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Role Of Atmanirbhar Bharat In Revitalisation Of Supply Chain In India

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Abstract: The primary objective of the study is to identify various challenges and solutions for the supply chain amidst COVID Pandemic and to determine Atmanirbhar as one of the possible solutions. The study adopts both primary and secondary data to substantiate the concept of Atmanirbhar Bharat. The survey collects data from middle and upper-level managers across industries through the questionnaire method and uses multiple regression techniques for analysis. The study finds a substantial reduction in imports, delays, affected logistics, and impact on investment returns as significant supply chain challenges to Industries. The recommended solutions for supply chain challenges are the use of automation and technology, meeting customers' changing demand, and the use of optimization. Moreover, Being Atmanirbhar opens up a plethora of opportunities to businesses with a rise in costs. The study highlights cases of different industries in India, adopting Atmanirbhar as a revival strategy for make in India.

1. INTRODUCTION

Effective supply chain management is essential for the growth of any company. It is necessary for satisfying the need of the customer. Effective supply chain management is correlated to value provided to the customer, which in turn increases the profitability of a company. Several factors can affect the supply chain of a company, which includes internal factors and external factors. External factors generally consist of macro-environment factors. The year 2020 has been challenging for this industry, as the COVID pandemic has caused disruptive risks to the global supply chain (Ivanov, 2020). The disturbing supply chain (SC) leads to a ripple effect on the deterioration of production, falling revenues, and profits for various firms (Gupta and Ivanov, 2019). A supply chain is an industry that is the crucial link for all other sectors, whether it is manufacturing, pharmaceuticals, food, automotive, or any other sectors. When a Pandemic smashes to the physiology of supply across the sectors, an economy is forced into recession.

Pandemics are low-frequency high impact events (Ivanov et al., 2019; Ivanov and Das, 2020). The world has experienced many pandemics such as Cholera, Ebola, Influenza, Meningitis, Poliomyelitis, Yellow fever, H1N1, and SARS, etc. However, COVID pandemic has a highly disastrous impact on world economies. Dr. Gita Gopinath, the chief economist of IMF, has stated the COVID19 crisis worse than the great depression of 1930. Major cities globally were under lockdown that has ceased the economic activities for a few months, and it leads all countries' economies into recession. IMF has estimated the global GDP by -4.9%

in 2020. It also anticipated that the total loss of $12 trillion due to the COVID effect (Global Financial Stability Report, IMF 2020). The global market for logistics is reduced by 206 billion rupees due to Pandemic (Dixit et al., 2020). Thus, Pandemic has paralyzed global supply and affected the nervous system of businesses so hard that it resulted in heavy losses to all economies.

The supply chain first broke from China being the first state to get affected by the epidemic. China is a manufacturing hub and hence a crucial link in the supply chain. Since the Pandemic began there, the supply chain across the world has been affected, and countries like India are finding it difficult to make products and services available across. India imports 85 percent of pharmaceuticals ingredients, 55 percent of electronics, and 27 percent of automotive parts from China; the SCs would be affected severely, and a shift in imports would lead to a hike in the prices of final goods (Agrawal, Jamwal, & Gupta, 2020). But Countries are looking now for local production and local supply chain to come out of this challenging period.

