


RESHORE AND NEAR-SHORE TO THE WEST



UNIVERSITY OF WISCONSIN, PLATTEVILLE

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By

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ABSTRACT. The COVID-19 pandemic exposed dramatic vulnerabilities in the supply chains that feed into the United States economy and national defense. This paper will focus on the risks U.S.-based companies face when sourcing a majority of their products from Eastern Hemisphere suppliers, mainly Asian markets. It will present data and legislative testimony as evidence of the increased risks that both the U.S. public and private sectors must address to maintain economic competitiveness and a strong national defense. The paper continues by promoting the possible solution to reshore to the continental United States and near-shore to Canada and Central and South American suppliers. It ends by providing a case study analysis on organizations that have already begun this migration and their stories of failure or success and recommending further research opportunities.

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Introduction

According to the Senate Finance Committee Chairman Chuck Grassley (R-Iowa), the United States imports 80 percent of its active pharmaceutical ingredients (APIs)—mostly from China and India—with 95 percent and 91 percent of its ibuprofen and hydrocortisone from China, respectively. “It also relies on China for commonly used drugs, importing up to 70 percent of acetaminophen and about 40 percent of both heparin and penicillin”. This problem was particularly made apparent with the COVID-19 pandemic. According to the testimony of Prashant Yadav, Ph.D., to the U.S. House of Representatives Ways and Means Trade Subcommittee, United States industries, particularly those that deal with medical supplies, that rely on Chinese suppliers are extremely exposed. “The challenges we have faced in the US medical supply chain have resulted from a combination of factors which vary depending on the type of medical products. PPE, test kits, medicines, and ventilators each have different economic geography of manufacturing. For PPE there is a high geographic concentration of manufacturers in China. A huge surge in PPE demand in China in February 2020 followed by similar demand surges in the rest of the world led to demand far outstripping supply of PPE” (Yadav, 2020).

Beyond the public health industries, our Defense Industrial Base (DIB) is considered extremely vulnerable. The House Armed Services Committee commissioned the Department of Defense (DOD) to identify and mitigate the risks to our DIB supply chains. “The mandate of the Task Force was to identify: (1) the processes by which DOD analyzes supply chain vulnerabilities and develops mitigation strategies; (2) DOD’s processes to prioritize and mitigate identified vulnerabilities; and (3) the steps Congress and others can take to help build resilience against future shocks to the supply chain, both in the near term concerning selected cases, and over the longer term, leveraging the lessons learned from the initial actions” (HASC, 2021).

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The overall aim of this paper is to identify, understand, and articulate the risks that the United States faces by off-shoring suppliers and sourcing solutions to Asian markets. This paper will advocate for U.S.-based companies to vacate eastern markets and reshore their supply chains to the continental U.S. and other Western Hemisphere sourcing options as a risk mitigation method.

It is divided into three further sections:

- Section 2 discusses the history behind the United States opting for Asian sourcing solutions beginning as early as the Nixon administration.
- Section 3 provides and analyzes the examples of supply shortages and constraints by highlighting high-risk categories like medical supplies, pharmaceutical supplies, and electronic chip supplies.
- Section 4 discusses the possibility of re-shoring to the Continental U.S. as well as near-shoring to other Western hemisphere markets. Is it possible to bring enough sourcing solutions back to the West to mitigate the current risk climate?
- Section 5 presents key conclusions and identifies areas for future research.

Literature Review and Analysis

The supply chain crisis that the global economy is still in the midst of provides numerous areas of concern that the United States must fully understand. Asian markets currently provide savings in U.S. supply chains but have proven to have more risk than previously thought. China plays a major role in some of our most critical supply chains. This includes energy-related products, medical supplies, and high-tech products, which ought to be sourced with diversity. If another trade war or health crisis were to happen, the United States would find itself again dealing with supply shortages, port congestion, and market overreactions. Reshoring certain supply lines back to the United States and nearshoring certain sectors to neighboring Latin America provides the U.S. with shortened supply lines and increases cooperation with our Western Hemisphere partners.

Overreliance on China Supplies is a Risky Business

Denmark and Hass (2020) attribute the US-China trade war to a collapse in negotiations between the two powers. President Donald Trump, a self-professed ‘deal-maker’, aimed to close the gaps in the trade deficit which he blamed as the cause of the U.S. manufacturing industry plummeting. “The agreement reportedly includes a Chinese commitment to purchase an additional \$200 billion in American goods above 2017 levels by the end of 2021.” After Trump's election, Chinese leader Xi Jinping met with the U.S. president at Mar-a-Largo where they established a 100-Day Action Plan to resolve trade differences. China required several stipulations including the United States to recognize their Belt and Road Initiative. “The 100 days concluded in July 2017 with no agreement, no press conference, and no joint statement out of the first meeting of the U.S. –China Comprehensive Economic Dialogue (which was declared dead by the Trump administration four months later).”

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As a result of this failed deal, Trump launched the trade war hoping to bring Beijing back to the table. “Between July 2018 and August 2019, the United States announced plans to impose tariffs on more than \$550 billion of Chinese products, and China retaliated with tariffs on more than \$185 billion of U.S. goods.” Moody’s Analytics, Bloomberg Economics, the Federal Reserve Bank of New York, and Columbia University were a few of many organizations claiming that this trade war was causing more pain to the American worker than helping them. While at the same time, the U.S. sought to make a difference with other trade partners causing trade deficits with Europe, Mexico, Japan, South Korea, and Taiwan. Although the trade war hurt China, Beijing did not capitulate to the Trump administration. Indeed, by January 2020, the final deal agreed upon resembled much of Beijing’s initial offer—“increased goods purchases plus commitments on improved intellectual property protection, currency, and forced technology transfer.”

The trade war ended with a signing ceremony in which President Trump met with the 11th-ranked member of the Chinese leadership, Vice Premier Liu He. The agreement stipulated that China would increase its purchasing by an extra \$200 billion over the following two years. “In the phase one deal, as described by Brad W. Setser and Dylan Yalbir at the Council on Foreign Relations, China committed to purchasing roughly \$60 billion more in U.S. goods than it had in 2017—roughly \$180 billion in U.S. goods this year. Yet U.S. goods exports to China currently are significantly below what they were in 2017.” In other words, China has not stuck to its promises.

The analysis from Denmark and Haas provides a glimpse into the fragility of the U.S.-China trade relationship. Whether one nation is achieving a strategic advantage over the other is not the point. The point is that these two global powers are reluctant to capitulate to each other

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increasing the tension and diminishing the predictability of the trade relationship which will heighten the risks for Chinese-to-U.S. supply chains. The environment is too volatile for any long-term stability, increasing risk and possibly increasing prices. The tensions between the U.S. and China regarding trade increased during the Trump administration highlighting the potential risks of operating in China—a corporation could begin operating there only to be cut off at the worst time.

Amiti, Kong, and Weinstein (2020) provide further insight into the consequences of the U.S.-China trade war. In the middle of the Trump Administration, the United States and China trade tensions mutated into a trade war. In early 2018, the U.S. imposed tariffs on over \$300B of imports from China. The average tariff rate increased from 2.7 percent to 17.5 percent, mostly in the second and third quarters of 2019. China did not take this lightly. “In response, the Chinese government retaliated, increasing the average tariff applied on U.S. exports from 5.7 percent to 20.4 percent.”

Amiti, Kong, and Weinstein (2020) found that the trade war impacted U.S. investment growth by 0.3 percent points at the end of 2019 and was projected to shave another 1.6 percent by the end of 2020. The trade war slowed down the Chinese economy, causing a tertiary effect on the returns firms made on investments in the Chinese market. The trade war caused a demand reduction. “For example, heightened trade policy uncertainty and reduced demand from firms that are dependent on the Chinese market may have affected the profitability of firms that were not directly exposed to China.” This led to U.S. suppliers raising their prices, either because they import from China or because increased markets allowed for a competitive advantage. The down-trace effects of the trade war could be seen in subsidiaries that don’t directly source from

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China. Amiti, Kong, and Weinstein (2020) estimate that the U.S.-China trade war cost U.S. firms \$1.7 trillion and would eventually decrease investment growth by 1.9 percent by the end of 2020. Suzuki (2021) writes about the challenges the United States faces when building a resilient supply chain. The Trump Administration Trade War with China and the COVID-19 pandemic caused hoarding, bull-whip effect purchases, layoffs, port congestion, and many other factors leading to an uncertain supply chain environment. “Global companies are now searching for responses to supply chain challenges such as ‘reshoring, near-shoring, and China+1,’ while the United States and China devise strategies to protect their industries and improve their international competitiveness.”

