

## VULNERABILITY OF SOME GLOBAL VALUE CHAINS IN CRISES

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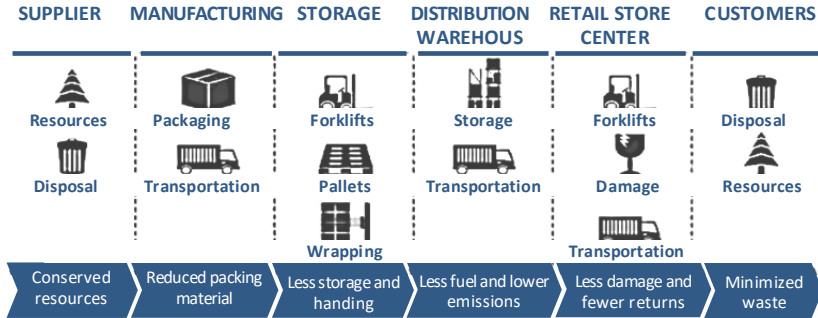
**Introduction.** A supply chain is defined as the entire process of making and selling commercial goods, including every stage from the supply of materials and the manufacture of the goods through to their distribution and sale. The literature pays sufficient attention to the architecture of their construction, however, there are practically no studies devoted to their vulnerability under the influence of global external factors.

**Presentation of the main research.** The definitions of the concept emphasize that supply chains include various entities, such as raw material extractors, service and component suppliers, a material product manufacturer or a producer of services, distributors, and end customers (e.g. Felea et al., 2013; Stock et al., 2009; Sweeney, 2011). Figure 1 below shows that supply chain includes various flows as well as various entities; materials and services flow from suppliers toward customers, payment flows from customers toward suppliers, and information flows are transmitted in both directions across the chain (Blanck, 2015).

The concepts underlying supply chain management have been around for many decades and cover a wide range of related but initially fragmented activities. The literature shows that supply chain management can be viewed in terms of different processes such as logistics, strategic planning, information services, marketing and sales, finance and so on. However, today the function of supply chain management is considered as a new challenge for achieve sustainable patterns of production and consumption (Hou, 2023). Besides the potential cost savings attributed to packaging materials, and decreased handling, storage, and transportation costs, etc., the main expected results from the stability and quality of fulfilling obligations by the actors of supply chain. The common objective must be that the supply chain as a whole was able to deliver in the uninterrupted and most efficient manner in accordance with the principles of openness and accountability (Paliekhova, 2020).

**Figure 1**

*The stages of sustainability in the supply chain (compiled from Blanck, 2015; Paliekhova, 2021)*



Given that, management for supply goes beyond the interests of a specific buyer and supplier it is essential to integrate strategies of these enterprises into broader regional and industrial development chains and networks (Paliekhova, 2021 ; Hou, 2023).

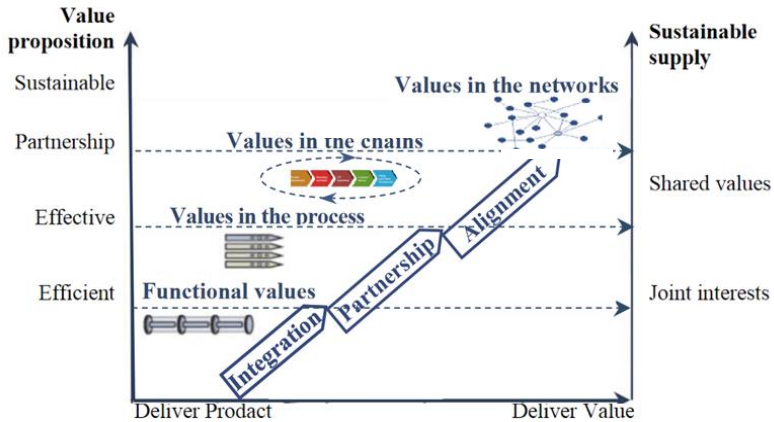
The Figure 2 also shows that the supply chain as a sustainability tool emerges when participants synchronize their respective processes and adopt a philosophy of supply chain management that has a unified strategic consideration of sustainability already in the network format. Businesses need further to pursue the partnerships for sustainable production and consumption through building sustainable their supply chains of local and national level, involving authorities, civil society and other partners in these processes.