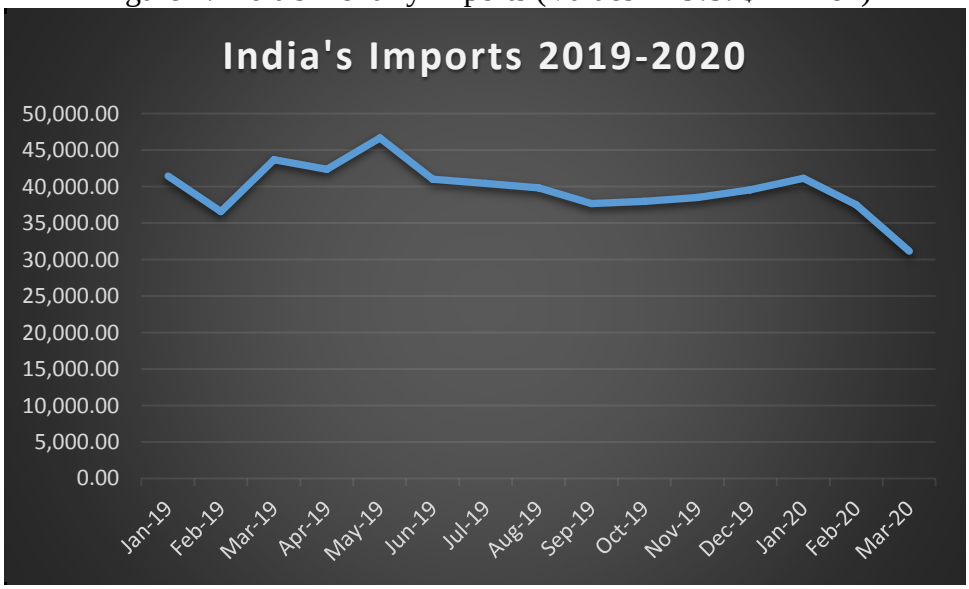
It is not surprising that the prime minister of India has focused on the supply chain in his initiative Atmanirbhar Bharat. In his address on May 12, 2020, the prime minister stressed the need for India to be self-reliant. According to him, one area where India is self-sufficient is the production of PPE kits, where the daily production amounts to 2 lakhs per day. He proposed five pillars, which are the basis of revival, namely Infrastructure, System, Demand generation, varied demography, and supply chain. He stressed the need for a competitive and self-reliant supply chain so that the delivery of essentials is maintained during the Pandemic.

The outbreak of COVID has provided opportunities for researchers to explore the impact of Pandemic on the supply chain (Queiroz et al., 2020). Hence, we explore the damage to the supply chain in the Indian context. The objective of the study is to identify the extent of damage in the supply chain industry in India and bring out the possible solutions for the same. The study would further reiterate the reasonable steps taken by various firms to be Atmanirbhar. The primary data is collected through questionnaires from middle and upper-level managers of different industry personnel for supply chain disruptions. The case study examples are illustrated for understanding the extent of Atmanirbhar Bharat.

I. India's Foreign Trade

India's y-o-y import reduced by 40 percent in March 2020, and y-o-y exports decreased by 52 percent compared to March 2019.

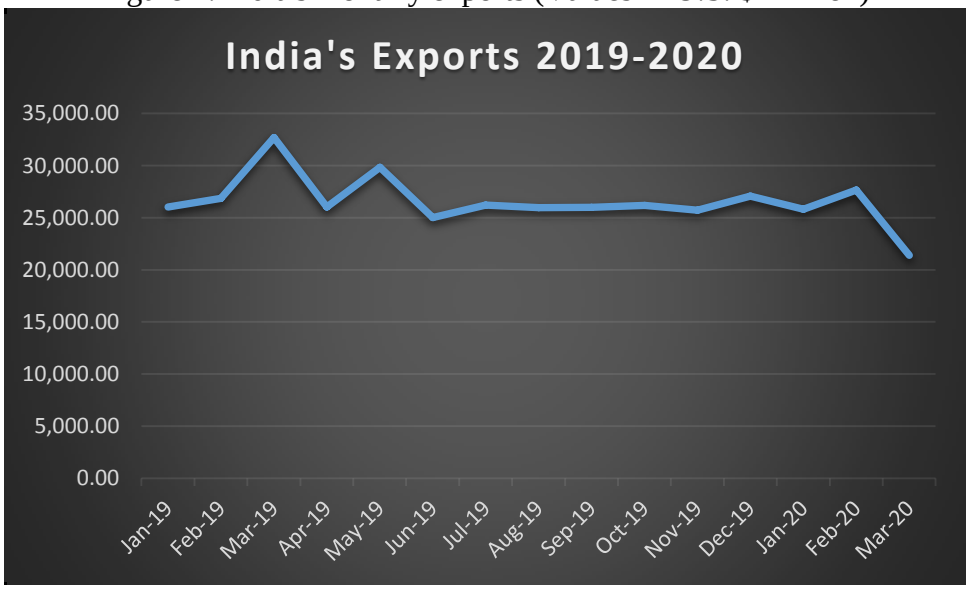
Figure 1: India's monthly imports (Values in U.S. $ Million)



Source: Ministry of Commerce and Industry, GOI

Moreover, India's imports were shrunken by 26 percent and exports by 45 percent for April to June quarter of 2020 (pib.gov.in). It shows an affected global supply chain for India. Figure 1 shows the trend in India's imports from January 2019 to March 2020. The direction is downgrading, especially in February and March 2020. Indeed, the disruptive supply chain has affected India's imports. Similarly, Figure 2 shows the downward trend of India's exports during February to March 2020.

