

Supply Chains Reconfiguration in a Post-Pandemic Era: An Exploratory Bibliometric Analysis

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Abstract

In an unstable global business environment, reconfiguring global supply chains is a necessary step. Supply chain reconfiguration gives the supply chain the ability to adapt quickly; new supply chain structures allow for increased responsiveness and flexibility to deal with disruptions.

The main objective of this paper is to identify the research interest in the area regarding the supply chain reconfiguration. The study is based on a quantitative research method, namely bibliometric analysis. By querying the existing database on the Scopus platform, scientific papers (research articles, books, papers presented at conferences) containing the keywords in the title, abstract, or in the keywords of the documents have been identified. The research results confirm the increasing academic interest in supply chain reconfiguration.

Keywords: supply chain, supply chain reconfiguration, bibliometric analysis, VOSViewer, Scopus

JEL Classifications: M16, F40, F49,

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1. Introduction

In the context of globalization, companies have developed global networks integrating supply sources, production centers and distribution points. This is what we call supply chain, *i.e.*, networks containing suppliers, manufacturers, distributors located in different parts of the world (Belu et al. 2021).

During the COVID-19 pandemic, there were a number of disruptions in the supply chain, such as difficulties with the supply and organization of logistics activities. Under these circumstances, driven by the disruptions experienced by worldwide SC during the COVID-19 pandemic but also by the emergence of new risks, companies have started the process of supply chain reconfiguration.

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Reconfiguring / redefining the supply chain is a topic increasingly addressed in the literature in recent years. The interest in this topic was prompted by the COVID-19 pandemic, when a major concern of those involved in the supply chain management was to ensure the resilience of the global supply chain.

According to a study (Ollagnier, J.M. et al. 2022), the reconfiguration of the SC is a necessity in the current context. The result of this process will be a more resilient and agile SC, able to react to growing uncertainties.

The article reviews academic literature dealing with the topic of supply chain reconfiguration, and asks the following questions: What are the main issues addressed in supply chain reconfiguration? What are the most common keywords used in the analyzed reviewed? What is the trend in the publication of research papers (articles, conference papers) in the field of supply chain reconfiguration?

With these questions in mind, the research objectives were set. The main objective is to analyze the status of research works on the supply chain reconfiguration from a bibliographic point of view. From the category of secondary research objectives, we mention: the evaluation of the links between keywords and articles published in different journals classified in the Scopus database and the analysis of research articles with the topic of redefining the supply chain, taking into account the co-authorship, journals, and year of publication.

2. Review of the scientific literature

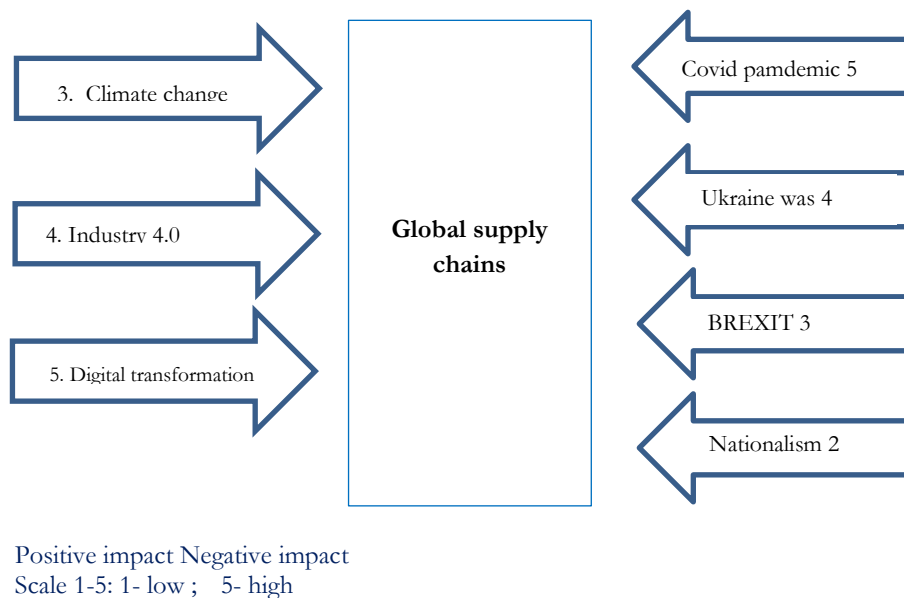
Supply chains (SC) is a generic name for an input-output structure of value-added activities, starting with raw materials and ending with the finished product. *Supply Chain Management* (SCM) means planning and coordination of all the company's activities relating to sourcing (purchasing from suppliers), production (transformation of inputs within the company) and distribution (logistics to consumers). It also includes coordination and collaboration with trading partners, which can be suppliers, intermediaries, third party service providers, customers (Popa & Belu, 2018). Supply Chain Management is an essential business tool that can affect the success or failure of a supply chain project (Dubey and Gunasekaran, 2016).