The most dynamic region for the supply chain uncertainty is the Indo-Pacific. The rising labor costs in these emerging economies, including China as well as their rivalry with the United States, and the protectionist policies in the U.S., have all led to a reassessment of business models. In 2018 and 2019, many multinational corporations announced plans to relocate their manufacturing operations to Vietnam and Mexico. “In particular, the impact on essential commodities such as food and medicines and on social infrastructure, coupled with political tensions, provided an opportunity to promote policies of homeland security in many countries.”

Suzuki (2021) describes the following measures that global companies are pursuing to reduce supply chain risk.

Reshoring: This is a strategy to redirect manufacturing operations back to the home market. This trend arose in the United States as a result of the U.S.-China trade conflict. U.S. manufacturing import ratio (imports as a percentage of total domestic manufacturing output) fell for the first time in almost a decade. However, developing countries are less able to restore entire

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supply chains because of additional labor and overhead costs, instead, they opt for strategic sectors for reshoring from a national security and industrial policy viewpoint.

Near-shoring: This regionalization policy aims to reduce risk while retaining a partnership with other nations. “Near-shoring is expected to facilitate communication by reducing the distance between markets and the risk of being drawn into trade wars and protectionist policies by strengthening political, social, and cultural ties among regional neighbors.” In the case of the United States, Mexico and other Central and South American countries present potential options for regionalization.

China +1: This trend was also evident before the Covid-19 pandemic due to growing trade friction between the United States and China. In fact, in 2019, imports of electronics from mainland China to the United States declined, while imports from suppliers in Vietnam, Malaysia, and Taiwan increased. Due to Covid-19, China+1 has become one of the most important strategies for supply chain vulnerability reduction in Asia.

The challenge that many multinational corporations will face when attempting to exit the Chinese market is finding a substitute. China’s share of global exports in the machinery and electrical equipment sector is over 20 percent, and China’s share in the garment sector is over 40 percent—larger than the combined export shares of the other five countries (Bangladesh, Vietnam, India, Germany, and Italy). That manufacturing infrastructure is difficult to replicate, even in the aggregate.

The United States is attempting to take political action to thwart China’s dominance over major markets. The U.S. Department of Commerce’s Bureau of Industry and Security (BIS) placed Huawei and like companies on the entity list. This prohibits U.S. companies from exporting goods with them, namely software and technology. Not only does this apply to U.S.-

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based companies but international corporations as well. “The U.S. crackdown on Huawei goes beyond export bans and calls for a “test of loyalty” for allied countries.” In 2020, the U.S. State Department announced the “Clean Path” initiative, which promotes the protection of telecommunications infrastructure on five fronts (carriers, apps, app stores, cloud, and cable) from companies that have ties to the Chinese government.

There are several methods that corporations are developing to counter the Chinese market dominance as well, including actions taken by the United States government. What this highlights is the volatility of the U.S. relationship with China. Tensions seem to be rising and the two nations are moving further away from an economic partnership, leaving many companies to manage the risks in their supply chains. Evidence suggests that China could turn off the supply chains at their choosing, increasing the risk for multinational corporations.

Johnson (2021) claimed Australia offers a glimpse of what the United States could face if too much reliance is placed on Chinese imports. At the height of the Covid-19 pandemic, Australia began to feel the tension in their urea imports and was at risk of their national supply chains collapsing. Urea is a chemical that is both used as a fertilizer and additive for diesel engines. “The product, injected into the exhaust system, is used in diesel cars along with civil construction and farming machinery. China supplies 80 percent of the Asia-Pacific region's diesel-grade urea.” China uses urea as part of its food fertilization process, causing the nation to halt exportation. China needed it and Australia was left with only eight weeks of supply as China provided 80 percent of the product in the Indo-Pacific region.

The lack of this product will likely halt the transportation of supplies within Australia. “Mr. Thornley, a former president of the National Road Transport Association, said Australia's supplies were likely to run out next month.” This one product is primarily produced in one nation

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could worsen inflationary pressures and encourage other countries to develop their supply chains. Michael Shoebridge, the Australian Strategic Policy Institute's director of defense, strategy, and national security, said “it will drive shortages but it will also push others to start building alternative supply chains.’ We've already seen that happen in the case of rare earths because China did exactly this, threatening to stop exports of rare earths to Japan.” Benson, Hokayem, Lim, Mortensen, and Reinsh (2021) provide further examples that if an industry is heavily dependent on an import, particularly one from China, they face greater risks. The supply chains that support the HVAC and transformer industries rely heavily on imports. Aluminum is an essential part of the HVAC systems, and aluminum is manufactured with alumi bauxite and lumina alloy. The United States does not have a competitive advantage to specialize in aluminum production. Also important for the HVAC and transformer industry is steel. “Steel prices have increased by over 200 percent since March 2020, and while prices have surged, demand has also increased, in part as a result of economies reopening and increased activity in the manufacturing and construction sectors. The World Steel Association estimates that worldwide steel demand will grow by 5.8 percent in 2021.” Shipping costs and delays have can cause significant supply chain disruptions. For example, shipping a 40-foot container has increased by more than 200 percent since the pandemic began. The average price is about \$12,000 a container but they can reach as high as \$20,000 for last-minute shipments. The pandemic saw numerous cases of the bull-whip effect of last-minute purchases because U.S.-based companies saw disruptions in the supply chain coming.

This bull-whips effect increased port congestion, especially when businesses began to open back up. “Moreover, an average of 80 container ships a day have been stuck outside the Port of Long Beach, the second-largest port in North America in terms of inbound shipments and

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a major destination for inbound raw materials from China and Thailand for a transformer company.” Though the offshoring process with China has been unreliable, Benson, Hokayem, Lim, Mortensen, and Reinsh (2021) do not believe that reshoring or nearshoring policies are the avenues to pursue. Several interviewees that believed on-shoring policies were undesirable because these companies had worked so hard to develop relationships and partnerships abroad where supply chain value was found. Reshoring would damage those relationships and create instability in the market. “Even with an additional influx of government funding, firms thought that reshoring would not be as cost-effective or efficient as existing global supply chains.” These firms also cited concerns that domestic labor policies will decrease earnings and they would instead opt to near-shore by opening facilities in Mexico. Just as in the Australian fuel sector, and the aluminum and steel challenges in America, we see similar challenges in the sustainability sectors as well.

Carey, Ladislaw, Nakano, and Tsafos (2021) contend that if the United States is to move forward on green-energy solutions, Chinese suppliers are a force within the industry and could prove to be a problem for U.S. supply chains. Like many manufacturing operations in other industries, China dominates clean energy and industrial manufacturing. After the United States, with support from Germany, developed the technology used in solar PV in 2004, Chinese manufacturers began to ramp up production. “By the early 2010s, however, Chinese manufacturers began to expand vertically up the supply chain. China started to account for an ever-increasing share of new polysilicon factories, eventually eclipsing other producers and forcing many of them into bankruptcy.”

After engaging in trade disputes with the United States, Chinese producers moved operations to other Southeast Asian nations to bypass tariffs. In December of 2010, the United States

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challenged China's Wind Power Equipment Fund which required grants contingent on parts and components being made in China and discriminated against imported goods. In 2011, the Obama Administration launched an investigation into the development of crystalline silicon PV cells from China, and in 2012 investigated Chinese and Vietnamese utility-scale wind towers. "By August 2014, the United States was once again looking into crystalline silicon PV cells from China and Taiwan, issuing countervailing and anti-dumping duties against products from China (and antidumping orders against Taiwan)." In 2014, China retaliated by imposing tariffs on U.S. polysilicon producers, causing a 50 percent production decline from 2014 to 2018. "China slowly came to dominate global polysilicon production—from producing effectively nothing in 2010 to having built a commanding position in 2020, with much of the production located in Xinjiang."

