agricultural producers and manufacturers were not harmed. This new form of trade management was called *"reciprocity"* and was defined as an extensive series of negotiated trade *"deals"* with other countries. The goal was to eliminate unnecessary trade barriers on both sides of trade deals, without generating fears of resulting trade wars.

In September 1901, President McKinley outlined this new view of global trade at the Pan-American Exposition, in Buffalo, Ohio. He said, *"Reciprocity is the natural outgrowth of our wonderful industrial development."* He also said, *"Isolation is no longer possible or desirable."*


**William McKinley**

We have always believed this period in American history to be rich in lessons about the impacts and consequences of trade manipulation. Even a patriotic-sounding *"America-First"* import program can stimulate artificial shortages, productivity gains, eventual surpluses and export expansions. The moral here is that when artificially manipulating markets, don't be ignorant of potential and generally predictable down-stream consequences!

5. **National Stockpiles.** The U.S. and indeed most industrial nations, depend on government-sanctioned physical stockpiles of critical commodities, or commodities that officials *"believe"* to be critical. These stockpiles are usually justified on the basis of unanticipated future humanitarian, economic, or sovereign protection rationales. The U.S. maintains (or maintained) the:
    - Strategic National Stockpile (SNS) of critical medical devices (including ventilators), critical medicines and a host of other healthcare items.
    - Strategic Petroleum Reserve (SPR) to stabilize market conditions and protect against foreign oil embargoes.

- Strategic Grain Reserves that included numerous grain types to be used in the event of famine, both domestically and foreign. There have been numerous variants of national grain reserves since the 1930's. All government sanctioned forms have since been discontinued and generally, replaced by privately funded forms.
- Federal Helium Reserve originally was a strategic reserve to hold over one billion cubic meters of helium gas for potential airship use. The reserve was depleted and closed in 2007.

Many other countries have strategic reserves for various food types in the event of famine. These include:

- Russia's General Food Reserves to manage risks of famine.
- PRC's Pork Reserves to protect against famine, control porcine disease and it's spread to humans and protect against fluctuating market conditions.
- Many countries in the Middle East, Sub-Saharan Africa, and Asia maintain a variety of grain reserves, again providing risk management for an unpredicted famine.
- Canada's Strategic Reserve of Maple Syrup to stabilize the global maple syrup market.
- Norway's Seed Vault is a strategic reserve of 770,000+ seed samples from around the world, available in the event of a near earth-ending crisis.

6. **Deliberate Currency Devaluation.** A more subtle, but often deliberate form of trade control occurs when an exporting country devalues its currency. This makes its exports cheaper and more competitive globally. Some countries incentivize their exporters of basic materials and manufactured goods through the use of a fixed exchange rate. For example, the PRC, one of the globes biggest traders, does not have a floating exchange rate that is determined by market forces, like most advanced countries. The value of the PRC's Yuan is periodically set by the PRC's Central Bank. Typically, they set the rate artificially low, making Chinese exports cheaper on the world market and more expensive for PRC's citizens to buy foreign imports. This is driven by their form of a national industrial policy that promises to deliver global dominance in agriculture and manufacturing industries.[13]

In terms of the manufacturing sector, virtually all trade scholars agree the single most important contributor to raising PRC's economic status has come from their central bank, which operates in lockstep with the Chinese Communist Party (CCP). The PRC is now a major exporter of manufactured goods and is a true global player. These policies have arguably shifted hundreds of millions of their citizens into a different economic reality. Unfortunately, it has also deprived them of many innovations originating outside the PRC. They have tried to make up the gap by forced transfer of technology or outright theft of intellectual property (IP).

7. **Increasing National Debt.** Similar to devaluing currency through central bank edict, is the effect of increasing national debt. When national debt increases, currency devaluation is effectively created through either inflation or explicit devaluation of currency to increase money supply and encourage lending.

When reading about the ways in which governments seek to achieve supply chain benefits and sovereign risk reductions, one can easily be struck by the consistency of unpredicted consequences of poor decisions. This is because supply chain decisions at the highest level of government usually fail to address the downstream consequences on the B2B and B2C participants, as well as other societal players. These consequences are often derived from a real inability (or perhaps an unwillingness) to map and understand the complex interrelationships in global commerce.


## ----- Historical Analogs - Lessons-Learned -----

From these analogs, one can be inspired by what has NOT WORKED and create some important lessons-learned, including:

1. **Sovereign Supply Chains are not new.** In one fashion or the other, virtually all countries, and especially the U.S., have considered sovereign interests in their supply chains. Because of this, no one should be fearful of proposed sovereign-centric trade actions when national interests are considered in global supply chain decisions.
2. Everyone today lives in a global supply and demand world where the principles of specialization and efficiency vary widely. **Our Sovereign Supply Chains, while designed to reduce critical commodity risks, must not lock-out foreign competitors**.
3. **Determining which global supply chains require a sovereignty perspective is surely difficult because it is based on more than pure supply availability.** Our society demands that we don't lock-out innovation by locking-out foreign suppliers. Again, the principles of specialization and efficiency suggest that great ideas and great sources of supply can come from outside the U.S., the U.S. just can't be dependent on them in times of national defense or a national well-being crisis.
4. **Supply chain sovereignty should be determined by real national defense and well-being needs, and not by politics or special interest lobbying**. This of course is the Achilles heel of Sovereign Supply Chains. Without mechanisms designed to bring clarity to sovereign needs, this type of government intervention can quickly devolve into a corrupted process.
5. **Ingenuity of process and implementation can be a key determinant**. While above are outlined seven ways in which nation states can (and have) attempted to build Sovereign Supply Chain concerns into trade policies, there are certainly innumerable hybrid approaches.

   For example, the U.S. does not have to ban the acquisition of N95 protective masks from the PRC to reduce its risks during a pandemic. An alternate plan to the one that would ban Chinese imports and grow domestic production would be to insist that Chinese manufacturers of N95 masks keep 15 million of them in a series of bonded warehouses located in the U.S, and of course, on their balance sheets. Keep in mind that stocks, even large ones are but temporary protection and if a prolonged disruption occurred it may well outstrip the quantities in the stock.

   This stock protects the sovereignty of the U.S. supply chains for protective masks, while at the same time allowing specialization and efficiency in the PRC to drive costs to the lowest possible levels. Essentially, the foreign supplier's domestically deployed safety stock is the *"sovereign risk tax"* they pay to participate in the U.S. market. Similarly, the PRC requires U.S. firms to operate entire plants in China as their *"sovereign risk tax"* on U.S. imports. This is NOT a new concept!

6. **Sovereign Supply Chains require an ongoing assessment of risks.** Sovereignty may never change, but items in Sovereign Supply Chain status should be expected to periodically change. As seen in the U.S. government's strategic grain and helium reserve programs previously discussed, Sovereign Supply Chains need to be periodically evaluated and a determination of current relevancy has to be concluded. Thus, Sovereign Supply Chains, while long-lasting in many cases, should ALL be considered temporary.

The most important lessons learned is:

*No item should enter Sovereign Supply Chain status unless there is an unambiguous line-of-sight to national defense and/or citizen well-being in the consuming country. As a corollary to this, one must remember that items with a clear line of sight MUST be placed on the Sovereign Supply Chain list.*

Beyond these lessons, a final lesson-learned might be that the best mechanism to protect a supply chain is to produce the product domestically. This means that efficiency and specialization impediments must be overcome, probably through application of innovative manufacturing technologies married to long-term investment thinking. Using the N95 mask as an example again, there is no way U.S. manufacturing plants can compete with Chinese mainland labor costs to achieve an equivalent total product cost. Any competing U.S. plant should not focus its competitive efforts on units-per-time-period-per-operator. A better approach would be to use automation and compete on quality and volume through a highly automated conversion process. This will require a capital investment which will only be viable if it successfully ameliorates Chinese labor costs. Success can perhaps be achieved by replacing Chinese variable labor costs with U.S. fixed and semi-fixed automation costs. American ingenuity and entrepreneurial spirit can make this happen, especially if encouraged.

## ----- Aggravating Factors -----

What may look good today may be quite different tomorrow. As time passes and business environments evolve, leaders need to reevaluate and adjust. The COVID-19 pandemic is a disruptive event that will cause permanent change in the world, our local environment, and our organizations. Global supply chains will never be the same as they were in 2019.

The decision to offshore is usually made in an effort to position the production of product or service in a low wage area of the world. That quest has lifted many geographic areas out of poverty. As that happens the labor force begins to realize that it can demand more, especially for skills learned in the new industries. Businesses also realize the benefit of skilled labor and are willing to pay more for more productive employees. This leads to wage inflation. As economies, such as Japan, emerged as economic powers, their wages grew enormously until they outstripped those of the developed nations they were providing the lower cost labor to.

A decade ago, many predicted that factory workers in the PRC would reach parity with the U.S. in 2019 or 2020. That has not materialized but the PRC continues to inch closer. The PRC has an enormous labor pool to draw from and that has suppressed the market especially at the lower end of the wage scale. Meanwhile, developed countries have instituted minimum wage laws that have artificially forced up low-skilled wages.

Other emerging economies have been more creative and brought in large numbers of workers from other countries at below domestic wage rates. This can often mean poor working conditions or even outright servitude. Meanwhile, in the developed world, routine low skilled jobs are faced with elimination through automation, autonomation, robotics, and task simplification.

The demand for low-cost labor has forged an unholy alliance between developed and undeveloped nations by willingly (or unwillingly), transferring advanced production technologies to companies in labor-centric under-developed nations. This always results in marginal labor-based producers improving their productivity necessary to compete against more automated competitors. This takes many forms from the simple transfer of skilled technicians to aid in factory set-up and maintenance, to training engineers and scientists to develop new products for their factories to produce. Willingly, it is done to make sure the ever-evolving technological base for the products is kept current. Unwillingly, it may be forced by the hosting nation insisting on the transfer to allow the exploitation of its cheap labor, or the ability of the firm to market its products and services in the emerging economy. The PRC has mastered this type of *"evolutionary economic blackmail"* in forcing many firms to speed the PRC's evolution as an industrial nation.

The funds thus transferred from the developed to the developing nations are not necessarily going to the workers to make their lot in life better. Much of it is being used to fund military expenditures used to keep the nations' people under control of dictatorial regimes or ideologies. In addition to its military and scientific investments, the PRC is using its wealth to buy assets in agriculture, mining, manufacturing and infrastructure around the globe.

Indeed, through their Belt & Road Initiative (BRI), the PRC is investing enormous sums of capital into countries that provide the PRC with a globally strategic military advantage. They are using their vast accumulation of centralized wealth to sucker capital-poor countries into allowing the Central Government of the PRC to control the developing nation's sovereign assets. These have been featured in the National Geographic magazine where large agricultural areas of Africa were shown to be under Chinese ownership or lease. There is also an extensive report from the Council on Foreign Relations on the BRI, touted by the PRC, and suspected as an economic trap.[14]

The PRC is embedded in most of our supply chains and long and tightly coupled chains lead from domestic deliverer back to reliance on production in the PRC. COVID-19 revealed how critical these are to our ongoing security as a nation. The risks reside in our food, medical and industrial sectors. They reside everywhere, having been unfortunately normalized and relegated to *"professionals"* who see risk as a metaphoric dormant parasite. All global supply chains are vulnerable to single-point failures that can bring down the entire chain.

As Gary Lynch proposed in his seminal work, "*Single Point of Failure: The 10 Essential Laws of Supply Chain Risk Management:"*

> *"We have lost the association of risk as a threat or even as a negative. Risk itself has become meaningless. Terms like 'risk management' and 'risk expert' have normalized the concept of risk as a parasite and as a very real threat, not only to profitability and brand, but often to an organization's ability to survive. Much new risk has been introduced – threats once not relevant now impact global supply chains with greater frequency and consequences. Thanks to globalization, the risk parasite can quickly weave its way through the logistics, sourcing and production processes that support these long-tailed supply chains. The parasite can lie dormant in these processes, undetected by the organization. Then an event unleashes the parasite, creating a single point of failure, a broken link in the chain. The catastrophic outcomes can affect any stakeholder in the supply chain regardless of geographical or organizational boundaries. The trigger, large or small, can result in the same outcome. No longer can we distinguish between low-probability/high-impact events and everyday incidents. Whether an explosion at a natural gas plant or the availability of a single part, today's interdependent and lean supply chains as well as a fiercely competitive global marketplace leave little space, or time, for error."*

Serious *"risk parasites"* have recently manifested in pet food, milk and baby formula where serious recalls occurred, mostly the result of contamination in sourcing and processing within the PRC. These were not minor incidents. Family pets died, and children and adults in the U.S. were sickened. It should not be surprising that global consumers' trust in Chinese supply chains diminished as a result.

Supply chains are ultimately based on trust. *Can one trust the PRC and other countries to live up to the quality, health and safety requirements imposed by the U.S.?* It does not seem likely, without establishment, implementation and enforcement of new global supply chain rules-of-engagement.

At the opposite end of the global supply chain spectrum of challenges, is where domestic growth is limited by access to necessary talent. An example of this can be observed in the U.S. need to draw on the talented Indian programming community to support many corporate IT projects, both domestic and abroad. Global supply chain leadership requires robust information systems and as a result, demands strategies to develop necessary talent pools. Thus, access to talent is clearly a global supply chain challenge.