According to (Devesh K. et al., 2023), supply chain reconfiguration (SCR) is a strategy by which a company changes its specific SC network and specific processes in order to achieve its goals. Through this change, the company can cope with changes/events occurring in the global market. The decision on the reconfiguration of the SC is based on several factors, such as: production tasks, supplier selection, configuration of the SC and associated risks.

According to Charu & Grabis (2009), SCR is a "chain of independent stages that possess the flexibility of changing its structure by using minimum resources and maximum customer expectation".

The need to reconfigure the SCs has emerged in recent times as a result of factors that influence the conduct of activities at the SC level. In the category of factors with positive impact we mention: new technologies, industry 4.0, environmental regulations, and factors that have distorted supply chains are: the COVID-19 pandemic, the war in Ukraine, Brexit. (see Figure 1)

Figure 1. Factors impacting the global supply chain



Source: Basu, R. (2023)

Digitization of global supply chains: new technologies enable the configuration of innovative logistics solutions with direct impact on costs, transparency, and resilience of the global supply chain. Improved supply chain information flow management is a condition for success (Christopher, 2016).

Industry 4.0 impact: thanks to new technologies (IoT, AI, blockchain, Big Data, 5G), companies are rethinking how they design their supply chain. Thanks to these technologies, companies will achieve a 30% reduction in operational costs (Belu et al., 2021).

Impact of climate change: given that global supply chains are responsible for 45% of greenhouse gas emissions, in the context of recommendations to reduce global warming and accelerate the shift to green economies, logistics players are forced to rethink the GSC so as to comply with the demands in the field. The importance attached to the SCs' reconfiguration process recognizes the key role they will play in the transition to a clean and socially just economy.

The impact of the COVID-19 pandemic: the pandemic is one of the most significant disruptions ever to affect global supply chains. Eurozone economies suffered losses of EUR 112.7 million of GDP in 2021 due to SCs (Ollagnier, J.M. et al., 2022).

War in Ukraine: The war in Ukraine has a significant impact on the SCs, leading to an increase in the number and duration of disruptions, and the extent of the impact depends on how the war will evolve.

Brexit: The United Kingdom's exit from the European Union has led to a redefinition of activities at SCs level, and companies have taken into account in this process the new customs regulations impacting logistics activities.

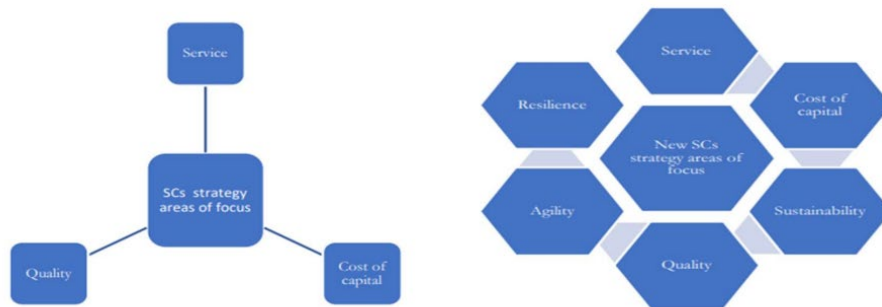
Nationalism: economic nationalism is recognized as one of the greatest challenges facing manufacturing supply chains. Protectionism is the result of economic nationalism (Cunnane, C., 2018).

