III. BUSINESS TECHNOLOGIES AND SUSTAINABLE ENTREPRENEURSHIP

NON-ALCOHOLIC DRINKS SUPPLY CHAINS: CASE OF NESTLE AND COCA-COLA AND THEIR CONTRIBUTION ANALYSIS DURING COVID-19 PERIOD

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Abstract. The supply chain of the non-alcoholic drinks market involves a complex network of suppliers, manufacturers, distributors, and retailers working together to ensure the availability of a wide range of beverages to meet consumer demand. During COVID-19, the supply chains of non-alcoholic drinks faced a revenue decrease of approximately 8.5 percent. The authors identified the research gap by revising publications in the Clarivate Analytics database on multinational enterprises (MNEs) and COVID-19 disruption. The review results show that only 14 publications were dedicated to revising MNEs' operations and responding to COVID-19 disruption when customers' demand suddenly decreased. Even, the researches by sector are provided, there is no research covering Nestle and Coca-Cola's supply chain contribution to COVID-19. The paper's non-alcoholic drinks supply chain specifics are revised, particularly those related to Nestle and Coca-Cola companies. The authors used the Bloomberg database to revise the upstream and downstream of Nestle and Coca-Cola supply chains and used secondary data from Statista and other sources to investigate the specifics of their supply chains and the sales results during the COVID-19 period. The authors concluded that Nestle and Coca-Cola faced a decline in net revenue in the beverages segment compared to PepsiCo, Red Bull, and Monster, which increased net revenue during 2020 worldwide.

Keywords: supply chain, COVID, MNE, Nestle, Coca-Cola, non-alcoholic drinks, demand.

JEL Classification: Q11.

1. Introduction

The non-alcoholic drinks supply chain is characterized by collaboration, innovation, and continuous improvement, which means that the beverage supply chain partners work together to meet consumer needs and address challenges such as sustainability, efficiency, and resilience in the supply chain. The number of suppliers in the beverages market varies depending on the type and geographical location of the market. However, some of the biggest and most influential players are multinational corporations such as Coca-Cola, PepsiCo, Nestle, Keurig, Dr. Pepper, and Danone. These companies have global supply chains and large production capacities that allow them to extract raw materials from all over the world, produce a wide range of beverages, and distribute them to different consumers' markets. In addition, many small suppliers, such as local farmers, ingredient suppliers, packaging producers, and contracted partners, play an important role in supporting the non-alcoholic drinks supply chain at regional and local levels.

This paper aims to address such questions:
1. What topics about Nestle and Coca-Cola emphasise the research papers.
2. What is the design of Nestle and Coca-Cola's supply chain.
3. What was Nestle and Coca-Cola's supply chains response to COVID-19 comparing with competitors' response.

The study is organised in such a way. The study starts with a literature review, which also presents the results of bibliometric analysis. The second section is dedicated to an overview of the beverage market and its reaction to the COVID-19 disruption. The third section reviews Nestle and Coca-Cola's supply chain features and briefly presents their operations during COVID-19. Finally, the study ends with conclusions.

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2. Literature review

2.1. General overview of papers revising MNEs' operations and responding to COVID-19 disruption

The topic of COVID-19 got some attention among the authors analysing multinational enterprises (MNEs) reactions and adoption. The authors of this paper retrieved publications from the Web of Science database according to the keywords „MNE" and „Covid" for the period 2020–2024. The authors identified 14 papers reflecting these keywords. An overview of these papers is provided below.

Bellucci and Rungi (2023) investigated the decisions taken by MNEs during the pandemic period. The authors identified that investment decisions were changed, and instead of rejecting investments (around 33% of them), new investments were handled (14% of them got the green light). In addition, the distance between the mother company and its subsidiaries increased during COVID-19, and at the same time, the number of countries where MNEs have subsidiaries (sales offices, virtual offices, and other branches) increased during COVID-19.

Lee et al. (2022) analysed the resilience of MNE subsidiaries during COVID-19. Following this, their study reveals 166 MNEs in Korea and identifies talented managers' positive and significant impact on the resilience of analysed companies and their subsidiaries.

McWilliam et al. (2023) reviewed how MNE restructured global value chains and potentially retreated from globalisation. These authors analysed MNE responses to COVID-19 and revised the changes in size. The authors of this research identified that MNEs' changes cover minimal changes and extensive reconfiguration of global value chains regarding governance and geographic structures.

Lorenzen et al. (2020) revised MNE strategies in their paper and found alignment between MNE strategy and COVID-19. To react to COVID-19, MNEs have to adjust strategies to undertake risk mitigation.

