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## Companies Coopetition in Sustainable Supply Chains

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### **Abstract:**

**Purpose:** The constantly demanding market requires new solutions to improve a company's market share and its products or services quality. One of the solutions to improve supply chains is through maintaining coopetition relations with other supply chains on different business levels.

**Design/Methodology/Approach:** The presentation of the coopetition solution begins with a literature review. Based on the literature, a list of advantages and barriers was created. A survey with this list was carried out among 250 managers and directors in different companies. A number of organizations in coopetition relation, as well as the COVID-19 pandemic impact, was also examined. Data analysis shows the relationship between the size of the company, the type of activity, the place in the supply chain to the number of enterprises in the coopetition relationship and the impact of the determinant and the barriers to its application.

**Findings:** The survey shows that 30% of the examined companies are in or have plans to establish coopetition relations. This result is promising for future market changes. The most important advantages of coopetition are the ensuring of product availability, making better use of resources, and gaining market advantage.

**Practical Implications:** This paper presents the advantages and the barriers of establishing correct coopetition relations and its importance for companies.

**Originality/Value:** The coopetition relationship is an example of a relationship that can lead companies to greater competitive advantage. In particular, developing this relationship across supply chains can bring economies of scale to the entire supply chain

**Keywords:** Coopetition, coopetitors cooperation, supply chain coopetition, resource sharing.

**JEL codes:** D21, D22, L14, L20, P13.

**Paper Type:** Research study.

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## **1. Introduction**

Market requirements relative to enterprises are constantly rising. Product quality and the level of customer service must be at the highest level at all times, yet at the same time the lead time must be shorter with each order. Enterprises that want to achieve market advantage are implementing improvements and are looking for new possibilities to grow. The same behavior can be observed with whole supply chains. Enterprises are cooperating within the supply chain aiming for a common goal which is the best product and service quality with the lowest cost level.

Achieving these goals can be reached by proper supply chain management, its parties, and the relationships between them, but most of all tightening cooperation between those organizations. Until now authors have deeply examined vertical relations in the supply chain. The next step in the supply chain relations analysis is identifying relations with enterprises from outside the supply chain.

The authors of this paper is highly interested in the examination of horizontal cooperation of companies in the sustainable supply chain, especially cooperation with competitors of the supply chain called cooptation. Cooptation is a relationship that has already been defined on the company to company level. Some of the main authors are, Brandenburger and Nalebuff (1996), Lado, Boyd, and Hanlon (1997), Polenske (2004), Bengtsson and Kock (2000), Czakon (2014) and Romaniuk (2013). An example of cooptation is the usage of the same warehousing space and then transportation of goods of two independent chains to one client with one transportation unit. In other words, cooptation is connected to the common organization of processes with the aim of getting a synergistic effect.

## **2. Types of Inter-Organizational Relationships**

Analyzing the competing organizations, four types of relationships can be distinguished, competition, cooperation, coexistence, and cooptation.

The term of competition has been described many times. Hunt's (2007) definition describes competition as a dynamic situation, where few entities on the market compete for rare supplies, produce, and sell very similar products and services to meet customers' needs (Stankiewicz, 2005). Competition is the rivalry of entities striving to achieve assumed goals and an attempt to defeat opponents in this process by using resources, developing effective competition strategies, and choosing the right instruments of competition. The competition seeks to gain benefits related to economic activity (Szczepaniak, 2014).

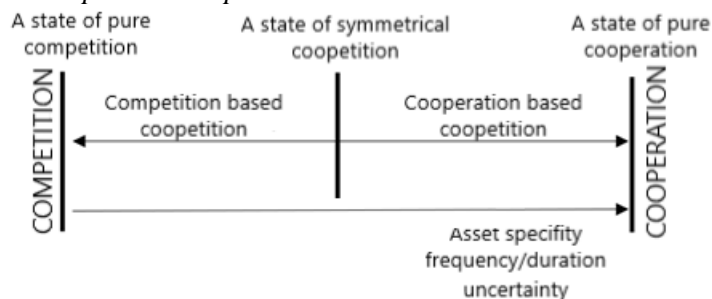
Coexistence is another relationship between organizations which is characterized by the lack of economic exchange in contrast to social and information exchange. There is no other relationship between the rivals, they are aware of each other's existence but they don't interact with each other (Romaniuk, 2013).