Of course, if businesses wish to, or have to, transform the strategy of participation in the supply chain into a strategy of partnership and then into a strategy of synchronous management, they are welcome to do that. The difficulty however is that the reliability of each of operators can be actually crucial for this.

Some of them show incapacity to deal with the small setbacks or fall into circumstances of force majeure (natural disasters, disorganization of the country's Government, etc.) that would close down the production for an indefinite period.

**Figure 2**

*From supply chains to value chains (compiled from Blanck, 2015; Paliekhova, 2021)*



Others show the internal shortcomings, such as incapacity to carry out the conversions of their strategies in accordance with the mechanism of the restrictions or requirements in specific supply and value chains. However, if some products are not uninterrupted supplied, a substantial part of production may be delayed or even rejected, producing destructive results, market failures and the appearance of suppliers with poor security.

To illustrate how strongly one type of supply can affect the overall sectoral development processes, consider the situation of the semiconductor chip shortage caused directly or indirectly by COVID 19 pandemic. The 2020–2021 global shortage of integrated circuits affected more 169 industries. Supplies of chip needed for manufacturing were unavailable for months. Unsatisfied demand caused shifts that rippled up the supply chains. The crisis led to decline in the output of carmakers, problems for broadband providers and dozens of other manufacturers that require semiconductors. Indeed, the supply chain crisis was the result of disruptions coupled with the boom in demand caused by CCOVID-19. Shortages of workers and

manufacturing facilities have only made the issue worse. At the same time, and more profoundly, COVID-19 was not the only factor behind the shortage. The situation showed us the fragility and vulnerability of value chains with the growing trends towards globalization (Wu et al., 2021). Summarizing the facts, we can highlight the key lessons to retain from the unmet demand for chips are as follows.

Firstly, it was the digitalization of work and life. Lockdowns spurred the digitization of all types of activities and, as a result, an increase in demand for chips. Laptop sales hit their highest level in a decade; home networking gear (webcams, monitors, home appliances, etc.) were snapped up as office work moved out of the office and so on. Secondly – insufficient planning and forecasting. Insufficient planning and monitoring, and ineffective synchronization of the activities of the main value chains were the key factors that resulted in disruptions of so many related industries. Automotive has particularly shown a lack of focus on strategic value chain management. Companies chaotically cut production, and then rushed to resume orders late in 2020. Nevertheless, it was too late.

Thirdly – weak links in the supply chain. In the panic and confusion, large producers began to build up inventories. For example, China's chip imports climbed to almost \$380 billion in 2020, up from about \$330 billion the previous year. Fourthly – unpreparedness of chains to respond quickly to natural disasters. For example, a bitter cold snap in Texas led to power outages that shut semiconductor plants clustered around Austin. A fire at the plant of Japan's Renesas Electronics Corporation, a major manufacturer of automotive chips, led to a force majeure. Its production was stopped for several months.

The feature of industrial markets is that difficulties in supply chain cannot be solved simply and quickly. In particular, integrated circuits are the tiniest yet most exacting product ever manufactured on a global scale. In this case, it takes up to 3 years to put up such manufacture and not less than a year to add capacity to an existing one.

**Conclusions.** Thus, the case with the shortage the shortage proved that industrial supply chain management is quite vulnerable to external factors, as well as there is insufficient attention from managers to growingly some supplying problems for the last several years. The situation analysis confirmed that other strategies, based on active partnership between suppliers and their customers (including

joint strategic planning for value chains), are required. It is important for all participants in the value chain to work out a set of principles and interrelated strategies on the supply and creation of value that potentially reduce vulnerability due to different situations, increase behavioural agility and resistance.

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