

The Supply Chain Crisis: An Alternative Perspective on the Causes, Consequences, and Policies

Giuliana Campanelli Andreopoulos¹, Beverlee Dacey², & Alexandros Panayides¹

¹ College of Business, William Paterson University, New Jersey, USA

² Amodex Products Inc., New York, New York, USA

Correspondence: Alexandros Panayides, College of Business, William Paterson University, New Jersey, USA.

Received: October 28, 2022

Accepted: December 10, 2022

Online Published: xx, 2022

doi:10.5539/ibr.v16n1p39

URL: <https://doi.org/10.5539/ibr.v16n1p39>

Abstract

Over the last two years the American economy experienced several interrelated crises: covid- 19, inflation, and the disruption of the supply chain. The focus of our paper is on the supply chain shortages. We are addressing its main causes, discussing its consequences, and suggesting policies to fix them. The emphasis is on several elements that have been overlooked by scholars, media, and industry. These elements include natural disasters, corporate consolidation, allocation of finished goods, and shift in stockpiling of raw materials.

Keywords: supply chain, consolidation, stockpiling

1. Introduction and Methodology

In this paper we will address supply shortages, its leading causes, its consequences, and suggest policies.

The literature on the supply chain has several shortcomings: does not include important factors such as natural disasters, does not provide a comprehensive discussion on its consequences, and the policy recommendations are limited.

The scope of this study is to overcome these limitations using an empirical approach based on the direct experiences of private-sector business leaders and associated business reports. This methodology is particularly relevant in the discussion on increase industry consolidation, reallocation of production towards the most profitable products, and shift in stockpiling of raw materials.

2. The Main Causes

The most common interpretation of the supply chain shortages is that they have been driven primarily by demand and are a short-term phenomenon. More specifically, the unexpected growth of the demand for goods (mainly furniture, appliances, auto, and electronics) during the pandemic, as well as the expansionary fiscal policies adopted by the Biden administration, have created an enormous pressure on production and, since companies were unable to keep up with these demands, prices increased. If this interpretation is sound, we can be confident that as the pandemic eventually abates the supply shortage will self-correct, the demand for goods will decline, services will rebound, and the shortages will be reduced.

However, additional investigation shows that the supply chain crisis is also due to supply forces: shortages of truck drivers, containers, production inputs, and utilities, including oil and gas. These shortages put pressure on prices and create enormous delays on the distribution. At the port of Los Angeles and Oakland, California, dozens of ships were forced to anchor out in the ocean for days before they could be unloaded. At the same time dockworkers and truck drivers were stuck in quarantine or not sufficiently available making unloading even more difficult. In addition, the cost of sending a forty -foot containers from China to the US from 2,000 dollars increased to 20,000 dollars from January 2020 to October 2021 and United States annually imports nearly half a trillion dollars of goods from China (Siripurapu, 2021).

Furthermore, we need to consider the just in time production model- implemented by many companies after globalization- which reduced warehousing space and relied exclusively on imports from other countries. This model has the advantages of reducing storage and inventory costs and avoid stock perishing, however, it can easily run out of stock and cause delays to customer receipts of goods.

"Just-in-time (JIT) and just-in-case (JIC) are on opposite ends of the inventory philosophy spectrum: One aims for

lean operations, the other makes stockpiling a priority. Both are commonly employed in manufacturing and distribution, but any business providing tangible products, such as retail or food and beverage, falls somewhere on the JIT versus JIC curve. Companies committed to just-in-time inventory focus on making the supply chain as lean as possible. It's a reactive strategy, where inventory purchasing decisions are based on current conditions.

In contrast, those that prefer a just-in-case inventory approach are proactive. Purchases are made to maintain a healthy stockpile and avoid running out of raw materials or work in progress items and slowing or stopping production (Jenkins, 2021). There is also less material cost elasticity with large quantities ordered at one time.

Finally, we should add China "zero tolerance Covid 19 policies". China has implemented one of the toughest policies in the world requiring cities to enter strict lockdown even if few covid cases were reported. In major cities, like Beijing and Shanghai, massive testing has been carried out, people have been locked up in their homes for weeks, travelling was not allowed, and production has shut down due to harsh government policies. Covid 19 also disrupted manufacturing production in Bangladesh, India, Vietnam, and other countries with which the US is trading. Thus, the recent supply crisis not only shows the difficulties, but also the vulnerabilities of the US supply chain.