The next analyzed relationship is cooperation. Cooperation means collaboration and the working together of different organizations. It means performance by one organization for the benefit of another in certain phases of the production process, or delivery by another company of raw materials and materials for finished products manufactured by the other company (Szczepaniak, 2014). Cooperation is working together for common benefits or voluntary working together between companies connected to the exchange and sharing of resources or common developing products, technologies, or services (Osarenkhoe, 2010). Analyzing cooperation from a supply chain perspective, it is a process which links parties of this chain (Jelonek, 2012).

Coopetition is a relation that connects relations of cooperation and competition. Coopetition can occur at different stages of activity, within enterprises, within supply chains as well as with entities outside these organizations. The essence of coopetition can be understood by treating business as a game. The first authors who described game theory were Brandenburger and Nalebuff. Classic competition relationships strive for the elimination of competitors, or at least reduction of their market share. Coopetition means that competitors, through cooperation, can bring greater profits to their organizations. Treating business as a game when it comes to coopetition refers to few winners. In this theory, the players are the clients, suppliers, competitors, and coopetitors (Romaniuk, 2013).

Lado, Boyd, and Hanlon (1997) had an important role in developing the definition. From game, resource, and network theory they defined that enterprises increasingly combine the use of aggressive and cooperative strategies, and long-term cooperation and competition are treated as the ends of a continuum, but the continuum itself is not (Figure 1). This definition indicates one of the most important characteristics of coopetition, which is the occurrence of competition and cooperation at the same time (Lado *et al.*, 1997). A second important characteristic is gaining profits by organizations participating in coopetition - this characteristic is called mutual benefit (Gąsiorowska-Mącznik *et al.*, 2019). Mutual benefit is the situation when those parties can achieve more than they would achieve with only cooperation or competition relationships. The benefits are not equal or constant, it is actually the part where the organizations compete with each other (Czakon, 2014).

**Figure 1.** The competition-cooperation continuum.



*Source: Eriksson, 2008.*

The essence of coopetition is cooperation with other organizations to increase the so-called cake, and competition concerns its division (Romaniuk, 2013). Except for increasing market share, coopetition has many more benefits. Some of these are increasing efficiency through cost reduction, synergy effect, and an increase in value. Coopetition allows companies to acquire the necessary resources and limit access to resources to other competitors. The motive of learning, as an attribute of coopetition, indicates the acquisition of knowledge, the use of this knowledge, and the improvement of one's process. Another premise of coopetition is uncertainty, which is reduced by cooperation with competitors (Czakon, 2014).

The next step in analyzing coopetition is expanding its effect on whole supply chains. Considering the situation from this perspective, one can distinguish the coopetition of individual supply chain enterprises with an enterprise from a competitive supply chain, as well as the coopetition relationship of entire supply chains. Collaboration and coopetition can occur at different levels of the supply chain.

The key to the coopetition of supply chains is that one link in the chain can compete with a company while another link will cooperate. This indicates a wide field of application of supply chain coopetition (Tundys, 2012). The attributes that supply chains should observe in coopetition are: product substitutability, the speed of adaptation of companies, and differences in the speed of adaptation of supply chains (Jalali *et al.*, 2021).

### **3. Coopetition of the Surveyed Companies in Sustainable Supply Chains**

The study aimed to assess the level of occurrence of coopetition in enterprises and the scope of its application. In addition, the impact of the COVID-19 pandemic on the desire to establish coopetition relationships was examined. Moreover, the influence of determinants and barriers on the decision to introduce coopetition in the surveyed companies was examined. Even more importantly, the correlation between coopetition and size of the company, place in supply chain and type of activity was assessed.