Figure 2: India's monthly exports (Values in U.S. $ Million)



Source: Ministry of Commerce and Industry, GOI

2. REVIEW OF LITERATURE

There are various studies on the impact of a pandemic to global economies, such as Haacker (2004) for HIV/AIDS, Yach, Stuckler, and Brownell (2006) for Diabetes, Thomas (2018) on Nipah virus spread in India, Bloom and Canning (2004) for various epidemics and pandemics and many more. The Pandemic affects the health system, financial system, and economic functioning of the countries that foster damaging all the sectors of an economy. There are also various studies on preparedness for future pandemics. The World Health Organization (WHO) issued a global preparedness report in September 2019, asking for readiness for the Next Pandemic. It highlighted 1483 epidemics materialized in 172 countries from 2011 to 2018 (Goodell, 2020). Thus, the world has suffered many pandemics already, and this time it is the COVID pandemic. However, the recent Pandemic is believed to be more severe and deadly as it has affected more than 200 countries and ceased the tourism and supply chain relentlessly.

Pandemics have a catastrophic impact on the supply chain by fading the financial sector. Epidemics such as HIV and malaria have caused large bank deposit withdrawals that resulted in the depletion of banking reserves and the promotion of bank defaults (Lagoarde-Segot & Leoni, 2013). The supply chain needs stable and robust banking to sustain, especially in the international market. The rise in precautionary cash requirements and reduction in the demand for various products and services leads to a condensed multiplier effect of money. Moreover, companies are also forced to change their capital structure during pandemics (Kraus & Litzenberger, 1973). It further affects B2B business orders and supply chain.

Many studies are highlighting various problems faced by the supply chain industry due to the COVID pandemic. There are problems of inventory, transparency in the supply chain,

demand uncertainty, logistics, optimization, shortages, last-mile delivery, employees, risk mitigation and other issues in the supply chain (Agrawal, Jamwal, & Gupta, 2020; Esper, 2020; Hobbs 2020; Mirchandani, 2020). Agrawal, Jamwal, & Gupta (2020) also highlights that world supply reliance on china is compounding the problem, along with increasing costs. Ivanov (2020) found that the significant determinants are the timing of closing and opening of various strata in the supply chain management. It indicates the timing of lockdown that directly affect the disruption of supply in the economy.

The need for the hour during any pandemic crisis is a resilient supply chain. According to the National Research Council (NAS, 2012), resilience is "the ability to prepare and plan for, absorb, recover from, and more successfully adapt to adverse events." Different studies have proposed various strategies to be resilient for the supply chain. Gupta and Ivanov (2019) highlight some of the SC strategies used by large retailers to prevent SC disruptions. To meet demand all the time, retail stores adopt a strategy of dual or multi-sourcing for many branded products. The same can be used for international SCs. A country can either initiate the manufacturing of goods at home or adopt a multicounty importing strategy. It provides leverage to a country during supply disruptions at the time of crisis. The studies by Majumdar (2020) and Hobbs (2020) mentions the importance of delivery using a contactless approach using online transactions. Transportation using the last mile is going to be the order for the day. New technologies using artificial intelligence and proximity check are going to be necessary. Logistics have to be stronger and more aggregated. There is an extreme need for technology being used extensively here so that delivery becomes more agile and cost-effective. There is a need for better automation, and the use of technology as employees may not be available due to social distancing.

Another article by Rajasekharan (2020) from CLEO talks about how the bullwhip effect can be avoided during COVID- 19. The bullwhip effect is where there are changes in inventory in response to demand as we move upstream in the supply chain. It can happen due to poor forecasting, price discounts, and a host of other factors. Highly automated companies faced fewer problems due to bullwhip. The article says understanding consumer behavior is primarily crucial in reducing the ill effects of bullwhip. Even during the Pandemic, it is essential to identify consumer trends. Connecting to the consumer digitally and maintaining an agile network is another way of nullifying bullwhip. It is vital to act globally and to include more suppliers if needed, as this agility will reduce the stress of getting supply regularly. Including more digital channels for sales is another option (Sharma, Adhikary, Borah, 2020).