On this issue it is worth recalling that the actual supply chain -which is the result of the proliferation of the trade agreements in the 1980s- consists of a series of intricate and highly specialized steps in different parts of the world to produce and sell products. This has allowed companies to manufacture or assemble parts of the product in the countries with the lowest costs, substantially increasing their profit margin. When a product is the result of multiple firms employing thousands of workers across continents, companies dramatically increase their exposure to risks such as cyberattacks, supply disruptions, and labor disputes.

A specific example of the complexity of the supply chain is the semiconductor where the design, equipment, materials, manufacturing, and sales are spread around Europe, US, Japan, South Korea, Malaysia, and China (Siripurapu, 2021). The semiconductor being one critical component of a vast array of products like computers and cars, was one of the products most affected by the supply shortage even before the pandemic.

However, all the above-mentioned factors – demand and supply forces, price increases, just in time production, and Chinese zero tolerance policies- do not fully explain the supply chain shortage.

We need to add a very important factor which has received less attention by scholars and media: the natural disasters which destroyed access to essential materials like plastic and paints produced by petrochemicals and chemical plants. We highlight the winter storm which hit the chemical plants in Texas in February 2021, the massive fire which destroyed the Rockton Illinois chemical plant in June 2021, the lightning strike which temporary shut down a chemical plant in Lake Charles, Louisiana, in July 2021. Another example is of natural disaster is the shortage of chlorine supplies due to a fire at a chemical plant in Louisiana last August that was damaged by hurricane Laura. As a result, prices for tabs have skyrocketed. "A quick look at Amazon shows that a 50-pound bucket of 3-inch chlorine tablets from the In the Swim brand now costs as much as \$169.66, about double the cost..." (Valinsky, 2021). Previously refineries and chemical plants were hit by Hurricane Ida and tropical Storm Nicholas (Wiseman and Krisher, 2021). Recently, on August 9, 2022, a fire burned down a manufacturing building in Chickasha, Oklahoma, holding some 1.5 million gallons of alcohol-based hand sanitizer.

These shortages occurred during the pandemic, when the demand for plastics surged especially for food and household goods packaging, automobile, medical supplies, automobile components and personal protective equipment.

It is worth adding that the shortage of essential materials for production has been accompanied by food shortages. Between 2021-22 there were more than 23 fires at US food processing facilities. Among the 23 fires are the following:

Company Name	Date of Fire	
Azure Standard	April	16
Taylor Farms Processing Facilities	April	13
Penobscot McCrum potato processing plant	March	24
East Conway Beef & Pork	April	12
A Nestle plant	March	16
Shearer's Foods potato chip plant	February	16
Wisconsin River Meats	February	3
Carqill-Nutrena plant	January	13
Poultry processing plant	January	6

Finally, Russia's ongoing invasion of Ukraine further straining farming and food production has kept global oil

prices very high.

Thus, due to the intensification of extreme weather conditions such as storms, flooding, and fires, many companies- global, domestic, big, and small- experienced disruption for which they were not at all prepared (Boyson et al, 2022).

3. The Main Consequences

The growing awareness of the supply chain risks may produce a reduction in the globalization process, a phenomenon defined as “slowbalisation”, but this is not a realistic expectation for the immediate future.

In the meantime, the supply shortages have produced three significant trends which have not received due attention: increase in industry consolidation, a reallocation of production towards the most profitable products, and shift in stock piling of raw material.

The merger and acquisition (M&A) dealmaking momentum accelerated throughout 2021, resulting in one of the most active M&A markets on record. According to Pitchbook estimates, 3,700 private equity (PE) deals were transacted in the first half of 2021, worth a combined \$450bn, while mega-deals of \$1bn or more surged. Several factors are driving the record activity, including a significant amount of available capital from private equity firms, the looming threat of a capital gains tax hike, and corporations continuing to use M&A to adapt, evolve and drive growth as the economy recovers. Valuation levels of potential acquisition are attractive, however, there is a lack of business supply. Many of these acquisitions include companies consolidating with those in their supply chain. Often companies that produce standard parts discontinue those components made by the acquired supplier. The outcome will be large businesses continuing to take market share from small businesses, and the corporations at the top of the pyramid consolidating into ever-bigger, mega corporations.