Georgopoulos et al. (2023) focused on the performance and the management of human resources, which could be linked to support the implementation of MNE strategies within rapidly changing environments. To confirm findings, the study revised 169 MNE subsidiaries in Greece that faced the outbreak of COVID-19.

Perez-Batres and Trevino (2023) suggested to facilitate regional supply chains. The authors mentioned that MNEs could benefit by keeping their operations running as close to capacity utilisation in cases where MNEs face partial or total system shutdown in global markets.

Branicki et al. (2021) examined 172 Australian public media articles focusing on COVID-19 and globalization issues in early 2020 and highlighted the importance of risk mitigation and MNE strategy.

Chatterjee et al. (2023a) defined transferring knowledge, skills, and best practices among MNE's employees as important to follow global standards and have a competitive advantage. The study investigated the exchange of knowledge in the post-COVID-19 period.

Schotter (2021) revised MNE resilience to crisis. The author states that increased location diversification due to COVID-19 showed a greater need to activate boundary-spanning managerial functions.

Nielsen et al. (2023) examined two types of disasters, natural and manmade, which show such MNE reactions: (1) a dominant MNE-centric view, which highlights MNE's strategies, responses, and the importance of focusing on resilience, and (2) an emergent view which investigates MNEs as the global actors.

Srinivasan and Eden (2021) investigated economic and social effects in a post-pandemic world. The authors argued that MNEs making substantial investments in digital technologies simultaneously could help reach targets of sustainable development goals.

Peerally et al. (2022) mentioned that COVID-19 induced the adoption of social innovations related to health and sanitation. Using secondary sources of information, the authors investigated various types of MNE pandemic-induced social innovation approaches.

Chatterjee et al. (2024) mentioned that COVID-19 has inspired MNEs to improve the capabilities of their global value chains to improve the management of risks and operational MNE performance, which are linked to company performance. After implementing risk management, the study results positively impacted global value chains.

Chatterjee et al. (2023b) examined the role of artificial intelligence technology for MNE international relationship management under COVID-19 conditions. The research provided practical suggestions to MNE leaders for adopting a system that embeds artificial intelligence. The study presented a theoretical model incorporating international marketing, covering customer relationships and knowledge management.

However, the research gap is evident in the papers, as no of the authors analyzed supply chains oriented to product distribution during COVID-19.

As the supply chain of non-alcoholic drinks is quite complex and involves raw material suppliers, packing suppliers, beverage manufacturers, distributors, and wholesalers, it also had challenges during the COVID-19 period.

The authors identified 25 papers about Nestle and 12 papers about Coca-Cola, which do not discuss COVID-19's impact. One paper published by Sharif et al. (2023) only mentioned the drink market challenges but didn't revise the Nestle and Coca-Cola supply chain cases. Other authors, Sarker et al. (2022), only highlighted that Nestle has to remain competitive in the post-COVID-19 period, and the main factor is the supply chain.

The research of Sharif et al. (2023) focused on the customer mix: price, quality, size of product, and taste on repeated purchases. In particular, it unveils consumers' attributes between consumer perceptions and the consumers' repurchase intention.

Authors Sharif et al. (2023) collected data from 403 beverage industry consumers, particularly about Nestle, Mitchell's Fruit Farms, Murree Brewery, and Omore in Pakistan during COVID-19, and disclosed the behaviors of consumers.

As the supply chain is highly important, the paper will study further the non-alcoholic drinks market and revise the features of Nestle and Coca-Cola supply chains and their reaction to COVID-19 disruption.

In the sub-chapter below, the bibliometric analysis results of the research papers will be presented.

2.2. Bibliometric analysis of papers researching Nestle and Coca-Cola supply chains

The authors performed the bibliometric analysis of the publication, researching Nestle and Coca-Cola supply chains. The papers' revision involved several steps:

- The papers were retrieved from the Web of Science database by entering the keywords "Neste", "supply chain", and "Coca-Cola".
- The report about titles of papers was generated separately for the period 2005–2024. First, the report was generated on "Nestle" "supply chain", and afterward, the report was generated on "Coca-Cola" "supply chain".
- The reports were uploaded to the VOSviewer tool by identifying the number of keywords that should repeat at least three times.
- Afterward, clusters from keywords were formed, and bibliometric maps were generated. These results are presented in Figure 1 and Figure 2.

Eight clusters are constructed from papers researching the Nestle supply chain (SC). The short presentation of clusters is provided below. The first of them focuses on technology applications. The second cluster points out the customer. The third cluster investigates multinational company operations. The fourth cluster mentions the market aspects. The fifth cluster revises the quality of products. The sixth cluster analyses demand. The seventh cluster targets value creation. And the eighth cluster is more oriented to sustainability and focuses on water problems and waste. Six clusters are constructed from papers researching the Coca-Cola supply chain (SC). The first one focuses on demand. The second cluster points out the disruption. The third cluster investigates revenue. The fourth cluster focuses on partnership. The fifth cluster revises technology applications. The sixth cluster analyses the market aspects.