The trade relationship with China became more contentious during the Trump administration. The United States tightened the rule for foreign investment and export of sensitive technologies; targeted major Chinese companies like Huawei, TikTok, and WeChat; and issued sanctions on individuals and companies with government ties. The tense relationship between the United States and China is well over a decade old. New disputes, fueled by U.S. policymakers eschewing reliance on Chinese sourcing options, will increase pressures and risks for U.S. supply chains that rely on Chinese manufacturing.

Today, China still dominates the market for solar modules imported into the United States. China continues to maintain its competitive advantage in the sustainable energy sector, leveraging its massive market to establish itself across the battery value chain. Despite Japan and South Korea playing a major role in the latter stages of development, cell manufacturing remains concentrated in China. One aspect of the sector that China does not lead is the production of

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wind turbines. Due to the transportation costs, many are produced within the continental United States and not imported.

Though it is evident that China plays a significant role in the global supply chains, clear decoupling and the severing of the relationship is undesirable, though the U.S. must recognize that China causes the most uncertainty and risk for global supply chains.

Senior Vice President and the Director of the Technology and Public Policy Program at the Center for Strategic and International Studies, James Lewis (2021) testified to Congress to explain why the United States has supply chain challenges and what could remedy the crisis.

Globalization provided cheaper goods delivered with greater efficiency. But two things disabled the global supply chain: China and the Covid-19 pandemic. The United States and the European Union must reconsider their global supply chains and are seen to be considering reshoring. “In a way, this mimics China. Chinese policy has always pursued indigenous capabilities to reduce reliance on foreign suppliers. This supply chain nationalism is reinforced by growing and powerful competition for technological leadership and by events like the semiconductor shortage.”

Past manufacturing strategies were geared towards heavy industry and military munitions. Those are outdated. The requirement now is to consider the impact of globalization, the role of the private sector in innovation, and the need to have resilient emerging technologies. With regards to globalization, the United States' high-tech industry must restrict technology transfers to opponents, such as China. “Congress has strengthened protective measures for competition with China with the Foreign Investment Risk Review Modernization Act and the Export Control Reform Act.” This is a step in the right direction. Next, the industrial strategy must consider the importance of federal funding and the role the private sector can play in tech

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competition. “Technology gave America unquestioned military superiority for decades, but this unquestioned superiority has ended as other advanced states challenge American technological leadership.” The United States must not give any more ground to China as the global narrative emphasizes economic success more than military power.

But the United States must reconcile its spending choices in recent years. Choices that were made over the past two decades have led to a drought in federal tech development. “Congress increased spending on life sciences, but trimmed “hard” sciences like physics, math, and materials.” Federal funding is critical for research because research in these areas has no immediate commercial value. It must be performed for strategic purposes.

There are calls to reshore supply chains. Commercial links between the United States, Europe, and Asia will make this effort nearly impossible. “We do not need to abandon a global supply chain but to shrink China’s role in it.” Establishing a public-private partnership to develop supply chain resiliency programs is critical if the U.S. will endure the future global crisis, like the Covid-19 pandemic. One particular industry to be prioritized is the technology sector, namely the semiconductor supply chains. “The United States still has the largest share of the global semiconductor market. It leads in chip design and it has roughly half of the global market for semiconductor manufacturing equipment, but it lags in chip fabrication. This lag is the source of supply chain risk.”

Developing supply chain risk mitigation strategies will ensure the United States doesn’t place China as the sole supplier for any segment of the tech supply chain. This is critical because they will take advantage of this to harm us. The U.S. still can source chip supplies from foreign suppliers like Israel, Ireland, and others. “We benefit economically and strategically from maintaining a global supply chain in which China’s role has been decreased.” To do this, U.S.

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firms need to selectively decouple their operations from China while supported by diplomacy. The current position China takes concerning Taiwan is especially troubling. If China absorbs Taiwan as it did Hong Kong, the U.S. loses a major supplier for advanced chip fabrication. United States policymakers have brought forth but failed to pass the Creating Helpful Incentives to Produce Semiconductors (CHIPS) for America Act. The CHIPS Act will strengthen the entire U.S. chip supply chain, promote a STEM labor force, control exports to China, and realign chip manufacturing with other allies. We saw the impact of a chip shortage during the Covid-19 crisis. “Just-in-time supply left carmakers with no reserves, and one question for reliance is whether and how to incentivize companies to move away from just-in-time supply.”

What should the role of the federal government be? This is a long-standing debate. “The well-known case of Solyndra became the poster child for why the government should refrain from selecting a specific technology company to support, and instead emphasize market competition to identify the most successful paths forward.” The issue is not easily solved but it must be recognized as a strategic challenge and not just an economic challenge. China is on the move.

As with Lewis, Broadbent (2020) disagrees with the reshoring movement. Her report describes how a few key supply chains operated during the pandemic and offers possible solutions, but not to reshore. Experience and economic reality suggest that the path to more resilient and secure medical supply chains is through rational diversification, flexibility, and closer cooperation with trusted partners, not protectionism and government directives to make everything at home. The Covid-19 pandemic caused a wave of demand shock throughout the global medical supply chains. Personal protective equipment (PPE) demands skyrocketed, magnifying the public health crisis. United States Strategic National Stockpiles (SNS) were

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exhausted and states, private industry, and hospitals competed to secure what they could, resulting in a procurement free-for-all.

As the pandemic progressed, the United States learned quickly that it had become too reliant upon only a few nations for its PPE imports. Many of the PPE products were supplied by China, a recent adversary in trade. “This led to supply chain vulnerabilities that have since drawn the attention of Congress and the Trump administration.” Furthermore, the Association for Professionals in Infection Control and Epidemiology (APIC) surveyed infection prevention experts in 2020, who estimated that “48 percent of U.S. healthcare facilities surveyed were already or almost out of N95 respirators to use in caring for a patient with Covid-19.” It became a common narrative that hospitals, which were short of supplies, reported long wait times for testing and results. Health and Human Services found that because of the delays, hospitals treated symptomatic patients as positive cases of Covid-19, further straining hospitals and national panic. The study released by Preventive Medicine listed four factors that contributed to the PPE crisis:

1. A dysfunctional costing model used by hospitals to budget for PPE
2. Demand shock triggered by both acute healthcare needs and a panicked marketplace
3. Poor federal government oversight of the SNS
4. Severe disruptions to the PPE global supply chain.

The secondary effect of the PPE crisis was caused by export restrictions. In an aim to maintain and replenish the SNS, the federal government enacted export restrictions on PPE. This artificially reduced export demand and discouraged production capacity. “At the outset of the pandemic, many governments imposed export controls with little notice, creating unpredictability and instability across global supply chains.” As the Trump administration

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implemented export controls on PPEs to prevent further shortages, many domestic manufacturers slowed their production for fear of holding surplus inventory.

The response from China affected the global supply chains for PPE drastically. China, the number one producer of the world's PPE, prioritized domestic distribution and also made large state-back purchases on the international market. This fueled global PPE scarcity and caused a run on world supplies. At the time of this writing, China was selectively exporting its supplies based on political calculations. This caused many nations to be discussing reshoring manufacturing or standing up domestic production. "The fact that China was the largest U.S. supplier of N95 respirators, surgical masks, protective garments, medical gloves, medical shoe covers, and medical goggles in 2019 highlights how heavy reliance on China for PPE imports might be a strategic vulnerability during a deadly global pandemic."

These instances are a few drivers that have given momentum to policymakers to get to the bottom of the shortage crisis. "On August 6, 2020, amid increased calls for reshoring and locating the production of essential medical products in the United States, President Donald Trump issued an Executive Order requiring the federal government to purchase "essential" drugs and other related products solely from U.S. manufacturers rather than from overseas companies, particularly those in China." The order tasked the Food and Drug Administration (FDA) to formulate a list of essential medicines, countermeasures, and critical components within the scope of the order. The FDA identified 96 types of countermeasure devices, PPE, vaccine delivery devices, ventilators, and other pieces of equipment used to manage acute illnesses. They also identified 227 drug and pharmaceutical products that were essential to responding to future pandemics, epidemics, and chemical, biological, radiological, and nuclear attacks.