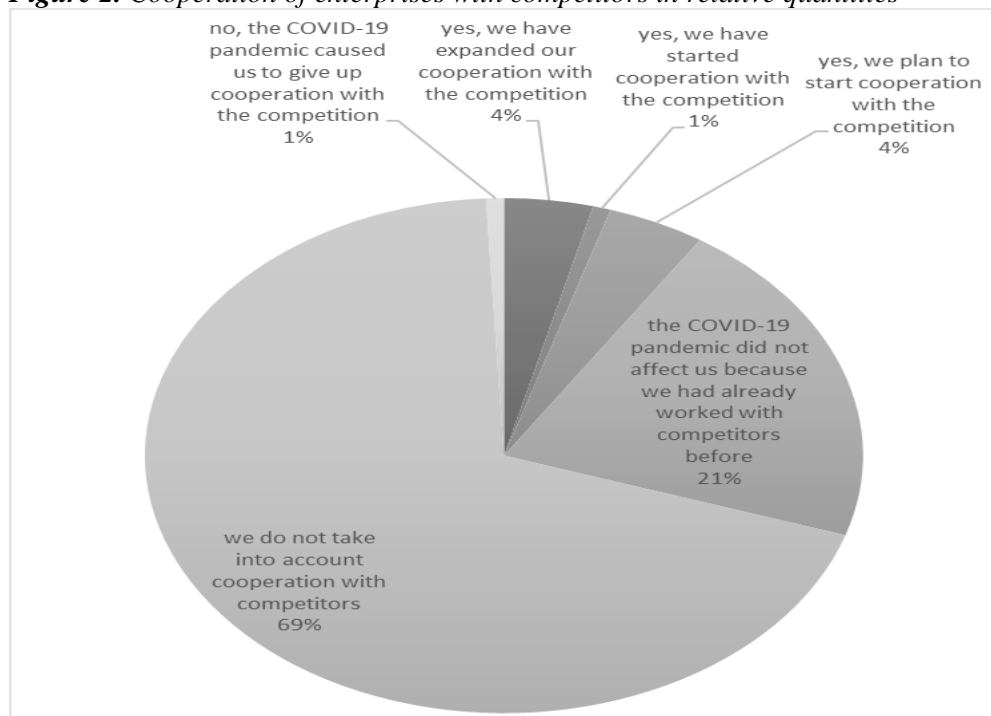
The empirical research that is the basis for the preparation of this article was carried out in the second quarter of 2021 using an electronic questionnaire supported by telephone. The surveyed group of enterprises consisted of 250 entities – 154 small enterprises, 46 medium-sized enterprises, and 50 large enterprises. The authors used the methods of descriptive statistics (including measures of the structure of the collective and the phenomenon of interdependence) and statistical inference. The data was analyzed using the STATA 15 program.

The first question was aimed at identifying the number of respondents whose companies are involved in a coopetition relationship, as well as examining the impact of the COVID-19 pandemic on the decision to undertake, expand or abandon

competition. As expected, the COVID-19 pandemic had a positive impact on the phenomenon of cooperation of enterprises; as many as 9% of the respondents declared to expand, start or plan cooperation with competitors.

It can therefore be assumed that because of the difficult pandemic situation, the prerequisites for commencing cooperation outweigh the risks and barriers associated with it. 21% of the surveyed entities had already participated in a cooperation relationship with their competitors before the pandemic. At the same time, 69% of respondents still do not consider cooperation with competitors, while 2 respondents said that due to the COVID-19 pandemic, the company has withdrawn from cooperation (Figure 2).

**Figure 2.** Cooperation of enterprises with competitors in relative quantities



**Source:** Own work based on the results of direct research.

Furthermore, it is important to analyze correlations between the size of the company, the type of activity, and the place in the supply chain to the number of enterprises in the cooperation relationship. The correlations in this paper were assessed with Cramer's V factor. First examined was a correlation of the number of competing enterprises versus the size of the company presented by the number of employees (Table 1). This correlation was statistically significant because of  $P=0$ . Cramer's V ratio equals 0,21, so this association is weak. To summarize, the size of the company has a moderate impact on the amount of competing enterprises.