There are differences between formed clusters among papers analysing Nestle and Coca-Cola supply chains.

Among them are clusters that commonly focus on technology applications and market aspects. But there are also differences between clusters; for example, there is a cluster focusing on disruption in Coca-Cola case, and there is cluster focusing on the quality of products in Nestle case.

In terms of keywords, the number of keywords stays higher under the research of Nestle supply chain (SC). Table 1 presents the most common keywords.

The authors retrieved 166 keywords, which are split in such a way: 100 keywords were identified in the papers focusing on Nestle SC papers, and 66 keywords in the papers focusing on the Coca-Cola supply chain. Among
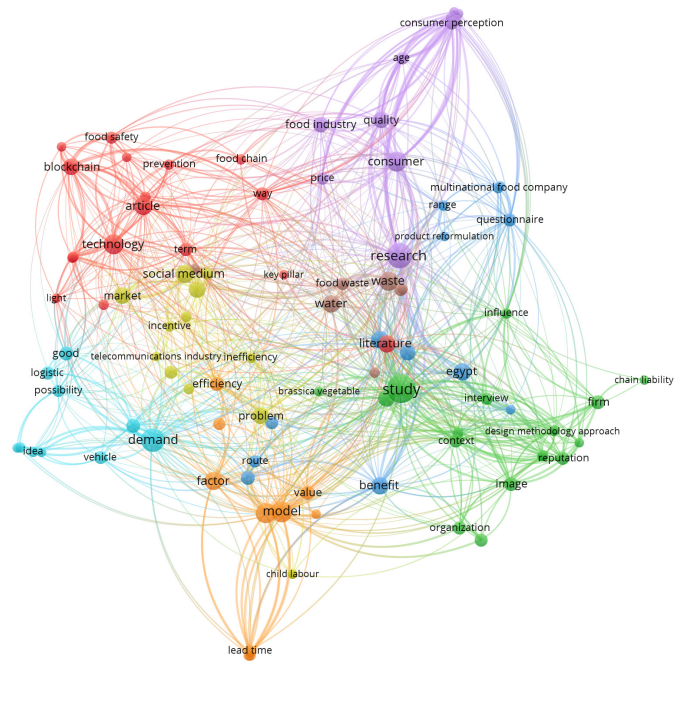

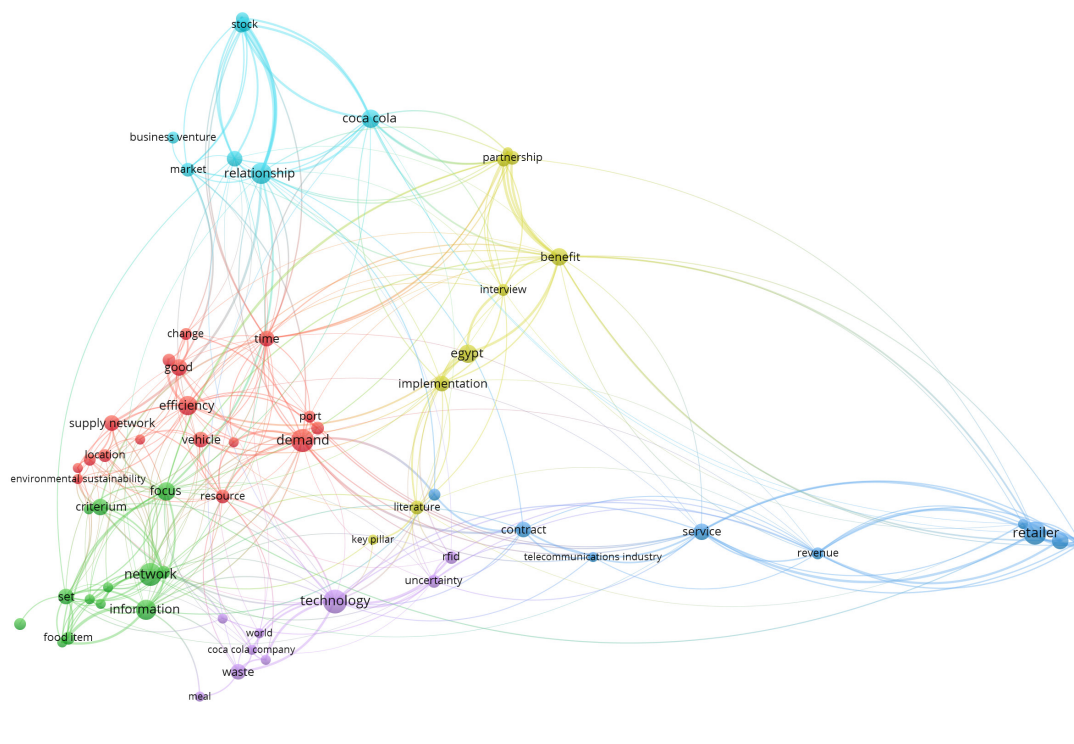Figure 1. Papers researching the Nestle supply chain