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Future research has been directed by Congress in December 2020. “The U.S. International Trade Commission (ITC) will complete an investigation of U.S. industrial sectors producing Covid-19–related goods—including manufacturers of raw materials and intermediate and finished medical devices, pharmaceuticals, PPE, and diagnostic products—and describe these sectors’ employment, production, and import and export patterns.”

In the research completed, lawmakers learned that advanced economies, like the United States, Germany, Switzerland, and Ireland dominate the production of intermediate ingredients and dosage-ready drugs, accounting for 30 percent of pharmaceutical exports. However, many small-molecule products that aren’t patent-protected are produced in lower-cost production regions like China, India, and Singapore. “While China and India export a relatively small share (3 percent each) of pharmaceutical products by value, they are the world’s key producers of APIs and small-molecule drugs. In some categories, such as antibiotics, sedatives, ibuprofen, and acetaminophen, China is the world’s dominant producer.” Both China and India are possibly key producers of API for the U.S. pharmaceutical market, China controlling about 40 percent of the global market. Despite India producing a large part, about 20 percent, of global exports by volume, they source a majority of their APIs from China. It was observed that “when the flow of these ingredients from China was restricted in the early stages of the Covid-19 pandemic, India temporarily placed export controls on dozens of essential drugs, including antibiotics.” Broadbent (2020) of this report suggests that reshoring is not the solution to solving the medical supply chain problems for several reasons. Despite cheap foreign labor being a reason many corporations manufacture offshore, it is not what keeps them from reshoring operations back to the continental United States. “Only 13 percent of overall goods trade in 2018 involved exports from a low-wage country to a high-wage country. More relevant in most industries are

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regulation, intellectual property protection, and access to a skilled workforce, infrastructure, tax policy, the ability to tap into a free trade agreement network, and other factors that impact the business and regulatory environment.” The author makes several suggestions on how to mitigate the risks that were unveiled during the pandemic.

1. Enhanced commercial ties grounded in a new network of trusted partner countries
2. Commit to coordinating and offering reciprocal support to trusted partner countries during emergencies.
3. The United States should also consider public-private cooperative understandings and other initiatives to encourage research and development (R&D) on pharmaceuticals, medical devices, and advanced manufacturing processes among trusted partners.

These criteria will support supply chain visibility, ease regulatory restrictions, protect intellectual property, and facilitate trade. However, it’s observed that trade flows are shifting from global to more regionalized within Asia, Europe, and North America. “Some multinational companies, to find a balance between cost, speed, coordination, and resilience, are deciding to near-shore production. McKinsey Global Institute (MGI) estimates ‘that 38 to 60 percent of the pharmaceutical value chain could shift geographically in the coming years.’”

Another survey by MGI found that because companies expected supply chain disruptions that lasted a month to happen every three years, many executives are taking steps to mitigate those risks. “An overwhelming 93 percent reported that they plan to take steps to make their supply chains more resilient, including building in redundancy across suppliers, nearshoring, reducing the number of unique parts, and regionalizing their supply chains” closer to consumers. Corporations are building more redundancy into their networks by adding more suppliers, storing more inventory, and placing a higher priority on flexibility. MGI estimates that 16 -26 percent of

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global trade will relocate shortly, moving between \$2.9 to \$4.6 trillion. Some of this could lead to increased domestic production, near-shoring, and shifting offshore locations from Asia to different regions.

However, the Organization for Economic Cooperation and Development (OECD) ran simulations that determined the localization of supply chains reduced GDP and would slow the post-Covid-19 recovery. “Not to be confused with maintaining global value chains and reorienting them toward trusted partners, the OECD localization model is more in line with attempts at wholesale reshoring and assumes a global rise in tariffs and subsidies, among other restrictions.” The National Bureau of Economic Research published a report that observed that “GDP contractions amid Covid-19 shutdowns would have been worse if global value chains were reshored because government lockdowns also affected the supply of domestic inputs.” The author’s view is that extensive reshoring policies would present added risks.

The alternative to reshoring could still be in line with the regionalization trend. Near-shoring provides possible solutions for the United States. The United States and Canada's performance during the pandemic confirm the benefits of maintaining supply chains with trusted partners. Canada has a deep trading history with the U.S. and is a military ally as a member of the North Atlantic Treaty Organization (NATO) and the North American Aerospace Defense Command (NORAD). Canada has been a trusted trading partner so much that the U.S. Federal Emergency Management Agency (FEMA) deemed them exempt from export restrictions of PPE in the spring of 2020. The strong U.S.–Canada relationship enhances the ability of both countries to meet the challenges of Covid-19 in three ways:

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1. Regulatory flexibility and cooperation between U.S. and Canadian health and safety regulators accelerate the authorization and use of drugs, disinfectants, and PPE used to fight Covid-19 in both countries.
2. Improving the North American medical-industrial base through government policies that encourage new investment in domestic PPE and medical supply manufacturing and avoid imposing export restrictions on each other.
3. Research and development cooperation on new drugs companies that have a presence in both the United States and Canada.

The United States and Canada have such a shared reliance on each other that near-shoring manufacturing capability ought to be preferred over reshoring back to the States. This move would diversify our medical supply chains as well as strengthen the alliance with Canada.

U.S. Opportunities to Reshore and Near-shore

Stonington (2020) offers a background of the United States' supply chain. First, the U.S. is a production giant and then moving towards the world's major consumer. With the global economy in its current state, reshoring could be the next wave.

The Covid-19 pandemic highlighted several gaps within the United States' supply chains. Many U.S.-based corporations have begun to consider ways to mitigate the risks inherent to off-shoring their supplier base. What is the delicate balance between on-shoring and off-shoring? By World War II, the U.S. had already developed a major manufacturing base so to support the wartime efforts, a minor shift was all that was required. Especially during a global crisis, like a world war, an onshore supply base was essential. "Americans realized the strategic benefit of onshore manufacturing – especially during a global crisis when there is limited access to foreign

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goods, services, and materials – so that we, as a country with vast resources, can be self-reliant and not have to shut down our industries.”

During the Nixon Administration, the United States began to open up a dialogue with eastern nations, namely China. America’s major public companies began to shift manufacturing operations to the developing nation. “By offshoring to countries with fewer labor and environmental regulations, the U.S. was able to generate enough profit to mitigate the enormous cost of shipping finished goods and even raw materials internationally.” The United States had shifted to become a consumer-led society and Americans desired cheaper products. China offered that.

Now that we’ve seen what happens to an off-shore supply chain during a global crisis, many companies are considering the value of reshoring essential manufacturing processes. This will not come easily. “Companies will need to figure out how to employ more U.S. workers at higher living wages while staying competitive economically.” This could lead to increased tariffs on imports which is not a wonderful solution for foreign trade with allies. However, with the rise of artificial intelligence, robotic technologies, and machine learning, the need for human labor could decrease and lower prices could follow. “The old notion of positioning yourself to sell picks and shovels to miners instead of being the guy who’s looking for gold still holds. Today’s picks and shovels are 3D manufacturing technologies, enterprise software, and software as a service (SaaS) apps.”

Reshoring manufacturing would provide enormous transportation savings costs and allow for innovation. “When you manufacture your product 5,000 miles away, you must spend extra time specializing your process to each market. In contrast, localized production facilitates just-in-

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time manufacturing, which optimizes workflow to more quickly produce a more specialized product for less capital investment.”

In our globalized economy, it wasn't just the United States, but many nations suffered supply chain shortages during the Covid-19 pandemic. Multinational corporations are seeking new ways to mitigate risks and avoid these challenges again. Calls for reshoring and nearshoring are being heard in political circles in many developed countries.

Fiott and Theodosopoulos (2020) portray the difficulties the European Union faces in achieving what they call supply sovereignty. That is the ability to be independent of foreign suppliers through internal production. Their analysis reveals several critical areas of dependence that must be rectified to maintain its security. For example, “the EU has a relatively high dependence on Russia for nickel (72.5%), a resource used in all sorts of manufactured goods such as batteries. Unsurprisingly, the EU also has a high level of dependence on Russian imports of coal, iron, steel and petroleum products.” Additionally, imports from China represent a larger dependence on imports. “The dependence rate is high for automatic data processing machines (33.8%), telecommunications equipment (33.5%), and electric power machinery (31.8%). The Union also has a high dependence rate on US-sourced non-electric motors and engines (53.1%), which are used in mining and fossil fuel refining because they are safer than electric engines and motors.”

