Supply Chain Brief: Global Supply Chains Prepare for Impact From Coronavirus

Published 31 January 2020 - ID G00467127 - 11 min read
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Initiatives:Direct Material Sourcing and Supply Chain Services

As the coronavirus spreads rapidly from Wuhan, China, to more than a dozen countries around the globe, businesses fear the consequences of the outbreak will result in severe supply chain disruption. Supply chain leaders can use this research to put scenario plans in place to mitigate the impact.

What You Need to Know

Since the World Health Organization (WHO) became aware of the coronavirus on 31 December 2019, more than 7,700 cases have been diagnosed worldwide, with the majority of them in China. Due to a shortage of test kits available and other factors, some experts believe that the total infected population may exceed 100,000, according to a report by the BBC and Imperial College public health expert Professor Neil Ferguson. In the U.S., 110 people are being monitored as the number of possible cases increases alarmingly fast. In 2003, severe acute respiratory syndrome (SARS) killed nearly 800 people and infected more than 8,000 others, temporarily stifling growth in China.

Although projecting the outbreak's impact is impossible, these outbreaks are tracked through epidemiological curves and usually show a significant exponential rise, plateau and almost equally fast decline in the best cases, where a vaccine or standard treatment becomes available.

The coronavirus could have a major impact on global supply chains, as numerous factory workers in China share accommodations on campus with many other workers. The first human-to-human transmission outside China already occurred, bringing new complexity to contain the spread. China has locked down 15 cities — a combined population of almost 60 million — in an effort to contain the spread of the virus. However, the longer the situation continues, the likelihood for supply chain disruptions increases — including raw materials, goods manufactured and logistics. However, getting supplies into affected areas will also be a challenge. Healthcare companies will likely face unique impacts, as demand for supplies like protective masks and trained professionals has already increased.

The outbreak will most likely accelerate with workers returning on 3 February from the Chinese New Year holiday. Shanghai and nearby manufacturing hub Suzhou have ordered workers to not return until 9 February. \(^1\) In many cases, factory workers in China live 24/7 on factory compounds, sharing their sleeping quarters, so it is just a matter of time before the virus exponentially spreads once workers return.
Although the consequences of a pandemic event are hard to predict, the risks always exist and are augmented with further globalization and integration of supply chains. This research will outline short-term, medium-term and long-term actions that supply chain organizations should implement as a starting point.

Analysis

Supply Chain Risk and Impact

As the coronavirus spreads into its second month, companies around the globe are starting to restrict travel to China and prepare for possible supply disruptions. The WHO declared a Global Health Emergency on 20 January 2020. The Centers for Disease Control and Prevention (CDC) issued a Level 3 warning that is its highest-degree alert, cautioning travelers to refrain from going to China. Major airlines cut their routes to China. Carmakers Honda, Nissan and Groupe PSA are removing employees from the country. Apple has approximately 10,000 direct employees in China, and millions of others who work on production lines for its iPhone and other products. The company has confirmed it has suppliers in Wuhan, although they are alternate sources. Apple is working on mitigation plans to make up for any losses in production.

Figure 1. Coronavirus Supply Chain Impact and Recommendations

A potential health pandemic brings different scenarios — mainly the unknown, along with a general sense of panic by the public, especially when tens of millions in more than a dozen Chinese cities...
are under quarantine to limit the spread of the virus. This uncertainty can complicate the usual rehiring process that occurs post Chinese New Year celebrations, when some factories regularly face a drop in workforce of about 20% or more. Given the coronavirus outbreak, the replenishment of trained workers will undoubtedly cascade into reduced output and capacity utilization for a foreseeable time until the number of new infections stagnates and treatments become available.

Given this, the impact on global supply chains could be significant. Wuhan, where the outbreak began, has grown significantly in the last decade, focusing on traditional but also high-tech industries. The city developed into a major transport and manufacturing hub and ranked as China’s ninth-best economically performing city. A lockdown of the city for a week or longer could disrupt logistics networks and many industries. The epidemic curve shows a clear pattern of serious outbreaks (see Figure 2).

Impacts on global supply chains from a pandemic event, such as the SARS crisis in 2003, can be varied. This is a critical and valid comparison baseline, since the coronavirus is closely related to SARS. Looking back to the SARS outbreak, China is now much more developed and integrated with the global economy, with significantly improved transportation networks. These are all enabling factors for the virus to spread even faster beyond regional implications. Travel restrictions, shortages in labor and materials, and logistical challenges through tightened controls and hub and border closures will cascade and augment the impact much further.

Macroeconomic factors already show warning signs. Markets weakened globally at the outset, and most experts predict a 1% GDP impact on the Chinese output the first quarter. The European
Centre for Disease Prevention and Control sees the impact of the coronavirus as high, with further global spread likely. Inevitably, there will be economic consequences, although how far they travel from China remains to be seen. Collateral impacts will most likely be clearer after the Chinese New Year celebrations. Maintaining healthcare services and containment measures will be nearly impossible, and the impact of any measure to slow down the transmission dynamics inside the Hubei province and globally is limited to developed and resilient healthcare systems in developed countries. Therefore, the supply chain will unavoidably show signs of unforeseen disruption, which will require further thought and action.

The risks for supply chain are manifold:

- **Materials**: Supply chains may face supply shortages of materials or finished goods coming from or routed through logistical hubs in impacted areas.

