

What Everyone Gets Wrong About the Never-Ending COVID-19 Supply Chain Crisis

Spoiler alert: Just-in-time inventory management was never the problem.

The ongoing global supply chain crisis caused by the COVID-19 pandemic shows no sign of abating. Widespread product shortages are focusing attention on supply chain issues as never before — and while this publicity has shed some light on the problem, it has also spawned (misguided) calls to end the practice of just-in-time inventory management.

Multiple factors have led to the current situation, but they spring from two overarching causes: suppliers' inability to adjust to soaring demand, and government interventions. In order to develop solutions to pandemic-induced product shortages, we need a better understanding of how these issues have played out since early 2020 and resulted in a worldwide logistics logjam.

The Pandemic Effect

As the pandemic took hold in March 2020, consumer demand patterns shifted abruptly. A shift to working from home, along with school closures, fueled increased demand for larger houses, home gadgets, computer and communications gear, furniture, toys, and recreational equipment. Such a dramatic shift would have strained manufacturing in the best of times. During the pandemic, manufacturers could not adjust in time to bridge gaps between supply and demand as they dealt with ongoing labor and material shortages, intermittent plant closures, and shipping delays.

Typically, short-lived supply crunches dissipate quickly as rising prices suppress demand and increased supply restores market equilibrium. But contrary to what standard economic theory about reaching supply-demand equilibrium suggests, prices have risen throughout the economy — in many cases substantially — while shortages have persisted.

Consider, for example, freight transportation. Early in the pandemic, transportation systems were strained by restrictions on air travel and quarantine requirements on vessel crews and interstate truck drivers. As Western countries swung back to higher levels of economic activity, ports could not process the increased shipping volumes. The entire transportation and distribution system was not built to add capacity at the rate the flow was growing, and labor shortages exacerbated the problem. The result was long delays, with ships anchored for weeks outside major ports — and a consequent shortage of maritime containers that were stuck on waiting vessels and could not be reloaded and shipped.

Shipping costs skyrocketed: The cost to ship a container from Asia to the United States' East Coast climbed from around \$1,400 per container to around \$20,000. Many importers of bulky, relatively low-value (per weight) commodities, such as wooden furniture, could not raise prices enough to avoid losses and consequently stopped placing orders.¹ However, many other importers hiked prices for their goods; as long as consumers were willing and able to pay, the market stabilized at higher prices. However, new COVID-19 outbreaks may lead to continued shortages and could drive prices even higher in the future.

Manufacturers Caught in the Squeeze

A prime example of the pandemic's long-lasting disruptive effects are the difficulties facing automotive manufacturers, which are collectively expected to lose some \$110 billion in revenue as a result of the continuing shortage of microchips.²

As the pandemic gripped the world in 2020, car sales plummeted, and automobile manufacturers cut production along with semiconductor orders. Meanwhile, demand surged for personal computers, TVs, and game consoles; new 5G smartphones were rolled out, and cloud computing grew substantially. Technology companies absorbed all the capacity the chipmakers had, and the chipmakers were happy to oblige.

When the economy roared back and consumers returned to dealer showrooms, carmakers and their parts suppliers found that chipmakers had little capacity available for them. By the end of March 2021, chip shortages forced Ford to reduce production significantly at six plants in North America and to cut it even further in June. Earlier in the year, the company said it expected to lose 50% of its vehicle production in the second quarter of 2021; in September, it said it would again cut truck production due to chip shortages.³

Demand for new cars soared in 2021: American consumers were forecast to purchase more than 7 million new vehicles during the first six months of the year — which would be the best first half of any year on record, according to J.D. Power.⁴ Prices increased due to higher material costs and dealers opportunistically adding surcharges. As a result, many consumers shifted to buying used cars, driving those prices through the roof as well.⁵ Despite already high prices, product shortages persisted, and prices continued to rise as a result of the chip shortages.

Making the Situation Worse

Many companies, like consumers, have engaged in buying behavior that can prolong shortages and cause the prices of parts and materials to skyrocket.

Consumers, spurred by media-driven fears of a toilet paper shortage, created one through their panicked overbuying. But consumers weren't the only hoarders. Many companies began ordering extra parts and materials, fearing that suppliers might ration future orders. So, to be

first in line when normal business resumed, some companies ordered much more than they needed, even though suppliers could not meet their demands. Although suppliers understood this game of “phantom orders,” they were committed to delivering what customers asked for. Manufacturers that ordered too much inventory from their suppliers were protected by supply contracts that allowed industrial customers to return all unused parts for a refund. Some suppliers that tried to reason with their customers were met with threats of lawsuits. This over-ordering exacerbated shortages — just like hoarding at the consumer level. The practice also led suppliers to question the demand data, because they believed that the ordering spree could not continue and were therefore reluctant to invest in new capacity.

Government’s Disruptive Influence

As I have discussed, current product shortages stem from multiple factors related to shifts in demand coupled with companies’ inability to increase supplies quickly. But the situation was exacerbated by certain government policies.

In the U.S., the government poured trillions of dollars into the economy in order to help people who lost their jobs or were otherwise in financial distress during the pandemic. These benefits included enhanced unemployment assistance, child tax credits, and expanded food stamp benefits. Government largesse, however, was not precisely targeted and ended up fueling many purchases, leading to a huge increase in demand for many specific goods.