The challenge this presents to European security can come in a variety of ways. First, Russia can withhold energy from Europe during colder seasons if President Vladimir Putin demands it, although that would cut revenues from the Russian treasury. China, however, can withhold from Europe because they have a more diversified export portfolio. In 2019, Russia exported 42% of its total goods to the EU while China only exported 15% in 2018.

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Fiott and Theodosopoulos (2020) acknowledge data shortfalls in their report. For example, despite performing a thorough analysis of the trade data associated with the European Union, it is difficult to ascertain a complete supply chain picture. “For example, we know from the data that the EU does not have a harmful dependence on painkillers because it both produces and imports such medicine, but there is a potentially harmful dependence on the Active Ingredients (APIs) that are used to produce them because those are concentrated in a handful of countries.” This instance occurs in other imports such as rare earth minerals (REEs), which are used in numerous technological and digital products.

What can be done? Fiott and Theodosopoulos (2020) proclaim that the internal European market must be strengthened for the EU to remain self-reliant. The challenge the Union faces is that through decades of de-industrialization, manufacturing and skill gaps in pertinent sectors have widened. To achieve digital sovereignty, those gaps must be filled. That takes time. In the meantime, sourcing from other nations is not without its challenges. The study sites the Fragile States Index (FSI) as a means to determine sourcing options. “However, trade diversification will not be a simple affair because the same geopolitical shifts that are pushing the Union to secure supplies are making diversification harder.” Where should the EU run to? It’s difficult to negotiate trade agreements with fragile states and then guarantee supply chain resilience. Is the choice a sourcing nation that can ‘weaponize trade’ or one that is embroiled in breakdowns of governance, coup d’états, civil war, conflict, or disease? “Looking at the Fragile States Index (FSI) it would seem that there is a higher risk in diversifying trade to countries located in Africa, Asia, and Central/Latin America and that the EU’s most stable trade partners would be Argentina, Australia, Canada, Japan, the UK, and the US.” While there is nobility in

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investing in emerging economies and developing nations, the fragility brings about risks that may undermine a nation's original attempt to ensure supply chain sovereignty.

The European Union does face major challenges when maintaining its supply chain security. Many of its energy and manufacturing goods are imported and those imports come from potentially volatile and coercive nations. The EU must be able to increase the internal infrastructure required to support its supply needs. Supply sovereignty is not achieved overnight and must be willing to purchase enough 'rainy-day' stock to buy them at that time.

If the European Union, as well as the United States, plans to change up their supply chains and seek new providers, they are at risk of miscalculating providers and overlooking corruption.

Wrage (2020) writes that with the chaotic trade and supply chain environment that the global economy has witnessed in the past several years, opportunities for corruption could increase.

Wrage (2020) offers suggestions to mitigate these risks.

If for some reason a company needs to decouple its supply chains and seek new options, especially in a hurry, they might select inappropriate suppliers. To mitigate this particular risk, corporations should select service providers that have been pre-screened against sanctions lists and have already made transparency a priority. Choosing these pre-screened service providers can expedite the processes.

Second, service providers that have good reporting procedures in place to safeguard against corruption signal they are prepared to be a strong advocate for transparency and legal practices. "All stakeholders who interact with the supply chain should be aware of hotlines and other reporting mechanisms, which should establish a clear path and adequate protections for whistleblowers."

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Finally, corporations must remain vigilant as they enter new markets and seek new sourcing options. Economies will recover from Covid-19 in a staggered fashion. “To keep up, many companies will be forced to shift parts of supply chains to unfamiliar markets to adapt existing infrastructure and operations. Even a high-level evaluation of corruption risks in a new market can provide insight into the red flags that will require particular vigilance.” One particular resource is the Bribery Risk Matrix, a free platform from TRACE.

The Covid-19 crisis caused supply chains to compress, decouple, pause, bull-whip, and more. The congestion at United States’ ports has put the industry in the spotlight. Therefore, supply chains will be scrutinized much more and become political fodder for years to come. “Government officials and watchdogs will intensify scrutiny of publicly funded stimulus packages, tracking financial flows, and examining corporate books and records more closely.” The global media is fully aware of the supply chain problems. They are looking for how companies respond to this challenge and will be reporting on personnel, human rights, and corruption issues.

While seeking new trading partners, the United States must consider a more regionalized approach. Nearshoring to the Americas provides both a shortened supply chain but also bolsters trade with the nearest neighbors. For that reason, the United States should move toward a new trade agreement for the Americas. This would increase resiliency and mitigate the risks of globalized supply chains. This alliance would not only mitigate the supply chain woes experienced during the Covid-19 pandemic but provide a competitive response to a rising China. China has multiplied its per capita income by 24 over the last 40 years. “It is now the second-largest economy in the world and the largest trader in the world, accounting for 12 percent of global trade. This success was boosted by China’s ability to become the world’s workshop,

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responsible for 35 percent of global manufacturing. “The trade deficit was \$6 million in 1985. By 2017, it was \$375 billion. “As U.S. Trade Representative Robert Lighthizer wrote in a recent op-ed, the pandemic ‘has revealed our overreliance on other countries as sources of critical medicines, medical devices, and personal protective equipment.’” To combat China’s rise, the United States must look south to maintain a competitive advantage. Reshoring manufacturing back to the States is an option but there are challenges associated with such a move. Labor costs and regulatory climate eliminate any cost savings won in the Chinese markets. But a new free-trade agreement within the Western Hemisphere could be a solution.

The Western Hemisphere is home to over 1 billion people, living in 28.4 percent of the Earth’s land area. It is rich in natural resources, technology, and human capital. With adequate incentives for investment, including trade preferences with the United States, capital would flow to the region, and value chains for U.S. companies would become more diverse, safe, and resilient. The U.S. has an established relationship with Mexico. “A recent report by Kearney shows that in 2019, while China’s exports to the United States fell by \$90 billion, those from Mexico grew by \$13 billion.” If other Latin American countries were to be included in U.S. foreign investment and trade, the value lost by vacating China could be found again.

For example, the Bolsonaro administration in Brazil is possibly open to the idea of rethinking agreements outside of Mercosur. If the United States signs an agreement with Brazil, an agreement with Paraguay and Uruguay could quickly follow. Over time, an agreement with Argentina could also be reached. The U.S. has free trade agreements with Mexico, Chile, Colombia, and several Central American countries. Now is the time to pursue a Western Hemisphere trade alliance. One of the most promising candidates for large-scale nearshoring in

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Mexico, due to its geography, existing high level of economic integration with the United States, and participation in the high-standards United States-Mexico-Canada Agreement.

The Biden administration, however, has so far shown little interest in engaging constructively with the administration of Andrés Manuel López Obrador on the broader improvement of Mexico's trade and investment climate. Labor reforms are necessary but not sufficient to get the United States and Mexico to a win-win outcome on both economics and security of reshoring from China to North America.

In a collaborative effort to explore the feasibility and benefits of relocating production to Mexico, the Center for Strategic and International Studies (CSIS) and the Peterson Institute for International Economics (PIIE) organized a group of leading scholars and former officials to offer their perspectives in the collection of short essays that follows. Hamre and Posen (2021) set out the case for a shared Mexican and US interest in building resilient supply chains in North America and prioritizing the economic policies Mexico needs to succeed as a destination for relocated production from China. The essays also explore how the United States, which has tended to focus too narrowly on border and migration issues in its bilateral agenda, can encourage the needed policy changes in Mexico. So doing would in turn deepen North American economic integration and enhance the US and Mexican competitiveness. But Mexico be one of those nations? Maybe, with effort and improvements in infrastructure, investment, and multi-national bureaucracy. "The evidence cited in this Briefing suggests that Mexico faces significant competition for investments in restructured supply chains. Compared with other leading nearshoring locations in Asia and North America, Mexican policies tend to discourage new placements in manufacturing sectors."

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The United States-Mexico-Canada Agreement (USMCA) has numerous flaws that handicap the trade between the three North American nations. The USMCA works “to Mexico’s disadvantage and favors new investment in US-based production of autos, trucks, and parts. As a result, Mexico cannot rely on its North American partners to finance its development and promote its effort to become a nearshoring hub for supply chains migrating from East Asia.” To entice the U.S. and Canada to increase manufacturing inside Mexico, Mexican officials need to improve domestic economic policy and thwart corruption and organized crime. This will make Mexico more attractive to domestic and foreign investment.

