

# BUILDING CRITICAL SUPPLY CHAIN RESILIENCE IN THE WAKE OF COVID-19

Policy Report

July 2020

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## **Executive Summary**

The global economic fallout caused by the COVID-19 pandemic has starkly revealed the great extent to which firms depend upon China for supplies. Consequently, governments from both the West and Asia have emphasised the need to decouple from China and build self-sufficiency. This report makes two key arguments in the context of these developments. Firstly, that it would be challenging to attain self-sufficiency, which would not result in greater supply chain resilience. Secondly, that it would be beneficial for firms to avoid a binary approach of either completely relying or decoupling from China. Rather, firms should pursue supply chain resilience by strategically switching their operations between China and other countries when needed. In this regard, this report proposes three key strategies that are focused on diversifying supply chains, establishing circular supply chains and attaining supply chain visibility.

## Introduction

The COVID-19 pandemic has resulted in the worst economic downturn since the Great Depression.<sup>1</sup> This is largely due to the disruption of supply chains in China caused by the pandemic. The global economic fallout has impelled governments from the West and Asia to persuade firms to decouple from China and reshore their operations to attain supply chain resilience through self-sufficiency.

In the context of these developments, this report argues that it would be difficult for firms to decouple from China and ramp-up on self-sufficiency as a means to greater supply chain resilience. It also argues against a rigid, binary approach of either completely relying or decoupling from China, advocating instead that firms pursue supply chain resilience by being nimble and strategically switching their operations between China and other countries when needed. This can be achieved through three key strategies that involve diversified supply chains, circular supply chains and supply chain visibility.

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<sup>1</sup> Gita Gopinath, "The Great Lockdown: Worst Economic Downturn Since the Great Depression," *IMF Blog*, 14 April 2020, <https://blogs.imf.org/2020/04/14/the-great-lockdown-worst-economic-downturn-since-the-great-depression/>.

## Equating supply chain resilience with self-sufficiency

The economic slump in China has reverberated globally. For example, in February 2020, US auto manufacturers had reported that their production schedules were severely curtailed by the disruption of supplies imported from China, which had fallen 19.1 per cent year-on-year in January and February.<sup>2</sup> On 23 March 2020, S&P Global estimated that global automotive sales could reduce to less than 80 million units in 2020, a contraction of approximately 15 per cent over 2019.<sup>3</sup>

Peter Navarro, the Director of Trade and Manufacturing Policy at the White House, has appealed for greater self-sufficiency in manufacturing across different industries, asserting that America had outsourced too much of its supply chains to China.<sup>4</sup> Similarly, in India, PM Narendra Modi has announced his economic stimulus plan and emphasised that a new era of economic self-sufficiency had begun.<sup>5</sup>

Nevertheless, it would be a fundamental mistake to equate self-sufficiency with supply chain resilience for two main reasons. The first pertains to China's competitive advantage as a manufacturing hub. According to James McGregor, Chairman of APCO Worldwide's Greater China Region, firms that relocated their supply chains outside of China had struggled to replicate China's production capabilities.<sup>6</sup> Over the years, China has engineered a sophisticated supply chain network that enables suppliers of different sizes to collaborate at scale seamlessly. This network is bolstered by a vast distribution system that is built upon an efficient transport infrastructure. China also offers a large and stable pool of workers who are competent and trained in operating complex machinery. Furthermore, the Ministry of Finance is increasing credit support to help the manufacturing sector with their operations.<sup>7</sup>

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<sup>2</sup> Kaj Malden and Suzanna Stephens, "Cascading Economic Impacts of the COVID-19 Outbreak in China," *U.S.-China Economic and Security Review Commission*, 21 April 2020, 14, <https://www.uscc.gov/research/cascading-economic-impacts-covid-19-outbreak-china>.

<sup>3</sup> Ibid.

<sup>4</sup> Hailey Waller, "Peter Navarro Says Coronavirus Shows U.S. Offshored Too Much," *Bloomberg*, 24 February 2020, <https://www.bloomberg.com/news/articles/2020-02-23/peter-navarro-says-coronavirus-shows-u-s-offshored-too-much?sref=HtSdRMBs>.

<sup>5</sup> Bill Spindle and Rajesh Roy, "India's Coronavirus Crisis Spurs a New Look at Self-Reliance," *The Wall Street Journal*, 17 May 2020, <https://www.wsj.com/articles/indias-coronavirus-crisis-spurs-a-new-look-at-self-reliance-11589724001>.