Figure 2. Papers researching Coca-Cola supply chain

Table 1. Common words among the papers

Keyword	Papers about Nestle SC		Papers about Coca-Cola SC	
	Cluster	Occurrence	Cluster	Occurrence
change	6	7	1	4
demand	6	19	1	15
supply	6	3	1	3
good	6	7	1	8
vehicle	6	6	1	7

these papers, only 22 keywords are common, which are presented in Table 1.

The next chapter will present the review results about the global beverages market.

3. Overview of the global beverages market

3.1. General overview

The beverage market is a dynamic and diverse industry that usually includes a wide range of soft drinks, both carbonated and non-carbonated. Soft drinks are popular worldwide and come in various flavors, formulas, and packaging forms to match consumers' different preferences and events. Carbonated soft drinks (CVPD) include cola, lemon-lime, oranges, and other flavored carbonated soft drinks. Cardiovascular diseases are usually sweetened and may contain caffeine. Still soft drinks, also known as still or non-carbonated drinks, this category includes a wide range of drinks, such as fruit drinks, iced tea, sports drinks, energy drinks, mineral water, ready-to-use tea and coffee, etc. The demand for low-calorie diets and varieties of soda, that contain artificial or natural sweeteners instead of sugar is increasing. Increased consumer awareness of health and wellness has changed the choice of healthier drinks, including natural, organic, and low-sugar functional drinks.

The export of non-alcoholic beverages is visible from different countries, but the highest volume exporter is Thailand, the second place is given to Germany, and the third place is Switzerland, according to the data stated in Statista's (2023) report. However, the most expensive non-alcoholic beverages are exported from Switzerland, and further exports by value are evident from Germany and the Netherlands. However, Thailand stays in fifth place due to the prices of exported bottles, which are much lower than in Switzerland (Statista, 2023). In contrast, the leading importers by volume are the United States, United Kingdom, in second place, and Germany, in third place (Statista, 2023). By value, the sequence of importers is the same – the first place is given to the United States, the second place – to the United Kingdom, and the third place – to Germany (Statista, 2023).

The global beverages market is substantial and reflects a stable growth path based on factors such as population growth, urbanization, the changing lifestyle of consumers, and the growing disposable income. The highest revenues among different sales categories are generated from bottled water. Talking about bottled water, the highest revenue comes from the United States market, i.e., it was 83 bln US dollars in 2022; the second largest market is China (with revenues of 65 bln. US dollars),

and the third one is Germany with revenues reaching 16 bln US dollars (Statista, 2023).

Despite the content of various drinks, the beverage market continues to grow due to innovations in flavors, formulations, and packaging and the introduction of healthier and more functional drinks.

The beverages market is highly competitive and has many international and regional players competing for market share. They are the main players of the Coca-Cola Company, PepsiCo Inc., Nestle S.A., and Dr. Pepper Snapple Group, Inc, and others. On the world worldwide level, according to the sales criteria, Nestle takes second place, and Coca-Cola takes third place (Statista, 2023). These companies offer various brands in different categories and use their wide distribution networks, marketing skills, and brand awareness to maintain a competitive advantage.

The beverages market reflects regional differences in consumer preferences, descriptions of tastes, and consumption patterns. For example, while carbonated soft drinks are more common in North America, bottled water and still drinks are more common in Europe and Asia.

Local and regional actors are often actively involved in a particular market, offering unique tastes and satisfying specific cultural preferences.

Consumers are increasingly concerned about the environmental impact of packaging materials and production processes. As a result, beverage manufacturers are increasingly demanding sustainable packaging solutions and social responsibility initiatives. Due to busy lifestyles and consumer behavior, there is a growing demand for convenient and portable packaging formats such as PET bottles, cans, bags, and disposable options. The main packing materials used for the packing of produced beverages, according to Statista (2023) worldwide data in 2022, were PET (29.8%), Glass bottles (19.6%), Cans (19.2%), Cartons (12.9%) and other (18.4%) packing formats, which all together represented the packing mix.