Companies have learned resilience supply chain techniques for a pandemic. However, the COVID pandemic has outdated all these traditional SC techniques of hoarding inventories to having multiple SCs (Ivanov and Das, 2020). The conventional methods have become obsolete, and the modern supply chain is connected to various involved nodes. COVID has affected at least one node connected that resulted in the disruptions in the global and local supply chain (Golan et al. 2020). Craighead et al. (2020) suggested fostering translucency in the supply chain that indicates to be ready for radical change in SCs strategies. Sarkees et al. (2020) studied supply chain disruption in the pharmaceutical industry in the US. It claims that a typical drug production for a pandemic usually takes ten or more years. However, the urgency for COVID pandemic drugs has forced regulators to license private players and many public-private partnerships in the US. It highlights an example of being Atmanirbhar by changing the rules of the game. India's Prime Minister Narendra Modi reinstates the same thinking and highlights the importance of strengthening the local supply chain so that India can be a global force. He wanted more investment in this area so that India can be self-reliant and Indian firms can also contribute to the global economy by a robust supply chain (Money

Control, 2020). Moreover, India is making all the possible efforts to bring greenfield foreign direct investment to make in India as it got locational advantages as a destination country (Massand, 2019).

Table I Challenges and Solutions in different Industries in India

Industry	**Challenges**	**Solutions**	**Source**
Automotive	Pandemic affecting China and other manufacturing countries	Technology Optimisation	E.T. Auto, (April 3, 2020)
	Demand Uncertainty and Bull Whip Effect Fewer Suppliers Acquisitions Effect on China	Digitization and Agility; Supplier Collaboration; Better local production	Sumantran and Gonsalvez, (May 15, 2020)
Food & Beverages	Supply constraints; Lack of local production	Understand how much stress the supply chain network can withstand and build resilience by risk mitigation and better technology. Localization of manufacturing	Simchi-Levi and Simchi (June 23, 2020)
	Supply Constraints Reduced Production fewer Imports Labor problems	The food industry is benefitting from more demand and less outside food consumption due to lockdown	Oberoi (April 29, 2020)
	Reaching the Market	Digital technology, Use of voice SMS, WhatsApp, and Mobile App. No restrictions on trade	Narain (June 25, 2020)
Healthcare and Pharmaceutical	Drug Shortages	Resilience Better System	Nawrat (April 8, 2020)
	More Opportunities	Digitization, Artificial Intelligence, Internet of things.	Tandon (June 8, 2020)

Table I indicates challenges and solutions in different industries based on secondary sources. We find solutions to all the compile challenges of various sectors related to supply chain management. It is presented in Table II.

Table II Possible Solutions for Disruptive Supply Chain

Supply Constraints	Usage of Digital Technology
Demand Uncertainty	Better forecasting techniques and analysis
Product Returns	Customer Collaboration
Sourcing	Multiple Suppliers and Management
Increase of Costs	Better methods of supply and more resilient supply chains
Transportation Issues	Optimum usage of trucks

Supply Chain Efficiency	Technology, Digitisation, Better collaboration with customers, Risk Mitigation, Optimisation, Manufacturing automation, Maintenance of quality, Use of Internet of Things, Artificial Intelligence. Digitization and use of augmented reality

Source: Authors' compilation based on secondary sources

3. RESEARCH METHODOLOGY

The study uses both primary and secondary data for analysis. Initially, the data was compiled from secondary sources that indicate various problems and their relevant solutions in the supply chain. For confirming these secondary data, the authors did primary research. The respondents were middle and top management personnel from the industry. More than 500 google forms were sent out to Industry persons, of which 355 were taken for the analysis. The sampling method was snowball sampling. The study objective was to find out the main challenges faced by supply chain and possible solutions. The sample size was 355, and this was taken from different companies ranging from manufacturing to information technology industries. The sampling area was Mumbai and Bengaluru.
The study also highlights cases from Industries that have changed their strategies and shifted in line with Atmanirbhar Bharat. These changes are either to answer the disruptive supply chain or to be Atmanirbhar and avoid future disruption in the supply chain in India.

