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Preparing for Post COVID-19 Sustainable Supply Chain

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Abstract

Coronavirus COVID-19 had disrupted the supply chains of all enterprises and particularly those who had global sourcing links. During the last two to three decades most of the supply chains had gone global in order to reap the benefits that global supply chains provide with respect to integral cost, total quality and time to market. COVID -19 had changed abruptly the demand as well as the supply side of the chain and the supply chain actors were rooted out from the bases. Asthe impact of this was severe and shall completely re-define the demand, supply, consumption patternof the post COVID supply chains, it was felt necessary to undertake a research study involving supply chain practitioners and expertsacross industry domains to understand how the solutions for post COVID supply chains shall emerge. This article enumerates the backdrop and details of the aforesaid research work.

Keywords

COVID-19, Sustainable, Delphi Technique, Paired Comparison, Scenario Building Exercise (SBE), Supply Chain Integration, Agile Supply Chain, Sourcing, Quick Response Manufacturing (QRM)

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Introduction

The COVID-19 pandemic is a global crisis without modern parallel. During the last two to three decades, most of the growing companies have gone global based on globally connected supply chains. The coronavirus pandemic exposes the vulnerability of such globally connectedsupply chains which shall face major reshuffle and monumental restructuring.As the outbreak spreads,supply chain vulnerability shall multiply and ultimately may lead to total collapse. The rapid spread of the pandemic may bring another shockwave, exposing global manufacturing to a stress test. The era of globalization, as we used to know, may come to a standstill with the world witnessing emergence of a new era.

The COVID-19 pandemic has hit the business world in an unprecedented scale and speed. It has resulted in standstill in many businesses, work suspension in production units, disruption to global manufacturing industries and their supply networks, dwindling workforce availability and fear of extinction of specialized skills, plummeting consumer confidence in disrupted supply chain. This has led to acute stress on working capital for business. Owing to the globalization of supply chain ecosystems over the previous 2-3 decades seemingly no company is immune.

Questions facing the supply chain fraternity as global lockdown is lifted in Post COVID scenario are: How consumer behaviour may change or go for a paradigm shift?, How shall supply chains be affected due to changing consumer behaviour?, What shall be the emerging consumer demands?, What are the areas businesses should stress and focus on now and in the coming months to prepare for the post COVID era?

COVID 19 can be termed as a Black Swan event which shall completely disrupt the global economy. It may cause the collapse of global supply chains. COVID-19 is causing large scale disruption to global supply chains with further impacts yet to be fully felt. Understanding the supply chain both upstream and downstream is critical to the continued effective management of a business' supply chain operations.One unique attribute that differentiates this crisis from others in recent years is its worldwide effect on both demand and supply side of the supply chain. Furthermore the consumption pattern within the supply chain shall get completely

disrupted. Actors in the supply chain will go through a paradigm shift with respect to human psychology. A major challenge the situation poses is to deal with the "Bullwhip Effect" as a result of major swings in inventory due to panic buying and hoarding of consumers, the impact of this sudden demand being magnified as it moves upstream in the supply chain.

There is not an iota of doubt that there shall be gargantuan re-shuffling of supply chains in the post COVID-19 period. The question is how to prepare and tune the organizations for this new era so that they are ready with robust, innovative and adaptable supply networks sustainable enough to take on the next "Black Swan".

This article attempts to unfurl this critical challenge and throws light on some critical domains emerging through this COOVID-19 scenario to better prepare the organizations in the post COVID-19 world with regard to their supply chains.

Literature Review

'The concept of black swan events was popularized by the writer Nassim Nicholas Taleb in his book, The Black Swan: The Impact of The Highly Improbable (Penguin, 2008). The essence of his work is the world is severely affected by events that are rare and difficult to predict. The implications for markets and investments are compelling and need to be taken seriously'.(Investopedia, Brian J Bloch, June 25,2019)

However, the concept was challenged by Nouriel Roubini who said these are predictable vulnerabilities. "In my 2010 book, Crisis Economics, I defined financial crises not as the 'black swan' events that Nassim Nicholas Taleb described in his eponymous bestseller but as 'white swans'. According to Taleb, black swans are events that emerge unpredictably, like a tornado, from a fat-tailed statistical distribution. But I argued that financial crises, at least, are more like hurricanes: they are the predictable result of built up economic and financial vulnerabilities and policy mistakes."(NourielRoubini#,The Guardian, International weekly edition,19th Feb 2020)