<sup>6</sup> Jackie Whisman and Robert D. Atkinson, hosts, "The Post-COVID China Challenge, with Special Guest James McGregor," Information Technology and Innovation Foundation (podcast), 11 May 2020, <https://itif.org/publications/2020/05/11/podcast-post-covid-china-challenge-special-guest-james-mcgregor>.

<sup>7</sup> Zoey Zhang, "China's Support Policies for Businesses Under COVID-19: A Comprehensive List," *China Briefing News*, 15 June 2020, <https://www.china-briefing.com/news/china-covid-19-policy-tracker-benefiting-business-enterprises-comprehensive-updated-list/>.

The second reason pertains to the fact that economic self-sufficiency depends on increasing domestic production, which by necessity still relies upon global supply chains, including those that are based in China. The experience of South Korea, where a new industry of producing COVID-19 test kits had emerged during the pandemic, is a key example. The test kits are able to quickly identify those who have been infected and help to curtail the spread of the virus. Approximately 25 South Korean companies had been authorised to export the test kits initially, with the number expected to reach 40 within the same month.<sup>8</sup>

This was only possible because of South Korea's status as a G20 economy with one of the most integrated global supply chains in the world. Supported by skilled supply chain managers and well-connected global supply chains, South Korea was able to build-up the production capacity for the test kits within a short period of time because the necessary components could be effectively sourced. The production of the test kits would have been virtually impossible if South Korea had solely depended on raw materials sourced locally. Hence, global supply chains remain an essential lifeline, despite the inherent vulnerabilities that emerge during a crisis.

Nevertheless, it is still unclear if governments can build consensus and develop constructive measures that would persuade China to moderate its mercantilist practices and level the playing field for competition and supply chain development. Hence, a fluid and unstable geo-economic climate is likely to persist as firms re-examine their supply chains for a post-COVID-19 economy, and navigate the pressure from governments to reshore operations versus the attractiveness of China as a manufacturing hub.

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<sup>8</sup> Sébastien Miroudot, "Resilience versus robustness in global value chains: Some policy implications," in *COVID-19 and Trade Policy: Why Turning Inward Won't Work*, ed. Richard E. Baldwin and Simon J. Evenett (London: Centre for Economic Policy Research (CEPR) Press, 2020), 126, [https://voxeu.org/system/files/epublication/Covid-19\\_and\\_Trade\\_Policy.pdf](https://voxeu.org/system/files/epublication/Covid-19_and_Trade_Policy.pdf).

## Building resilient supply chains: Three strategies

To navigate the post-COVID-19 economy successfully, firms should avoid a rigid, binary approach of either completely relying or decoupling from China. Instead, they should pursue supply chain resilience by being nimble and strategically switching their operations between China and other countries when needed. This can be achieved through three key strategies:

### ***Diversifying supply chains through multi-sourcing***

Firstly, firms should invest in building multi-source supply chain networks. This involves establishing a network of alternative suppliers and “just in case” counterparts that can be activated during a specific disruption in China or elsewhere.<sup>9</sup> These alternative networks should be geographically diversified to avoid a domino effect in supply chain disruption in times of crises. Thus, firms should build-up multi-source supply chains in different regions where possible to reduce their exposure to risk.

However, diversification could result in supply chains becoming more complex and difficult to manage. This could pose a significant challenge for firms when a crisis occurs. To prevent turning a solution into a problem, firms should focus on a select set of regions where they could establish a diversified yet condensed network of supply chains.<sup>10</sup> Another way to mitigate the risk of complexity would be to exercise full Intellectual Property (IP) ownership for component designs and production processes. This would make it easier for firms to set up and conduct uniform operations across different regions efficiently.<sup>11</sup>

To safeguard their diversification strategy, firms could also identify groups of suppliers who can collaborate and establish shared resource pools for raw material inventories.<sup>12</sup> This way, even when individual suppliers became affected by disruptions, collectively there would be a high chance for enough supplies to avoid a complete shutdown.

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<sup>9</sup> Bridget McCrea, “Using Multi-Sourcing to Diversify the Supply Chain,” *Source Today*, 25 February 2019, <https://www.sourcetoday.com/supply-chain/article/21867328/using-multisourcing-to-diversify-the-supply-chain>.

<sup>10</sup> “How to Rebound Stronger from COVID-19: Resilience in Manufacturing and Supply Systems,” *World Economic Forum*, April 2020, 15, <https://www.weforum.org/whitepapers/how-to-rebound-stronger-from-covid-19-resilience-in-manufacturing-and-supply-systems>.

<sup>11</sup> *Ibid.*

<sup>12</sup> Jim Kilpatrick and Lee Barter, “COVID-19: Managing Supply Chain Risk and Disruption,” Deloitte, 2020, 8, <https://www2.deloitte.com/global/en/pages/risk/articles/covid-19-managing-supply-chain-risk-and-disruption.html>.