According to Talluri & Baker (2002), there are three phases in SCR, namely: the first phase aims at identifying and evaluating supply chain units; the second phase refers to establishing SCR; and the third phase, tactical planning.

The reconfiguration of SCs is a process based on three pillars: a) resilience, i.e., their ability to absorb, adapt, and recover from disturbances, whenever and wherever they occur. Improving visibility, identifying risks, and mitigating solutions will enable companies to respond to sudden changes in supply chains; b) relevance: they will need to be customer-centric and agile so that they can adapt quickly and cost-effectively to changes in demand. Obtaining new data sets, including real-time data, from inside and outside the organization and across the value chain will be essential; c) Sustainability: SC plays a central role in transforming the sustainability of a company.

As a result of the reconfiguration process, SCs will be able to respond in real time to events, making the shift from traditional supply chains, based on services, the cost of capital and quality, to new supply chains, which involve adding new priorities: resilience, agility, and sustainability (see Figure 2).

Figure 2. Traditional supply chain vs. new supply chain



Source: Henrich, J., et. al. (2022)

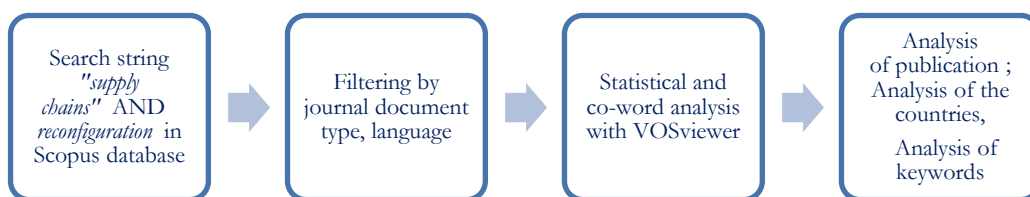
3. Research methodology

The paper is based on a quantitative research method, bibliometric analysis. Bibliometric analysis is defined as a research technique that studies a specific field of research using statistical and mathematical methods (Bellis, 2009).

By querying the existing database on the Scopus platform, scientific papers (research articles, books, papers presented at conferences) containing the keywords in the title, abstract, or in the keywords of the documents have been identified.

Considering previous research in the field (Suharmono et al., 2022); (Ivanov & Dolgui, 2019); (Lwesya & Achanta, 2022); (Swanson & Santamaria, 2021); (Wang, 2022), the research methodology involves going through a number of steps (see Figure 3).