According to a new investor update posted to General Electric’s website, “the company plans to streamline operations and its supply chain through a variety of changes designed to broaden profit margins and cut costs. Some of the big takeaways...include GE’s intention to reduce inventory, cut costs through ‘rigorous’ supply chain management, and ‘revamping the supply chain...The update also included a note regarding GE’s plan to acquire companies to improve its own supply chain.”GE aims to reduce inventory, manage supply chain ‘rigorously,’(Macri,2017).This is a very dangerous trend for both small companies and consumers, considering that many of the companies are already very big, for example in the food industry just four companies control about 85 percent of the beef market and three companies dominate the chicken business and CEOs are telling shareholders that they raised prices above their additional costs simply because “they could” (Hauter,2022).

In addition, manufactures are discontinuing products that are less profitable or contain raw materials that are in limited supply. These same corporations control access to raw materials, thus making it more difficult for small companies to compete. For example, “Kraft Heinz is another company whose portfolio of products is getting pruned this year. The company has been struggling to keep up with competition across 56 grocery channels...the Wall Street Journal reports that the company is retiring products that are less profitable and harder to produce.” (Dominko,2020). In addition, “Hugh Johnson, PepsiCo’s vice chairman and CFO, said the company has been ‘Buying ahead’ on a nine months’ timeline, for example...Coca-Cola executives, meanwhile, praised their production and supply system upgrades...the company may not be able to ‘perfectly’ handle short term ‘supply shock’ in 2022, Coca-Cola has been focused on adapting long-term ‘structural squeezes going on in supply chain.’ These changes include streamlining the company’s portfolio, eliminating, or selling off brands like Tab and Odwalla as well as reducing products in remaining brands.” (McCann,2022).

Current production limitations have resulted in manufacturers controlling the quantity of products allocated to distribution channels. This directly impacts retail store inventory, leaving empty shelf space eliminating the less profitable products, and charging exorbitant prices for the more profitable ones.

Thirdly, there is a shift in stock piling of raw material. Following the 2008 recession, the lean manufacturing movement escalated. As the pandemic emerged, this practice left many companies struggling to fill their orders due to limited raw materials. Small and medium-sized manufacturers ignored indicators of looming supply chain challenges. This has resulted in a reduction of end-products and corresponding gross sales. In response, companies pivoted to a hoarding inventory strategy to assure sufficient raw material quantities and mitigate material cost increases needed to meet production and sales goals. This accelerated their material investment, which resulted in cash flow challenges and increased costs of goods.

The effects of these three trends are an acceleration of inflation, a reduction of product variety, and a reduction in cash flow all leading to more complex order forecasting and loss of perishable goods.

The dramatic increases in the direct costs of products (materials) and conversion costs (i.e., utilities, salaries,

transportation, rent, etc.). will increase the price of goods at the register, with negative effects on consumers, particularly for those with low and fixed incomes.

4. The Main Policy Recommendations

Onshoring will likely make the American economy more resilient to future shocks. However- as already pointed out – domestic production can also be vulnerable to supply shocks due to natural disaster. In addition, onshoring is a long-term strategy that will not address immediate concerns. Furthermore, increasing domestic manufacturing of critical products like semiconductors, high tech products and essential medical supply is challenging for the following reasons:

- Limited materials for production and equipment (Willy et al,2021)
- Much higher unit costs than Asian manufacturers
- Limited manufacturing talents: engineers, technicians, factory workers. In the 50s 60s and earlier part of the 70s the US had these strengths, but many of them migrated to higher salary occupations a lot of young talents went to the finance industry (Blanchett and Hass,2022).

The policies commonly suggested to fix the supply chains are the followings:

1. Mapping supply chain for critical industries (i.e., defense, energy, pharmaceuticals & communications), and logistics.
2. Monitoring the supply chain in real time
3. Reducing the complexity of government (state & federal) regulations to expand manufacturing production and distribution
4. Expand the US immigration/Visa programs- mainly with Mexico (Lincicone, 2021)- providing for increased skilled and unskilled labor to address the shortage of truck drivers, factory workers, cargo, and logistics.
5. Increase domestic accessibility to product components via R&D
6. Work with US international partners to increase the imports of production components and/or finished products rather than being dependent on geopolitical competitors (Helper and Soltas,2021)

These are all very effective policies, with positive long-term effects. However, they disregard the risk that companies may face due to natural disasters and/or to future supply disruptions, as well as the three major trends discussed in section 2. Therefore, we recommend the following additional policies directed to private/public collaboration.