One way to address these issues is through a cohesive, albeit tempered, National Industrial Policy. The U.S. is a free economy, yet there are concerns that must be addressed as a nation to not allow core capabilities to be destroyed while allowing other nations to control key portions of domestic end-to-end supply chains. This cannot be a one-size-fits-all legislation. It should be a reasoned response to critical issues in supply chains that can enhance national health, safety and security, and yes, the continuing prosperity of the U.S.

## ----- Golden Rule of Outsourcing -----

Going back to business fundamentals, *"What is your organization's mission in business anyway?"* When we ask this in our Next Generation Global Supply Chain Leadership Programs at Caltech (California Institute of Technology), we invariably get the response: *"To make money!"* This is the wrong answer.

While every for-profit enterprise's GOAL is to increase shareholder value, its MISSION is to provide goods and services to the community and/or markets it targets and serves. How well the business executes its mission will determine how much profit and subsequent shareholder value it creates. There has to be a reason why communities and markets are interested in the goods and services a company provides. It may, for example, be that the company:

- Can do it better, faster, or cheaper than the consumer could do it themselves *or…*
- Can do it better, faster, or cheaper than competing enterprises *or…*
- Has superior technology *or…*
- Is the only enterprise capable of doing the task *or…*
- Is the only, or one of the only, approved suppliers

This is the value a business enterprise adds to its customer community.

The **Golden Rule of Outsourcing** states:

> *If a manufacturing enterprise has mastered the critical processes necessary to routinely produce goods and services demanded by its markets, the company has at the least, created a core and enormously valuable supply chain competency. Such a competency quickly becomes the lifeblood of the organization, which ultimately conditions customers to buy its products. Outsourcing this competency should be executed with EXTREME caution.*

There are THREE fundamental reasons why supply chain core competencies should be outsourced with caution:

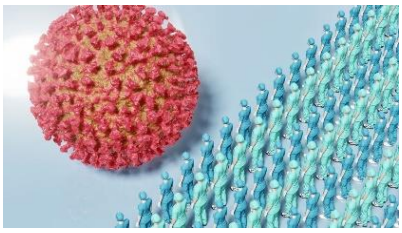
1. The company's reputation, product quality, customer service and IP can only be protected by maintaining control of the conversion and supporting processes.
2. The company's product life cycle demands rapid, efficient and effective transference of designs into production, and equally effective processing of subsequent engineering changes necessary to keep products relevant.
3. As the expert provider of the good or service, the company needs to evolve its product quickly and make them better to stay ahead of competition.

The excellence of a company's conversion process is a key reason customers come back for the products or services. If a manufacturing company enables another company to produce a product (even under contract), marketplace buyers can go direct and cut their original top-level supplier out of the Supply Chain. Sure, trade secrets and patents exist to provide some protection from this behavior. Unfortunately, such behavior is often difficult to manage when crossing international borders and cultures. IP has become a valuable asset and also a major commodity to those who would liberate it from its *"sweat-equity"* owner. Some countries will buy, cheat, or steal to capture IP they need to move forward on the development curve, without having to spend time and money evolving their own technology.

When a company outsources its manufacturing capabilities, it is in many ways, providing a future competitor with a *"kick start"* that allows the competitor to evolve the pre-designed product and manufacturing process to make an identical or better version. This learning should not be shared so easily in order to keep the company and products ahead of competition. If this learning is achieved at the outsourced supplier, then the outsourced supplier quickly becomes the master of the technology. Eventually this lower-level supplier no longer needs their customer. THEY become the new competitor.

What we have learned from COVID-19 is a validation of what we have been fearing for many years. The fundamentals of production of essential products and services can be difficult to maintain control of, especially across international boundaries. Products can evolve completely away from original production sources. This makes the U.S. dependent on other nations to service fundamental supply chain fulfillment requirements.

In trying to return foreign production of critical resources to domestic production, we face a new challenge. Offshored processes may have been changed or evolved by the current producer. The domestic process owner may not have the documentation or tribal knowledge that allows the offshore entity to produce the product. This means that careful reshoring may have to include process redevelopment, specification development, and product proof testing.



## ----- Corollary to the Golden Rule for Nations -----

Never allow domestic production to cease or not be developed for items that make the nation and its citizens: safe, healthy, nourished, and comfortable. If the means of production are in the hands of some other nation, your nation is no longer in full control of its destiny. In the days of empire building in human history, it was about the ability to conquer and rule larger sections of geography to use them as sources of resources. The Roman Empire was built on the conquest of the known world to enable the flow of products and services to Rome. Globalism relies on participating nations relinquishing independence and focusing on trade that can be disrupted, or even suspended, during a disagreement.

Every supply chain has a starting and ending point. They all start with the raw material. It is the point of origin of the supply chain and is in one of three forms. The material is either killed, dug, or grown. *"He who controls the raw materials controls the entire supply chain."*

At the other end are the consumers. When they have obtained the product or service, it may no longer have the same form, fit, or function. This may completely transform the item and it may cease to exist.

At the nation level, the concept of a National Manufacturing Strategy is highly dependent on the make/buy decisions of the entire supply chain. Those items considered critical must be locally sourced or stocked in sufficient quantity to support the nation during disruptive events.

## ----- Changing World Requires Changes in Offshoring Decision Making -----

The two overriding business objectives of every manufacturing company are to (1) increase enterprise profits and to (2) increase wealth to shareholders. This is not to say that safety, employee well-being, quality of processes and products, and all other stakeholder concerns do not manifest into critical objectives. Certainly, all of these are important… just not as important as making a profit and increasing shareholder value by every legal, ethical and moral way possible. In a sense, many of these lesser objectives are more like *"eligibilities"* to pursue the greater goals. Ship low quality products, and your customers will not buy future products from you. Go easy on employee safety, and your morale will

sink, staff will be hard to retain, and litigation costs will skyrocket. Offer sub-standard benefits to your employees, and your turnover and associated costs will destroy your bottom-line. Thus, we are now left with a clear distinction between enterprise goals and strategy:

- The number-one goal of any manufacturing company is to increase the entity's valuation, meaning shareholder value.
- Strategies and tactics are created and executed to achieve the number-one goal.

Given the guidance of the legal, ethical and moral underpinnings of all decisions; manufacturing companies still must continually find ways to:

1. Raise prices
2. Increase output volumes
3. Lower total costs

This is how operating margins are increased and share value is driven in a positive direction. All economic decisions in a manufacturing company, must consider how the decision will impact each of these three operating objectives. Offshoring is, and always has been, a strategy to impact volume and cost variables.

Offshoring production is a strategic and/or tactical solution to the cost reduction objective. It is also a contributor to volume enhancement because it can increase sales from new market opportunities (resulting from lower costs), as well as new market penetration (resulting from proximity to new markets).

Legitimate reasons for U.S. companies offshoring their manufacturing needs in the period between 1960 and 1975, were substantially different than the reasons used for similar decisions in the period between 1975 and 2001. Similarly, decisions to offshore production operations between 2001 and 2020 were different than decisions that will be executed in the post COVID-19 era.

**In the period roughly between 1960 and 1975,** offshoring production to LCRs was mostly driven by cost of labor reduction opportunities. Most offshoring was executed to take advantage of super low direct labor wages in places like Mexico, Puerto Rico, Japan, the Philippines, Thailand and Taiwan. Due to the wars in the Mainland Southeast Asian region (Viet Nam, Cambodia, Laos, Myanmar and Peninsular Malaysia), this region did not see much economic growth during this period, even though low wages and appropriate levels of automation were reasonably available. One global trade lesson we learned during this period, is that war drives global traders and manufacturers away.

Nevertheless, the super low direct wage geographies attracted numerous global manufacturing companies and as a result, drove the total costs of many commodities downward. This was a period of global expansion that increased many organizations' valuation through a labor exploitation angle. This period also lifted many countries out of poverty and introduced them to a new world of global commercial opportunities.

**The period between 1975 and 2001 is far more interesting.** While the period previously discussed could be labeled the *"Period of Global Labor Exploitation,"* this period could be labeled the *"Period of Global Economics Exploitation."*

By the mid-1970s, it was becoming obvious that while the U.S. provided wonderful market opportunities for an enormously large group of products (irrespective of where they were produced), the rest of the industrial world also wanted these great new products. Western European countries, Indonesia, Australia and some of the post-war Southeastern Asian countries all had growing economies and a seemingly insatiable desire for western industrial and consumer products. It made sense to produce these products in these regions because many of these products would be sold in these same regions.

Global trade considerations began to drive offshoring decisions as much as did cost reduction opportunities. It also became common knowledge that low-cost labor was a diminishing resource as more countries lifted themselves out of poverty and became legitimate market traders. It was in this period that we saw the first national industrial policies formulated in 2nd and 3rd world countries. These national policies usually stressed manufacturing as a road out of poverty and a path to economic independence.

Between 1975 and 2001, the world witnessed massive amounts of capital being poured into poorer countries in the form of manufacturing plants and supporting energy infrastructures. Poor countries like Morocco and the Philippines, attracted vast amounts of capital from foreign investors and built complex manufacturing sites, including semiconductor wafer fabrication, medical device production and even complex pharmaceutical compounding plants. This period has been half-jokingly described as *"a period when using a machete, you cut your way through the jungle to get to the dirt road leading you to the door of a class-10 cleanroom manufacturing facility!"*

Now, largely the result of globalization of capital, even 2nd and 3rd world nations could participate in high-tech manufacturing. These nations could now create huge levels of high-wage employment in these innovative technology sectors.

This *"Period of Global Economics Exploitation"* between 1975 and 2001 was about the combination of low wages, new markets, leveraging global logistics and global deployment of new conversion technologies. These technologies included advancements in containerized freight, advanced logistics management systems, Enterprise Resource Planning (ERP) systems, factory automation, global distribution network modelling and favorable trade pacts. Interestingly enough, the term *"offshoring"* only entered the supply chain world's vernacular in the late 1980s when it became obvious that *real* globalization of trade was now routinely possible.

Now, offshoring had many identified benefits in additional to low labor costs. These included new mechanisms to:

- Reduce AND better control ALL operating costs.
- Access world-class capabilities anywhere in the world, and new sources of raw materials.
- Free internal resources for other, more valuable purposes.
- Acquire talent and other resources that were scarce or unavailable internally.
- Keep the parent (host) company more focused on product development and market penetration activities.

- Share global risks.

To achieve these benefits, manufacturers looked significantly beyond labor costs. This was the period of expansion into TCO views, albeit in limited fashion. Emphasis was placed on techniques and methods inspired primarily from Japan's post WWII economic miracles, including Toyota's production systems, IBM Systems Group (inventor of MRP), Bell Telephone Laboratories (originator of Systems Engineering), and Eliyahu Goldratt's new throughput theories.[15] Together, these entities' contributions set in motion the *means* of true globalization with new mindsets, methods, techniques and systems; including:

- Planning, Scheduling, Control & Execution Systems, including:
  - Material Requirements Planning (MRP: Which was actually invented in the late 1950's but not popularized until the mid-1970s)
  - Just in Time (JiT) inventory management
  - LEAN manufacturing methods
- Process and Quality Management Tools and Methods, including:
  - Statistical Process Control (SPC)
  - Design of Experiments (DoE)
  - Quality Function Deployment (QFD)
  - Reliability Based Maintenance (RBM)
  - Total Productive Maintenance (TPM)
  - 6-Sigma and Total Quality Management (TQM)
- Enterprise Improvement Initiatives, including:
  - Theory of Constraints
  - 5S
  - Performance and Talent Management
  - Systems Engineering (SE)
  - Business Process Reengineering (BPR)
  - Advanced project management systems

In retrospect, this period was an important transitional period, in that it moved western executives from labor-cost focused offshoring decisions, to a more global and total-cost focus. The global supply chains we experience today (good or bad) simply could not exist if manufacturers failed to transition through this period.

**This brings us to the period between 2001 and 2021…** which we will refer to as the *"Period of Chinese Super Expansion."* As our appointed title describes, this period is all about the dominance of the PRC's manufacturing in global supply chains. To a lesser extent, it also includes the growth of eastern European manufacturing companies freed from Soviet domination after the 1992 collapse of the Union of Soviet Socialist Republics (USSR).

On December 11, 2001, the PRC was admitted to the World Trade Organization (WTO) where it would become a major influencer in global trade. This was the beginning of the PRC becoming THE major manufacturing region on the face of the earth. First, the PRC reduced their own import tariffs, making it easier for Chinese manufacturers to import necessary raw materials essential to their conversion

productivity. This in turn led to Chinese manufacturers being able to produce finished goods (with their inexpensive labor) at a lower total cost which in turn, fed their exports to the largest consumer market in the world – the U.S.

This was followed by numerous reforms that came from the PRC's national industrial initiatives which focused on achieving manufacturing dominance. These internal reforms included liberalization of regulations governing foreign direct investment and reducing requirements on local manufacturers to get export licenses. The PRC's central government also made capital available to manufacturers to invest in automation technologies and process controls. Their central planners believed these investments would result in higher efficiencies and faster throughputs – and they were right![16]

Within this 19-year period, the PRC developed a series of reforms and policies that encouraged manufacturing with inexpensive labor AND higher levels of automation. There is no country that invested more in automation technologies than did the PRC in this less-than-two-decade period. Couple this with a centrally established (non-floating) currency value, and the PRC had all the elements of a global market domination strategy for critical manufactured products. We have always marveled at how a communist country could *"out-capitalist the capitalists!"* Wondering aside, it is clear that with an autocratic ruling form of government, inexpensive labor, heavy investments in automation, perhaps some systematic IP theft and inexcusable civil rights violations, an economy can actually be *"forced"* to boom. Common sense would also indicate that such a system is not sustainable and not a system that western democracies will anytime emulate. All scholars we talk with believe the PRC's ways must lead to eventual social unrest, forcing a bit more democracy into the soul of the country's elite rulers.

