UNIVERSITY OF NIS FACULTY OF MECHANICAL ENGINEERING

THE EIGHTH INTERNATIONAL CONFERENCE
TRANSPORT AND LOGISTICS

til 2021

RE-SHORING IN THE SUPPLY CHAIN AS A RESPOND TO COVID-19

Aleksandra ANĐELKOVIĆ [1]
Melisa BEJTOVIĆ [1]

[1)] *Faculty of Economics, University of Niš*

Abstract

We have witnessed the impact of Covid-19 disease on the global economy for two years. The closure of border crossings and the suspension of foreign trade and the slowdown of transport activities have significantly jeopardized the functioning and sustainability of individual companies, as well as whole supply chains. The emergence of a pandemic has led to a reconsideration of the decisions and strategies of global supply chains, which were economically justified in the conditions before of the pandemic. Outsourcing and offshoring are strategies that have contributed to the development of supply chains, in terms of designing complex structures, composed of different companies, that specialize in performing specific activities. That specialization justified the engagement of various suppliers, manufacturers, intermediaries and other companies to provide logistics services.

Due to the high level of specialization in performing individual activities, these partners in the supply chain performed tasks faster, with better quality and at lower costs. Today, in pandemic conditions, complex supply chains with a large number of partners (especially in the automotive, aircraft, electronics industries) are becoming vulnerable due to numerous restrictions on the movement of raw materials, goods and people between different countries.

These restrictions significantly hamper the functioning of supply chains and in some cases even call into question sustainability of the whole supply chain. Therefore, as a consequence of the pandemic caused by the SARS-COV-2 virus, there is a need to redesign supply chains in terms of switching from outsourcing and offshoring to re-shoring. The aim of paper is to recognize the possibilities of re-sharing strategy in the supply chain in the conditions of the Covid-19 crisis, as well as to point out the advantages and limitations of making such a decision.

Key words*: supply chain, covid-19, outsourcing, offshoring, re-shoring*

1 INTRODUCTION

The need to increase the efficiency of the supply chain has encouraged the continuous finding of a partner who will supply the chain or perform certain activities faster, easier and cheaper. In this way, global supply chains have become significantly complex with extensive networks of partners, in different countries around the world. Outsourcing and offshoring are often mentioned as factors in the development of the supply chain, but also as factors in increasing the efficiency of processes in the supply chain. Outsorucing and offshoring are used as strategies to reduce costs and transfer risks and responsibilities to other affiliates or suppliers (partners) [11].

Outsourcing has ensured the transfer of processes and activities to those partners who are more competent in performing them, and who will ensure maximum efficiency. On the other hand, global supply chains have recognized offshoring as a way to achieve savings by relocating production or other processes and activities from home countries to tax haven countires. Both outsourcing and offshoring seemed to be the keys to success and an indispensable part of any supply chain. While outsourcing involves engaging a partner to perform certain activities for which they specialize, offshoring refers to relocating activities outside the country where the focal supply chain firm is located. Thus, the key difference between these strategies is the ownership and location of the activity. However, these two strategies are not mutually exclusive and are often combined [18].

Original Equipment Manufacturers (OEMs) from automotive industry are very well know as users of outsourcing and offshoring strategies into supply chains [2]. According to these strategies automotive manufactures shifted some activities to low-labour cost locations in Asia, Africa and Latin America, while high-end design, R&D, product development performed mostly to high-cost and high knowledge-intensive domestic locations. Asia, and specially China, becomes the "world producer" of 1990s and 2000s [1]. That these two strategijes of supply are not without limitations has been previously discovered by global supply chains, but this has been especially shown with the appearance of Covid-19 disease and the proclamation of a pandemic caused by the SARS-COV-2 virus. The Covid-19 pandemic has changed the business environment. This pandemic has highlighted the importance of quick reaction, resilience companies and risk management in order to weather situations of uncertainty [10]. The overall impact of Covid -19 will be seen in future. But for now it is clear that global supply chain and companies have been faced with a large number of interruptions and disruptions, which affected the decline of business activity or the complete stop of the process. The SARS-COV-2 virus was spread during the first half of 2020 to almost all countries. Disease Covid-19 has extreme effect on global supply chains, and for both sides supply and demand. Institute of Supply Management according to its research determined that 75% of the companies had in supply chain disruptions, 80% expected disruptions in the near future, 62% had delays in receiving goods, and 53% of the companies reported difficulties in getting information from China [19].