## ***Establishing circular supply chains***

The second strategy involves establishing circular supply chains based on three key principles: (i) “prioritising renewable inputs”, (ii) “maximising a product’s usage and lifetime”, and (iii) “recovering and reusing by-products and waste to make new materials or products”.<sup>13</sup>

Such a strategy shields firms from the price volatility of raw materials that can be induced by crises like the pandemic. Crises can result in resource scarcity due to disruption of supply chains.<sup>14</sup> This inevitably causes a spike in the prices of raw materials, which would make it challenging for firms to maintain operations and remain profitable. In this regard, if firms were to establish circular supply chains, they would be able to incorporate a greater amount of reusable materials in their production processes, allowing for better cost control while sustaining operations during a crisis.

Renault is an example. It has a manufacturing plant in Paris that primarily relies on reused automotive parts. Renault generates \$270 million annually from this plant alone,<sup>15</sup> and its success is founded on a network of supply chains that not only collects used automotive parts of its own vehicles but also those of other automotive companies. It has done so by partnering with vehicle disassemblers across France and Europe. These disassemblers collect various metal components, car bumpers, catalytic converters and car batteries which are then refurbished or downcycled into reusable components at Renault’s plant.<sup>16</sup>

In this context, there are three essential technologies that would enable the swift development of circular supply chains. The first involves the use of Artificial Intelligence (AI) in highly specialised equipment that could speed up the process of disassembly. This is especially relevant at the end of a product’s life cycle. A key example involves Apple Inc’s robot Daisy that was developed with the use of AI. It is primarily used to quickly and accurately disassemble old iPhones, separate the components and extract those that can be reused.<sup>17</sup>

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<sup>13</sup> “The Road to Circularity: Why a Circular Economy Is Becoming the New Normal,” PwC, 2019, 8, <https://www.pwc.nl/en/assets/documents/pwc-the-road-to-circularity-en.pdf>.

<sup>14</sup> *Ibid.*, 27.

<sup>15</sup> Christopher Koch, Will Ritzrau, and Dan Wellers, “SAP BrandVoice: A Historic Tipping Point For A New Supply Chain,” *Forbes Magazine*, 10 June 2019, <https://www.forbes.com/sites/sap/2019/06/10/a-historic-tipping-point-for-a-new-supply-chain/#32faf0b01232>.

<sup>16</sup> *Ibid.*

<sup>17</sup> “The Road to Circularity: Why a Circular Economy Is Becoming the New Normal,” PwC, 2019, 30, <https://www.pwc.nl/en/assets/documents/pwc-the-road-to-circularity-en.pdf>.

The second technology involves the Internet of Things (IoT). IoT can serve as the foundation for product-as-a-service models that allow for the reuse of singular components over a prolonged period of time.<sup>18</sup> For example, Renault sells its electric cars without the batteries, which are leased to the buyers instead. Specially built sensors are used to send information about the status of the battery to Renault. When the batteries are no longer fit to be used in the car, they are used to store renewable energy for other processes.

The third technology involves additive manufacturing otherwise known as 3D printing. Such a technology facilitates the development of sustainable design which improves the longevity of products. A key example would be Feetz, a company that sells customised 3D-printed shoes.<sup>19</sup> These shoes are made from recycled materials extracted from used shoes that have been returned by Feetz customers. 3D-printing technology enables Feetz to quickly create spare parts to repair and refurbish the returned shoes for resale.

Aside from adopting the right technologies, it is also necessary for firms to have a talent pool that is equipped with the relevant skills in reverse logistics.<sup>20</sup> This is critical in handling challenges pertaining to how the used materials would be extracted from the “market, where they would be returned to, sorted, processed, and recycled or refurbished”.<sup>21</sup> Furthermore, business management skills such as systems thinking would also be critical to coordinate operations and achieve scale.

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<sup>18</sup> Ibid.

<sup>19</sup> Ibid, 31.

<sup>20</sup> Pierfrancesco Manenti et al., “Future of Supply Chain: Reshaping the Profession,” Gartner, November 2019, 32, <https://www.scmworld.com/report-future-supply-chain-reshaping-profession/>.

<sup>21</sup> Ibid.