Think this can't happen? Well, it did in the Soviet Union. It can happen again. Unfortunately, there may be more blood spilt due to the iron-fisted control of the Chinese Communist Party.


Speculations aside, the PRC has become a world productivity powerhouse with a number of product-centric market domination strategies. More than 75% of all powdered food ingredients going into convenience foods and nutraceuticals are grown and processed in the PRC. 63% of the world's necessary pharmaceutical drugs are produced in the PRC, including nearly 100% of penicillin and erythromycin. 88% of all cellphones are produced in the PRC.[17] More than 90% of weapon-carrying drones are now made in the PRC, who incidentally will sell them to almost any country, irrespective of terrorism concerns!

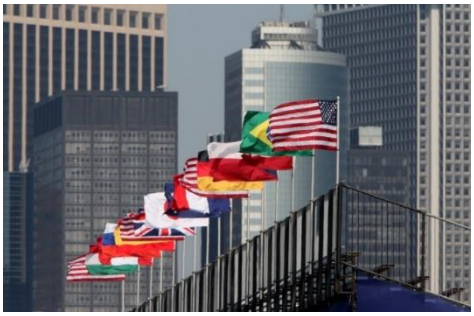
One could go on for an extended time presenting products critical to U.S. national defense and citizens' well-being that are almost exclusively sourced or have components that are ultimately sourced from the PRC. While in some ways Globalists applaud the PRC's domination strategies, we emphatically state that such strategies are not in the best interest of the U.S. Products, components, ingredients, sub-assemblies and assemblies that are critical to U.S. national defense and our citizens' well-being can no longer be allowed to be sole sourced from Chinese manufacturers… or any other nations' manufacturers. The U.S. must bring common sense and our nation's best interests into global supply chains, lest our standard of living and security be compromised by non-sovereign interests.

It is worth noting that all supply chain risks are not necessarily derived only from foreign entities that play by different trade rules. Domestic supply chain leaders, and indeed C-Suite participants, must back away from pure economics when making sourcing decisions. Risk amelioration plays an EQUAL role. Leaders should recognize that their historical laser focus on narrow sourcing economics without considering risks to U.S. society, may be why the U.S. needs a new Sovereign Supply Chain model. Government is in a unique position to provide incentives to businesses necessary to align enterprise economic interests with societal risk mitigation interests.

# *Part 3*
# *Implementing Sovereign Supply Chains*

## ----- Game Plan for Government -----

By now, the reader should recognize that global commerce is by design, an uneven playing field. This is the natural state of global trade. A field where no country or multinational company has a competitive advantage over other marketplace participants, would be unnatural. Such a marketplace could only exist with government intervention. This intervention becomes problematic when competitors exist in different countries, each with its own self-interests.



A desire to dominate markets is but one powerful driver of competition. Competition itself is what drives innovation, and innovation is a critical driver of market demands. This in turn drives investment in further innovation. To imagine a world with all competitors acting *"perfectly responsible"* would be delusional, at best. Without *"unequal"* competitors, some who would purposely break marketplace rules, there would be fewer entrepreneurs thinking about new paradigms that can disrupt old paradigms. Without these entrepreneurs executing their competitive desires to be unequal with other competitors, there would be no disruptive technologies that elevate the world's citizens. However, inequalities also have a downside when a singular nation monopolizes critical global markets.

It appears that all the economies are permanently stuck with competition locally and on a global basis. Nations are also stuck with their own economies complete with cultures, values, beliefs, laws and national survival instincts. This is why Sovereign Supply Chains for items critical to U.S. national defense and citizen well-being are necessary. The *"sovereignty"* element does not represent unreasonable intrusion by government in free markets any more than a stop sign on a road represents repression of freedoms. There has to be reasonable boundaries and acknowledged rules for capitalism to work and to serve the twin Master of Business owners and sovereign citizens, especially in global supply chains.

After the end of the Civil War, the U.S. enjoyed a new trajectory in economic growth and industrial development. This trajectory was largely supported by common and homogeneous cultural values, including undeniably important Judeo-Christian ethics. Because the U.S. economy's participation in global trade (as a percent of GDP), was substantially smaller than it is today, there was a common belief that all global traders played substantially by the same rules. Today, common trading beliefs and value systems do not exist. For example, the PRC uses government policies to manipulate their currency, encourage IP theft to drive *"unearned innovation"* without sweat equity, and create global monopolies that favor the PRC. While one can argue that the PRC is doing an excellent job for itself, it is often at the expense of the U.S. and other nations.


William Lyles

*"Doing an excellent job for itself,"* includes building manufacturing capabilities to dominate essential global commodities like respiratory ventilators, N95 masks, and a broad spectrum of food and pharmaceutical ingredients. This presents an unacceptable risk to U.S. national defense and citizen well-being and is why the U.S. must build sovereignty into essential commodity supply chains.

The importance of common culture was further explained by William Lyles, retired CEO of Lyles Diversified, one of California's great multi-generational infrastructure builders. Mr. Lyles has often spoken about the importance of *"common culture,"* how it shapes societies, and how it drives economies. He has spoken about difficulties the European Union (EU) would likely face when creating

a common currency and common trading rules that would apply to countries with vastly different cultures.[18] He and many economists have viewed the EU as a bit of an experiment because of this. Now we have Great Britain leaving the EU precisely because British citizens do not appreciate a multi-national governing body passing laws that a majority of citizens believe to be misaligned with the British experience. Behind much of this misalignment are trade disputes, and behind the trade disputes are cultural differences.

Moreover, it appears that behind cultural differences are the inability to trust. Once a marketplace expands beyond domestic boundaries, common values and trust no longer apply. For supporting supply chains to operate across cultural limits, trading partners must have some degree of trust in each other. This has always proven problematic when fundamental rules of business transactions, civil fairness, and human rights are not shared. Add monopolistic aspirations and motivations of a powerful central government-competitor (like the PRC and its CCP), and unencumbered trade becomes an impossibility. Many businesses put their trust in written contracts. This may also be an unfortunate assumption in international transactions. Contracts must be enforced through mutual governmental cooperation. For the U.S. to rely on global supply chains built on these kinds of disparate value systems, would only lead to strengthening the bad actors at the disadvantage of the ethical trade partners.

In general, American citizens tend to believe leaders of other countries act or should act like us in global trade matters. This of course is not true, and has never been true, irrespective of policy and cultural disconnects that include:

- Where the U.S. was built on principles of self-reliance, the PRC is built on government direction.
- Where the U.S. emphasizes individual property rights, the PRC emphasizes states ownership of assets.
- Where the U.S. has historically relied on Judeo-Christian morals to guide individual behaviors, legislative principles and the underlying definitions of *"right"* and *"wrong,"* the PRC provides a compass constructed of government policies and rules only.
- Where the U.S. culture presupposes limited government *"Of the people, for the people, and by the people,"* the PRC presupposes government that disproportionately benefits party operatives.
- Where the U.S. government structure, and indeed commercial enterprise, prefer to push decision making downward closer to those affected by the decisions, the PRC believes strongly in top-centric centralized control mechanisms.
- Where the U.S. is intellectually obsessed with human rights, the PRC is substantially less concerned.

The cultural divide between the U.S. and the PRC is more a chasm than a gap. There is no such thing as a level playing field between these two nation-states. Equivalency does not exist in human rights. It does not exist in individual freedoms. It does not exist in government structure. It does not exist in financial markets. It does not exist in labor costs and skills. It does not exist in availability of capital, and it certainly does not exist in trade. It does not exist in monetary policy. This is why the U.S. must have Sovereign Supply Chains. Differences between these two countries are so significant that without some commodity protections, shortages or excessive pricing will surely manifest. The U.S. has been the dominant player in the global economy. Some may say that it is now time for the PRC to take that role. The difference is the underlying philosophies of the nations. The U.S. has worked hard to promote freedom and independence of people in other nations while the PRC wants to dominate the rest of the world.[19]

Understand that we actually appreciate and support the PRC's right to compete in the ways it sees fit. As Americans, we just don't ascribe to their ruleset. Thus, it is incumbent upon our policy makers to exploit all of our best practices to not allow such an aggressive, domination-driven country to control our economy and every one of our citizens' lives.

For the U.S. to move from an unconstrained, or minimally constrained global supply chain to a Sovereign Supply Chain that can still compete with the PRC and similarly managed economies, a roadmap is necessary. This roadmap MUST address all agendas within the sovereignty. These interests include, but are not limited to:

- Critical Supply Chain Resources important to U.S. national defense.
- Critical Supply Chain Resources important to U.S. citizen well-being.
- Who makes these determinations without corruption and aggressive lobbying input, and what mechanisms are utilized.
- How government partners with companies to appropriately manage supply chain risks.
- How downstream consequences can be more accurately predicted.
- How government can implement trade restrictions that by design are temporary and politically blind.

A National Industrial Policy that supports sovereign interests also needs to be structured in a manner that encourages individual businesses to produce Critical Supply Chain Resources, but without government micro-management. The *"secret power"* of the U.S. capitalist system has always been in its preference to use government incentives instead of mandates to drive industrial change. Unlike the PRC where the central government often dictates the *"who"* and *"how"* of production, the U.S. government can use free-market incentives to create *"conditions"* which encourage competition to evolve in a particular direction. These conditions can include familiar *"techniques-with-a-sovereign-twist,"* including but not limited to:

- R&D tax credits to stimulate innovation in domestic companies that exist within Sovereign Supply Chains.
- Productivity investment tax credits to stimulate increased levels of automation investment that overcome Low-Cost Region (LCR) labor advantages, especially for companies that exist within Sovereign Supply Chains.
- Orphan drug status to stimulate domestic drug development, even in less profitable diseases treatments.
- U.S. Manufacturing Zones that stimulate manufacturing over other industries, such as distribution of mostly foreign-sourced goods.
- Sensible deregulation that assists domestic manufacturers in Sovereign Supply Chains with cost reductions, margin increases and the creation of new domestic competitors.
- Possible elimination of all corporate income tax on profits derived specifically from U.S. manufacturing sites. Incidentally, the Treasury only collects about 3% of its annual tax receipts from domestic manufacturers. Elimination of this tax would clearly incentivize domestic manufacturing with an economic benefit to the Nation that will likely exceed the tax receipts loss.

To the last point above, it is well understood that every manufacturing job created in the U.S. stimulates between 2.5 and 9 secondary non-manufacturing jobs, mostly in supporting supply chains and services.[20] High-tech manufacturers tend to create secondary jobs at a rate toward the high end of this range. Assume a midpoint of 6 secondary jobs for every new manufacturing job, and a modest 10% growth in manufacturing jobs resulting from the elimination manufacturing income tax. This would create 1.1 million new manufacturing jobs PLUS 6.6 million secondary jobs. These 7.7 million new taxpaying workers would generate personal income tax and Social Security receipts for the treasury that exceed the loss of manufacturing corporate income taxes noted above.[21]

There are likely many yet undiscovered conditions the U.S. government could use to assist in the mission of protecting Sovereign Supply Chain interests. These should be explored, prioritized and codified within a National Industrial Policy in the name of protecting national defense and citizen well-being. Again, we are not talking about restraint of global trade… we are talking about minor restraints AND significant incentives necessary to manage sovereign risks derived from foreign interests that are not aligned with U.S. risk management strategies. [22]

## ----- Implementing Sovereign Supply Chains -----

Government, manufacturing companies, distributors, trade and professional organizations must work together to implement Sovereign Supply Chains and protect America's national defense and citizen well-being. This will require a plan. Below is a solid starting point for constructing such a plan. Later, we will suggest responsibilities and accountabilities for implementation.

| Step | Activity |
|---|---|
| **1** | Identify Critical Sovereign Items |
| **2** | Publish & Maintain *Item Sovereign Criticality Classification"* (ISCC) List |
| **3** | Evaluate Supply Sources |
| **4** | Assess Supply Risks & Metrics |
| **5** | Implement Sovereign Supply Chains |

Though this is only a skeleton plan and does not fully comprehend all that is required to implement Sovereign Supply Chains, it should serve as a directional beacon for getting started:

### 1. Identify Critical Sovereign Items

The first step is to identify items that qualify as truly *"critical"* to national defense and citizen well-being. Criticality also exists at the corporate level where it emerges from a need for any item to complete the core business of the enterprise and deliver its product to the customer in functioning order. Products can be as complex as respiratory ventilators or as simple as a common liquid added to intravenous solutions. The end product cannot be completed or function correctly without the component/ingredient.

Identifying critical items in a global supply chain is probably easier to discuss than to implement, but there are analogs in U.S. history to inspire us and suggest such an identification is indeed

possible. We know this because categorizing commodities has successfully been done before, in fact, in several diverse ways.

For example, in the mid-1950's the U.S. Department of Transportation (US-DoT) created the National Motor Freight Classification (NMFC) system to provide a standard for comparisons of commodities moving via truck in interstate, intrastate and foreign commerce. Commodities were grouped into one of many categories based on an evaluation of four transportation characteristics: density, stowability, handling and liability. Together, these four synthesized characteristics established a commodity's *"transportability."* There must be thousands of variables that need to be considered when building a mechanism to describe a commodity's transportability, yet a working group of knowledgeable professionals were able to successfully summarize transportability in just four brilliantly defined characteristics. This proves to us that categorizing commodities, for virtually any purpose, is doable.[23]

These standards are still published by the National Motor Freight Traffic Association (NMFTA), a non-profit membership association headquartered in Alexandria, Virginia. Its members are motor carriers operating in interstate, intrastate and foreign commerce. The US-DoT assigned development and maintenance of the index system to an autonomous board called the Commodity Classification Standards Board (CCSB), which is supported by the NMFTA.