**Table 1.** Correlation of cooperation of enterprises with competitors in relative quantities versus employment volume

<b>Cooperation of enterprises with competitors in relative quantities</b>	<b>Employment volume</b>	<b>10-49 persons</b>	<b>50-249 persons</b>	<b>250 and more people</b>	<b>Total</b>
yes, we have expanded our cooperation with the competition yes, we have started cooperation with the competition yes, we plan to start cooperation with the competition		15 (14,3)	3 (4,3)	5 (4,5)	23
the COVID-19 pandemic did not affect us because we had already worked with competitors before		20 (32,3)	11 (9,6)	21 (10,1)	52
we do not take into account cooperation with competitors		119 (107,4)	32 (32,1)	22 (33,5)	173
<i>Pearson chi</i> <sup>2</sup> =22,415 <i>Cramér's V</i> =0,2126 <i>P</i> =0		154	46	48	248

**Note:** The table shows the actual and theoretical abundances (in parentheses)

**Source:** Own work based on the results of direct research.

The next examined correlation applies to the number of cooperating enterprises versus the type of company (Table 2). This research was evaluated with a statistical significance of 0,23, so it is statistically insignificant. At the same time, Cramer's V ratio equals 0,11, so it has a very weak association. These results show that the type of company has no impact on the number of cooperating enterprises.

**Table 2.** Correlation of cooperation of enterprises with competitors in relative quantities versus company type

<b>Cooperation of enterprises with competitors in relative quantities</b>	<b>Company type</b>	<b>Production</b>	<b>Trading</b>	<b>Service</b>	<b>Total</b>
yes, we have expanded our cooperation with the competition yes, we have started cooperation with the competition yes, we plan to start cooperation with the competition		7 (7,6)	8 (5,7)	8 (9,7)	23
the COVID-19 pandemic did not affect us because we had already worked with competitors before		18 (17,2)	7 (12,8)	27 (22)	52
we do not take into account cooperation with competitors		57 (57,2)	46 (42,6)	70 (73,2)	173
<i>Pearson chi</i> <sup>2</sup> =5,5397 <i>Cramér's V</i> =0,1057 <i>P</i> =0,236		82	61	105	248

**Note:** The table shows the actual and theoretical abundances (in parentheses)

**Source:** Own work based on the results of direct research.

The last examined correlation was the relationship between the number of cooperating companies and position in the supply chain (Table 3). This set of data is statistically significant ( $P=0,04$ ), but the correlation itself is weak because Cramer's V ratio equals 0,17. To summarize, the position in the supply chain weakly affects the number of cooperating enterprises.

**Table 3.** Correlation of cooperation of enterprises with competitors in relative quantities versus position in the supply chain

Cooperation of enterprises with competitors in relative quantities	Position in the supply chain	Intermediate supplier of the supply chain leader	Direct supplier of the supply chain leader	Supply chain leader	Direct recipient of the supply chain leader	Intermediate recipient of the supply chain leader	Total
yes, we have expanded our cooperation with the competition		4 (2,2)	2 (2,9)	9 (11,4)	5 (3,3)	3 (3,2)	23
yes, we have started cooperation with the competition							
yes, we plan to start cooperation with the competition							
the COVID-19 pandemic did not affect us because we had already worked with competitors before		6 (5)	7 (6,5)	16 (25,8)	11 (7,5)	12 (7,1)	52
we do not take into account cooperation with competitors		14 (16,7)	22 (21,6)	98 (85,8)	20 (25,1)	19 (23,7)	173
<i>Pearson chi<sup>2</sup>=16,0391</i> <b>Cramér's V=0,1798 P=0,042</b>		24	31	123	36	34	248

**Note:** The table shows the actual and theoretical abundances (in parentheses)

**Source:** own work based on the results of direct research

In the context of the results presented so far, the next stage of the research was the identification of determinants influencing the decision to undertake cooperation, as well as the identification of barriers preventing companies from entering into the indicated relationships. In the survey questionnaire, respondents were presented with the following determinants of cooperation: cost reduction, greater efficiency of operations, higher level of customer service, shorter delivery time, ensuring product availability, better use of resources, the ability to launch online sales, increasing their know-how, gaining market advantage.

