IMPLICATIONS OF COVID-19 CRISIS ON SUPPLY CHAIN MANAGEMENT

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ABSTRACT

Pandemics cause chaotic situations in supply chains around the world, which can lead to survival challenges. The current Covid-19 pandemic is an unforeseen humanitarian crisis that is seriously affecting the global dynamics of all businesses. Also, in the past, the emergence of various epidemics caused great weaknesses for businesses.

Due to such phenomena, the introduction of strategies for prevention against organizational disorders should be established to create clear signposts and vigilant conceptualization. In this regard, there is a need to explore supply chain management and operations strategies to overcome the challenges posed by Covid-19-like situations.

This research is done in order to understand the strategies created to measure the sustainability of supply chains in companies, the impact of the pandemic crisis on the business environment, in terms of effective allocation of resources, supply and demand disruptions and optimization of the transportation network, i.e. the overall operation of all links in a single supply chain.

KEYWORDS: Pandemic, strategy, supply chain, pandemic crisis

JEL CLASSIFICATION: M10, M11

1. INTRODUCTION

Risks of supply and demand uncertainty are associated with accidental uncertainty and the usual situation. Such risks are also known as recurrent or operational risks. Supply chain managers significantly improve global chain management and mitigate recurring supply chain risks through improved planning and execution (Chopra and Sodhi, 2014). Research on supply chain risk focuses primarily on operational risks that jeopardize investment in supply chain reserves and costs (Sodhi et al., 2012). Risks are considered to be low frequency events, but with a strong impact on the supply chain that affect the structural design, change it and significantly affect performance (Dolgui and Battaia, 2018).

The COVID-19 pandemic is changing the business environment of many organizations around the world and highlighting the importance of being able to respond, adapt and set up crisis management mechanisms. According to Wyman (2020) research on the impact of the pandemic on supply chain management, their disruption and anticipation of changes that may occur and bring uncertainty to the working atmosphere of enterprises, supply chain disruptions that are sudden in the beginning, as well as those that are currently emerging as a result of COVID-19, pose a series of challenges for companies. Current events reveal weaknesses in global supply and many companies are struggling with a range of supply problems. Dealing with a supply chain crisis requires immediate response and understanding of supply chain exposure, as well as securing supply. It is also crucial that the organization has the skills and abilities to respond effectively, in terms of having trained response teams and being able to help systems and resources address issues outside the organization. Real mitigation will mean strengthening the ability of teams to make and implement decisions and take swift action guided by strong and systematic plans. The pandemic scenario that the world is currently facing contributes to highlighting some of the fundamental characteristics of international supply chains and the professionals who work in them. First, the network economy, with its high degree of division of productive activities globally, is a source of vulnerability for the world economy. Most large, international corporations know exactly where their products are located and usually think that they should not be exceeded, given that there is a normal fluctuation of demand and supply that does not take into account unforeseen situations. Second, supply chain managers are proving their adaptability to challenging conditions.

Logistics are proving to be a crucial factor for the global production system even during the shock of the crisis. In Italy, France and Spain, they quickly adapt their functions, such as execution, planning and support, to work from home, following the recommendations of European governments. Transport and storage services are provided across European countries, even if operations become slower and more difficult to maintain. Delays and cancellations of delivery cause problems for 66% of German and at least 28% of Italian companies (Bouzeid, 2020). Although there is a surge in demand at the beginning of the crisis, the largest road trade associations believe that there is a short decline of 25% to 30% in the activity, compared to the usual levels, due to falling demand and difficulties in international transport, coming from the rise of border controls and health checks, creating queues of tens of kilometers (Ivanov, 2020).

METHODOLOGY

Data for the purposes of the research in the paper is obtained from the used literature, as well as from the primary research. For this purpose, several scientific research methods have been used. Within the paper, the two basic methods, inductive and deductive, are also used in formulating conclusions and recommendations. The comparative method was used in the analysis of the answers from the conducted questionnaire. In part of the paper, an empirical analysis of the questionnaires was performed, ie the primary data obtained from the survey questionnaire, using quantitative and statistical analysis, ie using the quantitative method and methods of statistical analysis, such as descriptive statistics, statistical grouping. of data and graphical display of data. Furthermore, basic analytical methods are used, such as the method of analysis (analysis of all selected materials from domestic and foreign literature), the method of specialization (creating own views based on the read literature), the method of deduction (from general findings to specific and individual findings, in relation to labor needs) and the synthesis method. In order to fulfill the basic goal and the set secondary goals, as well as the full scope of the research subject, a combination of several basic quantitative and qualitative methods for data collection and processing is used in the preparation of the paper. The survey questionnaires were conducted in the period January - April 2021. The respondents are managers and/or

owners of private small and medium enterprises in several cities in the Republic of Northern Macedonia.