The point here is that if successful large-scale classification of commodities has been previously and successfully accomplished by government for complex freight industry needs, *"government-led"* categorization of commodities for national interest reasons can surely be accomplished.

This leads us to an important question:

> *"Who should execute categorization of commodities with an eye toward legitimate national interests?"*

We believe it is up to government, collaborating with manufacturers, trade groups and supply chain professionals to develop categories that depict an item's legitimate *"sovereign risk."* Further, it is up to these working groups to establish an *"Item Sovereign Criticality Classification"* (ISCC) appropriate to its impact on national defense and citizen well-being.

Below are two frameworks, one for citizen well-being and the other for national defense. In terms of citizen safety, the first framework preliminarily identifies SEVEN high-level essential criteria that four selected commodities have been evaluated against. Using a simple Low/Moderate/High rating scale, each commodity has been preliminarily evaluated based on how essential it is to citizen well-being. As noted before, this determination of rating criteria and subsequent application to commodity evaluations, would be accomplished by a working group analog of the previously discussed CCSB.

Within the *"Critical to Citizen Well-Being"* table, note the HIGH essential scores for respiratory ventilators and penicillin. *"High"* ratings would suggest these items must be assigned high ISCC ratings and as such, be stipulated by government as items of national interest. This of course means that government needs to regulate and/or incentivize conditions that naturally cause domestic manufacturers to produce these commodities and/or seek methods to minimize risks in ways that enhance national well-being.

Remember, reducing risks does not have to lead to banning imports of the risk-identified commodity. Other measures like domestic safety stock deployment, bonded inventories, and

even government managed national stockpiles in the SDS are but a few of the alternatives to domestic-only production.

| Critical to Citizen Well-Being | | | | |
|---|---|---|---|---|
| **Criticality Criteria** | **Potato Chips** | **Respiratory Ventilators** | **Penicillin** | **Ammo Resistant Armor** |
| Essential to Citizen Health Care | Low | **High** | **High** | Low |
| Essential to Citizen Nutrition | Low | Low | Low | Low |
| Essential to Citizen Safety | Low | Low | **Moderate** | Low |
| Essential to Citizen Privacy | Low | Low | Low | Low |
| Essential to Mobility | Low | Low | Low | Low |
| Essential to Economic Stability | Low | Low | Low | Low |
| Essential to Voting Integrity | Low | Low | Low | Low |

Commodities that score in the *"moderate zone"* on any criteria are undefined and should probably be subject to additional evaluation, except in cases where the same commodity has scored *"high"* in another criteria, as seen in the penicillin example above.

Remaining items identified as *"low"* in the citizen well-being test are not subject to either re-evaluation or designation as a Critical Supply Chain Resource. The term *"well-being"* suggests the commodity is necessary to one's health, survival, security and safety. Though it could be argued that potato chips are important to well-being (seriously, who can eat just ONE potato chip!), the delicious feelings that this food brings to a citizen simply does rise to the level of health, survival, security and safety.

| Critical to National Defense | | | | |
|---|---|---|---|---|
| **Criticality Criteria** | **Potato Chips** | **Respiratory Ventilators** | **Penicillin** | **Ammo Resistant Armor** |
| Essential to Military Communications & Privacy | Low | Low | Low | Low |
| Essential to Monetary Sovereignty | Low | Low | Low | Low |
| Essential to Military Missions | Low | Low | Moderate | **High** |
| Essential to Diplomatic Missions | Low | Low | Moderate | **Moderate** |
| Essential to Military Safety & Health | Low | **High** | **High** | **High** |
| Essential to Diplomatic Safety & Health | Low | **Moderate** | **High** | **Moderate** |

In terms of national defense, commodities are preliminarily graded relative to SIX critical criteria. When evaluating this way, it becomes clear that Ammo Resistant Armor should be added to the high priority ISCC list. Respiratory ventilators and penicillin are further validated as having a high national interest.

In both of these SUGGESTED and preliminary frameworks, items evaluated with a *"High"* ISCC rating are said to have a high *"Item Sovereign Criticality"* and resultantly become candidates for government intervention in the form of regulations, incentives and even national stockpiles.

### 2. Publish & Maintain ISCC List

Once all commodity items are evaluated relative to national interests, mechanisms for maintaining, periodic re-evaluation and publishing Item Sovereign Criticality data must be developed. Again, we propose a working group similar in mission to the CCSB as discussed previously. We believe it is even possible to deliver updated data in a cloud-based system that would update ERP systems in manufacturers the way ERP system providers routinely and remotely update their customers' application software.

Though mentioned before, the Achilles heel of this recommendation will probably emanate from political corruption and commercial lobbying sources. Such a system would have to be void of commercial influence for commercial benefits. It should be published and updated annually, with input from the same select groups that helped to create the original list. Perhaps some NGO can partner with government to build a collaborative system similar to what the NMFTA has done in freight classification processes.

It is good to remind everyone at this point, that such classifications and subsequent inclusion on the ISCC list is NOT designed to protect shareholders and their commercial enterprises nor is it to provide them with a direct competitive advantage. This may be an indirect result, but the real purpose should never waiver from that of supporting national defense and citizen well-being.

### 3. Evaluate Supply Sources

So what does it mean to global supply chain leaders when their products, and/or inputs to their products (including raw materials, ingredients, intermediaries, sub-assemblies and assemblies), are on the ISCC list? How do supply chain leaders address Critical Supply Chain Resources within their multi-echelon manufacturing and distribution channels?

The answers to these two questions may not be as complex as first thought. Let's consider two examples:

- **Example #1 - An item that has been designated on the ISCC list, AND exists within a specific company's supply chain, AND more specifically, exists within the company's internal multi-level Bill of Material (BoM).** In this case, the producing company knows that an item in its internal multi-level BoM is designated as a Critical Supply Chain Resource. This means the company has TWO options for acquiring the ISCC designated item:
    1. **Option 1:** Acquire the item directly from a domestic source that produces it domestically with no offshore components. The domestic supplier would maintain a predetermined stockpile of this commodity and be incentivized through the U.S. Critical Supply Chain Resource Program to keep it replenished.

       A side benefit of this type of supplier is that lead times would always be short, mostly just the sum of pick, pack and ship cycle times. Customers would experience rapid delivery of these items and retain less safety stocks. Most would probably require less finished goods safety stocks also, because with

shorter cumulative lead times, they will be more agile in terms of satisfying customer requirements. In a sense, the *"system"* incentivizes local supply where possible.

For reasons stated above, we believe the benefits of onshoring previously offshored items will be numerous. Shorter cycle times, reduced lead times, lower safety stocks, more rapid inventory turns, minimization of in-transit costs and being closer to quality *"drivers"* are all techniques that have proven useful toward achieving a competitive advantage. With a U.S. Critical Supply Chain Resource Program, the U.S. might introduce a whole new level of competition into the global marketplaces.

2. **Option 2:** Acquire the item from a foreign source that participates in the U.S. Critical Supply Chain Resource Program. Foreign producers who participate will have access to U.S. markets, but with conditions, including but not limited to:
    a. Stockpiles of highly ranked ISCC items in strategic U.S. locations in specified quantities.
    b. Stockpiles of highly ranked ISCC items in strategic non-U.S. locations in specified quantities, with controls that assure rapid and sufficient access by U.S. manufacturers, customers and consumers.
    c. Production and storage of foreign designed highly ranked ISCC items on U.S. soil.
    d. Production and storage of foreign designed highly ranked ISCC items in non-U.S. locations in specified quantities, with controls that assure rapid and sufficient access by U.S. manufacturers, customers and consumers.
    e. Preferential treatment for U.S. producers built into foreign trade agreements. These treatments would effectively allocate foreign production and stocks in time of emergency and would be backed by sufficient trade penalties to ensure compliance.

There are surely many additional conditions that can be imposed within an organized U.S. Critical Supply Chain Resource Program. Determination of these conditions are left to the working group previously discussed. Again, remember that all determinations must have a clear line of sight to aiding in U.S. national defense and/or citizen well-being.

- **Example #2 - An item that has been designated on the ISCC list, DOES NOT exist in a specific company's multi-level internal BoM, but DOES exist within the company's multi-echelon supply chain in one of the company's supplier's supplier BoM.** In this case, the producing company knows that an item used by its lower-tier suppliers (in the product that the lower-tier supplier sells), is designated in the U.S. Critical Supply Chain Resource Program as a Critical Supply Chain Resource. This occurs because the company has complete visibility to every item and its Region-of-Origin (RoO) from where the original raw material was dug, killed or grown, to the present level. It is this transparency that is the real power behind Sovereign Supply Chain operations.

Transparency and visibility will require some information systems work, but numerous analogs to inspire this transparency are already in place. The most obvious analog exists in every large pharmaceutical manufacturer in the U.S., if not the world. This industry, perhaps because of its life/death nature has for many years utilized multi-echelon systems that can link every molecule to any molecule that was used at all lower levels in the global supply chain. Ask a large pharmaceutical company about the solvent used in a manufacturing process four levels deep in the end-to-end supply chain, and you will learn the name of the solvent supplier and the ingredients in the solvent, and the production batch number. All of this was developed decades ago, again by working groups coordinated by the U.S. Food & Drug Administration (FDA). The Good Manufacturing Practices (GMP) developed from these groups are yet another example of good public/private partnering to serve a national interest.[24]


The pharmaceutical and medical device industries are enormously regulated because they directly impact human life. These multi-echelon systems, while at times clumsy and inefficient, nevertheless prove that any manufacturer can know where their supplier's supplier gets their ascorbic acid… and its lot number, expiry and the name of every human who touched it.

Continuing with a company that buys certain items from a Tier-1 supplier, who in turn buys ISCC items from a Tier-2 supplier, TWO options again exist for acquiring the designated item:

1. **Option 1:** Acquire the item directly from a domestic source that produces it domestically, utilizing supplied items that are registered ISCC items in its BoM. The domestic supplier would maintain a predetermined stockpile of this lower-level ISCC commodity and perhaps be incentivized through the U.S. Critical Supply Chain Resource Program to keep it replenished. Replenishment can be maintained at the company's supplier or at the supplier's supplier.

   Again, a valuable side benefit of this type of supplier is that lead times would always be shorter, thereby improving inventory and capital efficiencies. All the benefits noted in Example #1 above would likely manifest here, albeit in different ways. What's critical to learn here is that shorter cycle times, reduced lead times, lower safety stocks, more rapid inventory turns, minimization of in-transit costs and being closer to quality *"drivers"* ALWAYS improves end-to-end supply chain efficiency and inventory investments, even when manifesting at lower tiers in the global supply chain.

2. **Option 2:** Acquire the item from a foreign source that participates in the U.S. Critical Supply Chain Resource Program, both itself and in partnership with its suppliers. All requirements for traceability and sourcing responsibilities will be the same as in Example #1.

Clearly, rules and applications for utilizing the ISCC list will have to be developed. This will be reasonably straight-forward until one requires transparency systems to *"look across"* the supply chain in order to know where every input originates and how much risk it creates in the global

supply chain. Nevertheless, there are enough analogs and sources of information systems inspiration to provide comfort that such enabling systems can be developed, even if by cumbersome spreadsheets.

## 4. Assess Supply Risks & Metrics

Risk is about the potential for the unexpected to occur. The Association of Supply Chan Management (ASCM, previously known as APICS) Dictionary, 16th edition[25] defines the management of risk as:

> ***Risk management*** *- The identification, assessment, and prioritization of risks followed by coordinated and economical application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events or to maximize the realization of opportunities.*

And the analysis of risk as:

> ***Risk analysis*** *- A review of the uncertainty associated with the research, development, and production of a product, service, or project.*

The first step in managing supply chain risks is to determine if the part, process, or component requires core competency of the enterprise to produce it. If that is the case, it is an item to place on the *"Make"* list and not the *"buy"* list. The make list requires internal skills to produce the item. This gives the item the protection of the enterprise itself in the Sovereignty process. It is when the line is crossed into the *"Buy"* world that caution signals go up and the procurer must make a determination as to the reliability of the source.

Once the business has done the work to identify the items with high scores on the Item Sovereign Criticality Classification list, it is necessary to secure them from suppliers that will fit within the lowest risk category in the supply chain.

Direct sources are the Tier-1 suppliers to the enterprise. Most businesses have some knowledge of suppliers that are critical to their operational success. Procurement functions have standards for evaluating suppliers. What changes in dealing with higher risk items in the ISCC is the suppliers have an additional layer of concern laid upon them in the evaluation process.

Businesses *"certify"* suppliers, and on top of the common standards, in that process very typical of aerospace procurement, there must be a layer of concern for the sovereignty of the sourced supplier. In order to protect the sovereignty of the supply chain, one must add to the conventional certification process the desired characteristics that will maintain the protection of the national defense and citizen well-being.