Though Mexico enjoys a proximity advantage and market access to its major export market, the USMCA is now being challenged by an upcoming 15-member Regional Comprehensive Economic Partnership (RCEP). To overcome this new competitor, Mexico must improve its business regulations, inadequate and irregular power supplies, and congested road and rail networks. Failing to do so will erode any added value to supply chains, earned by the multinational corporations seeking a new home.

For Mexico to succeed as the choice for nearshoring, promoting sectors where they’ve already attracted Foreign Direct Investment (FDI). Especially, if they previously hosted operations that subsequently moved to China or other Asian nations. This would include areas like machinery and equipment, computer, communications, measurement devices, and transportation equipment.

As it stands, the current USMCA doesn’t seem to support Mexico as a nearshoring manufacturing choice, and reestablishing negotiations won’t be without its challenges. “The pact reopens old conflicts and offers new avenues for trade retaliation. But the main obstacle to Mexico’s success in attracting new investment is homemade.” Mexican leadership should

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evaluate their current policies and regulations, compare those to competitors, and recalibrate to entice nations looking to near-shore. Currently, progress is being made with the leaders of the United States and Mexico launching a renewed Cabinet-level High-Level Economic Dialogue (HLED), dormant since 2017.

The HLED was a productive bilateral cabinet-level working process from 2013–to 2016, but it was dropped by the Trump Administration. Momentum was lost on important items, including border modernization, which was costly to economic efficiency and growth. This new HLED effort recognizes the value of learning from the pandemic economic recession that exposed weaknesses in US-Mexico cross-border supply chains and the management of border trade flows in key sectors such as autos, health supplies, electronics, and aerospace. COVID also underscored the costs and dangers of being dependent on long supply chains to Asia, whereas shorter value chains with Mexico could provide more security in future crises as well as the potential for more efficient supply chains in such areas as semiconductors, medical devices, and pharmaceuticals.

If you grouped with the US and Mexican border-states, they would amount to the third-largest economy in the world. Better facilitation of trade, investment, and development on both sides of the border could easily attract more nearshoring investment, grow jobs, and promote well-being in the cross-border production regions that are already flourishing to the benefit of the United States and Mexico. There are four pillars to consider:

1. The first pillar is “building back together.”
2. The HLED’s second pillar is “promoting sustainable economic and social development in Southern Mexico and Central America.” Mexico’s Economy Minister has also mentioned

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potential supply chain investment in the south of Mexico, and private sector actors argue that road, port, rail, and energy infrastructure investments are vital.

3. The third pillar will look at “securing tools for future prosperity,” including enhanced cybersecurity cooperation and managing the evolution of information technology networks that will become increasingly important in North American trade.
4. The fourth pillar is “investing in our people,” Mexico and the United States should also try to align their recognition of the credentials that workers receive through skills and education programs, a step that can improve wages and worker mobility.

Focusing these efforts on small and medium enterprises to bring them into the USMCA economy and promoting basic skills in southern Mexico and Central America will help attract investment there. There are good US and Mexican examples of collaboration on workforce development that bring together national, subnational, academic, union, foundation, and private sector actors. These examples could provide valuable inspiration for pilot projects. One key area for pilot innovation is the sustainability sector. As China continues to play a major role in this area the United States can gain ground thanks to the natural resources in the Americas.

The United States is increasing efforts to be a more sustainable economy. Energy is of primary concern and the move to harness more green energy becomes increasingly competitive. One competitive solution the U.S. needs to consider is to pursue more trade agreements with South America, namely those that rest in what is called the Lithium Triangle. Lithium is often referred to as “white gold”. The Lithium Triangle is a lithium-rich region in the Andean southwest corner of South America, spanning the borders of Argentina, Bolivia, and Chile and forming a geographic triangle of lithium resources underneath their salt flats. Approximately 58 percent of the world’s lithium resources are found in these three countries, according to the 2021

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USGS Mineral Commodity Summary. There are 86 million tons of lithium sources. Bolivia has 21 million tons, Argentina has 19.3 million tons, and Chile has 9.6 million tons. These nations must be prepared to source from the global market. “While Chile has successfully transformed the majority of its available resources into economically viable reserves available for commercial production, Argentina and Bolivia have thus far failed to do so, largely due to unfavorable investment climates and more challenging geographic conditions.”

Argentina has the largest opportunity to expand lithium production because they’re trying to expedite its economic revival. Only behind Bolivia as the world’s second-largest lithium reserve and third-largest amount of commercially available lithium reserves. It has two operational sites and since 2019, many other extraction mines are being constructed. Argentina’s economic recovery is slow, leading President Alberto Fernandez to reduce taxes on mineral exports this year, to entice more investment.

Bolivia’s political climate has proven to be unreliable to promote foreign investment in its lithium industry. Bolivia has the world’s largest lithium resources but has struggled to turn that into a vehicle for success. “In 2018, a privately owned German firm, ACI Systems, signed a joint lithium venture with Bolivia’s state-owned company, Yacimientos de Litio Bolivianos (YLB). However, the deal was annulled in 2019 amid Bolivia’s political turmoil and has yet to be reinstated under President Luis Arce of the Movement for Socialism (MAS) party, who promised to increase the productivity of Bolivia’s lithium industry.”

Finally, Chile has the largest amount of commercially viable reserves in the world. It has a desert climate and access to the Pacific Ocean. Albemarle, a U.S.-based company that also controls the largest operations in Australia, and Sociedad Quimica y Minera de Chile (SQM), Chile’s largest lithium company.

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Future trade deals and negotiations with the three nations may be difficult for the Biden administration. “The United States’ historically rocky relationship with both Argentina and Bolivia—countries currently run by left-leaning governments that are often critical of the United States—presents a challenging landscape for such cooperation.” However, these poor nations have the opportunity to speed up economic recovery and might be willing to come to the table with the U.S. Special Presidential Envoy for Climate, John Kerry could organize a multilateral clean energy forum that would put the Lithium Triangle nations in a position to improve their foreign investment. “This collaborative effort could increase investment partnerships with Argentina, Bolivia, and Chile, as well as find solutions to common lithium extraction challenges faced by each of the lithium-producing nations. A global partnership with the Lithium Triangle countries, other key allies.”

Not only do the natural resources of the Americas and the United States’ capability to lead in technological innovation, but the Latin American economic climate is also ripe to be picked out of poverty. Central and South American countries have been hit hard by Covid-19, political unrest, and organized crime. This may present a high risk to foreign investment but could also be the right time to get in.

COVID-19 had an impact on Latin America and this report shows that several nations in the south were already in a fragile state. Shifting supply chains to these regions is not without risk. However, these challenges present an incentive for Latin American countries to accept U.S. operations. Hogenboom and Teijlingen (2020) look into the impact that the Covid-19 pandemic had on the employment and labor rights in the Colombian and Peruvian mining sectors. As a result of decreased global demand for the mining products from these countries, companies and

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their down-trace subsidiaries tried to cut costs on the “back of their labor force, resulting in layoffs, renegotiations, and suspension of contracts.”

After the first case appeared in Brazil in February 2020, governments across the continent began to take action. These actions included lockdowns, mobility restrictions, social distancing measures, emergency responses, and economic support packages. Latin America was already in the middle of economic, political, and social challenges. “The past decade has been characterized by economic instability and the average regional growth rate over the period 2014-19 marked a historical low of 0.4% (ECLAC, 2019a).”

Beginning in 2015, Latin American political leadership shifted from predominantly progressive and left-leaning governments to more conservative and right-wing regimes. To remedy economic woes, these administrations began to embrace neoliberal economic policies, introduced austerity measures, and requested more foreign loans. Many students, workers, and indigenous people went on strike or protested in Chile, Ecuador, Colombia, Costa Rica, Nicaragua, Panama, Honduras, and Haiti.