New trends arise in the reuse of packing materials and require the adoption of supply chains, which is mentioned in Mahmoudi and Parviziomran's (2020) paper. In addition, Ren et al. (2015) highlight the new packaging opportunities, which production is helping to reduce carbon dioxide. According to Kumar et al. (2012), Coca-Cola invests in recycling plants that are dedicated to collecting packing materials and reuse of these materials.

In the sub-chapter below, the COVID-19 disruption of global beverages will be presented.

3.2. COVID-19 disruption

The COVID-19 pandemic has significantly impacted the beverages market, creating challenges and opportunities for businesses in this sector. The pandemic has disrupted global supply chains, resulting in a shortage of basic components, packaging materials, and soft drink equipment. Due to restrictions on movement and trade, the closure of factories, and reduced production capacity, supply chains have been delayed and disrupted. Preventive measures, social distancing, and health and safety problems have led to changes in consumer behavior. As more and more people stay at home, consumption patterns are changing, including a decrease in the demand for drinking drinks and a decrease in demand for home consumption. The closure of restaurants, bars, cinemas, and other inns during the lockdown led to a sharp drop in sales of local beverages. This influenced the sale of in-house consumable drinks and other products, which are normally consumed in outside places. The closure of restaurants, bars, cinemas, and other food service establishments during lockdowns resulted in a sharp decline in on-premise sales of soft drinks and energy and sports drinks, with revenues falling in 2020 by almost 9 percent, according to Statista (2023). This affected sales of fountain beverages and other products typically consumed in these venues.

As consumers search for convenient contactless shopping options, online shopping and home delivery of drinks have increased. Companies with strong online sales channels can take advantage of this trend. The pandemic has raised health and wellness awareness by increasing the demand for healthier drinking options. Consumers started looking for products with natural ingredients, low sugar content, and functional benefits such as immune-boosting properties. Manufacturers of beverages responded by changing consumer preferences and market dynamics, introducing new products, packaging formats, and marketing strategies. This included delivering smaller packages for home use, promoting elements of the immune system, and highlighting sustainable initiatives.

As lockdown restrictions eased and food service establishments reopened, there was a gradual recovery in on-premise beverage sales, and in 2021, the sales increased by 14 percent (Statista, 2023).

In the next chapter, a review of Nestle's and Coca-Cola's supply chain features will be presented.

4. Review of Nestle and Coca-Cola supply chains

4.1. Design of Nestle and Coca-Cola supply chain

Nestle and Coca-Cola shape the supply chain differently. Nestle sells the products directly to retailers, and Coca-Cola sells to its subsidiaries. However, Li et al. (2024) highlight that revising the direct store delivery strategy for Coca-Cola could be important for further supply chain design.

Nestle, one of the world's largest food and beverage companies, has a complex and efficient supply chain that provides consumers a diverse range of products worldwide. Nestle's suppliers play an important role in supporting the company, ensuring the availability, quality, and sustainability of its products, and Nestle's commitment to responsible purchasing and protecting the environment throughout the supply chain. Nestle's supply chain consists of several key components, including the purchase, production, distribution, and retail sale.

Raw material suppliers play a crucial role in the non-alcoholic drinks supply chain by providing ingredients such as fresh components, herbs, tea leaves, coffee beans, sweeteners, and flavorings, and the supply of such components means that both MNEs belong to long-value chains.

Nestle is looking for ingredients from around the world to produce a wide range of foods and beverages. These products include agricultural products such as cocoa, coffee, and dairy products, as well as ingredients such as sugar, flavors, vitamins, and minerals. For example, Nestle buys cocoa beans from Ivory Coast (West Africa), Brazil, Colombia, Kenya, Mexico, the Philippines, and Vietnam (Nestle, 2024).

Nestle works with suppliers to ensure components' quality, safety, and compliance with legal and internal quality specifications.

The company works closely with farmers, agricultural cooperatives, and suppliers to ensure quality, durability, and traceability of raw materials. Nestle buys milk through the Farmer Connect program from approximately 230,000 growers worldwide in South America, South Africa, Asia (China, Pakistan, Thailand, Uzbekistan), the United States, and other countries. Nestle has implemented some programs and initiatives to support responsible sourcing practices, including the Nestle Cocoa and NESCAF plans. According to Nestle's cocoa plan, Nestle buys cocoa from 157,157 farmers (Nestle, 2024).

Nestle has an extensive network of production facilities on several continents. These machines are equipped with the latest technology and meet strict quality and safety standards (Nestle, 2024).

The production process involves processing raw materials into finished products, for example, by grinding, frying, mixing, and packaging. Nestle produces a wide range of drinks.

The Nestle distribution network is designed to efficiently transport products from production facilities to distribution centers, warehouses, and stores worldwide. The company uses a combination of logistics and third-party suppliers to manage transportation and warehousing operations.