LITERATURE REVIEW

The goal of Supply Chain Management (SCM) is to seamlessly integrate information and material flow into the supply chain as an effective competitive weapon. According to Mentzer et al. (2016), "Supply Chains are a set of three or more entities (organizations or individuals) that are directly involved in the up and down flows of products, services, finance and / or information from source to customer." Supply Chain Management covers the active management of such activities and relationships in order to gain a sustainable competitive advantage and maximize customer value by optimizing the supply chain in the most effective and efficient way. To be successful, organizations are required to carefully manage their operations by planning, scheduling, and controlling supply chain activities (Bozarth and Handfield, 2016). The supply chain management literature focuses on three modes of action / operation, which are of great importance for the success and future of supply chains in order to prevent supply chain disruptions and ensure risk mitigation. Supply chain disruptions can be caused by a variety of events that are beyond the firm's control, such as natural disasters (e.g., the COVID-19 pandemic) and firm events that are under the firm's control, such as a lack of contingencies. situations or poor management. Risk can be seen as an "expected outcome of an uncertain event". Important dimensions of risk in the global supply chain are the probability and impact of losses, speed and frequency (Manuj and Mentzer, 2008). Two of the common external risks associated with supply chain disruptions are supply and demand uncertainty. Uncertainty in the supply of the end part / supplier refers to the "risk of interruptions in the flow of components needed for their internal operations". The quality of the purchased goods is as important as the reliability of the estimated delivery time, as well as the dependence of the goods on unforeseen defects or price increases (Childhouse, 2003). The risk of significant and invaluable fluctuations in demand for goods is called demand uncertainty, which organizations face on the customer side (Bozarth and Handfield, 2016). As a consequence of greater uncertainty in supply and demand, market globalization and shorter product and technology life cycles occur.

Supply chain risks are multifaceted and can be classified into operational (recurring) and destructive (specific) risks (Tang, 2006). Operational risks deal with day-to-day disruptions in supply chain operations, such as fluctuations in duration and demand, and destructive risks, in turn, relate to events with a strong impact (Ivanov et al., 2017). Examples of destructive risks are natural disasters, such as earthquakes and tsunamis (for example, the 2011 tsunami in Japan and the huge impact on the world supply chain), man-made disasters (for example, the 2016 BASF plant explosion in Germany). and as a result of shortages of raw materials in global supply chains), further, legal disputes or strikes.

The Bullwhip effect looks at weekly / daily demand and fluctuations as the primary drivers of supply chain changes that can be eliminated in the short term. In recent years, the research community has begun to investigate serious supply chain disruptions that may be caused by, for example, natural disasters, political conflicts, terrorism, maritime piracy, economic crises, the destruction of information systems, or the failure of transportation. infrastructure (Queiroz Maiel et al., 2020). We treat these severe natural and man-made disasters as a ripple effect in the supply chain where changes occur at the structural level and recovery can take a long time, with a significant impact on production performance, such as annual revenue (Dolgui et al., 2019). In this setting, supply chain disruption management can be considered a key capability that helps to create effective supply chain protection and implement appropriate supply chain disruption recovery and performance improvement activities (McKenzie, 2020).

Risks in the time of pandemic and their components

The COVID-19 pandemic is one of the special cases that poses a huge risk to supply chains. This type of risk is presented in a very specific way because it causes long-term disorders. Epidemic control and related logistics operations of a single supply chain are categorized and mapped according to chain operations and management (Fernie and Sparks, 2004). Retail, with attractive discounts and proven product authenticity, has been an important channel for the industry all these years as 20-30% of consumers buy outside their home country (Achille and Zipser, 2020). However, this work focuses on visibility and sustainability during ripple effects caused by disasters or specific disturbances. All countries in the Western Balkans act to encourage companies to retain jobs, ie create new ones, in addition to health care

measures, tax breaks, guarantee schemes, subsidized credit lines and social assistance measures (Waters and Rinsler, 2014) . According to the World Bank Group (2020), in the long run, the Western Balkan countries also need to increase investment in skills and expand access to skills development. Therefore, early detection of disturbances and rapid remedial action may enable industries to reduce the impact of current and future shocks. For example, it is advisable to build transparent systems to strengthen logistics capacity, optimize operations, and improve access to the right customer to reduce the effects of the bullwhip effect (Cuturi, 2015). Numerous studies have focused their attention on tracking these challenges, as an opportunity to measure the percentage of organizations facing serious challenges in their supply chains and the way they rank, among other problems currently facing businesses (Janev, 2020). McKinsey research (Figure 1) shows that when compared to financial needs, supply chain problems appear on the 5th scale of the business at risk, ie companies are "very" or "extremely" worried.

Figure 1. Percentage of companies who are very or extremely worried for each question

Source: <https://www.mckinsey.com/business-functions/risk-and-resilience/our-insights/covid-19-implications-for-business>

It can be seen that the pandemic strikes a significant blow to businesses, as a result of which companies face specific problems in the supply chain and are forced to react extremely quickly. The table below shows that a number of impacts are being felt - the

biggest of which is the impact of travel restrictions on the flow of goods, especially internationally. At the same time, there are a number of practical challenges, most notably a delivery problem, as they become more complex and fragmented, but also due to strong pressure on limited transport and logistics options.