A major reason Latin American economies struggled during the Covid-19 pandemic is because the global economy came to a halt with lockdowns, leading to decreased production that led to decreased demands. “An important issue here is the high dependency of Latin American economies on the export of minerals, oil, and agricultural products, and therefore on the fluctuations of international commodity markets. Particularly for some South American countries, the export of raw materials represents over 70%, or even 90%, of total exports (World Bank Group, 2018).” Crude oil prices fell. Mineral and metals like platinum, copper, and zinc all declined. “The global reduction in total volume of international trade in 2020 is estimated to be 13% to 32%, which is mainly explained by the slowdown in consumption and economic activity

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in China, the United States of America (USA), and Europe.” This global reduction strongly affects revenues from commodity exports in Latin American economies.

Also, when the Covid-19 crisis occurred, commodity chains declined because foreign investment by multinational corporations was put on hold. Peru saw a 10-30 percent reduction in mining investment in 2020. Anglo American, the London-based mining operation, delayed a US \$1.5 BN investment in a Peruvian copper mine. In Colombia, this report found that investors redirected U.S. \$115 MN out of the country which accounted for 16 percent of their total investment portfolio.

This economic climate in Latin America appears to be similar to that of the 1980s, which was called the ‘Lost Decade’. “In 1982, the continent experienced a severe debt crisis after commodity prices plummeted. Years of negative or zero growth followed in many countries, and the region’s average growth rate amounted to 0.7% in the period 1980-85.” Similar to the 1980s growth rate of 0.7 percent, the last few years have seen 0.4% of average growth. Essentially, Latin American economies are thus in a much weaker position now than they were in the 1980s. The supply chain crisis that the global economy is still in the midst of cannot be tied to one particular issue (Covid-19) or be blamed on one particular country (China). But there are numerous areas of concern that the United States must consider when searching for answers as to why this supply crisis happened. Covid-19 and China are usually found to have contributed in some way. Asian markets currently provide savings in a supply chain, but for how long and under what circumstances. Critical supplies, such as energy-related products, medical supplies, and high-tech products, ought to be sourced with diversity. Currently, China plays a pivotal role in each sector. If another trade war or health crisis were to happen, the United States would find itself again dealing with supply shortages, port congestion, and market overreactions. It doesn’t

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have to be this way. Reshoring to the United States certain supply lines, and more importantly nearshoring certain supply lines to neighboring countries provides the U.S. with shortened supply lines and increases cooperation with Central and South America. Both Central and South American nations are poised for economic growth with the right foreign direct investment. The opportunity is there.

Methodology

A literature review revealed several published studies and articles that evaluate the current risks associated with U.S. multinational corporations and their global supply chains. However, there seem to be just as many advocates for strengthening eastern-based supply chains as there are for reshoring and near-shoring those chains to the western hemisphere. Qualitative research was performed for this seminar paper to draw attention to the idea that different industries face similar, if not identical, risks to their supply chains sourced in Asian markets. By choosing a qualitative approach, there is no need to predict or provide causal explanations, but to provide context and interpretation for future research. Qualitative research seeks to build an understanding of phenomena (i.e. human behavior, cultural or social organization); often focuses on meaning, and may be described as describing social or cultural dynamics, or individual perception. This methodology often uses exploratory questions, such as how and why an event occurred. The intent is to understand the supply chain and economic community's perspective and present a conclusion.

The primary instrument for this research was to review the current industrial discourse taking place. The public dialogue related to the Covid-19 pandemic has reduced dramatically as of this writing but the U.S. economy has yet to fully recover. Supply chain shortages remain for multiple industries and with the Russian invasion of Ukraine, global supply chain risks have only

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increased. The research aimed to explore the risks associated with medical equipment supply chains, pharmaceutical supply chains, and electronic chip supply chains. Through qualitative research, think tanks like the Center for Strategic and International Studies (CSIS), the Brookings Institution, the Peterson Institute for International Economics (PIIE), and the European Union Institute for Security Studies (EUISS) proved to have performed valuable quantitative research about sourcing from Asia and the possibilities of reshoring and near-shoring to the West. Finally, news outlets provided current, generic context to the effects of supply chains sourced from Asia.

Authors of the original documents come from astute professional backgrounds with numerous qualifications in international trade, public policy, and national defense. For example, Ryan Haas from the Brookings Institution is a 15-year veteran of the Foreign Service and has served in Beijing as a Foreign Service Officer, as well as a member of the National Security Council for the Obama administration. Numerous authors from the CSIS are members of the Scholl Chair in International Business, examining the relationship of international trade to economic development. Dr. Ryan Berg is a premier authority on U.S.-Latin America relations, authoritarian regimes, armed conflict, strategic competition, and trade and development issues. He's a former research fellow at the American Enterprise Institute (AEI), where he helped lead its Latin America Studies Program. Also from CSIS, James Lewis was a diplomat and member of the Senior Executive Service with experience in remote sensing, encryption, high-tech exports, and cybersecurity. His testimony to the U.S. Senate Committee on Commerce, Science, and Transportation proved to be vital in conveying the national security risks associated with U.S. global supply chains. Think Tanks like the Brookings Institution, CSIS, and the Peterson Institute for International Economics (PIIE) provided the qualitative analysis as a reference point

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to articulate the array of risks in the global supply chains. From there, further research was performed to uncover sourcing possibilities that lie in Central and South America. As with their risk analysis, the Think Tanks also have an abundance of economic intelligence on Latin American Nations which provided insight into the risks associated with the overall recommendation of this paper. What are examples of the risks multinational corporations face in Asia, specifically China? Are those same risks present in prospective Latin American countries? If so, are companies able to mitigate those risks?

Further research opportunities into global supply chain risk are available from a quantitative methodology. Multinational corporations may not be as forthright about past or potential financial losses as they could threaten future investment. However, statistical analysis of trade wars, state-on-state conflict, port congestion, the U.S. economic outlook, and rare earth element cultivation could uncover a trove of evidence that would support a reshoring and near-shoring recommendation. That recommendation could be supported by further research into emerging Latin American economies, their political currents, and possible opportunities for multi-national corporations looking for new nation-state partnerships.

Conclusion and Recommendations

Multinational companies that source from and manufacture primarily in Asia will have challenges to overcome if a reshoring and near-shoring initiative is pursued. One can look at a variety of data to determine the feasibility of this recommendation. For the conclusion of this seminar paper, five criteria were chosen to analyze the challenges a company could face:

1. Cost of Living
2. Fixed Broadband
3. Cargo Throughput

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4. Logistics Performance Index
5. Corporate Tax Rates

Five Asian nations were analyzed, with regards to these metrics, as well as five Central and South American nations. Not all countries, from either hemisphere, ranked in the top five of each category entirely, but were routinely competitive and thus chosen as nations to measure. The countries included:

Asia

1. China
2. India
3. Japan
4. Singapore
5. South Korea

Central and South America

1. Brazil
2. Chile
3. Colombia
4. Mexico
5. Peru

The ten countries were then scored against the five criteria. In most cases, the highest score was given a score of ten and the lowest number was given a score of one. The only exception to this technique was the Corporate Tax rate as the lower the rate, the more attractive it is to corporations. Therefore, the lowest tax rate received a score of ten and the highest tax rate received a score of one.

Cost of living was chosen as a criterion to get a sense of labor opportunities and challenges. A major draw for U.S.-based companies to manufacture in Asia is the cost of labor. “Although America can produce all it needs, China, Mexico, and other emerging market countries can produce it for less. Their cost of living is lower, which allows them to pay their

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workers less. Thus, they are better at producing what U.S. consumers want than American companies could. This is called the "theory of comparative advantage." (Amadeo, 2021). T

Fixed Broadband was chosen as criteria to speculate whether or not potential near-shoring countries have the technological infrastructure to support multi-national corporations. "5G, when fully implemented, is poised to be a very big deal, a far bigger transformation in mobile technology than any previous generational shift. Its speed, capacity, and dramatically reduced power consumption and communications response times, or "latency," will make possible an astonishing range of innovative new products and services. The economic and social benefits could be enormous." (Abbosh & Downes, 2019) The competitiveness of a corporation is inextricably tied to network speed and strength. Do potential near-shoring contenders have the ability to offer this now or shortly?