To assist in the evaluation of a domestic supplier, we provide the following framework outlining assessment categories, criteria and metrics.

| **Domestic Supplier Risk Assessment Framework** | | |
|---|---|---|
| **Assessment Area** | **Inescapable Questions** | **Metrics** |
| **Ownership** | • Who are the majority owners of the firm?<br>• If it is a subsidiary, who owns the majority of the parent? | • **Ideal –** All domestic influence. |

| Domestic Supplier Risk Assessment Framework | | |
|---|---|---|
| **Assessment Area** | **Inescapable Questions** | **Metrics** |
| | • Are there investors, customers or suppliers that influence decision making?<br>• How do governance practices impact sovereignty-centric decisions | • **Tolerable –** less than 10% non-domestic influence.<br>• **Unacceptable –** >50% non-domestic influence. |
| **Financial** | • Annual reports, including Balance Sheet, P&L, Source & Use of Funds, 10K, 8K, etc.<br>• Source of borrowed funds.<br>• Critical legal issues.<br>• Banking relationships. | • Acceptable critical financial ratios & trends.<br>• Domestic & international sources of funds. |
| **Technical** | • Local engineering, customer service & servicing staff.<br>• Core technical competencies.<br>• Quality of Product Data Management (PDM). | • Entire technical team is domestically based.<br>• Process engineering is all domestic.<br>• High data integrity in all manufacturing datasets.<br>• Secure domestic data storage & in-place catastrophic data loss plan. |
| **Planning** | • ERP & adjacent systems effectively used.<br>• Demonstrably trained staff.<br>• Formal, structured & disciplined S&OP/SIOP. | • ERP Implemented, relied upon & data is reliable.<br>• >75% of planning teams hold APICS Certifications or equivalent. |
| **Sourcing** | • Reliability of all supplier information, delivery & quality.<br>• Supplier lead times.<br>• Visibility of all sourced materials' origin through all tiers.<br>• Suppliers meeting reporting requirements of their sources.<br>• Most non-critical parts sourced locally.<br>• No parts sourced from hostile nations or potentially hostile nations.<br>• Policy in place, complied with & audited for all tiers of critical suppliers to conform to domestic sourcing. | • All parts sourced domestically.<br>• Most parts sourced domestically.<br>• All ISCC parts sourced domestically.<br>• Most ISCC parts sourced domestically. |

| Domestic Supplier Risk Assessment Framework | | |
|---|---|---|
| **Assessment Area** | **Inescapable Questions** | **Metrics** |
| | • Suppliers' relationships with their sources of supply. | |
| **Scalability (Flexibility)** | • Adequate available capacity.<br>• Ability & speed of scaling.<br>• No excessive customer concentrations.<br>• No excessive supplier concentrations.<br>• Leverage with suppliers. | • < 80% utilization of capacity. |
| **Quality** | • Policies & procedures in place, being adhered to & audited.<br>• Reactive vs. proactive quality management. | • ISO 9000 Compliance 100%. |
| **Logistics** | • Short domestic preference.<br>• Longer routes are protected & safe.<br>• Packaging & cargo security methods.<br>• International routes are protected from disruption. | • Distances to source & customer.<br>• Logistics losses. |
| **Distribution** | • Finished goods deployment strategy.<br>• Warehouse locations near customers.<br>• Central warehouse at or near the plant.<br>• Service levels to customers. | • No geopolitical or customs barriers to products.<br>• Complete & high performing domestic & international distribution network. |
| **Speed** | • Lead time considerations in all aspects of the supply chain. | • Production & distribution speeds well within customer lead time expectation. |
| **Cost** | • True comparison to the TCO of each sourcing option.<br>• Identification of supplier economic waste. | • TCO is constantly being driven down. |

If the direct source is located outside of the domestic nation, then the criticality of the above metrics is even more important. Buffer stocks and decoupling inventories must be considered. Unfortunately, buffers only provide a limited time protection for a critical component. Constant flow of materials and alternate sources located in third party nations can also help mitigate the risk.

In many cases, Tier-1 suppliers are not the origin of the raw materials but play intermediary roles in the supply chain. When this occurs, the risk is transferred up and down the supply chain, and at each echelon the vendors must be required to complete the equivalent of the table above and report the results to the channel master.

Whenever non-domestic sources are required, additional evaluation is also required. The following framework identifies four additional areas to examine when trying to paint a holistic picture of risks derived from a foreign source:

| Foreign Supplier Risk Assessment Framework | | |
|---|---|---|
| **Area** | **Inescapable Questions** | **Metrics** |
| **National** | • Socio-geopolitical direction of the nation-base & location.<br>• Political stability of the source nation.<br>• Hostilities between customer and sourcing nations.<br>• Examine & assess compatibility of the location of the plant & the ownership.<br>• Examine conditions in country/region. | • >75% compatibility with the buyer's domestic social-geopolitical environment. |
| **Legal** | • Compatibility of legal structures.<br>• Protection of IP. | • Assess based on customer's risk tolerance. |
| **Logistics** | • Distance to supplier.<br>• Complexity of the supply lane(s).<br>• Tariffs, duties & other trade restrictions.<br>• Local infrastructure in the sourcing nation.<br>• Additional packaging & security requirements.<br>• Transit time, including port & customs time. | • Distances to source & customer.<br>• Transit duration.<br>• Logistics losses.<br>• Additional costs. |
| **Sourcing** | • Geographic dispersion of supplier's suppliers. | • Geographic breadth.<br>• Impacting location characteristics. |

It is important to note that the future of intuitive end-to-end global supply chain transparency and traceability systems is in its infancy, but it does exist and will only get better. Blockchain technology with its promise of unalterable distributed ledgers, seems to be the winning technology behind this promise.

For example, Walmart is CURRENTLY using IBM's Food Trust Blockchain System to maintain multi-tier visibility of meat products it sources from the PRC.[26] Its blockchain records provide unalterable evidence for each piece of meat, where it came from, where it was processed, all the places it has been stored and its sell-by-date. Numerous large multi-national food companies including Unilever, Nestle, Tyson and Dole also use blockchain for similar purposes.

BHP Billiton, the world's largest multi-national mining company, CURRENTLY uses blockchain to track and record detailed operational data throughout the mining process, including operations performed by most of its suppliers and their suppliers.

Finally, De Beers, the giant diamond producer, CURRENTLY uses blockchain technology to track each stone from the point it was mined, through all the distribution channels and all the way to the point when it was sold to a specific consumer. It is blockchain technology that

assures the company avoids *"conflict"* or *"blood diamonds."* It also assures consumers they are buying a genuine, ethically mined diamond.


We see only improvements in the future of global transparency and traceability systems, mainly because companies across the globe are demanding such systems.

### 5. Implement Sovereign Supply Chains

Proven supply chain best-practices are well-documented and clarified in the Association of Supply Chain Management (ASCM) professional certifications and training programs, including:

- Certified in Production & Inventory Management (CPIM).
- Certified Supply Chain Professional (CSCP).
- Certified Logistics Transportation & Distribution (CLTD).

These practices, while being necessary guides, are in themselves not enough to fully support this new Sovereign Supply Chain initiative. Companies will have to examine their supply chain participants, across their particular end-to-end supply networks.

Selecting suppliers that are not subsidiaries or controlled by foreign enterprises, becomes important for Critical Supply Chain Resources. Also, selecting suppliers who do not have validated information about THEIR suppliers, creates untenable risk and should be avoided. This validation must continue at each echelon of the supply chain, ending at the final source of raw materials. Stated simply: Sovereign Supply Chains define magnitude of risk through absolute transparency of sources all the way back to where the raw material was dug, killed or grown.

As the most significant global supply chain contributor, the U.S. should never again allow its supply chains for Critical Supply Chain Resources to be seriously compromised by external events. To protect the security of all citizens and the economic well-being of our country, the above roadmaps and implementation activities should be addressed, discussed, negotiated and implemented where appropriate.

## ----- Reshoring Essentials -----

Even after addressing the sovereignty of any supply chain, a company must address how individual item sovereignty designation impacts its customers and shareholders. Companies must determine a working agreement for determining what can be outsourced and what should not be outsourced, all in a drive to manage supply chain risks. This requires the development of a corporate plan of action.

Prior sections addressed the global and societal implications of not having reliable risk-managed sources of supply for materials, and how risk-independence is eroded in a business or society. A prudent leader in any manufacturing enterprise must examine raw material needs, and either:

1. Identify qualified, reliable and cost-effective domestic sources.
2. Have substantial buffer inventory stocks.
3. Source materials from qualified, reliable and cost-effective non-domestic sources.

Now, add to this list:

4. Source materials in a manner that does not create insurmountable supply chain risks.

In all cases, supply chain leaders must evaluate their supply chain risks and construct risk mitigation plans to implement PRIOR to the risks actually materializing. In terms of what supply risk means to customers and shareholders, the focus will be on the supply side (in contrast to the demand side) of supply chains where the greatest present risk exists, especially in distant supply tiers where visibility may not be as immediate as in Tier-1.

Tier-1 suppliers are those who sell directly to B2B or B2C entities. Tier-2 suppliers are suppliers who sell to Tier-1 suppliers. Tier-3 are those who sell to the Tier-2 and so on until reaching a primary source of the raw material. It is important to note that the tier of a supplier depends on the supply chain partner that is sold-to as Tier-1. Typically, tiers of suppliers start with those who sell directly to the Manufacturer in a supply chain, but it can be anchored anywhere, even at the customer. A fundamental mistake that businesses and governments make, is to only look at their direct (Tier-1) suppliers and assume that if they are domestic, all is fine. But in 21st century global supply chains, all tiers are critical, and buyers need to know precisely where materials and services are generated through the entire multi-tiered supply chain. In other words, companies need to know where THEIR suppliers get THEIR materials.

There is a key principle within the discipline of supply chain risk management that views each tier as a critical link. With a tightly coupled supply chain, any single link's failure can stop or impede the entire multi-tier global supply chain (this was previously discussed in the prior *"Aggravating Factors"* section). This requires companies to review not only their Tier-1 suppliers, but all tiers. A review of the criticality of each acquired material or service in such a chain of tiers, is the starting point of managing supply chain risks. Then each component/ingredient beyond Tier-1 suppliers and through the supply chain to the *"rawest"* of raw materials, must be reviewed. As mentioned earlier, that is where the material is killed, dug, or grown.

Once a working definition of *Item Sovereign Criticality* (discussed previously) is established, and the subsequent comprehensive ISCC is compiled, then it's a good time to narrow the scope of examination and look at your company's internal operations. More specifically, determine the company's competencies that either contribute to or protect the company from supply chain risks. This would be followed by assessing the suppliers in the same manner.

| Competency | What It Qualifies For | How Is It Competitively Unique? | Priority |
|---|---|---|---|
| High precision & excellent tolerance-stack-up management. | Higher brand recognition, dominance of high-end markets & higher price-points. | To build products that most competitors would have difficulty doing. | **Core** |
| Robotic precision & repeatability. | Higher brand recognition & higher price-points. | Repeatability & higher routine quality. Gives the business & its | High |

| Competency | What It Qualifies For | How Is It Competitively Unique? | Priority |
|---|---|---|---|
| | | customers a TCO advantage as well as a 1st pass yield advantage. | |
| Customer service. | Enhanced product brand & company reputation. | Intuitive & comprehensive online help that also generates useful statistics to support more continuous improvement initiatives. Also, have at least one mobile service technician in every geographic micro-market. | High |
| Captive company-owned distribution centers. | Improved customer service because all SKU locations are known. | Has increased comparative TCO as a result of new 3rd Party Logistics (3PL) providers in all markets. These 3PLs are now so sophisticated that competitive advantage of captive distribution has all but disappeared. | Low |
| 6-Sigma quality levels. | Higher brand recognition, higher price-points, lower TCO & higher margins. | Low failure modes preclude poor quality escaping the factories and getting to customers, thereby reducing the need for field service. No other company in the space has similar quality. | **Core** |

To conduct this analysis, construct a table of the enterprise's competencies and then evaluate them based on how they qualify the business to perform in its supply chain. Also look for the company's uniqueness that creates value in specific markets. A sample (and abbreviated) competency analysis grid is noted above.

Based on this initial analysis, begin the process of evolving the business to a more *"supplier-independent"* operating environment. The example above would suggest this company should protect its core manufacturing capabilities and be willing to outsource its non-core distribution function to 3PL's.

We believe strongly that core competencies should NOT be outsourced but should be developed, supported and protected by internal operations. Whether a company is bringing back just Sovereign Supply Chain items, or the company's entire offshore manufacturing operations, there are rules that must be followed to avoid risks. Following are the fundamental steps and key questions that should be considered when approaching reshoring decisions:

1. **What are the target items or families of items?**
    a. What would be gained by bringing it back to domestic manufacturing?
    b. Can it be produced in house?
        i. Do we have, or can we acquire necessary competency?
        ii. Are we able to leverage existing skills, capital, know-how, facilities, equipment and talent?
        iii. Will this enhance our profit, and more importantly, the valuation of our enterprise?

c. Are there capable domestic sources?
d. Can capable domestic sources be developed?
e. Are the domestic sources price competitive with offshore locations?
f. Can non-competitive sources be improved through training, automation, or economies of scale to meet offshore prices?
g. What freight, logistics, or distribution savings could be gained?
h. What less obvious saving could impact the TCO such as carrying costs during shipment from offshore, inventory carrying costs, or handling, freight, or tariff costs?