Nestle uses advanced supply chain planning and logistics technologies to optimize transportation routes and reduce costs and environmental impacts. The company is also focused on improving inventory management and demand forecasting to ensure product availability and freshness.

Nestle's products are sold through various retail channels, including supermarkets, shops, e-commerce platforms, and grocery stores. The company works closely with retailers to develop personalized marketing and advertising strategies to increase sales and improve brand awareness.

Nestle also has stores (see Figure 3): Walmart, Tesco, Rewe, Carrefour, and Nescafe, where consumers can buy their products directly and enjoy the brand nearby, according to the data retrieved on the 14th of December 2023.

In addition to traditional retail channels, Nestle has expanded its presence in the market directly to consumers through online sales platforms and subscription services that allow consumers to order products for home delivery or pick-up. Despite that, both MNEs have cross-channel sales from Alibaba Group Holding and Monster Beverage, which are mentioned in Figure 3 and Figure 4 as suppliers. It would be some partnership schema to sell products in areas that Alibaba Group Holding and Monster Beverage do not cover. The paper of Sodhi and Son (2009) highlighted different partnership models present in Nestle's and Coca-Cola's supply chains.

Coca-Cola's supply chain is distinguished by efficiency, innovation, and stakeholder collaboration. Using cutting-edge technology, strategic partnerships, and a global network of manufacturing and distribution facilities, Coca-Cola continues to meet consumer demand for its iconic drinks, adapting to market dynamics and changing consumer preferences (Coca-Cola, 2024).

Coca-Cola has one of the world's most complex and extensive supply chains, so its drinks are available to consumers in more than 200 countries (Figure 4). The company's supply chain includes several key elements, including the supply, production, distribution, and retail sale.
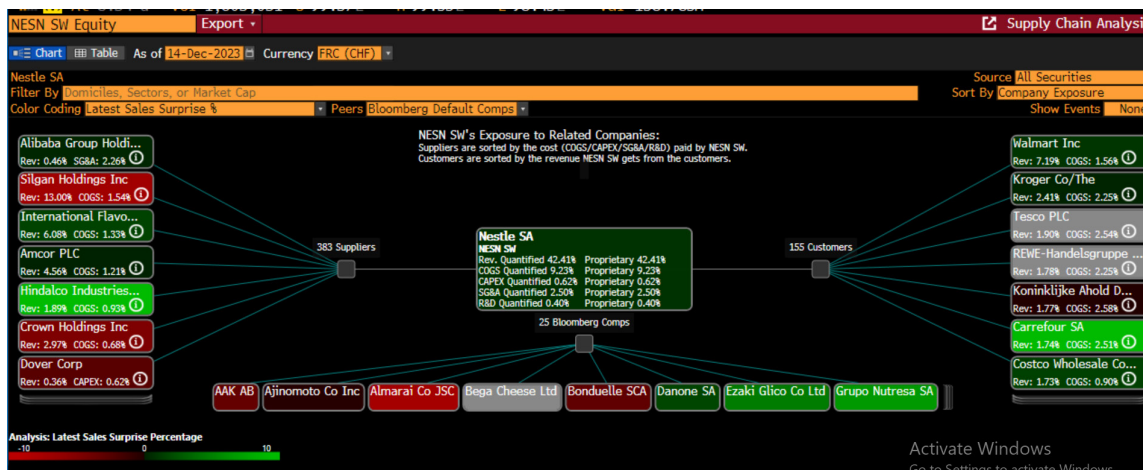

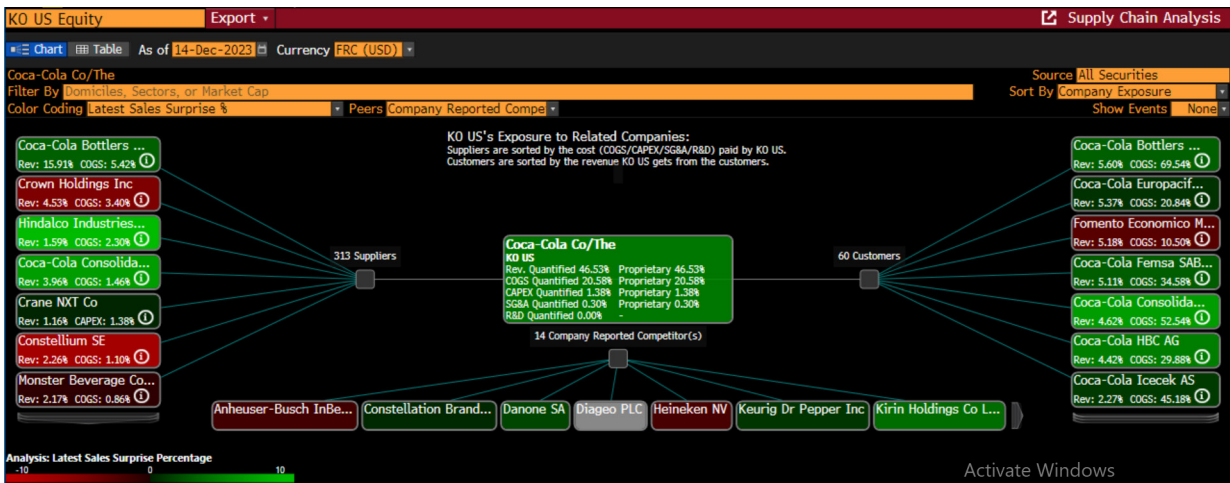Figure 3. Nestle supply chain partners (source: Bloomberg database, 2023)