According to the results of the research (Table 4), the most important determinant in favor of undertaking a cooperation relationship is to ensure the availability of the product (avg. 3.02; SD 1.26). Another important determinant for respondents is to

gain a market advantage (avg. 2.88; SD 1.36) and better use of resources (avg. 2.81; SD 1:23).

**Table 4.** *Determinants of cooperation of the surveyed competitors – average measures*

<b>Determinants of competitors' cooperation</b>	<b>Arithmetic average</b>	<b>Standard deviation</b>
<b>Cost reduction</b>	2,6	1,112182
<b>Greater efficiency of operations</b>	2,704	1,212545
<b>Higher level of customer service</b>	2,708	1,254204
<b>Shorter delivery time</b>	2,592	1,148395
<b>Ensuring product availability</b>	<b>3,024</b>	1,260866
<b>Better use of resources</b>	<b>2,808</b>	1,226848
<b>The ability to launch online sales</b>	2,12	1,094712
<b>Increasing their know-how</b>	2,64	1,167842
<b>Gaining market advantage</b>	<b>2,876</b>	1,135686

*Source:* Own work based on the results of direct research.

The last stage of the research was the assessment of individual barriers influencing the decision to undertake a cooperation relationship. The survey questionnaire lists the following barriers: the risk of leakage of confidential data, the mental barrier of management and management, uneven benefits to competitors, the extension of product delivery times, technical difficulties in cooperation. From the perspective of analysis using average measures (Table 5), the biggest barrier to starting a cooperation relationship indicated by respondents was the risk of leakage of confidential data (avg. 2.78; SD 1.21). Subsequently, significant barriers are uneven competitors' benefits (avg. 2.62; SD 1.21) and technical difficulties of cooperation (avg. 2.55; SD 1:11).

**Table 5.** *Barriers to competitors' cooperation – average measures*

<b>Barriers to competitors' cooperation</b>	<b>Arithmetic average</b>	<b>Standard deviation</b>
<b>Risk of leakage of confidential data</b>	<b>2,776</b>	1,214795
<b>The mental barrier of management and management</b>	2,476	1,155319
<b>Uneven benefits of competitors</b>	<b>2,616</b>	1,121416
<b>The extension of product delivery times</b>	2,216	1,151803
<b>Technical difficulties in cooperation</b>	<b>2,548</b>	1,108427

*Source:* Own work based on the results of direct research.



#### **4. Concluding Remarks**

Comparing the results of the conducted research in the area of cooperation of enterprises in sustainable supply chains, several conclusions can be drawn. First of all, as many as 30% of respondents participate or plan to participate in a cooperation relationship. This is a high result given the significant impact of cooperation barriers. The dependency analysis showed that the size of the enterprise and the type of activity do not affect the undertaking of the cooperation relationship, while the position in the supply chain has a moderate impact on the number of cooperating enterprises.

The most important determinants influencing the decision to establish cooperation are: ensuring the availability of products and better use of resources. These determinants may indeed have influenced the decision to start cooperation during the COVID-19 pandemic, as they prevented the biggest problems of the pandemic among entrepreneurs.

Another conclusion that comes to mind is the lesser importance of barriers for entrepreneurs experiencing a bad economic situation due to the pandemic. In particular, the risk of leakage of confidential data is acceptable when companies can exchange information on solutions in difficult markets.

The findings of this study have to be seen in light of some limitations. First of all, population constraints might be too strict. Secondly, the research was conducted among enterprises operating in Poland. Lastly, the questionnaire contained too general questions. These limitations are caused by the beginning of research project, as well as due to budget limits. Future research should include larger region, more liberal population constraints, but most of all more detailed and deepened questions.

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