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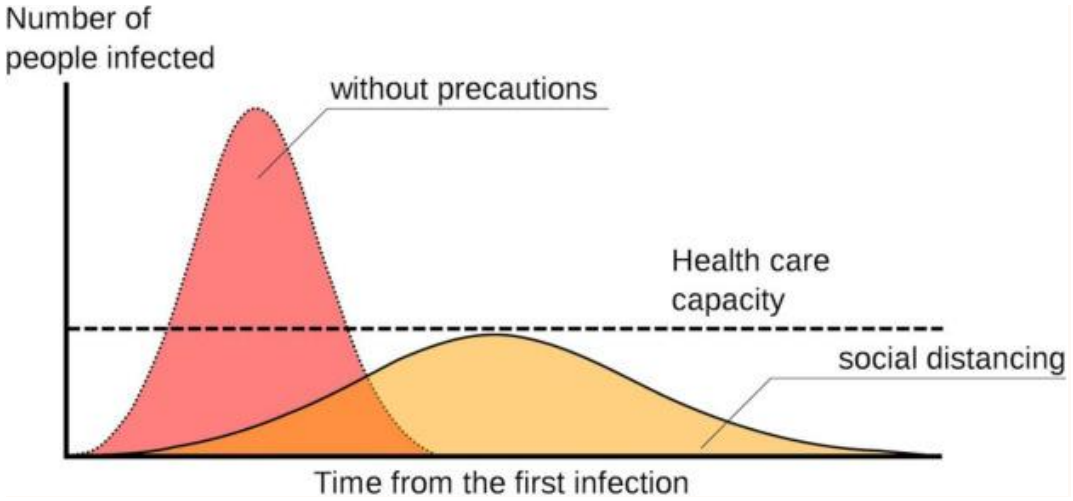
Whether we agree to either of these two philosophies, it is clear that not enough measures were taken by the nations to make the supply chains resilient leading to COVID-19 Supply Chain Collapse. The companies and nations were busy to create supply chains for their narrow gains, going miles apart from supply chain global integration.

#NourielRoubini is a professor at NYU's Stern School of Business and was senior economist for international affairs in the Clinton White House's Council of Economic Advisers. He has worked for the IMF, the US Federal Reserve and the World Bank.

For the crisis of today, the literature review points out crisis emerging out of uncertainty of predictability of measures like ***social distancing.*** *Work of Neil J Rowan, John G Laffey published in Elsevier, volume725, July 2020 highlights this uncertainty.*



While talking about solutions for post COVID-19 Supply Chains, authorAmitavaSengupta, entrepreneur media,inc,April 2020 highlighted concept of 'supply chain control tower'a single platform for all actors, but seem to be originating from his own perspectives and not necessarily through a research methodology.

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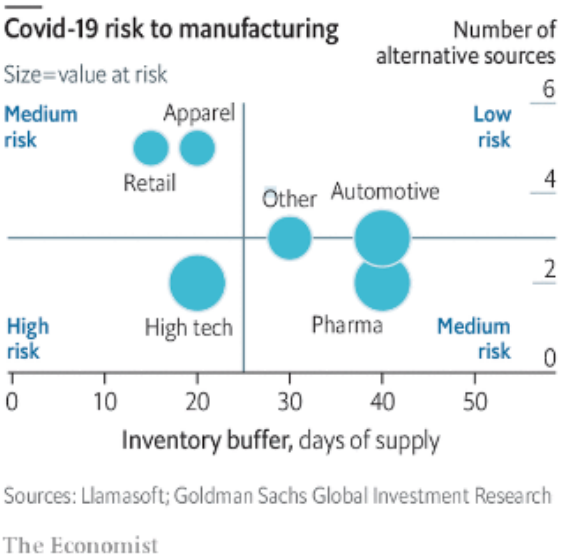

The above figure depicts the supply chain and manufacturing risks associated with the COVID-19 pandemic. Industries which have good inventory buffers and more number of alternate supply sources are at lower risks. Accordingly, automotive industry is at a relatively lower risk in terms of their supply chains while retail and pharma are at medium risk and high tech industries are at a higher risk.

Research Method

The following research techniques were deployed for collection of primary data and its scientific analysis:

Delphi Technique

Paired Comparison Matrix

Decision Evaluation Matrix

There were total of 225 respondents participated in this survey conducted during the period March 2020 to mid of April 2020.Survey was conducted maintaining social distancing protocols through webinars on digital platforms. Most of the respondents were supply chain practitioners and experts and few were from educational institutions teaching and consulting in supply chain domain.All participants remained anonymous minimizing the risk of 'bandwagon effect' or 'halo effect', allowing free expression of opinion, encouraging open critique which

facilitated admission of errors while revising earlier judgements .Respondents participated in four webinars and five rounds of iterations.In the initial round,there were 120 ideas generated and at the end of fifth round it converged to twelve different proposals. Table below gives the breakup of respondents:

Respondent Demography

Type of organizations	No. of respondents
Global Multinationals	**15**
Large Transnational Companies	**10**
National Companies	**35**
Consulting Companies	**04**
Educational Organizations	**35**
Supply Chain Students	**30**
MSME Sector	**96**
TOTAL	**225**