2 RE-SHORING – WAY OF SUPPLY CHAIN STRUCTURING

Even in conditions when outsourcing and offshoring were gaining in importance in global supply chains, there was a need to reconsider the justification of higher efficiency with a lower degree of resistance of supply chains. Operational challenges and increasing costs have affected supply chains in terms of reconfiguring their activities, as well as relocating facilities and changing the supply base to the home country. Therefore, re-shoring is not a phenomenon fueled by the Covid-19 pandemic and its aftermath, but is something that global supply chains have been using since before in order to achieve better results.

Re-shoring represents reallocation of owned manufacturing or supplier activities and back to the manufacturer's home country [4, 8]. Re-shoring presents where manufacturing activities are to be performed, and who is performing the manufacturing activities is irrelevant, here is a key location decision only. According to this explanation of re-shoring It could be recognized four types of re-shoring [8]:

- in-house re-shoring, situation where company fulfills demand in its local market by relocating manufacturing activities being performed in wholly owned offshore facilities back to wholly owned facilities;
- re-shoring for outsourcing, situation where company fulfills demand in its local market by relocating manufacturing activities being performed in wholly owned offshore facilities back to suppliers;
- re-shoring for insourcing, situation where company fulfills demand in its local market by relocating manufacturing activities being performed by offshore suppliers back to wholly owned facilities; and
- outsourced re-shoring, situation where company fulfills demand in its local market by relocating manufacturting activities being performed by offshore suppliers back to suppliers.

Figure 1 shows these four types of re-shoring.

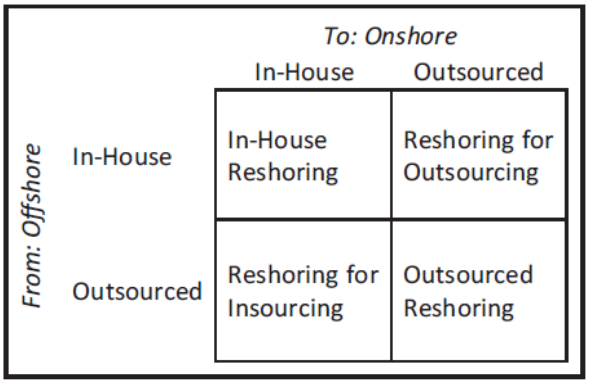

Fig. 1 *Types of re-shoring*

So, re-shoring is not unknown pehnomen, and it is not a consequence of pandemics only. Even before pandemic of Covid-19 some authors recognized reasons for re-shoring some manufacturing activities to 'home' countries. Those reasons could be more competitive exchange rate, higher transport costs, rising wages in key areas of China, inventory or supply rigidities associated with the physical distance, and a greater awareness of supply chain resilience [1]. Many factors may affect to decision of re-shoring and changing destinations of manufacturing activities. For example those factors could be: input factor costs (tax rates, tariffs, currency changes); risks (currency risk, expropriation risk, quality risk); network effects (clusters/agglomeration); differences between locations (psychic distance, cultural distance, institutional distance) [8]. Also, the factors or drivers of re-shoring are shown in Table 1.

Table 1 Re-shoring drivers [7]

Factors	Category	Exemplars
Bounded rationality	Performance projections	Cost assessment of initial decisions
		Management performance aspirations
	Failures	Use of prior experience in decision making
		Decision biases
		Changes in managerial valuation
		Tacitness of required knowledge
Opportunism	Relational issues	Inter-firm relationship management
		Inter-firm relationship management
		Power-dependence issues
Environmental uncertainty	Business context uncertainty	Exogenous costs
		Macroeconomic changes
		Institutional changes and differences
	Supply chain complexity	Vertical and horizontal complexity
		Supply chain length and dispersion
		Supply and customer market proximity
		Cultural and psychic geographic distance
		Environmental regulation and concerns
	Task uncertainty	Task scale (volume)
		Task and product complexity
		Task frequency
		Task novelty
		Product variety
		Process modularity
Asset specificity	Physical asset specificity	Focal firm investments into plant or supplier
		Supplier or plant investment into focal firm
		Obsolescence of technology
		Resource availability and scarcity
	Human asset specificity	Dedicated personnel to supplier
		Skills & knowledge specificity

