

After COVID-19: supply chain change

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Abstract

Worldwide indexes confirm supply chain disruptions are 'historically high' and as the Economist makes clear 'uncertainty lies ahead.' After Covid 19, and now in the context of the war in Ukraine, "disaster" is real. The purpose of this paper is first to identify the levers, the key visible breakdowns in Covid 19 impacted supply chains. Then to identify the fulcra" that maybe "really important and relevant" to supply chain change. Resilience to pandemic breakdown in supply change are considered in five key areas. The resilience of supplier networks has been tested. Despite measured environmental benefits from reduced traffic delivery delays. Despite significant growth in the air cargo market delays are only just past their peak. The resilience of employment is being challenged as greater productivity, happier and health workers and lower emissions has demonstrated the importance of 'the physical dimension' of work and opportunities taken to switch occupations. The resilience of the component parts of products and services has become the new watchword as interruptions in the source and supply of critical components has promoted search for substitutes. Reshoring and reinvention identify how bringing back, with innovative technology, a skilled workforce, tax incentives, means improved innovation and product differentiation. The resilience of supply chains to adapt quickly is marked by the prominence of consulting firms who have advanced supply chain monitoring technology and weaponized the supply chain. The trend for economic spheres to develop to insulate companies from geopolitical concerns. There is an ongoing acceleration of slowbalization. The resilience of technology means reshoring of the apparel, food, and beverage industries, among others, is becoming cost-effective. Predictive control strategy, still in its infancy, with modelling and optimization is becoming the work horse for supply chain management. The paper concludes with an assessment of the levers and fulcra for supply change.

Keywords: Supply Chain change, supply chain disruptions, supply chain symptoms, supply chain resilience

1. The Worldwide Supply Chain Crisis

Worldwide indexes, compiled from a variety of indicators, confirm that supply chain disruptions “are historically high,” and “uncertainty lies ahead.” (Economist, 2022). Flexport Research (2022) maintain records of ocean-going freight, both FarEast-Westbound and Transpacific-Eastbound. This January 2022 Flexport Research found for their ocean timeliness indicator that the days taken from ‘cargo ready’ to ‘destination port departure’ have doubled from under 50 days to over one hundred days. Similar delays have occurred in the three other types of freight transportation (Mach1, 2022).

An extended period of reliable logistics has meant that “relatively little slack had been built into global supply chains” (Spence, 2021). Then, quite unexpected, the Covid pandemic introduced a cornucopia of deviations from the then normal. In the absence of much history “on low-probability, high-impact events” (Simchi-Levi et al, 2014) traditional methods for managing supply chain risk lacked appropriate strategy and so the global supply chain “disaster is real” (Lillo, 2022).

In business the manager rarely encounters a situation where a decision can be taken without determination of the real problem. For companies, their supply chain is no exception. The first stage of defining their problem is to identify so many “symptoms” of breakdown in the supply chain and then determine which of these symptoms are “really important and relevant.” So often “the most visible symptoms are the least revealing ones” (Drucker, 1954).

What then are visible symptoms of supply chain change? More important what are the symptoms behind the current analysis which are less visible and yet “really important and relevant” the symptoms which will provide “the levers and the fulcra” for the coming supply chain change. The purpose of this paper is to identify key “symptoms” of breakdowns in the world of Covid 19 impacted supply chains; then to identify the levers and the fulcra that are important and relevant to supply management.

2. Symptoms of the Supply Chain Crisis: Supplier Network Resilience

The ability of supply chain networks past to recover quickly from difficulties encountered is well documented. Post pandemic research sees supply chain growth from experience, this is how supply chains are built.

Overland, by road, rail, or other means, from cargo ready to customer delivery, Covid-19 caused crises in supply. A perfect storm of waiting and delay, missed scheduled places, federally mandated workday hours, and mandated Covid-19 restrictions (Smith, 2021) seriously weakened the transport and trucking industry

worldwide. So, despite environmental benefits from reduced traffic (Mohn, 2020) overland delivery delays increased during the pandemic (Heilweil, 2021).

Flexport's new ocean timeliness indicator (Friedman, 2021) and other freight forwarding, and customs brokerages confirm "how much longer containers are taking to reach their destination" explaining port snarl-ups seen the world over (Chambers, 2022).