4. RESULTS AND DISCUSSION

Initially, various challenges and solutions were identified based on a literature survey and from other secondary sources. These challenges and solutions were rated by Industry persons, mainly from Mumbai and Bangalore. Cronbach's Alpha tests the reliability of the data for both problems as well as solutions. The data are found reliable as Cronbach's Alpha was above 0.9. Then, we performed a factor analysis by compiling similar questions as a single factor. In the case of challenges, there are three factors identified, to reach problems, financial difficulties, and employee shortage. In the case of solutions, the defined factors are Technology, Services, and Artificial Intelligence (A.I.). Finally, multiple regression is used to analyze the relationships among the elements.
The solutions suggested in the literature review are all confirmed in the primary data analysis. The most important solution is a better use of automation and technology, the use of optimization, better customer service, sustainability, and better use of analytics. These solutions will help to manage the challenges effectively. Table IV shows the rating given for identified problems, and Table V shows the scores given for identified solutions by the Industry persons.
According to the survey, the main challenges are increased delay, the effect on logistics, the impact on ROI, and the effect on imports. The values close to 5, which is strongly agree, are the solutions suggested in the literature review that have been confirmed in the primary data analysis. The most important solution is a better use of automation and technology, the use of optimization, the use of better transportation, better customer service, sustainability, use of local manufacturing, and better use of analytics. These solutions will help to manage the challenges effectively. If these solutions are systematically implemented, then all the problems faced by supply chains of companies across will be solved. Table III gives the respondent profiles.

Table III RESPONDENT PROFILE

Industry/Experience	**<10years**	**10-20 years**	**>20 years**	**Total**

Consumer Goods	12	10	13	35
Banking	17	12	15	44
Logistics	15	16	15	46
Education	16	12	12	40
Electronics	17	14	10	41
Healthcare	10	16	10	36
Manufacturing	11	13	17	41
IT	07	06	12	25
Retail	07	12	07	26
Tourism	06	09	06	21
Total	118	120	117	355

Source: Authors' data collection

The respondents consisted of middle level and upper-level managers from different industries mentioned in table III.

Table IV Challenges in supply chain

S.I.	**Parameter**	**Rating**
1	Uncertain Demand	3.78
2	Uncertain Supply	3.88
3	Increased Costs	3.77
4	ROI affected in a big way	4.16
5	Logistics affected in a big way	4.18
6	Increased delay	4.21
7	Increased returns from customers	2.82
8	Quality is affected	3.04
9	Less resilient supply chain	3.27
10	Imports affected in a big way	4.09
11	Reaching customers is more difficult	3.54
12	Employee Shortage	3.07

Source: Authors' data collection

Table V Rating to Parameters of Solutions for Supply chain disruption

S.I.	**Parameters**	**Rating**
1	Use of AI	3.82
2	Use of Local Manufacturing	4.01
3	Use of Local Sourcing	3.89
4	Use of Demand Forecasting Tools	3.86
5	Use of Blockchain Technology	3.64
6	Better use of Analytics	4.20
7	Better use of automation and technology	4.26
8	Better Customer Service	4.11
9	More Effective Transportation	4.04
10	Use of Optimisation	4.05
11	Sustainability	4.01
12	Employee Welfare	3.93
13	Resilient Supply Chain	3.97
14	The overall supply chain will become better in 6 months	4.09

Source: Authors' data collection

Table VI: Overall Reliability

Reliability Statistics

Cronbach's Alpha	N of Items
.912	28

Reliability test- Cronbach alpha is generally considered, and value above 0.7 is considered to be good. Here, 0.912 is of excellent reliability. Hence, data is reliable.

Table VII Factors determining supply chain disruption

Dependent Variable	Independent Variable	R Square Value	T-test Sig	Inference	Other Variables
Overall Supply Chain affected	Imports, Uncertain supply, reach difficulty	0.631	0.000<0.05(Imports) 0.011<0.05(Supply Problems) 0.000<0.05(Reach difficulty)	Imports, Supply and Reach problems affect the overall supply chain	No Influence
Overall Supply Chain will be better in 6 months	Effect of Local Sourcing and Transportation	0.275	0.035<0.05(Local Sourcing) 0.043(Effective Transportation)	Impact of local outsourcing and effective transportation local will help in supply chain becoming better	No Influence

From Table VII, we can Interpret that Imports, supply and reach problems influence the overall supply chain, and local sourcing, along with effective transportation, is the primary way ahead for improving the supply chain.

A. Factor Analysis

Table VIII KMO for Supply Chain Challenges

STATISTICS	**VALUE**
KMO	**0.829**
BARTLETT'S TEST	**0.000**

Factor analysis is done for both challenges and solutions. The investigation is done based on Kaiser-Meyer-Olkin values (KMO-acceptable value is more than 0.6). KMO value is more than 0.7 (see Table VII), and so the data can be used for factor analysis.