Figure 4. Coca-Cola supply chain partners (source: Bloomberg database, 2023)

The Coca-Cola supply chain begins with raw materials such as water, sweeteners (i.e., fructose-rich corn syrup, artificial sweeteners, etc.), flavorings, and packaging materials (i.e., plastic bottles, cans, and aluminum boxes). The company receives water from the municipal water supply network or has treatment plants in specific places. When it comes to sweeteners, Coca-Cola works with suppliers around the world to produce sugar, corn syrup, and other ingredients. Coca-Cola buys sugar and corn syrup from various suppliers worldwide. Depending on regional selection and availability, these include cane sugar and fructose-rich corn syrup. For products such as fruit-flavored drinks, Coca-Cola relies on suppliers of fruit juice concentrate from fruits such as oranges, lemons, apples, and other fruits. For coffee and tea products such as Coca-Cola ready-made coffee brands and iced tea, the company supplies coffee beans and tea leaves from various suppliers worldwide (Coca-Cola, 2024).

Ingredients come from various suppliers around the world. Coca-Cola often maintains long-term relationships with its suppliers to ensure consistent quality and availability of raw materials. Coca-Cola demands certification of its first-level suppliers according to ISO 9001 (quality), ISO 14001 (Environment), and OHSAS 18001 (occupational health and safety). Ingredient and packaging suppliers must be FSSC 22000 certified by the World Food Safety Initiative (GFSI) (Coca-Cola, 2024). Touratier-Muller and Ortas's (2021) paper also highlights the certification requirements that Coca-Cola applies to the first-tier suppliers.

Coca-Cola Poland and HBC Baltics subsidiaries of Coca-Cola's mother company receive components, packaging materials, equipment, and services from approximately 3,900 suppliers, which belong to small local companies and large international companies. The richest 80% of Coca-Cola purchases come from 4 main ingredients: sugar (cane and sugar beet), corn (corn syrup rich in fructose), and orange juice (Coca-Cola, 2024).

Once the ingredients are found, Coca-Cola produces its beverages worldwide at many bottling and production facilities. Coca-Cola requires special bottling, canning, filling, labeling, and packaging equipment. Equipment suppliers supply machinery, production lines, and related technologies to Coca-Cola bottling plants and production facilities. These include suppliers of filling and canning machines, conveyor belts, filling equipment, marking machines, pallets, and other automatic systems. The production process involves mixing ingredients according to original recipes, making carbonated drinks, and packing them in bottles, cans, or other containers. Coca-Cola has its bottle factories and franchised single bottles, known as Coca-Cola Tools, which are responsible for producing and distributing Coca-Cola products in certain regions. Production plants of beverages producing products for the Poland and the Baltics markets are located in Radzimin (Poland) and Staniatki (Poland). Natural mineral water production factories are located in Tylicz (Poland) and Varėna (Lithuania), and there is a 770 km distance among these factories (Coca-Cola, 2024).

Produced Coca-Cola drinks are distributed to warehouses, distribution centers, and shops, combining domestic transportation and independent logistics suppliers. Coca-Cola uses advanced logistics systems and technologies to optimize transportation routes, reduce costs, and ensure the timely delivery of products to retailers. Distribution warehouses are located in 22 locations in Poland, including cross-warehousing and other storage places; and warehouses in Kaunas (Lithuania), Riga (Latvia), and Tallinn (Estonia), which are dedicated to the distribution of drinks in the Baltics (Coca-Cola, 2024).

Coca-Cola works closely with retailers to ensure their products are highly visible and accessible to consumers. The company invests in marketing campaigns, promotions, and advertising to increase sales and improve brand awareness. Coca-Cola also works with retailers to develop personalized marketing and advertising programs tailored to specific markets and consumer preferences.