Yet the Covid-19 slowdown in manufacturing activity (impact of traffic congestion, material, and labor shortages) favored air cargo growth. Significant growth in cargo tonne-kilometres (CTKs) satisfied business's "need to rapidly transfer goods" ("Air Cargo Market Analysis," 2021). Thus, adding to the inflating cost of shipped goods "to offset pandemic-driven supply chain issues" (Popken, 2022) and making future supply chains more resilient.

3. Symptoms of the Supply Chain Crisis: Employment resilience

The ability of supply chain networks to recover quickly from human resource practice and policy changes is in discovery.

"The Great Recognition" (Fieldman, 2022) is a "critical thinking" moment for business as employees worldwide are recognizing the advantages of "flexibility, 'gig' work, and remote activity". The outcome of the impact of Covid-19 workforce solutions is yet to be determined. A new focus on "working people" one that better recognizes "workers' humanity" is expected (Cage, 2021).

"Greater productivity, happier and healthier workers and lower emissions" (Nauta, 2021) demonstrate the resilience of the workforce and the products of the work-from home practices brought on by the pandemic. But the pandemic's disruption of the workplace has also broken-down traditional workplace design initiating current trends which are still in their infancy and confirm the need to "stay on top of these trends" to understand their potential outcomes (Gartner, 2022).

The pandemic has "for the first time" demonstrated the importance of "the physical dimension" of work and research. McKinsey (2022) estimates that "more than one hundred million workers" in the eight countries they studied "may need to switch occupations." Balancing operational goals in the context of shifting employee expectations (PwC, 2022) means companies need a cutting-edge strategy to take advantage of this "tremendous opportunity to transform" the workplace.

4. Symptoms of the Supply Chain Crisis: Product component resilience

The ability of supply chain networks to recover quickly from production difficulties.

Overcoming interruption in the supply of critical product components, sources of critical parts, and or essential raw materials has generated new supply chain strategies. "Resilience has become the new watchword" (Shih, 2021).

United States companies face a choice "to coast or to rebuild" (Shankland, 2021) that is to continue outsourced plant facilities or onshore the manufacturing they migrated to Asia and elsewhere overseas. Recent world events highlight the risk from overreliance on the import of those manufactured goods and services. Instead, the domestic production of critical goods and materials (known as "onshoring" or "reshoring") is taking advantage of "new opportunities and incentives to locate facilities within the United States" SmithGambrellRussell (2021). Intel, for example, "is committed" to spending more than \$100 million on "new manufacturing capacity" in Arizona, New Mexico, and Ohio (Intel, 2022). Indeed, more than one million manufacturing jobs have been reshored since the start of the pandemic (Reshorenaw, 2022).

Reshoring also provides the opportunity to update technology and thereby cut costs and improve quality. For example, when GE "did the math" in the context of rising overseas wages and escalating transportation costs, they "decided to bring production back to the U.S" (Northam, 2014). The benefits of bringing business back home being "a skilled workforce, local tax incentives, improved innovation and product differentiation" (Newburgh, 2021).

5. Symptoms of the Supply Chain Crisis: Consulting resilience

The ability of supply chain networks to recover quickly from difficulties encountered with their agents and consultants is well documented.

A first-ever ranking of the top supply chain consulting firms in the United States was recently released to mark how Covid 19 has changed the world of the supply chain (The Top Supply Chain Consulting Firms in the US for 2021, 2021). The pandemic disruption of supply chains offers research opportunities for "reinvention" and supply chain reinvention may "turn your supply chain into a competitive weapon" (Bain, 2022).

Trading across borders slowed significantly as the pandemic took hold; "Slowbalization" became the new globalization" (PwC, 2022). The trend for economic spheres, where supply and tech chains are insulated from geopolitical concerns, "has myriad potential market implications," and recent events provide the context for an "acceleration of slowbalization" (Zezas, 2022). And reshoring "opens the door to smart factory opportunities" (Burke, 2021).

6. Symptoms of the Supply Chain Crisis: Technology advances

The ability of supply chain networks to adapt quickly to new Apps and software is well documented.

Reshoring means “SMART” opportunities for once outsourced manufacturing industries. “The importance of emerging technology” means reshoring apparel, food and beverage, as high technology manufacturing proves to be cost-effective. Conversation about moving manufacturing into the U.S. “is happening across all product types” (Parker, 2021).