Since the sample size is 355, loading values that are almost equal to or more than 0.5 are taken and shown in the above Table VIII. The first factor contributes 30%, Second factor 19%, and third 11%. The statements in each factor are shown in Table IX.

Table IX Supply Chain Challenges- Factors

FACTOR 1-Reach Problems	FACTOR 2-Financial Challenges	FACTOR 3-Employee Shortage
Demand Uncertainty-0.704	Returns have increased-0.845	
Supply Uncertainty-0.792	Increase of costs-0.655	Employee Shortage-0.833

Delays have increased-0.739	Less resilient SCM-0.644	
Affecting Logistics-0.733	Effect on quality-0.603	
Effect on ROI-0.667		
Effect on Imports-0.567		
Reach Difficulty-0.514		

Table X KMO Solutions for Supply Chain Solutions

STATISTICS	**VALUE**
KMO	**0.866**
BARTLETT'S TEST	**0.000**

The KMO value is high, and Bartlett's test value is less than 0.05, and so factor analysis is valid.

Table XI Supply Chain Solutions-Factors

FACTOR 1-Technology	FACTOR 2-Service	FACTOR 3- A.I.
Use of better demand forecasting tools-0.854	Effective Transportation-0.862	Use of AI-0.777
Better use of Automation-0.748	Employee Welfare-0.85	Local Manufacturing-0.719
Better Use of Analytics-0.704	Resilient SCM-0.769	
Sustainability-0.661	Better customer service-0.698	
Local Sourcing-0.649	Use of blockchain-0.466	
Use of Optimisation-0.619		

We Interpret from Table XI that there are three factors for supply chain solutions. The first factor contributes 28% of the variance; the second factor contributes 27% each of variation and the third factor, roughly 15%. As the sample size is less, only statements adding equally to or more than 0.5 loadings are taken into the analysis. The values are shown in Table XI. From Table XII, we interpret that technology factors which we got from factor analysis have an impact on service, and artificial intelligence affects service factors using regression.

Table XII Result of Multiple Regression Analysis

Dependent Variable	Independent Variable	R Square Value	T-test Sig	Inference	Influence of Variables
Service	Technology	0.463	0.000<0.05	Technology factor and use of artificial intelligence technology	NIL
Service	AI	0.351	0.000<0.05	Use of AI and local manufacturing affect Service factor	
Reach problems	Import Financial	0.205	0.039<0.05 for Employee shortage	Financial challenges factor is influencing reach of supply chain	Employee shortage is not having any impact on reach

Reach	Technology	0.202	0.00<0.05, Influence but more variables and sample size are required to confirm		

B. Summary of Findings

Based on secondary sources-Demand and supply uncertainty, increased delay, import problems, and reaching the market are found to be the significant problems in all industries and automation, technology, use of analytics, and resilience were found to be some of the solutions suggested. The results of the analysis indicate that technology and the use of artificial intelligence help in servicing the customers better (Table XII). Table XII also shows that the technology used has an impact on reaching the customers. It is also essential to focus on improving imports so that more products can reach customers faster. The most crucial solution proposed is manufacturing and sourcing locally, which is discussed in Atmanirbhar Bharat and the use of technology and optimization techniques, which will help in managing the problems and reaching the customers faster.

Based on Primary Research-Imports, supply and reach are big problems for the supply chain. Technology utilization, analytics, and localization are effective solutions. Disruption in Imports are affecting the supply chain, and localization is the best substitution for imports. Factor analysis for both challenges and solutions yield sufficient KMO values. Technology is found to be an essential solution, whereas the reach factor is the most critical challenge. There is an Influence of one solution over the other. In short, being Atmanirbhar is very important for the supply chain. Import and financials don't influence reach problems. Reach problem has to be solved by technology, but the inference is difficult as the sample size is less, and R-Square is less. It is essential to identify these problems and use technology and automation to address them.

5. DISCUSSION

The leading suggestions are to have multiple sources for global supply and manufacture and source locally. There is also a need for companies to use analytics technology and artificial intelligence in all functions. The objective is to reach the customers more efficiently, and for that optimization and resilience is required. The need of the hour is to reduce the bullwhip effect and use a combination of human intelligence, analytics techniques, and technology to reach customers faster and more efficiently. There is a need for reducing costs and effective risk management so that the supply chain can be more sustainable and agile. There is a need for companies to find out the best technology suited for improving reach to the customers and service them better. Companies should be more technologically advanced and balance automation with intellectual capital with the right mix of global and local manufacturing and sourcing approaches.