Figure 3. Flow Chart



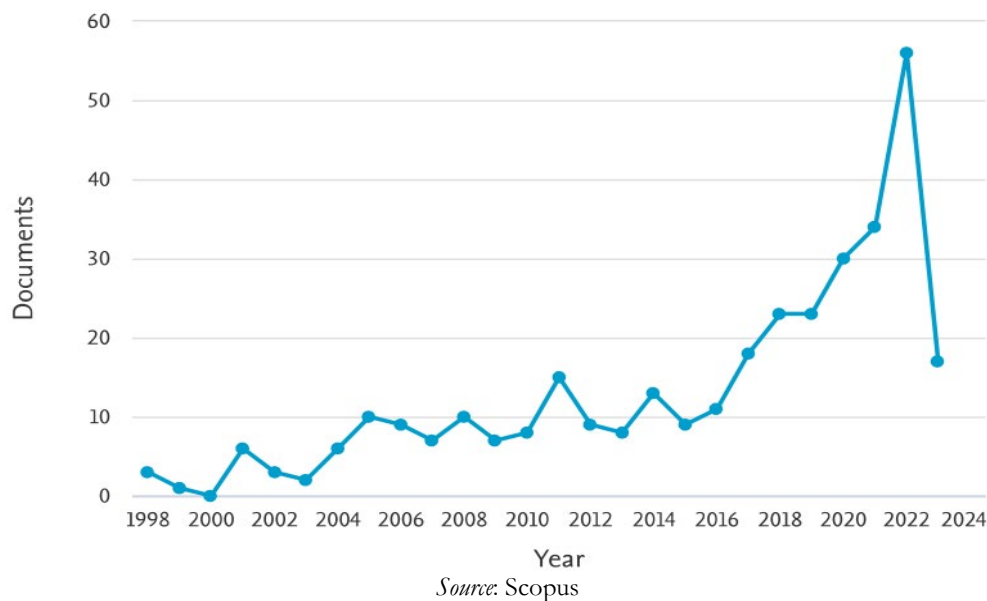
The VOSviewer software offers the possibility to graphically represent the most frequently occurring words in the documents for which the Scopus database was searched (Van Eck & Waltman, 2011). The maps are designed based on the articles, publications, books or citations related to the scientific documents

existing in the Scopus database, following the extraction of a file with the extension ".cvs" from the platform.

4. Results and discussion

The Scopus database query resulted in 338 scientific documents in which the terms "*supply chains*" AND *reconfiguration* were found in at least their title, abstract, or keywords. The 338 documents analyzed refer to articles (63%), conference papers (23.4%) and book chapters (4.7%). With regard to the temporal distribution of the selected papers, the period under review is 1998-2023. From the analysis of the information, it can be observed that starting with 2016, there has been an increase in the number of papers dealing with the issue of supply chain reconfiguration, which shows an awareness of this necessary approach (see Figure 4).

Figure 4. Time distribution of articles published between 1998 and 2023



With regard to the semantic analysis of the keywords with the highest number of appearances in the papers analyzed, we present in Table 1 a selection of the first 5 keywords according to the strength of the links (given by the number of co-occurrences) they have created with other keywords.

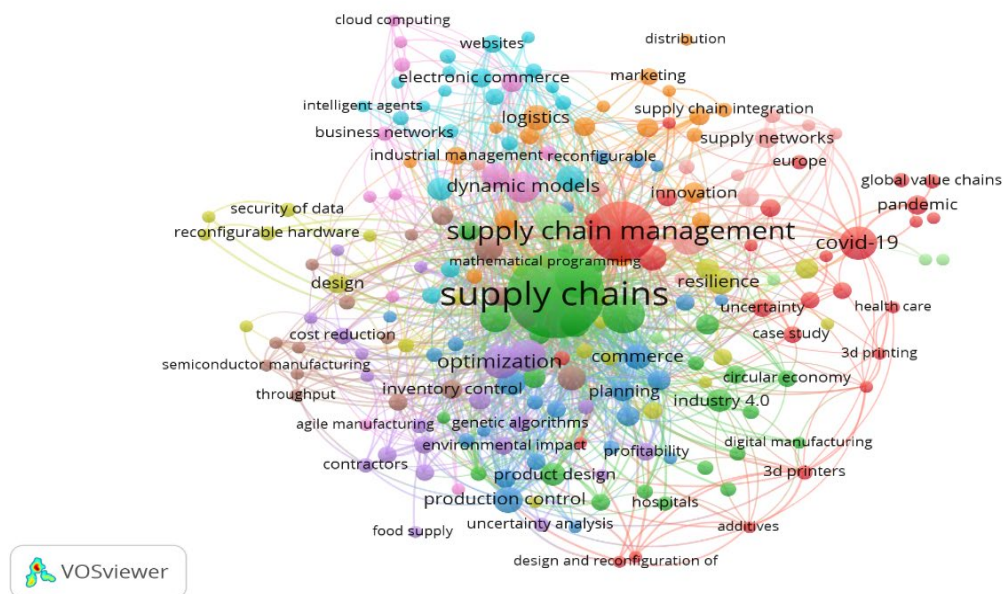
Table 1.