RESEARCH AND DISCUSSION

The results of the research were obtained as a result of the survey questionnaire conducted from January to April 2021. The research was conducted in several consecutive phases, as follows: first the information was collected through a survey questionnaire, they were analyzed and grouped, then they were computer processed and presented in tabular and graphical form, and a statistical framework was created in order to draw conclusions. The main findings of the survey are presented below, based on 148 complete answers. The analysis begins with descriptive data on the business entity that responds to the survey. Then, the impact of the COVID-19 pandemic on the companies and their supply chains is examined in detail, and it ends with the innovative solutions taken by these companies for support and with recommendations and measures for the directions that would be most beneficial for the companies.

Figure 2. Influence of the COVID-19 pandemic on the supply chain

Source: Own research

The results presented in Figure 2 show that 47.3% of the surveyed managers and owners of companies estimate the degree of endangerment of their supply chains at <25% - less than 25%. 19.6% of the respondents think that the degree of threat is 25-50%, 18 of the respondents think that there is no threat, 13 of them, ie 8.8% answer

that the supply chain operations exceed the normal capacity, and only three of the respondents, ie 2% of them think that they are facing disconnection of the supply chain, ie closure of the company.

Figure 3. Level of readiness for the COVID-19 pandemic on an organizational level

Source: Own research

From the data in Figure 3, it can be seen that, regarding the question of how they would assess the readiness of their organization before the crisis, 37.8% of the owners think that they have done some planning and are somewhat prepared, 25.7% of them claim that they have a limited plan for crisis response and are somewhat unprepared, 18.2% are unsure of their organizational readiness, 14.2% answer that they are ready and the lowest percentage, 4.1% or only 6 of the respondents think that are without a plan and are not ready to respond to the crisis at all.

Figure 4. Areas of SC most affected by the pandemic

Source: Own research

The companies surveyed were asked to list the main challenges facing their supply chains before the crisis began., presented in Figure 4. The main focus is on the individual links contained in their company's supply chain. The biggest problem reported by about 40% of companies is the damage to the reserve management part. It is followed by supply chain planning (31%), supplier network and international logistics with the same degree of crisis exposure (30.4%). Manufacturing, including sourcing and procurement, warehousing and distribution, and domestic logistics - are the other major challenges facing companies and their chains that affect their functional and uninterrupted operation. From the answers obtained to this question, it can be clearly seen that the efficiency of their entire supply chain of goods and raw materials and distribution to final consumers is significantly reduced.

Figure 5. Timeframe to overcome COVID-19 SCM challenges

Source: Own research

According to the answers in Figure 5 to the question about how long do they think it takes for the supply chain to recover from the shock caused by the pandemic, a larger number, ie 37.2% of respondents answer that it takes 6-9 months to heal their chain. for supply from the impact caused by the pandemic, further, about 35% of them think that they need 3-6 months to recover and continue working on their chains, 9.5% think that they need less than 3 months to return to normally, 8.8% of the respondents, ie 13 of them answer that they need 9-12 months, 6.8% think that they need more than 12 months, and the remaining 2.7%, ie four of the owners think that they will never recover from the shocks caused by the pandemic or that it would take them a long time to recover from the damage to the supply chain and to adapt to change.

From the above it can be clearly seen that timely analysis and a plan for the functioning of a company are needed to anticipate the damage caused by this crisis on their chains and their businesses in general so that they can be properly identified and resolved. They believe that with a realistic plan they would easily adapt to the changes and would focus on new or existing suppliers, and thus would not interrupt their work. Most of them face the crisis and direct their production and work in a good direction, therefore, they believe that 9 months are enough to heal and deal with the crisis, and only a small number of them believe that they will not recover from the shocks caused by the crisis.

CONCLUSION

Disruptions in business operations and global supply chains caused by disasters are forcing analysts and researchers to focus on survival as the most worrying topic in this post-coronavirus and business crisis. The importance of the plan and the analysis in every company are significantly increased in today's modern operation. Therefore, the first goal is to explain and understand the functioning of supply chains in each company, the meaning of supply chains, the links from which the chain is created and the way they are connected and function with each other, supply chain problems versus financial and health challenges, as well as special attention to the most vulnerable parts of the supply chain and the risks that arise in them.

In order to create a realistic picture of the condition of the chains, it is necessary from the beginning to the end to properly realize all the links that make up the chain and the supply process, as well as to give a special review and analysis of the details that make it up. With timely recognition of the problems and taking appropriate measures and actions, the current processes in the work organization will not be stopped and negative external influences will not be felt, but the functioning of the processes will continue to proceed smoothly with a positive response to change. After the research of small and medium enterprises in our country, it is concluded that some of the enterprises are ready to respond to any kind of external influence with a prepared plan and timely analysis, but there are also enterprises that are not fully prepared and this type. crisis, for them it is a complete loss and danger of closing the company. It is very important to understand that control systems increase mutual commitment and coordinated action towards the desired results, stimulate

communication, emphasize the definition of goals, reduce uncertainty and lead to higher performance. We also conclude that an effective supply chain is incredibly important, which increases the effectiveness of solutions to locate supply chain problems.

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