The reviewed articles mentioned in Literature stress the need for self-reliance. It is not easy in this particular scenario when COVID-19 cases are increasing. In India, there are cases of self-reliance. Pharmaceutical is an example where India contributes 60% to the global vaccine production in the world. However, in a lot of industries, India is dependent to an extent on countries like China for production and supply chain. The need of the hour is to be self-

reliant in these areas. Table XIII shows the list of Indian firms that have acted to be self-sufficient either through Indigenous production or by changing their importing venue. The record in Table XIII is not exhaustive as there are many Indian firms across Industries moved to Atmanirbhar Bharat. We only could present some sample examples. It indicates that the mantra of Indian Prime Minister "Be Vocal for Local" has been incorporated by many Indian firms recently. However, it is the short-run results due to supply chain disruption, and the long term effect is yet to be measured in the coming period.

Table XIII Atmanirbhar Indian Businesses

S.I.	Company	Action	Revised action
1	Hero Cycles-Automobiles	Cancelled Rs. 900 crore project with china	Planning to join hands with German firms for Europe supply and Indigenous production for India
2	TTK Industries-Prestige Pressure Cookers	Cancelled raw material contracts from china	Shifted to Indigenous materials or will change to Vietnam (Massand, Lodi, Ambreen, 2020)
3	Xiaomi India-Electronics	Cancelled parts and mobile phone imports	99% of smartphones and smart T.V.s are made in India (Co-founder and M.D., Manu Kumar Jain, June 11, 2020)
4	Peter England-Textile	Production of Shirts. Import of PPE kits by GOI.	Ventured into new segment-Production and export of PPE kits
5	AB Industries-Ventilators	Importing parts from abroad	Tied up with Indian firms such as BHEL (Bharat Electronic Ltd.) and DRDO (Defence Research and Development Organization) for production
6	Scanray-Ventilator	Importing parts from abroad	Tied up with DRDO (Defence Research and Development Organization) for production (Founder and MD, Vishwaprasad Alva, May 8, 2020)
7	Tulips-Pharmaceutical	India imports nylon-flocked and viscose swabs from the U.S. and China	Tulips started producing indigenous polyester swabs. (Rahul Jain, co-owner)
8	Lloyd-Electronics	Importing air conditioners from China	100% indigenous production of air conditioners in India (Chairman and MD, Havells India)

6. CONCLUSION AND SCOPE FOR FUTURE RESEARCH

The study investigates the various challenges and solutions of the supply chain both through secondary sources and primary data analysis. The significant challenges of the supply chain are disruptions in imports, delays, affected logistics, reaching to customers, and fewer returns on investment. It discourages production, manufacturing of goods, and services in the economy. The lack of efficiency in the supply chain will lead to creating less value for customers that will further reduce profitability. It is the need of the hour for technology utilization and usage of optimization techniques to improve reach, uncertainty in demand, and supply. These methods will ensure that there is the right level of forecasting with the optimal amount of stock. Bullwhip effect will reduce. Usage of drones and automation transportation

will become faster. Blockchain technology will minimize the risk of payments. Automation will reduce expenses in warehouses. The use of employees as intellectual capital will make reduced expenses and effective utilization. The use of technology will also help in supplier collaboration that will reduce the risk in the supply chain. Technology will help in the end to end visibility which will help in the better supply chain. From the results, we can infer that the use of technology will reduce uncertainty and improves service given to customers. Manufacturing and sourcing locally will help to reach the customers faster and to service them more quickly. Atmanirbhar's concept is especially important to revive the supply chain in COVID times.

Firms need to change their strategies according to the challenges in the supply chain. Companies must invest in technology and employee development. The government can provide the necessary technological up-gradation of systems and technology. They can invest in developing the education system so that future employees are technology-driven and are ready for the industry from day 1. The government can invest in infrastructure development. We must maintain a balance between being global and able to provide locally. All stakeholders need to imbibe the benefits of foreign technology, keeping the local flavour intact. Here the role of firms is essential as they have changed their strategy to domestic production using local resources and raw materials recently. It indicates the way forward is Atmanirbhar Bharat. Future goals of the organizations have to be sustainability based on technological advancement, employee development, and environment-conscious systems. Sustainability practices will ensure the resilience in supply chains.

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