Cargo throughput, specifically the ability to perform port transfers of the standard twenty-foot equivalent (TEU) containers was chosen as criteria as it is a standard supply chain key performance indicator (KPI). Modernized port infrastructure speaks to a country's ability to compete in a globalized economy. As stated earlier about the deteriorating U.S.-China relationship and the Covid-19 pandemic, these contributions to supply chain risks will become evident at congested U.S. ports. "The traffic surge on the eastbound trans-Pacific has led to long waiting times for unloading, extended dwell times as terminal operators had to cope with equipment and staff shortages, and delays in unloading and returning empty containers or repositioning them for export loads. This has spilled into the intermodal rail networks that bring products to Midwestern distribution centers with additional delays and congestion surcharges" (Shih & Foucault, 2021). The challenge with using this metric is that research showed China as having nine of the top 20 ports in the world with TEU throughput. China possesses a much larger

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coastline of approximately 9,000 miles, and Peru has roughly 1,500 miles, the former would have more ports. Due to the Chinese dominance of ports, this paper only considers China's number one port in Shanghai. Furthermore, if a reshoring and near-shoring movement were to commence, those statistics would most certainly fluctuate.

The **Logistics Performance Index** (LPI), developed by The World Bank Organization, is a ranking system that analyzes nations for their attractiveness to global corporations. This index provides an aggregated score based upon recent theoretical and empirical research and on the practical experience of logistics professionals involved in international freight forwarding. These components include:

1. The efficiency of customs and border management clearance (“Customs”).
2. The quality of trade and transport infrastructure (Infrastructure”).
3. The ease of arranging competitively priced shipments (Ease of arranging shipments”).
4. The competence and quality of logistics services—trucking, forwarding, and customs brokerage (“Quality of logistics services”).
5. The ability to track and trace consignments (“Tracking and tracing”).
6. The frequency with which shipments reach consignees within scheduled or expected delivery times (“Timeliness”).

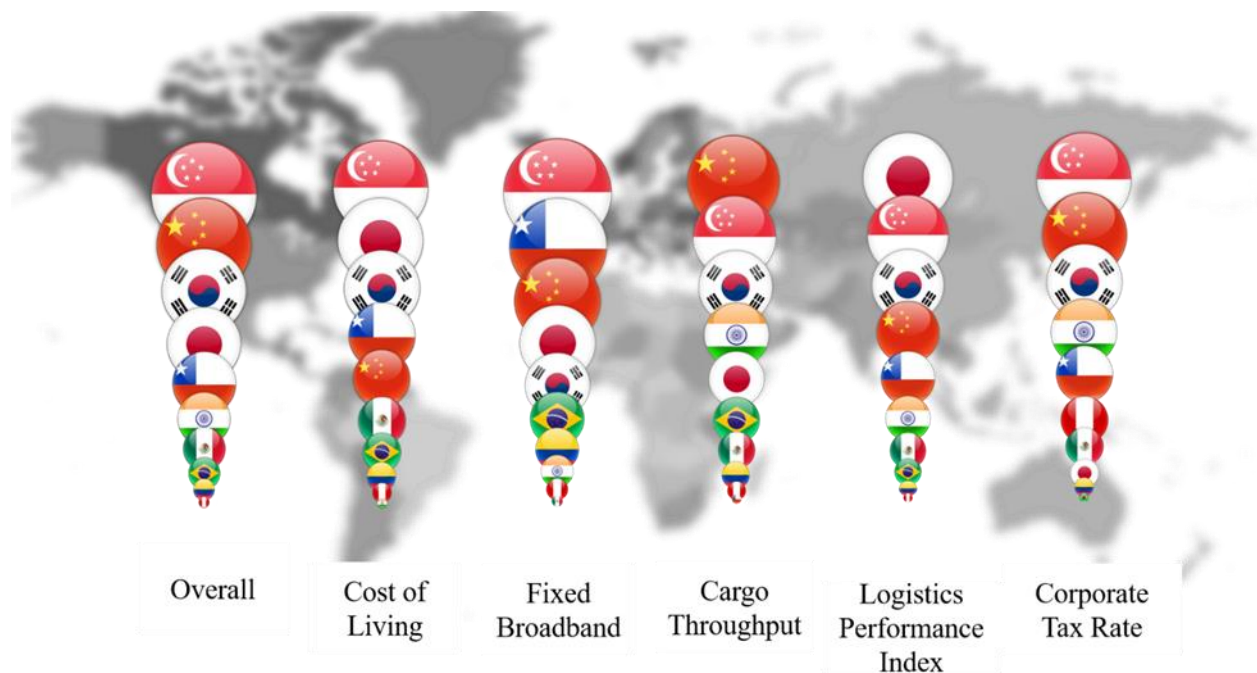
The LPI uses standard statistical techniques to aggregate the data into a single indicator that can be used for cross-country comparisons. (lpi.worldbank.org)

Corporate Tax rates were chosen as criteria as it speaks to a nation's friendliness towards business. Some nations favor a more free-market approach to corporate economics and would thus be a more enticing option for corporations looking to near-shore. According to the

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Heritage Foundation, placing higher costs on labor and capital via taxes limits freedom and creates barriers to production. “In keeping with this understanding of modern economics, the countries of the Organization for Economic Cooperation and Development have been cutting corporate tax rates to remain competitive in the global market since the 1980s. Before the ’80s, those countries had corporate tax rates ranging from percentages in the mid-30s up to nearly 60% in Germany and Sweden. Such levels are unheard of today. Every Organization for Economic Cooperation and Development nation now has a corporate tax rate under 35%” (Kim, 2019). This criterion, unlike the other metrics, was scored with the most favorable corporate rates, or the lowest tax rates, given a rank of ten and the least favorable scoring a one.

The results from these metrics show that the Asian nations predictably outperformed the Central and South American nations. This result was never truly in question. This does provide insight into the areas that the western hemisphere countries should aim to improve upon.



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Of the Central and South American nations, Chile shows the most promise for immediate near-shoring moves. While it does considerably poor in cargo throughput, the fixed broadband, higher cost of living, LPI score, and corporate tax rate provide some competitiveness. The other four nations are never competitive with the Asian counterparts of this study. This short data analysis does not at all provide an exhaustive list of logistics KPIs that a multinational corporation must consider when near-shoring.

Therefore, the conclusion can only be that, though there are numerous risks with sourcing and manufacturing in Asian markets, multi-national companies have nowhere to go in Latin America if they wish to remain competitive in a global economy.

Further Research

There lie many opportunities for further research within the scope of this seminar paper. For instance, the qualitative approach to the paper provides anecdotal information on the subject but a quantitative approach could expose further risks in the medical supply, pharmaceutical, and electronic chip industries. Furthermore, the Key Performance Indicators (KPI) used to conclude the feasibility of near-shoring each provides ample opportunities for further research.

The Cargo Throughput data set provided insight as to the capability of a Latin American nation to support global supply and demand, but only as it is today. This concept presents a future scenario where that nation would become a global manufacturer. Simply, these nations don't need to have an increased port infrastructure today, therefore they scored lower than their Asian competitors.

Further research could define the potential savings earned through a reduction in transportation costs because of shorter maritime routes, free trade agreements, and so on.

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The Cost of Living data set only sheds light on the labor market issue. This metric could be expanded with further research as to the correlation with higher wages garnering greater employee expertise. Researchers could measure that against production costs associated with quality control. The technical competency enjoyed by Japan cannot simply be built overnight in Mexico. It must be developed. How long would that take and at what cost through investment and opportunity costs?

Further research into the risks highlighted earlier in this seminar paper could be expanded. At the beginning of this research project, Russia had not invaded Ukraine. This invasion only exacerbated global supply constraints. Indeed, global powers have begun to show their intentions to pick a side.

The tense U.S. – China relationship has not eased with a new Biden administration. There are opportunities to research alliances between China, Russia, and Latin American nations. China and Russia may be out-maneuvering the United States in supply chain competition. The overall aim of this paper was to identify, understand, and articulate the risks that the United States faces by off-shoring suppliers and sourcing solutions to Asian markets. Additionally, to advocate for U.S.-based companies to vacate eastern markets and reshore their supply chains to the continental U.S. and near-shore to other Western Hemisphere sourcing options as a risk mitigation method. It is apparent that for this to occur, the United States would need to promote improved trade agreements with these Latin American countries, increase foreign investment in their infrastructure, and do so while decoupling from Asian markets.

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