Keyword	Occurrences	Total link strength
Supply chains	136	777
Supply chain management	66	282
Manufacture	31	220
Decision making	19	187
Costs	205	131

Source: by the author using VOSviewer

Figure 5 highlights the links between keywords, shown graphically by the branches linking the different keywords (represented by circles of larger or smaller size, depending on the frequency of occurrence in the papers analyzed). Depending on the strength of the links, the lines are thicker or thinner. It is necessary to specify that in Figure 5 include 82 keywords, each of which has a minimum of five occurrences in the collection papers. These have been grouped into 6 clusters according to the distance between them.

Figure 5. Map of links between keywords

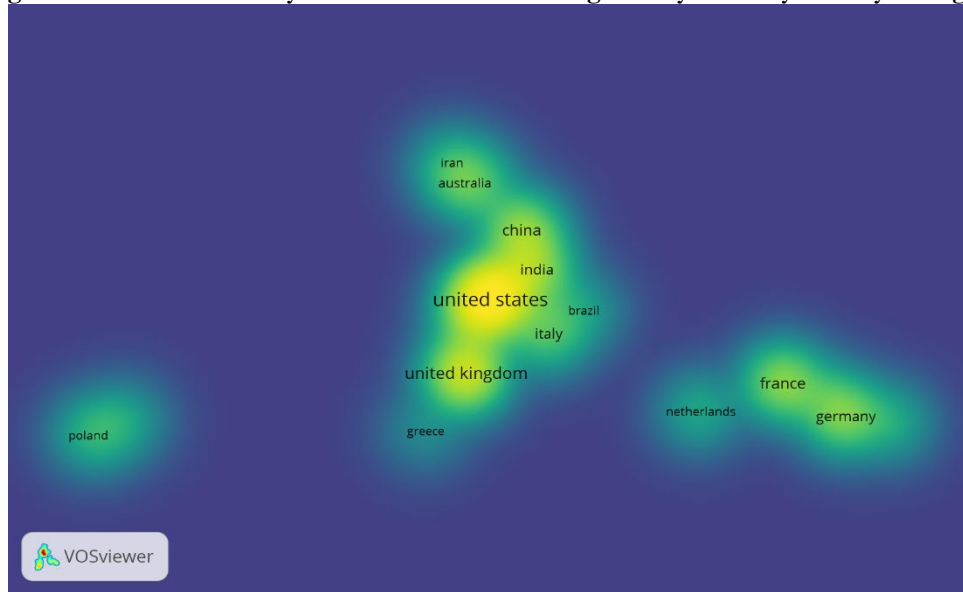


Source: by the author using VOSviewer

As can be seen in Figure 6, the density visualization map based on the criterion of the minimum number of 5 articles / country, the USA represents the part with the

highest density, 75 specialized papers have been published in this country. Alongside the US there are other countries with a large number of works such as: Great Britain 47, China 30, France 29, Germany 26, India 25.

Figure 6. Bibliometric analysis of the works containing the key terms by country of origin



Source: by the author using VOSviewer

Conclusions

From the study we can say the following: the concerns in the field of supply chain redefinition peaked in the year 2022 - which gives us the concerns about supply chain reconfiguration.

As far as the limitations of the research carried out are concerned, these relate to the database used in the analysis, but considering the similarity of the most important databases that inventory scientific works at a global level, we consider that this limitation does not have a significant effect on the results of the work.

In the context of increased regionalization, energy transition, and worrying inflation, there is a need for robust SCs based on sustainability, collaboration, transparency, and diversification of supply sources. The new SC model could help tackle economic fragility, climate change, and inequality, but reinvention is needed as a new economic order takes shape.

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