2. **Are there legal or environmental regulations prohibiting domestic manufacturing?**
    a. Can the rules be changed?
    b. Are there other domestic locations without these rules?
    c. Can the process be modified to avoid sensitive areas?
    d. Can the manufacturer or its source locate in less restrictive domestic areas?
    e. How do taxing and currency issues impact manufacturing location?
3. **Is there an advantage to being able to label the product *"made"* and *"sourced"* in the U.S.?**
    a. Would customers be willing to pay more for domestically made or sourced product?
    b. Would quality or performance be better for a product that has components sourced domestically?
    c. How will labeling requirements be impacted, especially for export?
    d. Are there any incentive or support funds available from governments or NGOs?
4. **Is there a current supplier who has, or can develop the skills to do the job?**
    a. Are there local suppliers who can do the work?
    b. Can the supplier provide a logistics benefit?
    c. Can evolutionary internal tribal knowledge be converted into tangible specifications?
    d. Can domestic suppliers meet scaling requirements?
    e. Can domestic suppliers deliver reliable, quality product at a required TCO threshold?
    f. Are there global colocation opportunities, i.e., global suppliers willing to locate their supplying factories adjacent to U.S. factories?
    g. Will supply chain partners be willing to address Sovereign Supply Chain needs in their supply tiers?
5. **Are there responsible supplier evaluation and selection protocols?**
    a. What is the reliability of supply?
    b. Are they easy to do business with (trust requires transparency and compliance in actions)?
    c. Can they deliver the desired quality of supply?
    d. How will cumulative lead-times change?
    e. What is and will be the cost of supply (can the supplier improve their cost to improve the cost margin for the overall supply chain.)?

f. What are the risks, including sovereign risks?

6. **What are the cost tradeoffs in making the switch to internal production or <u>domestic</u> outsourcing?**
    a. What is the TCO of each domestic alternative?
    b. Are there corporate & logistics interests that must be considered?
    c. How does internal make vs. buy priorities impact supply?
    d. Are there critical intangibles that outweigh cost?
7. **What are the cost tradeoffs in making the switch to internal production or <u>foreign</u> outsourcing?**
    a. What is the TCO of each foreign alternative?
    b. Are there corporate or national interests that must be considered?
    c. Are there critical intangibles that outweigh cost?

When a company moves beyond a core competency, it must evaluate all supporting processes that in turn support a CORE COMPETENCY. Those functions which cannot be executed internally should be sourced locally or at a minimum, domestically. In the context of sovereignty and failing to identify acceptable domestic sources, the company needs to find sources in the most like-minded socio-geopolitical, non-domestic nations. Multiple sources from multiple nations are preferable to a sole source from a single nation because it spreads risk and mitigates any one nation from having a stranglehold on supply lines.

# *Conclusions & Call to Action*

## ----- Concluding Comments -----

Global supply chains serve virtually all stakeholders. The most important stakeholders are (1) customers, (2) shareholders, (3) employees and (4) sovereign interests. Consequences of the COVID-19 pandemic make clear the need to protect sovereign interests with policies that preclude any country and/or event resulting in serious harm to the U.S. and its citizens. Principles of Sovereign Supply Chains, as described here and applied in U.S. policy, do not criticize principles of capitalism and globalism, they just provide a structure to make capitalism and globalism safe for U.S. citizens.

Sovereign Supply Chains are not instruments of isolationism, nationalism or national self-sufficiency. Sovereign Supply Chains provide a mechanism to encourage global trade while simultaneously protecting sovereign U.S. interests to the benefit of U.S. citizens. This new view still seeks to lift foreign countries out of poverty, just not at the expense of U.S. national defense and U.S. citizen well-being. Just as the Securities & Exchange Commission (SEC) regulates stock transactions in order to protect investors from unfair and unscrupulous practices, Sovereign, Supply Chains must be designed to provide security to U.S. interests.[27] It is paramount that the U.S. not allow control of vital items to be in the hands of potentially hostile nations.

To implement Sovereign Supply Chains will be to implement regulations that might appear to increase prices slightly, and perhaps temporarily to consumers. Nevertheless, the authors strongly believe that the U.S. must practice Sovereign Supply Chain management for all Critical Supply Chain Resources in order to protect and enhance American physical and economic security. It is important to encourage U.S. ingenuity and entrepreneurship to solve cost and developmental issues rather than take the easy way out of offshoring the manufacturing to another nation.

We also believe it is in the best interest of each business enterprise in the U.S. to work toward developing domestic sources that are competitive with offshore options when factoring in the TCO and risk issues. Sovereignty may also factor into moving supply chains back to domestic sources.

## ----- Call to Action -----

If you have read this far, we believe you have found something of value or interest in the preceding. We encourage you to pass this on to friends and associates. We hope you will take up the cause and send a copy to your representatives, senators and members of the administration. It will not hurt for them to receive more than one copy of this paper. It would be especially important if you know or have supported any of these individuals. Thank you for reading!

# Citations & Footnotes

1. In ***"The New Industrial State,"*** Galbraith argues that some level of State control over production is necessary because corporate interests do not always align with societal interests. He argues that *"perfect competition"* as described in classical economic theory does not occur in markets with few, mostly dominating competitors. Though he concedes that markets comprised of mostly small and fragmented competitors can still behave in a classical economic manner, competition itself eventually *"breeds"* larger competitors, thereby reducing overall competition.

   Galbraith further argues that companies that control around two-thirds of an industrial sectors total output, are in practice, controlled by a *"technostructure"* rather than shareholders. He claims that these technostructures do not focus on profit maximization, but instead, focus primarily on maintaining the organization. He states that the key aim of these technostructures is to maintain control over the company and its shareholders.

   Galbraith asserts that risk management, a daily imperative in smaller companies, is less important in larger companies because larger companies can manage risks through longer term supply agreements, labor contracts, favorable financing arrangements and alliances/support from political establishments that are not available to smaller companies.

   Thus, Galbraith asserts, unfettered competition is itself, a myth. It requires deep involvement and some elements of direct central planning that only government can do.

2. In ***"The Next American Frontier,"*** Dr. Reich suggests that societal imperatives are not incompatible with economic growth, but essential to it. He asserts that a social organization premised on equity, security, and participation will generate greater productivity than one premised on greed and fear. He states that modern business success will require an acceptance of this new economic reality. He further asserts that business adaptation of societal elements into capitalism will be America's biggest challenge. This real choice will be *"between shielding America from a changing world economy and adapting to engage the new realities of international competition."*

   Dr. Reich is also critical of what he calls *"paper entrepreneur"* business managers who *"innovate"* by tax avoidance, financial management, mergers, acquisitions, and litigation. He is clear that these actions "do not create new wealth. They merely rearrange industrial assets and hasten societal decline. His solution is again, direct government intervention that perfects mandates upon corporations.

3. ***"Globalization Reduces Poverty,"*** YaleGlobal Online, by Laurence Chandy and Geoffrey Gertz, July 5, 2011, "…A major success in a poverty-reduction goal for the new millennium – halving the proportion of people whose income is less than $1.25 per day – largely went unnoticed. The World Bank estimates poverty levels, but the most recent data is from 2005. By combining the recent country survey data of household consumption with latest figures on private consumption growth, Brookings Institution researchers Laurence Chandy and Geoffrey Gertz generated poverty estimates to the present day. They conclude that the world – even stubborn Sub-Saharan Africa – is in the midst of rapid poverty reduction; they credit economic growth and widespread development brought by globalization. Poverty reduction was one part of a key UN Millennium Goal, and global observers may sit up and take notice after two other key parts are achieved: full and productive employment for all and halving the proportion of people who suffer from hunger. In the meantime, the authors promise far-reaching consequences from rapid poverty reduction via growth."

4. ***"How China Could Shut Down America's Defenses,"*** FP Insider Access, by Keith Johnson & Lara Seligman, June 19, 2019.

5. ***"Coronavirus Outbreak Exposes China's Monopoly on U.S. Drug, Medical Supplies,"*** Breitbart News, by Rebecca Mansour, February 19, 2020. "… China is the world's largest producer of active pharmaceutical ingredients (APIs). The United States is heavily dependent on drugs that are either sourced from China or include APIs sourced from China." The report further explains that although India is the world's leading supplier of generic drugs, India gets 80 percent of its active pharmaceutical ingredients directly from China. The United States also imports 80 percent of its APIs from overseas (primarily from India and China) and a substantial portion of its generic drugs either directly from China or from third countries like India that use APIs sourced from China."

6. ***"China's Grip on Pharmaceutical Drugs Is a National Security Issue,"*** Washington Post, by Anna G. Eshoo and Adam B. Schiff, September 10, 2019, "…There is no single accounting of the percentage of active ingredients in U.S. drugs that are manufactured in China, but it's significant and growing. The Food and Drug Administration has said approximately 80 percent of active-ingredient manufacturers are located outside the United States, and for some key drugs, China is the only supplier. For instance, China produces the ingredients found in almost every antibiotic and blood pressure medicine and hundreds of other drugs. Thus, China has a virtual monopoly on the ingredients required to manufacture critical medicines."

7. ***"China Gears Up to Weaponize Rare Earths Dominance in Trade War,"*** Bloomberg New, by Jason Rogers, David Stringer and Martin Ritchie, March 29, 2019

8. ***"Does Globalization Help or Hurt the World's Poor?*** *Overview/Globalization and Poverty,"* Scientific America, by Pranab Bardhan, March 26, 2006. "… for a quarter century after World War II, most developing countries in Africa, Asia and Latin America insulated their economies from the rest of the world. Since then, though, most have opened their markets. For instance, between 1980 and 2000, trade in goods and services expanded from 23 to 46 percent of gross domestic product (GDP) in China and from 19 to 30 percent in India. Such changes have caused many hardships for the poor in developing countries but have also created opportunities that some nations utilize, and others do not, largely depending on their *domestic* political and economic institutions. (The same is true for low-wage workers in the U.S., although the effects of globalization on rich countries are beyond the scope of this article.) The net outcome is often quite complex and almost always context-dependent, belying the glib pronouncements for or against globalization made in the opposing camps. Understanding the complexities is essential to taking effective action."
9. ***"How the Specialization of Labor Can Lead to Increased Productivity,"*** Houston Chronical, by Sampson Quain, February 04, 2019, "…specialization of labor is most often known as the division of labor and refers to a process in business in which large tasks are divided into smaller tasks, and different employees or distinct groups of employees complete those tasks. Specialization is highly desirable in large-scale operations such as car manufacturing because it allows workers with specific skill sets to efficiently perform a specific task. However, specialization is also beneficial for small-business owners who are interested in increasing productivity."
10. ***"The Protectionist Smoot-Hawley Tariff of 1930,"*** Thought Company, by Martin Kelly, July 03, 2019, "…during World War I, countries outside of Europe increased their agricultural production. Then when the war ended, European producers stepped up their production as well. This led to massive agricultural overproduction during the 1920s. This, in turn, caused declining farm prices during the second half of that decade. One of Herbert Hoover's campaign pledges during his 1928 election campaign was to aid the American farmer and others by raising tariff levels on agricultural products."
11. ***"The Solyndra Failure:"*** Majority Staff Report Prepared for the Use of the Committee on Energy and Commerce Fred Upton, by Chairman U.S. House of Representatives 112th Congress August 2, 2012, "… Solyndra is a prime example of the perils that come when the Federal government plays investor, tries to keep a company and industry afloat with subsidies and attempts to pick the winners and losers in a particular marketplace. Policy and political pressures inevitably come into play to the detriment of taxpayers, as it did with Solyndra."
12. **U.S. History.com.** "World War I severely disrupted agriculture in Europe. That was an advantage to farmers in the United States, who increased production dramatically and were therefore able to export surplus food to European countries. But by the 1920s, European agriculture had recovered, and American farmers found it more difficult to find export markets for their products. Farmers continued to produce more food than could be consumed, and prices began to fall. The decline in demand for agricultural products meant that many farmers had difficulty paying the mortgages on their farms.

    By the 1930s, many American farmers were in serious financial difficulty. In South Dakota, the county grain elevators listed corn as minus three cents a bushel — if a farmer wanted to sell them a bushel of corn, he had to bring in three cents. Fields of cotton lay unpicked because it couldn`t be sold even for the price of picking. Orchards of olive trees hung full of rotting fruit. Oranges were being sold at less than the cost of production. Grain was being burned instead of coal because it was cheaper.

    When Franklin D. Roosevelt was inaugurated president in 1933, he called Congress into special session to introduce a record number of legislative proposals under what he dubbed the New Deal. One of the first to be introduced and enacted was the Agricultural Adjustment Act. The intent of the AAA was to restore the purchasing power of American farmers to pre-World War I levels. The money to pay the farmers for cutting back production by about 30 percent was raised by a tax on companies that bought farm products and processed them into food and clothing. The AAA evened the balance of supply and demand for farm commodities so that prices would support a decent purchasing power for farmers. This concept was known as *'parity.'*

    AAA controlled the supply of seven *'basic crops'* — corn, wheat, cotton, rice, peanuts, tobacco, and milk — by offering payments to farmers in return for farmers not planting those crops. The AAA also became involved in assisting farmers ruined by the advent of the Dust Bowl in 1934. In 1936 the Supreme Court, ruling in United States v. Butler, declared the AAA unconstitutional. Writing for the majority, Justice Owen Roberts stated that by regulating agriculture, the federal government was invading areas of jurisdiction reserved by the constitution to the states, and thus violated the Tenth Amendment. Judge Harlan Stone responded for the minority that, *'Courts are not the only agency of government that must be assumed to have capacity to govern.'*

Further legislation by Congress restored some of the act`s provisions, encouraging conservation, maintaining balanced prices, and establishing food reserves for periods of shortages. Congress also adopted the Soil Conservation and Domestic Allotment Act, which encouraged conservation by paying benefits for planting soil-building crops instead of staple crops. The rewritten statutes were declared constitutional by the Supreme Court in Mulford v. Smith (1939) and Wickard v. Filburn (1942).