In some cases, re-shoring is referred to as the opposite action to the process of business internationalization, while in others it is described as a corrective strategy of previously made wrong location decisions [13]. Also, studies show that as many as 40% of managers within five years of making decisions about the transition from outsourcing and / or offshoring to re-shoring [9, 17]. Re-shoring is also often viewed from the aspect of increasing supply chain transparency. Therefore, there are expectations that in the future, re-shoring as a long-term and ethical perspective on the location of production, which provides greater transparency, better reputation and less exposure to supply chain risks, will outweigh the need to relocate production to the lowest cost locations.
Squire Sanders, re-shored its production to the UK between 2011 and 2014. Similarly, Walmart encouraged re-shoring in its supply chain by announcing that by 2023 it plans to increase supply from U.S.A. suppliers for $ 50 billion [6]. Companies as General Electric and Apple are announced investment to "re-shore" the manufacturing. General Electric from China to United States and according to research of GE even than (ten years ago) 38% of direct competitor has re-shored and 14% has planned to re-shored. Also, Kinkel (2014) recognized re-shoring as a trend in Germany that each year is present in 400 to 700 German companies [9]. This trend is a logical step after previously failed outsourcing and offshoring activities. On the other hand Martínez-Mora and Merino (2014) recognized re-shoring as a consequence of changes which could not have been predict [12] and also that intensity of re-shoring differs between countries [18].

3 THE IMPORTANCE OF RE-SHORING FOR SUPPLY CHAINS IN THE CONDITIONS OF THE COVID-19 CRISIS

The emergence of the SARS-COV-2 virus has influenced the review of outsourcing and offshoring decisions. The closure of border crossings and the suspension of foreign trade have threatened the survival of global supply chains, especially those supplied with raw materials around the world. There is a delay or complete suspension of deliveries of raw materials, non-execution or delay in performing logistics activities and the like. This global event has inexorably raised concerns regarding the uncertainty and vulnerability of the supply chains, and in order to ensure their resilience, companies, as initiators of supply chains, recognize it as a key problem.
The use of export restrictions on essential goods has increased sharply during the Covid -19 crisis. This is a key reason why a lot of global supply chains made decision for re-shoring production of essential goods. Available information shows that 86 countries have introduced export prohibitions or restrictions as a result of the Covid-19 pandemic (46 WTO members and eight non-WTO members) (see Figure 2) [16].
The manufacturing re-shoring decision-making process comprises five generic steps, which are as follows [3]:

- controlling the boundary of the company;
- analyzing the current performance of the company;
- obtaining information on possible re-shoring alternatives;
- analyzing the data for re-shoring alternatives; and
- making the re-shoring decision.

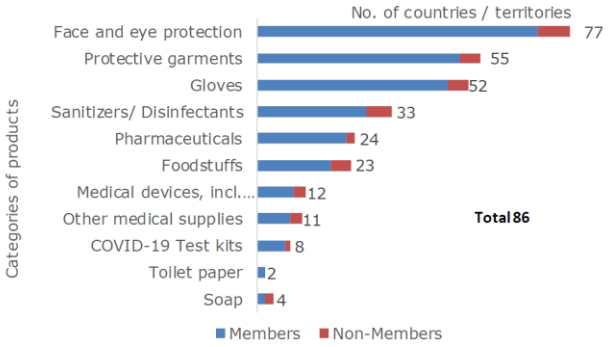

Fig. 2 *Number of countries with restrictions in foreign trade* [16]

During the pandemic of Covid-19, many companies have exposured to supply chian disruptions, becouse of their reliance on outsourcing and offshoring strategy. A lot of global supply chains were faced with disruptive effects of pandemic. So, after this pandemic it will be expected that managers' focus will change from efficiency and growth to riskrelated practices. They have in mind the steps in the process of implementing the re-shoring decision we could recognize the triggering role played by the Covid-19 pandemic (Trigger) [4].
After the cause, problem, event or trigger, a gap is identified between the expected and achieved results of the supply chain or the focal firm in the chain. It is necessary to determine the level of costs and necessary investments, existing and necessary production capacities, select machines and the like. In that sense, it is necessary to define all available alternatives, and then analyze each individual alternative [14].