In addition to traditional retail channels, Coca-Cola has expanded its online presence and direct user platforms that allow users to purchase products online for home delivery or pick-up (Coca-Cola, 2024).

In the last sub-chapter, information about Nestle and Coca-Cola operations during COVID-19, which was collected from secondary sources, will be overviewed.

4.2. Revising Nestle and Coca-Cola operations during the COVID-19 period

The COVID-19 disruption has an impact on the sales of drinks. In 2020, due to COVID-19, the supply chains of non-alcoholic drinks faced a revenue decrease of approximately 8.5% (Statista, 2023). The lowest sales volume worldwide (in terms of liters) during 2020 was in the bottled water product category, i.e., the decrease in volume was around 3.5%. However, the absolute volume of soft drinks and juices in 2020 compared with 2019 declined was around 3.1% (Statista, 2023).

The Nestle sales in 2020 decreased by 9 billion. US dollars. But in 2021, sales started to increase by 3 billion dollars and in 2022, they overcame the sales evident in 2019 by 2 billion US dollars (Statista, 2023).

There is also information that Nestle Canada had to close their beverage factory on the 26th of March, 2020 for eight weeks due to coronavirus cases (Nestle, 2024).

Talking about Coca-Cola Company's net operating revenues worldwide during COVID-19 also declined in 2020 by 4 billion US dollars. But in 2021, net operating revenues increased by 5 billion US dollars and overcame the level of which was in 2019. The net operating revenues steadily decreased in 2022 (Statista, 2023). There is also information that Coca-Cola had temporarily suspended its production in India due to COVID-19 issues from the 24th of March 2020 (Coca-Cola, 2024).

However, the competitors (i.e., PepsiCo, Red Bull, and Monster Beverage) of both companies (Nestle and Coca-Cola) had no fall in sales during 2020, but instead, their sales grew (Statista, 2023). Even following the information that PepsiCo had to temporarily close its production plant in India due to COVID-19 disruption, this did not affect its sales in 2020.

From the above-mentioned information, we could not identify the reasons for the sales decrease, but one of the reasons could be that complex systems are not flexible and easily adaptable to face COVID-19 disruption, and this adaptation period takes longer than one year than for smaller systems, which Nestle's and Coca-Cola's competitors manage.

Further on, the concluding remarks will sum up the paper.

5. Conclusions

The topic of the paper is still actual. It fills some research gaps that are not mentioned in the papers in the Web of Science database. The authors identified the most important topic mentioned in 14 papers focusing on MNE operations and COVID-19-influenced challenges. But, they lack focus to the supply chain operations of MNEs during COVID-19.

Following the analysis of bibliometric data and the clustering results on different papers researching Nestle and Coca-Cola supply chains, these papers have two common clusters, which focus on the change of demand and supply. Among the mentioned above research papers, there are no papers covering COVID-19 disruption results.

However, the review of Statista (2023) data shows that Nestle's and Coca-Cola's competitors were in a better position during COVID-19, and their sales grew in 2020. This means that Nestle's and Coca-Cola's supply chains could be more resilient to such distruptions.

Talking about the design of supply chains, the study shows that the upstream supply chains of Nestle and Coca-Cola are complex. Raw materials are collected from suppliers and farmers located in many countries. Some raw materials, like cacao beans, must travel long distances to production plants. Taking the whole upstream and downstream supply chain, both Nestle and Coca-Cola belong to long-value chains. There could be more than one supplier's tiers in their value chains. But, most of the supply chain requirements are dedicated to the first-tier suppliers. Talking about internal Nestle's and Coca-Cola's supply chain, it is visible that the beverage factories are located at a minimum distance of 770 kilometers. It could be treated that the customers, which are located in this territory, are served from one or another production plant. Such numbers, of course, should be evaluated using these MNEs' main policy guidelines.

The sales channels of both companies are also different. In particular, Nestle sells produced products directly to retailers. However, Coca-Cola sells produced products directly to internal Coca-Cola companies, focusing on product distribution to customers. However, investigating direct store delivery possibilities and forming such a strategy for Coca-Cola could be important in designing its future supply chain.

During the COVID-19 sales of all types of non-alcoholic beverages produced by Nestle and Coca-Cola decreased. The highest impact was on the bottled water category. These numbers could be related to temporarily closed production plants in different countries.

The research has some limitations. From the available data it is difficult to identify reasons for sales drop during COVID-19. Further on, balanse sheet data of Nestle's and Coca-Cola's sould be important and helpful to identify reasons which affected sales descrease during 2020 and early 2021 and the social and economic effects of COVID-19 disruption.

Contribution

Conception and design of the work – A.J.; data analysis and interpretation – A.B.

Disclosure statement

The authors don't have any competing financial, professional, or personal interests from other parties.

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