During World War II, the AAA turned its attention to increasing food production to meet war needs. The AAA did not end the Great Depression and drought, but the legislation remained the basis for all farm programs in the following 70 years."

13. ***"How China's Currency Manipulation Cheats America on Trade,"*** The Hill, by Corey R. Lewandowski, July 19, 2019, "…with the People's Bank of China taking action over several years to reverse the market forces that strengthened the RMB as China's economy grew, China gained a systemic advantage in international trade by using currency manipulation to flood markets with artificially low-priced exports. Simultaneously, in an effort to protect the development of nascent domestic industries, manipulation of the RMB created significant non-tariff barriers to foreign nations seeking to get involved in this large emerging market, by keeping imports artificially costlier than Chinese products."

14. ***"Perils of China's Belt & Road Initiative."*** The Hindu Business Line, by G. Parthasarathy, April 3, 2019, "…President Xi's *'Belt and Road'* initiative is not only involved in building roads and bridges but also railways, ports, dams, power stations and other infrastructure projects across 68 countries, spanning Asia, Africa and Europe. Estimates of total investments envisaged for these projects vary from $1 trillion to $1.3 trillion. The primary focus is on the Eurasian landmass. The main source of concern in India, however, pertains to Chinese projects across the Indian Ocean.

    While the OBOR focusses primarily on the construction of roads, bridges, electrical power projects and dams, the terms for such assistance are opaque. Moreover, relatively little attention is paid to developing indigenous skills and capacities for operations and maintenance. The terms of interest and repayment are far less generous than the vastly concessional assistance/aid provided by institutions like the World Bank and Asian Development Bank, or bilaterally by countries like Japan and Germany.

    The net result of this Chinese *'generosity'* is that a number of developing countries, beguiled by Chinese protestations of altruistic assistance, soon find themselves handing over substantial tracts of territory and natural resources to the Chinese, with little development of indigenous skills and expertise.

    There is extremely limited transparency in Chinese *'aid.'* Moreover, there are cases of ruling elites across Asia and Africa falling prey to Chinese *'inducements.'*

    India's western Indian Ocean neighborhood, in an area extending from Djibouti and Mombasa on the shores of East Africa, to Gwadar in Baluchistan and to Hambantota and Colombo, in Sri Lanka, remains its primary source of concern about Chinese intentions. Using its *'aid'* as leverage, China has secured its first military base in the East African Port of Djibouti. China has, in turn, undertaken work on port facilities, construction of two airports and a rail line, from Djibouti, across landlocked Ethiopia.

    In neighboring Kenya, China's involvement in the strategic port of Mombasa and construction of a railway line linking the port to the capital Nairobi, have also raised eyebrows internationally. There are growing apprehensions in Kenya that it would soon be unable repay its debts to China and be forced to make *'concessions'* on the management and use of Mombasa port. China is the largest lender to Kenya, with debt liabilities reportedly amounting to around $42 billion

    Closer to India, reckless spending by the government of former President Abdulla Yameen in Maldives, has resulted in the island nation, with a population of 4 lakh and a GDP of $4.9 billion, acquiring a debt of $3 billion, on account of the usual Chinese infrastructure mix of roads, bridges, airports and housing. The newly elected government of President Ibrahim Solih has been more circumspect about such projects getting the country into a Chinese debt trap and being forced to mortgage its crucial security interests.

    This is an experience which Sri Lanka also faced, when, unable to repay its debts, it was forced to concede substantial control of the Hambantota Port, with a 99-year lease of the Port to China. Colombo was then also compelled to allow Chinese nuclear submarines to berth in Colombo.

    Pakistan and Myanmar are inevitably going to experience similar dilemmas in coming years. The $62 billion *'China Pakistan Economic Corridor'* involves road, rail, mining, port, power sector and agricultural projects, under conditions, which have not been made known transparently, even to Parliamentary Committees and the country's central bank."

15. ***"The Causes of Globalization?"*** Comparative Political Studies, by Geoffrey Garrett, September 2000, "…the most important causes of globalization differ among the three major components of international market integration: trade, multinational production, and international finance. The information technology revolution has made it exceedingly difficult for governments to control cross-border capital movements, even if they have political incentives to do so. Governments can still restrict the multi-nationalization of production, but they have increasingly chosen to liberalize because of the macroeconomic benefits. Although the one-time Ricardian gains from freer trade are clear, whether trade is good for growth in the medium term is less certain. In the case of trade, the increasing interest of exporters in opening up domestic markets has had a powerful impact on the trend to liberalization. Cross-national variations in market integration still endure, but these are more the product of basic economic characteristics (such as country size and level of development) than political factors (such as regime type or the left-right balance of power).
16. ***"Was letting China into the WTO a Mistake?" Foreign Affairs, by Philip Levy, April 2, 2018, "***...in a report released earlier this year, the U.S. Trade Representative argued rather provocatively that the United States had indeed *'erred in supporting China's entry into the WTO on terms that have proven to be ineffective in securing China's embrace of an open, market-oriented trade regime.'* But did it? It would be poor decision making to reject a policy solely on the basis of the unfortunate outcomes that followed. Such an approach fails to address whether there were any superior alternatives at the time when such a policy was made. In the case of China's accession to the WTO in 2001, the reality is that identifying a preferable alternative, even with the benefit of hindsight, is surpassingly difficult."
17. ***Mark LeDoux, Chairman of the Natural Products Association & CEO of Natural Alternatives International, Inc.*** "Recognize that as of today the US does not produce Vitamin A, Beta Carotene, Vitamin C, Vitamin D, Vitamin B-1, Vitamin B-2, Niacin, Niacinamide, Pyridoxine, Cyanobolamin, Folic Acid or other essential compounds for human health. Almost all amino acids are made in the Orient, as part of the original plan to help Japan recover from the beating it took in WW2. The vast majority of vitamin production and most active pharmaceutical ingredients and excipients are ALL MADE IN CHINA. This is because the corporations who sell this want to avail themselves of subsidized production and labor costs afforded by the Communist Chinese Party. This is unconscionable on so many levels."
18. ***"The Joy of Building: My Life in Business, Community Affairs and Philanthropy,"*** West of West Books, by William M. Lyles III, 2018. Bill Lyles is a friend like no other. Alan Dunn sat on a corporate Board of Directors with Bill for nearly 15 years. Bill's understanding of world economic events and domestic tax impacts on decision making could never be challenged… because he always had his facts and always knew his tax codes. His understanding of economic history, along with consequences of popular, but often incorrect economic policy decisions, influenced us immensely. His book is a worthy read for anyone who runs a large multigenerational family business and seeks some of the *"wisest-wisdom"* around.
19. ***"China's Grand Plan to Take Over the World"*** Forbes, by John Mauldin, Senior Contributor, November 12, 2019. When the US and ultimately the rest of the Western world began to engage China, resulting in China finally being allowed into the World Trade Organization in the early 2000s, no one really expected the outcomes we see today. There is no simple disengagement path, given the scope of economic and legal entanglements. This isn't a *"trade"* we can simply walk away from. But it is also one that, if allowed to continue in its current form, could lead to a loss of personal freedom for Western civilization. It really is that much of an existential question. Doing nothing isn't an especially good option because, like it or not, the world is becoming something quite different than we expected just a few years ago—not just technologically, but geopolitically and socially.
20. ***"The Multiplier Effect: There are More Manufacturing Related Jobs than You Think,"*** Manufacturing Executive Leadership Journal, by Keith D. Nosbusch and John A. Bernaden.
21. ***"The Magic Job Multiplier of Manufacturing"*** National Association of Manufacturing, by Jerry Jasinowski, former NAM president, September 27, 2013.
22. ***"Why Manufacturing Jobs are Worth Saving,"*** The Century Foundation, by Andrew Stettner, Joel S. Yudken and Michael McCormack, June 13, 2017, "…manufacturing jobs continue to provide above-average wages, especially for skilled positions that require on-the-job training but not college degrees. Among workers without a four-year college degree, manufacturing workers earn $150 more per week than in other industries. On average, an econometric analysis finds that workers in manufacturing earn 9 percent more per week than workers in other economic sectors, holding other differences between workers equal. However, plummeting manufacturing unionization in the Rust Belt over the past twenty-five years (from 28.4 to 14.5 percent) has shrunk the real wage advantage of manufacturing jobs from $220 to $170 per week in the crucial region."
23. ***"What are NMFC Codes and Why Do They Matter,"*** Winnisota Corp., April 3, 2018, "…NMFC codes were born when regulators within the transportation industry realized there was a need for more effective standardization. In an effort

to establish fair measures and standardize freight pricing, the National Motor Freight Traffic Association (NMFTA) created a classification system for every type of freight. This system divides freight into different classes—18 of them, to be exact—and is catalogued with the National Motor Freight Classification tariff (NMFC). The 18 freight classes are defined with a number between 50 and 500. These numbers become essential when shippers and carriers need to define tariffs associated with a given shipment and set shipping rates to be charged to the customer.

24. ***"History of GMP,"*** The Mastery Institute, 2011, "…in 1937 when this tragedy occurred, the Senate had introduced a bill to overhaul the 1906 law, but congressional action had stalled. As a response to the tragedy, the Federal Food, Drug, and Cosmetic Act was passed in 1938. It required that drug manufacturers show that a drug is safe before marketing it. Other provisions of this act include that cosmetics and therapeutic devices were regulated for the first time; proof of fraud was no longer required to stop false claims for drugs; poisonous substances in foods became regulated; authority was granted to FDA to inspect factories; and federal court injunctions were added as an allowable legal remedy."

25. ***The Association for Supply Chain Management (ASCM)*** is the global leader in supply chain organizational transformation, innovation and leadership. As the largest non-profit association for supply chain, ASCM is an unbiased partner, connecting companies around the world to the newest thought leadership on all aspects of supply chain. ASCM is built on a foundation of APICS certification and training spanning 60 years. Now, ASCM is driving innovation in the industry with new products, services and partnerships that enable companies to further optimize their supply chains, secure their competitive advantage and positively impact their bottom lines. Learn more at www.ascm.org.

26. ***"Ready to Rumble: IBM Launches Food Trust Blockchain for Commercial Use,"*** Forbes, by Aaron Stanley, October 8, 2018, "Perhaps most importantly, the traceability delivered by IBM Food Trust figures to generate sector-wide efficiency gains through the ability to specifically identify and locate product that may be subject to a recall, a process that is extremely expensive, wasteful and challenging - if not altogether impossible - under current processes.

    An example: 6.5M pounds of beef were recalled in the United States over salmonella fears in what was reportedly the largest recall order ever issued. The ability to trace and identify the location where a parcel of beef was produced and target the recall toward those items that are specifically impacted will enormously reduce food waste and improve consumer welfare and confidence. We use the term *'supply chain,'* but we all know it's not really a chain. There's nothing linear about the way food is provided to any of us - it's a web of interconnected companies, retailers, suppliers,"

27. ***"What is the Securities and Exchange Commission?,"*** Kredit Carma, September 18, 2018, "…during the Great Depression, Congress started thinking about ways to protect the country from future economic crises. Ultimately, Congress passed the Securities Act of 1933 and then the Securities Exchange Act of 1934. The latter created the Securities and Exchange Commission in an effort to restore public confidence in the financial markets, among other goals. Based on these laws, the SEC has two primary functions. One is to ensure that companies selling securities to the public tell the truth about their businesses, the securities being sold, and the risks associated with the company and investing in its securities. The other is to try to ensure that securities professionals treat investors fairly and honestly.

    Overall, the SEC is an accomplished institution with a strong track record for protecting investors. Individual and institutional investors alike should appreciate the work the SEC does to keep the stock market fair for everyone involved. The Securities and Exchange Commission is important for investors. It works to ensure that anyone wanting to buy and sell stocks or other securities can do so without fear of being manipulated, and that the SEC will take action against offenders.

    While it may be easy to get caught up in the securities cases that make the news, like Martha Stewart's insider trading scandal, the SEC works daily to protect the public from harm. Financial crimes are not victimless crimes — we can all suffer from unfair gains and market manipulation.

    Unlike putting your money in a savings account, where your money is pretty safe, you *can* lose if you invest in the stock market. That's why the SEC's role — monitoring the securities market and working to ensure investors are treated fairly — is so important. Without trust in the integrity of the financial markets, we probably wouldn't have the confidence to invest in — for example — a 401(k) account for retirement. Without the SEC, companies may not be able to raise the funds they need from investors to grow and expand. It would be tough to be an investor in the U.S. without the SEC!"