There is evidence that global supply chains have recognized re-shoring as a way of overcoming the Covid-19 crisis. For example, statement of Fondazione Altagamma[1] that it is time for the luxury production of silk and technical tissues to come back to Italy.
Also, President of the French group Sanofi and the French Federation of Health Industries declared that it is necessery to bring back to France production of active pharmaceutical ingredients (or at least in Europe).
Changing of supply chain structure will be determined by attitude of national governments from which supply chains originate. For example, governments of US, Australian and Japanese already look for to decouple their economies from their dependence on China (assuming that China is seen as the country responsible for the Covid-19 pandemic) [15]. French Government called for recreating the paracetamol supply chain locally. Japan launched the initiative for financing 70% of the relocation costs for small and medium enterprises that producing raw materials for drugs [14]. Here we have examples that decisions of policymakers could be stimulative for re-shoring activities in supply chain.

[1] President of Italian association of 107 brands operating in the high-end of fashion, jewellery, design, food, hotels, automotive and wellness industries

Re-shoring decision based on the mentioned examples is certain that it cannot be implemented in a relatively short period of time. So after implementing all the steps in the re-shoring decision-making process that was discussed, it is necessary to implement the same decision. In the case of a Covid-19 pandemic, the process of implementing a re-shoring decision can be more or less complex depending on the time horizon and depending on whether the decision is implemented at the level of one company in the supply chain or at the level of the firm. In this regard, the following table shows the variants in the re-shortening decision-making process.

Table 2 Type of re-shoring decision [4]

		Time horizon	
		Short-term	Long-term
Decision maker	Single company	Individual reactive re-shoring	Individual preventive re-shoring
	Supply chain	Joint reactive re-shoring	Joint preventive re-shoring

Re-shoring could be very important in process of reducation cost and risk. Through re-shoring supply chain could provide to supply chain to be closer and more responsive to customers' needs. By implementing this strategy, the supply chain should become shorter and less vulnerable. But re-shored activities still could be dependent from raw materials that can be only supplied from some other countries.

Rates of infection and measures defined by governments in different countries have a great influence on supply shock and the demand shocks. Global supply chains through diversification in revenue streams (selling products in domestic as well as in foreign markets) try to reduce unsystematic risk. So, re-shoring activities could be a factor of increase resilience for domestic sales, but in the same time factor of increasing costs for foreign sales. Also, re-shoring activities of supply chain, in condition of Covid-19 pandemic, could be completely justified, only if Covid-19 has a local character (localized in multiple countries). In this situation re-shoring activities from those countries would give significant results. But, Covid-19 is a global phenomenon, and both the health and the economic impacts are present by most countries in the world.

4 CONCLUSION

The Covid-19 pandemic will end at some point, by gaining immunity to the SARS-COV-2 virus, either by vaccinating with vaccines that will be more effective than existing ones, or by infecting and gaining natural immunity. However, the end of the pandemic will not be the end of all research, but only the beginning of the investigation into the origin and epidemiological behavior of the virus, responses of governments and international organizations, as well as measures taken to reduce negative effects on human health and mitigate economic consequences. Also, the end of the pandemic will be the beginning of an investigation at the level of global supply chains to review their configuration in terms of number of partners, location of certain activities and their management, as well as defining measures to increase supply chain resilience and crisis management. One of these measures will certainly be the reorientation of activities, which will shorten supply chains, make them less complex and vulnerable to restrictions on the movement of goods and people in the event of such and similar crises. Outsourcing and offshoring activities could also have benefits, especially for cost saving, focus on core competencies, access cheaper and / or better quality inputs due to competition between outside suppliers [16]. Benefits from both ways of supply show need for finding optimum between resilience and efficiency. It is certain that there will be many more dilemmas about achieving greater openness of supply chains by combining the reorientation of activities that were previously carried out outside national borders, and the internationalization of activities and leaving them to independent suppliers.