The MIT Center for Transportation and Logistics has identified the impact of supply chain strategy and coordination and made recommendations for transferability of Wal-Mart and Amazon.com logistic practices to other industries (Colby and Dau, 2005). The impact of these and other studies is the subject of videos which demonstrate the expansion of Wal-Mart and Amazon supply chains to include significant fleets of airliners (Inside Amazon’s New \$1.5 Billion Air Hub, 2021) and (Can Walmart Catch Amazon In E-Commerce? 2020).

While in the United States we see Ford and General Motors, among others, encounter assembly delays because their supply chain for chips broke down (Hicks, 2021). In contrast Toyota with their post 2011 Tohoku earthquake and tsunami experience were better prepared (Symes, 2021). Corporate “predictive control strategy” (Perea et al, 2003), still in its infancy, with modelling and optimization, is becoming the workhorse for supply chain management.

7. The levers and the Fulcra for supply chain change:

Our World Annual Gross Domestic Product will “reach a remarkable milestone in 2022” (Rapp, 2022). As the Center for Economics and Business Research (CEBR) forecasts aggregate World GDP will, for the first time, pass \$100 trillion. The US economy has yet to be overtaken by China, indeed CEBR projected, prior to the war in Ukraine, that that possibility would be no earlier than 2030. As supply chains change that date will more likely be past 2030.

This sort of resilience, “the ability to adapt well in the face of threat, adversity, or significant stress” (Akins, 2022) as the symptoms of resilience show, are being analyzed in the marketplace as the world adapts to the threat of pandemic, adversity in the Ukraine, and the stress precipitated by these events.

London is a good example of such resilience. Since 50AD when the Romans founded “the place of the bold one” (Lambert, 2021) the city has faced many pandemics, two world wars, the stress of market change and yet “is shaping up to be the capital of the 21st century” (Bell and Weiland, 2007).

This paper has analyzed five symptoms of resilience that identify levers already working for change. We have yet to see how the impact of war further requires adaption to these new realities in the marketplace.

8. Conclusion:

The fulcra for change are founded in the minds of people facing challenges in our morphing marketplace. These seem to be the key levers:

- **Movement of the workplace:**

There is confusion caused by the pandemic's apparent need for absence and how that absence has identified a far too "traditional" concept of required presence at the workplace. This "tradition" has been mitigated with the Zoom of technology and technological upgrades in business communication. "Many new methods of electronic communication" (Fenell, 2022) have seen the introduction of innovative methods of social networking and video conferences. Zoom, Google chat, Blue jeans, Teams, 247 meeting and others (Gartner, 2022) are accelerating the existing trends to remote work. Forbes magazine estimates that 70% of the workforce will be working remotely at least five days a month" by 2025 (Castrillon, 2021). Movement of the workplace is coming.

- **Movement of the market:**

Recent supply chain disruptions are accelerating moves away from offshore industry. Strategic planning for reliable supply chains is newly aware of geopolitical tensions. Traditional flow paths are under scrutiny. "The debate on re-shoring is very lively," (De Backer, 2016) as innovative technology reduces the impact of labor costs and facilitates moving the production of many products closer to consumers. Companies in the apparel and grocery markets are reskilling workforces and choosing to "invest more in artificial intelligence and robotics" (Cooper, 2022). Markets are moving production and service locations.

- **Movement by Technology**

My generation are witness to the transition of recorded music from 78 rpm shellac discs, via tapes, to Apple music; the telephone from Nanna's wall telephone to the iPhone; computers from column cards to laptop and iPad; medical discovery that extends our lifetimes. Our grandchildren grow up ready to enjoy the accelerating change technology has yet to bring. The cartoons of our youth are the realities of today and tomorrow. Movement, advances, in technology, are so many in hand. There and such movements to come.

- Movement of the Mind:

As at the end of the Antonine period of the Roman Empire, a remarkable post-war period of peace and American-led world order (Kagan, 2021) has ended. Globalization is seen to have been a power grab by global elites at the expense of those who produce goods and services, those who 'do the work.'

Now the pandemic and war in Ukraine have triggered a "once-in-a-generation reimagining of global capitalism" (Economist, 2022). A library of books on transforming supply chains have been published, buffer stocks levels are changing, much production is on the move. The need for security is overtaking the need for efficiency. The new emphasis is on trust, on doing business with reliable partners, on the Russian proverb *Доверяй, но проверяй* (trust but verify).

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