- **Labor**: White- and blue-collar labor may not be available due to quarantine guidelines or illness. In China, the usual rehiring process following the Chinese New Year celebrations (known as “job seasons”) has become more challenging in recent years due to a competitive labor market. An outbreak means that replenishment of the trained workforce becomes increasingly difficult, impacting output and capacity utilization.

- **Sourcing**: Travel may be restricted to certain areas, limiting the ability to discover, qualify and certify new business or programs and to transact business. The costing baseline and budgets may show variations that complicate cost control measures and show unpredictable purchase price variances.

- **Logistics**: Established hubs and supply networks may experience limitations in capacity and availability so that, even if materials are available, they would be stuck elsewhere. Finding alternative routes and means of transportation will become difficult when many industries experience this simultaneously.

- **Consumers**: Consumers may be more cautious in their purchasing habits due to fears about being in public and potential exposure to the virus. Many may turn to online sales, challenging logistics networks.

Supply chain organizations typically manage these unknowns through risk and business continuity management approaches. Leading companies utilize enhanced risk management processes, including measures to dynamically assess risk, impact and effectiveness of controls. This includes a framework to continuously measure key risk indicators and to prepare scenarios for controllable and foreseeable uncertainties such as compliance, labor, material, capacity and financial issues. It also focuses on aligning the organizational risk appetite and strengthening its risk capacity and supply chain resilience to absorb uncontrollable and unpredictable challenges to its best abilities.
It is not about analyzing “if” a disruption will happen but about having action plans in place and ready to deploy rapidly “when” disaster strikes. What initial actions should supply chains take in response to this event?

Initial Response Actions

Epidemics and pandemics present a different scenario, as the main impact is a lack of access to staff, decreased productivity, and a change in public behavior in terms of shopping practices and spending. Early indications are that the economy in China is already being impacted, as millions are forced to remain in their homes, and events planned around the Chinese New Year have been canceled. China's economy makes up 19% of the global GDP. This means that global supply chain will be impacted next as inventories deplete with missing replenishments due to labor shortages and other potential logistical impediments, such as the mentioned hub closures or travel and material flow limitations most likely to be instated by local and regional governments.

An October 2019 simulated event of a coronavirus outbreak led and supported by the World Economic Forum, called Event 201, ended at an 18-month outbreak point, with 65 million deaths. Event 201 simulated an outbreak of a novel zoonotic coronavirus transmitted from bats to pigs to people that eventually became efficiently transmissible from person to person, leading to a severe pandemic. The pathogen and the disease it caused were modeled largely on SARS, but it was more transmissible in the community setting by people with mild symptoms. Even though the latest statement clarifies that the applied virus from the simulated event was different in complexity and type, yet related to SARS, it showed the indication and impact potential if it was underestimated, unprepared or ignored.

At the time of this research's publication, it was unknown if any regional supply issues for the Hubei province, with its 60-million population, surfaced, given that most airports and highways were closed in the region for more than a week. However, supply chains need to start taking initial steps to prepare themselves for potential disruptions.

The full impact of coronavirus on supply chains might not become obvious until sometime in the next few months and beyond. However, given Wuhan's stature as a major manufacturing center and transportation hub, it is likely that ripples will be felt through global supply chains and result in economic losses.

Recommendations

Supply chain leaders involved in direct material sourcing and supply chain services should take the following initial steps to monitor and prepare for the impact on their value chain.

Short Term (Next Month):
• Develop a high-risk supply chain disruption-monitoring and response program for countries impacted by the virus and the potential supply chain exposure from Tier 1 and below. If lower tier transparency is missing, start building up the program and prioritize discovery to get a full picture as soon as possible.

• Assign high-risk weighting to suppliers and subtiers from emerging and developing countries with less developed healthcare systems that are less prepared. Link the country monitoring to supply chain interdependencies within the region. Work closely with demand planning to assess how consumer spending may be impacted as part of the decision-making process to build inventory within reach and outside of affected routes for at least the next quarter.

• Conduct a contract review to understand any financial implications of not being able to deliver supplies to manufacturing locations and customers. Assess force majeure clauses and exclusions. Engage with human resources to provide any additional guidance to employees located in the impacted areas, and reassess the travel policy and guidance for employees travelling to impacted regions.

Medium Term (1 to 3 Months):

• Focus on balancing supply and demand, building buffer stock as necessary as part of the business continuity strategy, especially with the unpredictable volatility of material and logistics in the force majeure context.

• Assess opportunities and start to diversify suppliers now to ensure raw material security and manufacturing capacity. More complex supplies will require time and resources from discovery, to qualification and integration, which must start in parallel to mitigate systematic impacts.

• Establish a congruent risk management approach to monitor and prepare for potential material and manufacturing capacity shortages, working with internal stakeholders and strategic and critical suppliers. Review the organization’s assessment of consumer confidence for fluctuations of demands.

Long Term (3 Months or More):

• Implement and utilize enhanced risk management, including scenario planning to create preemptive action plans. Tackle strategic and concentrated supplies at risk to reduce exposure of value when internal risk capacities, such as alternative sources, routes, inventory and cash reserves, aren’t sufficient enough to mitigate any major disruption.

• Review the NPI process and utilize design measures to discover or develop alternative sources and routes in order to diversify your value chains. At the same time, analyze cascading implications of changes in volumes, quality and markets.
This complimentary research is part of Gartner's ongoing coverage of the business impact of the coronavirus (COVID-19).

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