# Additional References

1. ***"12 Iconic American Products That Are No Longer Made in The U.S.,"*** HuffPost, by Harry Bradford, January 1, 2013:
    1) **Rawlings baseballs.** The official balls of the MLB are handmade in Costa Rica. Up to 2.4 million balls are made each year.
    2) **Radio Flyer Red Wagons.** Production of the iconic red wagon moved to China in 2004 due to unsustainable maintenance costs at its previous Chicago plant, MSNBC reports.
    3) **Barbie Dolls.** Mattel manufactures many of its most iconic American toys like the Barbie doll in places such as Hong Kong.
    4) **Converse All-Star Shoes.** Converse, maker of the iconic Chuck Taylor All Star sneaker, was purchased by Nike back in 2003, which promptly outsourced production to China, Thailand and India.
    5) **Levi's Jeans.** Levi jeans, which the company describes as the "ultimate icon of American culture," are in fact manufactured outside America with the exception of one particular line that is made in North Carolina, Global Post reports.
    6) **Etch-A-Sketch.** The company outsourced manufacturing of its never-ending doodle machine to China in 2000 to save on costs.
    7) **Olympic Uniforms.** Polo Ralph Lauren found itself in hot water when it was discovered that the uniforms it made for the 2012 U.S. Olympic team were actually manufactured in China.
    8) **Televisions.** Five Rivers Electronic Innovations, the last company to manufacture TVs in America, went out of business in 2004, according to Business Insider.
    9) **Huffy Bicycles.** Huffy Bikes, that first bike of many American kids, haven't been manufactured in America since 1999.
    10) **iPad.** Despite widespread criticism, Apple continues to manufacture its popular iPad in China for cost-cutting purposes, among other reasons.
    11) **Monopoly.** Monopoly, the game that embodies the spirit of American capitalism, produces many of its game pieces overseas, including the green and red houses which are made in Ireland, according to The Street.
    12) **American Flags.** $3.2 million worth of American flags were imported by the U.S. in 2010, with the vast majority being made in China, the Washington Post reports.
2. ***"Some U.S. Military Parts Imported from China,"*** CBS News, by Wyatt Andrews, June 9, 2013. "…the hellfire missile -- launched from helicopters, jets and predator drones -- has been a critical weapon in the war on terror. But the propellant that fires the missile must be imported from China.

    It's not the only area where the Pentagon military depends on imports. The glass in U.S.-made night vision goggles requires a soft, white-colored metal called lanthanum, 90 percent of which comes from China. *'We need to onshore our critical defense supply chains,'* said retired Army Gen. John Adams. He is the author of a report which lists 14 categories where the military relies on imported minerals or technologies. *'Some of those supplies,'* Adams said, *'could be stopped during a conflict."*
3. ***"How Counterfeit Materials Undermine Our Armed Forces,"*** Advanced Conversion Technology, September 17, 2018. "…when subpar counterfeit parts make their way into components used by the military, they can cause significant issues, including mission failure, safety hazards to personnel, and compromised national security. Counterfeits can show up almost anywhere — it could be a fastener used on aircraft or materials used in engine mounts, but the more prominent issue for the military is counterfeit electronic parts. These parts can appear at any level: system, sub-system, component, or sub-component.

    A Senate Armed Services Committee investigation in 2012 uncovered dozens of examples of electronic parts in critical military systems that were suspected to be counterfeit, including parts used in a large quantity of military aircraft, in thermal weapons sights for the Army and in mission computers for the Missile Defense Agency's Terminal High Altitude Area Defense (THAAD) missile. The investigation found over a million total suspected counterfeit electronic parts in the U.S. defense supply chain.

This number is so high in part because electronic counterfeit parts can be especially difficult to detect. They can also be very problematic. Even the tiniest electronic components can make or break the effectiveness of a much larger piece of equipment. Electronic devices consist of circuit boards that comprise of passive and active components as well as integrated circuits. A counterfeit part could be present at any of these levels.

Counterfeit microchips have been found to be especially rampant in military systems. For example, counterfeit microchips have shown up in replacement parts for missile guidance and satellite systems. When any type of counterfeit part, including electronic parts, renders an important piece of equipment ineffective, it can result in failed missions and even loss of life.

Counterfeit electronic parts can be used for harmful purposes, such as intercepting classified information or disabling weapons systems. All it takes is for the counterfeiter to hardwire these capabilities into the parts without the Armed Forces or the manufacturer knowing.

Counterfeiters with malicious intent can be very crafty in their execution, so their parts appear identical to and function just like the parts from the original manufacturer. Therefore, standard inspection and testing protocols are unlikely to detect this malicious functionality built into components."

4. ***"The Real Reason American Manufacturing Jobs Have Gone Overseas,"*** AdrianChilders.com, by Adrian Childers, January 23, 2012. "…although middle class Americans suffer when economies transition such as those from an agricultural economy to a manufacturing one or manufacturing to an information age, we are now faced with a much larger challenge, which is the huge increase in labor force. Americans have never had to compete with the hundreds of millions of workers in the Chinese labor force that twenty or thirty years ago were walled off from the global economy. The workforce in China, India and other newly industrialized countries dwarf the entire U.S. population and they are willing to work under much stricter conditions than we are used to working in.

   The only external factor that has been positive for Americans that has slowed manufacturing jobs from going overseas much quicker than it has is high transportation costs thanks in large part to expensive fuel. While it's important for the entire supply chain of a finished product to be close to each other it's also important to be close to your customers. That's why perhaps Foxconn has opened a huge facility just outside of Juarez, Mexico literally less than half a mile south of the U.S. border.

   The U.S. can't compete with the efficiency of the productive workforce around the world alone. We can fix our schools and invest in technology but if we are going to compete with the rest of the world, we need to work with our trading partners in North America. Mexico, for example offers a less expensive workforce than in the U.S. which is why many companies in the U.S and around the world have set up shop in cities along the Northern border of Mexico. If a manufacturing plant is going to move to another country, it's better that they operate in a country that borders the U.S. so that the opportunity still exists for American companies to be involved in the supply chain of a finished product. There is no excuse why Canada, the United States and Mexico shouldn't be able to produce everything we need in North America and then still export products to foreign countries."

5. ***"The Unintended Consequences of Outsourcing,"*** Investopedia, by Adam Hayes, June 16, 2020.

6. ***"U.S. Officials Worried About Chinese Control of American Drug Supply"*** NBC News, by Ken Dilanian and Brenda Breslauer, September 12, 2019. "…basically, we've outsourced our entire industry to China," retired Brig. Gen. John Adams told NBC News. "That is a strategic vulnerability."

7. ***"China Rx,"*** by Rosemary Gibson and Janardan Prasad Singh, "…millions of Americans are taking prescription drugs made in China and don't know it--and pharmaceutical companies are not eager to tell them. This is a disturbing, well-researched wake-up call for improving the current system of drug supply and manufacturing. Several decades ago, penicillin, vitamin C, and many other prescription and over-the-counter products were manufactured in the United States. But with the rise of globalization, antibiotics, antidepressants, birth control pills, blood pressure medicines, cancer drugs, among many others are made in China and sold in the United States. China's biggest impact on the US drug supply is making essential ingredients for thousands of medicines found in American homes and used in hospital intensive care units and operating rooms. The authors convincingly argue that there are at least two major problems with this scenario. First, it is inherently risky for the United States to become dependent on any one country as a source for vital medicines, especially given the uncertainties of geopolitics. For example, if an altercation in the South China Sea causes military personnel to be wounded, doctors may rely upon medicines with essential ingredients made by the adversary. Second, lapses in safety standards and quality control in Chinese manufacturing are a risk. Citing the concerns of FDA officials and insiders within the pharmaceutical industry, the authors' document incidents of illness and death caused by contaminated medications that prompted reform. This probing book examines the implications of our reliance on China on the quality and availability of vital medicines."

8. ***Parrot Will Manufacture Prototype of U.S. Army Short Range Reconnaissance Drone – In the U.S.," drone life, April***, by Miriam McNabb, April 16, 2020. "… Parrot partners with a U.S. firm, NEOTech to build the drone in the U.S. is a good example of managing sovereign supply chain risks. The U.S. DoD understood the importance of not allowing such sensitive production activities to take place outside the U.S.

9. ***"DoD Can Lead Microelectronics Manufacturing Back to the U.S.,"*** DoD News, by C. Todd Lopez, August 20, 2020. "…for a variety of reasons, while many of the microelectronics available in the United States are designed here, they are manufactured overseas. This presents problems for national security, and for the Defense Department, the undersecretary of defense for acquisition and sustainment said."

10. ***"Commentary: Pandemic Lays Bare Supply Chain Vulnerabilities,"*** National Defense Magazine, by Dr. Peter Emmanual, June 23, 2020. ***"…***commerce has evolved into an international patchwork of supply and demand that connects the United States to every corner of the Earth. The last decades have seen corporations embrace the tenets of Lean Six Sigma improvement methods, and the benefits of just-in-time manufacturing. In normal times, just-in-time manufacturing allows a well-planned logistical network to deliver products to the right place at the right time, minimizing inventory stockpiles in warehouses around the globe.

    But these are not normal times, and the COVID-19 pandemic has frozen the supply lines necessary to feed global corporations. The worldwide embrace of social distancing policies has laid bare the fragility of our supply chains and made clear how vulnerable the U.S. defense industry is in its ability to sustain production of national security materials. Within weeks of the World Health Organization's declaration of a pandemic, standing domestic inventories of textiles and chemicals were approaching depletion, forcing defense leaders to make operational response decisions based on availability of supply rather than best tactical characteristics."

11. ***China's Grand Strategy: Trends, Trajectories, and Long-Term Competition"*** A report by Rand Corporation by: Andrew Scobell, Edmund J. Burke, Cortez A. Cooper Iii, Sale Lilly, Chad J. R. Ohlandt, Eric Warner & J.D. Williams, 2020: China and the United States will likely be in competition with each other for many years to come. Indeed, the two countries seem destined to be locked into long-term competition because neither is likely to withdraw from world affairs in the foreseeable future. In addition, each country perceives the other country as a significant rival, is deeply suspicious of the actions and intentions of the other country and is highly competitive.

    To explore what extended competition between the United States and China might entail through the year 2050, this report focuses on identifying and characterizing China's grand strategy, analyzing its component national strategies (diplomacy, economics, science and technology [S&T], and military affairs), and assessing how successful China might be at implementing these over the next three decades. Foundational prerequisites for successful implementation of China's grand strategy are deft routine management of the political system and effective maintenance of social stability.

    China's grand strategy is best labeled "national rejuvenation," and its central goals are to produce a China that is well governed, socially stable, economically prosperous, technologically advanced, and militarily powerful by 2050. China's Communist Party rulers are pursuing a set of extremely ambitious long-term national strategies in pursuit of the overarching goals of their grand strategy.

    Two fundamental questions are at the heart of this report: (1) What will China look like by 2050? (2) What will U.S.-China relations look like by 2050? The answers are provided by analyzing trends in the management of politics and society and studying national-level strategies in diplomacy, economics, S&T, and military affairs. Using these analyses, the report develops a range of potential future scenarios for mid-21st-century China and then generates an accompanying set of potential future trajectories for U.S.-China long-term competition.

12. ***"Americans Notice a Very Problematic Part About Those 'Free' Covid Tests the Government Is Sending Out"*** An article reported in Townhall, writer by Leah Barkoukis, January 26, 2022. iHealth is a unit of the Chinese company, Andon Health Company, Ltd., according to Reuters. It was awarded a US$1.275 billion contract for COVID-19 rapid tests by the U.S. government on January 13, 2022, according to the Defense.gov website.

## About the Authors

**Alan G. Dunn** is President of GDI Consulting & Training Company and founder of the Manufacturing Executive Institute (MEI). He is also the creator and lead-instructor of the 18-22-month Next Generation Global Supply Chain Leadership Development Program at the California Institute of Technology's Center for Technology & Management Education, where he has taught since 1984.

Before founding GDI, Mr. Dunn was a Vice President at **Gemini Management Consulting** and a Partner at **Coopers & Lybrand** (now **PricewaterhouseCoopers**). In both organizations, Mr. Dunn was responsible for leading large teams of technical manufacturing consultants in innovative productivity enhancement projects. For the twelve years prior to joining Coopers & Lybrand, Mr. Dunn was President, (and Founder) of **ADI**, a successful systems implementation consulting and training company that Mr. Dunn sold to Coopers & Lybrand in 1992.

In addition to his 35+ years of technical and management consulting experience, Mr. Dunn has several years of line management experience in manufacturing environments. He has extensive background in most functions within manufacturing companies and has participated in over 185 manufacturing and distribution consulting projects in over 110 companies. Mr. Dunn has consulted in more than 23 countries and across most manufacturing industrial sectors.

Mr. Dunn also possesses substantial experience in organization governance; having served on numerous private, public and not-for-profit Boards of Directors. Mr. Dunn currently serves as an independent Director on three manufacturing industry Boards. In 2007, Mr. Dunn was voted *"Board Member of the Year"* by the National Association of Corporate Directors (NACD). He holds a BA degree in business management from **California State University Fullerton** and is qualified by **ASCM** as a Certified Practitioner in Inventory & Production Management (CPIM).

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**Nicholas M. Testa Jr.** is an independent consultant and educator in all areas of supply chain and operations management. He has been Vice President of Operations in manufacturing companies, Vice President and Business Unit Manager, and various other senior positions in consulting firms. Nick was CEO of Acuity Consulting, Inc. for 10 years.

Notable past projects include evaluating and redesigning supply chain planning for an aerospace manufacturing company, evaluating and integrating planning systems for a major agribusiness, physical and systems design for a major warehouse operation, SIOP development for a large winery and bottling plant. Nick has also implemented LEAN and TOC in heavy industry, aerospace, prison industries, and major administrative departments of a university. He recently improved tool fabrication processes for a Boeing supplier where one process redesign saved more than 13% for all machinists on staff. Past clients range from multibillion-dollar global companies to privately held local enterprises. Products ranged from medical devices and food to metal fabrication and artwork.

Nick is an implementer, integrator, and trainer of tools for Supply Chain Management, Project Management, Process Improvement, Management Information Systems, Customer Relationship Management, and *"World Class"* techniques of the Theory of Constraints, ERP, Lean, Six Sigma, and related statistical tools where process improvements have freed up millions in cash and reduced operating expenses.

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