Action taken by the U.S. Federal Reserve also added to the amount of spendable cash driving up demand. It cut its target for the federal fund rate in March 2020 to a range of zero to 0.25%. (It stood at 0.09% as of September 2021.) And the Fed directly encouraged banks to lend by both lowering the rate it charges banks and relaxing regulatory requirements regarding capital buffers.

In a tacit admission of the government’s role in the shortages, Federal Reserve chairman Jerome Powell said on June 16, 2021, “It turns out it’s a heck of a lot easier to create demand than it is to — you know — bring supply back up to snuff.”⁶ The shortages could result in continued inflation, and, again, the Fed chairman noted that “inflation could turn out to be higher and more persistent than we expected.”⁷

The combination of surging COVID-19 cases around the world and increasing demand will make the shortages hampering companies last longer than previous recoveries, thereby preventing the market from reaching equilibrium (even at high prices) anytime soon.

Why Just-in-Time Is Just Not at Fault

As business leaders search for solutions to these issues, it is critically important that they do not allow themselves to be swayed by false narratives — especially those concerning just-in-time (JIT) practices.

Many media outlets have blamed the pandemic shortages on companies' use of the JIT system of minimizing inventories. A typical article in The New York Times argued that companies chose JIT to cut costs, and claimed that the savings "helped finance another shareholder-enriching trend — the growth of share buybacks."⁸ This line of reasoning, and attendant calls to build more inventory, are misguided for three main reasons:

1. The rationale for JIT is not cost reductions — it is to make products with far fewer defects.

The principle of JIT is to limit inventory in each stage of production; it is achieved by pulling only as many parts or as much material as needed for the next batch of products from one production stage to the next, just in time. Defective parts and other problems with parts or process are identified and corrected quickly, thereby iteratively improving not only the finished product but the process as well. The system did help JIT's inventor, Toyota, save money, but the primary aim was to avoid wasted scrap, rework, and warranty claims rather than to reduce the modest costs of holding inventories. Thus, JIT is a story of boosting quality and customer satisfaction rather than a story of penny-pinching.

2. JIT has knock-on benefits because it also enables flexibility. If either demand or supply fluctuates, a JIT system can adjust subsequent production activities on the fly because there is less pre-committed inventory in the system. The repeated deliveries of precisely the right parts at just the right time require tight connections between suppliers, manufacturers, and customers. The result is a process that allows for fast adjustment to changing market conditions, making the company far more adaptive. JIT creates resilience — not fragility.

3. In contrast, deep inventories become a financial liability and environmental waste if demand for a product slumps. This is especially true for technology, fashion, and perishable products that rapidly lose value and salability over time. For example, inventories of dress slacks could not help meet higher demand for sweatpants when people switched to working from home.

Abandoning JIT would do little to help current supply chain problems. Companies do keep significant amounts of inventory, even with JIT. However, such so-called safety stock helps insulate a company only from short-term fluctuations. Most natural disasters create temporary, localized disruptions that companies resolve quickly by using minimal inventory, switching suppliers, changing formulations, and so forth. The pandemic, however, is not a quick-hit disaster; in the face of global, persistent parts shortages, keeping extra inventory on hand doesn't prevent production problems — it simply delays the inevitable reckoning with them. And when consumer preferences shift, extra inventory won't help correct a persistent mismatch between production and demand.

Toyota itself exemplifies this problem of the limits of safety stock. Following the triple disaster of an earthquake, a tsunami, and a nuclear reactor meltdown in Fukushima in March 2011, the company reviewed its vulnerabilities. It found that the automotive industry's supply of semiconductors was limited because vehicles largely depended on simpler chips of older designs made in older chip factories that were not receiving continuous investment.

Furthermore, building new fabrication plants requires long time horizons and large investments. As a result, Toyota and its suppliers built safety stocks of chips. During the first half of 2021, while most automobile manufacturers were announcing significant production cuts and plant closures, Toyota factories kept humming along at close to full capacity, using their inventory of chips.⁹ In fact, during the second quarter of 2021, Toyota took the top position in the U.S. for the number of vehicles sold, for the first time ever. However, in September 2021, the company had to reduce its worldwide output by 40% as a result of the continuing chip shortage.¹⁰

How Long Will It Last?

As this article is being written, product flows are cresting seasonally in the lead-up to the 2021 year-end holidays. Thus, no relief should be expected by year's end. Without further government interventions, the market will likely have solved the imbalances toward the second quarter of 2022. While the delta coronavirus variant is likely to continue wreaking havoc on plant capacity around the world — especially in Southeast Asia — prices may remain high while shortages abate, and as high prices temper demand, market equilibrium should return.

By the second quarter of 2022, manufacturers and their suppliers may reach a better understanding of actual demand and inventory constraints, minimizing phantom orders. Suppliers may also have time to invest in expanded capacity in those segments where they expect demand to stay high.

However, another injection of government money — as much as it may be justified — could upend these projections and lead to even worse shortages in 2022-2023. Many other factors could come into play too. A new coronavirus variant might cause another round of school closings and prevent parents from working, which could spur plant closures and transportation restrictions. Such an outcome could trigger another round of shortages.

Clearly, we are not out of the product-shortage woods yet, but as companies continue to navigate their way through the crisis, they are learning much about the vulnerabilities of their supply chains. They are also investing more than ever in supply chain technology and improved processes — investments that are likely to bear fruit whenever the inevitable disruptions and unexpected turmoil hit next.