4.1 Consolidation & Reallocation

Provide low and fixed interest rate financing to motivate new businesses, particularly medium and small companies, that can fill the supply chain void created by mergers and acquisitions. This increased production of materials will result in a higher supply quantity and lower pricing.

Enforce anti-trust policies to minimize the corporate acquisitions, requiring transparency and accountability on pricing and inventory. It is also important to monitor freight rates and shipping costs which are currently very high due to bureaucratic barriers (West, 2022).

Educate companies, particularly small and medium-sized manufacturers, in identifying those signs (such as unanticipated delivery delays) that reflect supply chain shortages. Utilizing this strategy will mitigate manufacturers from managing inventory via limiting retail allocations. Such allocations create shortages and dramatic price increases.

4.2 Stockpiling

Price Controls for gasoline – treat gas like utilities which may limit what corporations can charge and reduce prices.

Improving companies understanding of how natural disasters can affect the supply chain and plan for business continuity. Specifically, corporate closures due to natural disasters result in a dramatic reduction of raw materials.

Provide government incentives through tax credits for encouraging companies to relocate their distribution centers. These locations should address accessibility to key retail accounts, non-natural disaster regions, and labor availability.

Promote the Just-in-Case strategy for supply chain management through state agencies and other business

development partners. Current J-I-T supply chain trends have made forecasting extremely challenging. J-I-C inventory strategy provides more flexibility, bulk discount purchasing, fewer lost sales, and expands competitive edge by providing finished goods to market when competitors are out-of-stock.

Experiences show that both the US private and public sectors have prioritized low costs and increased product accessibility over security and sustainability which has resulted in a myriad of supply risks. Now it is the time to increase the resilience, stability, and security of the US supply chain and promote an environment where small and medium-size companies can compete, flourish, and consumers enjoy a variety of products at competitive prices.

5. Conclusions

The scope of this paper is to study the causal factors behind the supply shortage crisis that the US economy is currently facing, its effects, and suggest additional policies related to the three trend identified.

The investigation on the origin of the supply shortage shows that- in addition to the elements commonly discussed by scholars and the media- natural disasters in production facilities also played a crucial role.

Considering these factors, our investigation reveals that the supply shortages have produced three significant trends: increase in industry consolidation, a reallocation of production towards the most profitable products, and shift in stock piling of raw materials. The effects of these three trends are an acceleration of inflation, a reduction of product variety, and a reduction in the cash flow.

We conclude with formulating several policy recommendations addressing the challenges arising from the natural disasters and three previously identified trends.

References

- Blanchette, J., & Ryan, H. (2022). Can Semiconductor Manufacturing Return to the US? *The Brookings Institution and Center for Strategic and International Studies*, April 14, 2022.
- Boyson, S., & Michael, G. (2022). Lahirish Guntuka, Tiom Linton, Greg Muraski, Bindiya Vakil, and Sumit Vakil. "How exposed is your supply Chain to Climate Risks? Harvard Business Review, May 2022.
- Dominko, M. (2020). *Eat this, Not that*. News, July 20, 2020.
- Hauter, W. (2022). *One Way to Control Inflation? Enforce Price Controls on Corporations*. Otherwords, April 18, 2022.
- Helper, S., & Evan, S. (2021). *Why the Pandemic Has Disrupted Supply Chain*. The White House Blog, June 2021.
- Jenkins, A. (2021). *Just-in-time vs Just-in-case: Choosing the Right Strategy*. Oracle NetSuite, May 3, 2021.
- Lincicone, S. (2021). *More Bad policies contributing to the Supply Chain Crisis*. Cato at Liberty Blog, October 20, 2021 .
- Macri, K. P. (2017). *GE Aims to reduce inventory, manage supply chain 'rigorously'*. Supply Chain Dive, 11/15/2017.
- McCann, M. (2022). *How CPG giants like PepsiCo, Kellogg, and Coca-Cola are navigating inflation*. Modern Retail, February 15, 2022.
- Siripurapu, A. (2021). *What Happened to Supply Chain n 2021*. Council of Foreign Relations, December 13, 2021.
- Valinsky, J. (2021). *Supply Chain Interrupted*. CBB Business, May 9, 2021.
- West, D. (2022). *Six Ways to Improve Global Supply Chain*. Brookings, Report, July 12, 2022.
- Willy, S., Robert, H., & James, W. (2021). *The Challenge of Rebuilding U.S. Domestic Supply Chains*. Harvard Business Review May 2021.

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).