Results and Analysis

The proposals were tabulated under following broad headings:

SL. NO.	PROPOSAL
1	Quick Response Manufacturing (QRM)
2	Supply Chain Integration
3	Scenario Building Exercise (SBE)
4	Supply chain visibility
5	Sourcing
6	Automation
7	Industry 4.0
8	Safety stock
9	Forecasting
10	Machine learning
11	Agile supply chain
12	Multiskilling

The respondents converged to the following seven criteria for the purpose of evaluation of proposals:

Cost Effective,High Impact, HighSustainability, Ability to Absorb shocks (Black Swan), Adaptability,Ease of Implementation,Capabilitytocut across (industry segments)

Paired Comparison was done to arrive at weightage of each factor.

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EVALUATION MATRIX

IDENTIFY CRITERIA FOR SELECTION			
IDENTITY	**CRITERIA**	**SCORE**	**RANK**
A	Cost effective	2	4
B	High impact	5	3
C	High sustainability	9	1
D	Ability to absorb shocks (Black Swan)	8	2
E	Adaptability	1	5
F	Ease of implementation	1	5
G	Capability to cut across (industry segments)	8	2

NB : Scores and Rank derived from Paired Comparison Table.

PAIRED COMPARISON CRITERIA

COMPARISON	POINTS
Major difference	**3**
Medium difference	**2**
Minor difference	**1**
No difference	**0**

PAIRED COMPARISON TABLE

A	B	C	D	E	F	G
	B2	C3	D2	E1	A2	G2
	B	C1	D2	B2	B1	G1
		C	C0	C2	C2	C1
			D	D2	D2	D0
				E	F1	G3
					F	G2
						G

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DECISION MATRIX

5 POINT SCALE 5 – EXCELLENT 4- VERY GOOD 3 – GOOD 2 – FAIR 1 - POOR	DESIRED CRITERIA	HIGH SUSTAIN ABILTY (C)	ABILITY TO ABSORB SHOCKS (BLACK SWAN) (D)	CAPABILITY TO CUT ACROSS (INDUSTRY SEGMENTS) (G)	HIGH IMPACT (B)	COST EFFECTIVE (A)	ADAPTABILITY (E)	EASE OF IMPLEMENTATION (F)	TOTAL	RANK
PROPOSALS	**WEIGHTAGE FOR CRITERIA**	**9**	**8**	**8**	**5**	**2**	**1**	**1**		
QUICK RESPONSE MANUFACTURING (QRM)		4	3	5	4	3	3	3		
		36	24	40	20	6	3	3	**132**	**5**
SUPPLY CHAIN INTEGRATION		5	4	5	5	4	4	3		
		45	32	40	25	8	4	3	**157**	**2**
SCENARIO BUILDING EXERCISE (SBE)		5	5	5	4	4	5	3		
		45	40	40	20	8	5	3	**161**	**1**
SUPPLY CHAIN VISIBILITY		4	4	4	4	2	3	2		
		36	32	32	20	4	3	2	**129**	**6**
SOURCING		4	4	4	4	5	5	4		
		36	32	32	20	10	5	4	**139**	**4**
AUTOMATION		3	3	3	4	2	2	2		
		27	24	24	20	4	2	2	**103**	**11**
INDUSTRY 4.0		4	3	4	5	2	3	2		
		36	24	32	25	4	3	2	**126**	**7**
SAFETY STOCK		2	4	4	3	2	2	2		
		18	32	32	15	4	2	2	**105**	**10**
FORECASTING		4	3	4	3	2	2	3		
		36	24	32	15	4	2	3	**116**	**9**
MACHINE LEARNING		3	2	4	4	2	2	2		
		27	16	32	20	4	2	2	**103**	**11**
AGILE SUPPLY CHAIN		4	4	5	5	4	5	4		
		36	32	40	25	8	5	4	**150**	**3**
MULTISKILLING		4	3	4	3	3	5	4		
		36	24	32	15	6	5	4	**122**	**8**

Conclusion :

From the detailed research study conducted and considering the ranks of the various proposals, it can be concluded that the following interventions to a large extent may prove to be effective in preparing for a post COVID-19 sustainable supply chain:

1. Scenario Building Exercise (SBE)
2. Supply Chain Integration
3. Agile Supply Chain
4. Sourcing
5. Quick Response Manufacturing (QRM)

After the COVID 19 situation dissipates, the world shall see companies fall into one of two categories:

Companies that didn't do anything hoping that such disruption won't ever happen again. These companies are taking a highly risky gamble.

There will be firms that learn from this crisis, garner and implement robust interventions that shall make them well prepared when the next crisis strikes (next Black Swan) and equip them with solutions (as mentioned above) when disruptions occur.

The second group of organizations shall emerge as winners in the long run.

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