## ***Achieving supply chain visibility***

The third strategy involves firms attaining maximum visibility of all the supply chain networks. This would enable firms to accurately assess the business risks caused by disruptions emanating from China (or elsewhere) and quickly switch to alternative supply chain networks when needed. Firms should strive towards achieving full supply chain visibility in two key areas:

The first area pertains to having full visibility of the supply chain across different tiers. Most firms, especially those with large-scale operations, tend to monitor only their tier one suppliers,<sup>22</sup> who are relied upon to collaborate with the tier two and three suppliers to achieve the production goals. However, this practice exposes firms to substantial risk during a crisis, as the over-reliance on tier one suppliers for data on supply bottlenecks could compromise their capacity to respond in a timely and accurate manner. Hence, firms should avoid over-relying on tier one suppliers, and build the capacity to achieve visibility of the operations conducted by their tier two and three suppliers.

Secondly, as firms begin to attain visibility of their tier two and three suppliers, there should be enhanced focus on gathering data on “the inventory at the supplier locations, supplier production schedules, and supplier shipment status”.<sup>23</sup> It is also critical to gather data on the constraints faced by suppliers at the different tiers with regards to the flow and quality of materials. This would enable better insights into the logistical preparedness of the suppliers.

Armed with such data, firms would be able to run accurate and in-depth risk analyses to identify potential bottlenecks in supply chains and adopt the necessary precautions. Thus, instead of solely relying on tier one suppliers, firms would be able to work with them to constructively develop alternative plans to mitigate disruptions throughout the supply chain networks. This could involve activating alternative supply chains located at different regions or even investing further resources into circular supply chains to stabilise operating costs.

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<sup>22</sup> Darryl Yu, “The Importance of Multi-Tier Supply Chain Visibility: Understanding How Companies Can Better Support the Suppliers They Work With,” *The Asset*, 24 April 2020, <https://www.theasset.com/article/40250/the-importance-of-multi-tier-supply-chain-visibility>.

<sup>23</sup> Jim Kilpatrick and Lee Barter, “COVID-19: Managing Supply Chain Risk and Disruption,” Deloitte, 2020, 9, <https://www2.deloitte.com/global/en/pages/risk/articles/covid-19-managing-supply-chain-risk-and-disruption.html>.

To achieve supply chain visibility, firms are increasingly leveraging digital enablers that include blockchain technology. Firms such as Corning, Emerson, Hayward, and IBM are utilising blockchain technology, specifically blockchain record keeping, to facilitate the creation of a complete, reliable, and unchangeable audit trail that tracks an asset from production to delivery across different supply chains.<sup>24</sup> This primarily involves assigning unique identifiers to different inventory units and customer orders, which serve the function of a digital token. Concurrently, supply chain managers are assigned unique digital signatures. In this way, every step of a transaction involving any specific component of a supply chain would be recorded as a unique transaction. Ultimately, firms would be equipped with chronological strings of detailed records for every transaction that transpires across the different tiers of suppliers.

To further consolidate supply chain visibility, firms could ensure that the information on all transactions are shared across different tiers of suppliers. This creates a large, transparent, and tamper-proof source of vital supply chain data that facilitates evidence-based decision-making. In this way, firms and suppliers alike can “review the status of a transaction, identify errors, and hold counterparties responsible for their actions”.<sup>25</sup> Consequently, firms would be able to overcome challenges in traceability and coordination especially during a crisis.

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<sup>24</sup> Vishal Gaur and Abhinav Gaiha, “Building a Transparent Supply Chain,” *Harvard Business Review*, May-June 2020, <https://hbr.org/2020/05/building-a-transparent-supply-chain>.

<sup>25</sup> Ibid.

## Conclusion

It remains unclear whether governments would be able to build and achieve consensus on a more constructive alternative strategy. Thus, as firms prepare to enter the post-COVID-19 economy with greater supply chain resilience, the pressure from governments to reshore operations versus the attractiveness of China as a manufacturing hub would remain a persistent economic tension.

In this regard, firms should avoid a binary approach of either completely relying or decoupling from China. Rather, firms should pursue supply chain resilience by strategically switching their operations between China and other countries when needed. This can be achieved through three key strategies that are focused on diversifying supply chains, establishing circular supply chains and supply chain visibility.

In order to implement these strategies, firms would have to rely on a skilled workforce that is able to carefully coordinate the changes to supply chain networks and achieve scale. Ultimately, if done right, firms could observe a significant shift from a “just-in-time” to a “just-in-case” business model capable of effectively navigating the uncertainties and challenges of the post-COVID-19 economy.

## About the Author

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**Yogaanathan S/O Theva** is an Associate Research Fellow in the Policy Studies Group at the S. Rajaratnam School of International Studies (RSIS). Prior to joining RSIS, Yogaanathan held both Policy and Research positions in the public sector and academia. Across these positions, he has led research projects that focused on the security and economic relations between Southeast Asia and the Asia-Pacific region.

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