REFERENCES

1. Bailey, D., de Propris, L., 2014, Reshoring*: Opportunities and Limits for Manufacturing in the UK – the case of the Auto Sector,* Revue d'économie industrielle, 145 (1), pp. 45-61. https://doi.org/10.4000/rei.5732
2. Bailey, D., de Propris, L., 2014, *Manufacturing reshoring and its limits: the UK automotive case*, Cambridge Journal of Regions, Economy and Society, 7 (3), pp. 379-395. https://doi.org/10.1093/cjres/rsu019
3. Bals, L., Kirchoff, J.F., Foerstl, K., 2016, *Exploring the reshoring and insourcing decision making process: toward an agenda for future research*, Operations Management Research, 9 (3/4), pp. 102-116.
4. Barbieri, P., Boffelli, A., Elia, S., Fratocchi, L., Kalchschmidt, M., Samson, D., 2020, *What can we learn about reshoring after covid-19*? Operations Management Research, 13, pp. 131–136. https://doi.org/10.1007/s12063-020-00160-1
5. Ellram, L. M., 2013, *Offshoring, reshoring and the manufacturing location decision*, Journal of Supply Chain Management, 49 (2), pp .3-5.
6. Fine, C., 2013, *Intelli-sourcing to replace off-shoring as supply chain transparency increases*, Journal of Supply Chain Management, 49 (2), 6–7.
7. Foerstl, K., Kirchoff, J. F., Bals, L., 2016, *Reshoring and Insourcing: Drivers and Future Research Directions,* International Journal of Physical Distribution & Logistics Management, 46 (5), pp. 492-515. https://doi.org/10.1108/IJPDLM-02-2015-0045
8. Gray, J. V., Skowronski, G.,, Esenduran, G., Rungtusanatham, J. M., 2013, *The Reshoring Phenomenon: What Supply Chain Academics Ought to know and Should Do*, Journal of Supply Chain Management, 49 (2), pp. 27-33.
9. Kinkel, S., 2014, *Future and impact of backshoring – Some conclusions from 15 years of research on German practices*, Journal of Purchasing & Supply Management, 20 (1), pp. 63-65.
10. Magableh, G. M., 2021, *Supply Chains and the COVID-19 Pandemic: A Comprehensive Framework*, European Management Review, XXX. https://doi.org/10.1111/emre.12449

11. Manuj, I., Mentzer, J.T., 2008, *Global supply chain risk management strategies*, International Journal of Physical Distribution & Logistics Management, 38 (3), pp. 192-223.
12. Martínez-Mora, C., Merino, F., 2014, *Offshoring in the Spanish footwear industry: A return journey?* Journal of Purchasing & Supply Management, 20 (4), pp. 225-237.
13. Robinson, P.K., Hsieh, L., 2016, *Reshoring: a strategic renewal of luxury clothing supply chains*, Operations Management Research, 9, pp. 89–101. https://doi.org/10.1007/s12063-016-0116-x
14. Sequeira, M., Hilletofth, P., Adlemo, A., 2021, *AHP-based support tools for initial screening of manufacturing reshoring decisions*, Journal of Global Operations and Strategic Sourcing, 14 (3), pp. 502-527. https://doi.org/10.1108/jgoss-07-2020-0037
15. Strange, R., 2020, *The 2020 Covid-19 pandemic and global value chains*, Journal of Industrial and Business Economics, 47, pp. 455–465. https://doi.org/10.1007/s40812-020-00162-x
16. Strange, R., Magnani, G., 2018, *Outsourcing, ofshoring and the global factory*, In G. Cook & F. McDonald (Eds.), The Routledge companion to the geography of international business (pp. 60–77). Abingdon: Routledge.
17. Tate, W. L., Ellram, L. M., Petersen, K. J., Schoenherr, T., 2014, *Current Practices in Offshoring and Reshoring*, Council of Supply Chain Management Professionals report, pp. 1-71.
18. Wiesmann, B., Snoei, J R., Hilletofth, P., Eriksson, D., 2017, *Drivers and barriers to reshoring: A literature review on offshoring in reverse*, European Business Review, 29 (1), pp. 15-42. https://doi.org/10.1108/EBR-03-2016-0050
19. World Economic Forum, The ongoing impact of COVID-19 on global supply chains, The ongoing impact of COVID-19 on global supply chains | World Economic Forum (weforum.org), Accessed, 6th September, 2021.
20. World Trade Organization, Covid-19 and Global Value Chains: A Discussion of Arguments on Value Chain Organization and the Role of the WTO, ersd202103_e.pdf (wto.org), Accessed, 21st September, 2021.

Contact address:
Aleksandra Anđelković
University of Niš
Faculty of Economics
18000 Niš
Trg kralja Aleksandra Ujedinitelja 11
E-mail: aleksandra.andjelkovic@ekonomski.rs