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## Developing relationships as a security factor in supply chain management in the metal sector in Poland

### Kształtowanie relacji jako czynnik bezpieczeństwa w zarządzaniu łańcuchami dostaw sektora metalowego w Polsce

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**Abstract.** Ensuring security in the current environment, becomes particularly important in both social and economic terms. The changing conditions for business operators are not conducive to ensuring process stability and thus reducing risks in supply chains. It is becoming essential to identify areas, resources and activities that have the potential to ensure process stability and security and reduce uncertainty as well as risk in supply chains. Developing bonds between business partners is particularly important in this regard. Cooperation based on trust is the basis of such partnerships in supply chains. At the same time, creating such relationships is not only a challenge, but also an additional source of risk. The objective of this paper is to identify the key aspects of relationship formation within companies and their role in ensuring the security of supply chains. Achieving the purpose of the thesis requires the identification of the essence of relationships and relational capital, and the presentation of research findings on key aspects of corporate relationships in supply chains. The research was conducted using a proprietary questionnaire and covered businesses operating in the metal industry in Poland. The issues examined included such elements as: competences of enterprises in supply chain management in terms of shaping relations: within the enterprise, with customers, suppliers of materials and services, intermediaries (distributors), the number of contractors with whom enterprises cooperate and the level of their relationships, at which they cooperate, involvement of partners/contractors in decision-making, concepts used in relationships with co-operators, type of contracts and partnerships created, measurement/evaluation of cooperation and the scope of control of cooperation with contractors, elements of building trust, factors conducive to cooperation, barriers and reasons for failures in establishing supply chain management relationships. The research thesis is identifying the relationships of enterprises with contractors has a positive impact on their formation and ensuring the security of supply chains.

The research niche presented in the article concerns the use of opinion and judgment research based on the author's survey questionnaire in the environment of enterprises from the metal industry. Obtaining

the results allowed to identify the role and scope of business relationships in supply chains and important factors influencing their shaping. The role of managing relationships with business partners as an important element impacting the security of supply chains was also emphasised.

**Keywords:** supply chain, relationships, supply chain security, partners, cooperation

**Abstrakt.** Zapewnienie bezpieczeństwa, w obecnych warunkach, nabiera szczególnego znaczenia zarówno w aspekcie społecznym, jak również gospodarczym. Zmieniające się warunki funkcjonowania podmiotów gospodarczych nie sprzyjają zapewnieniu stabilności procesów i tym samym redukcji ryzyka w łańcuchach dostaw. Istotną staje się identyfikacja obszarów, zasobów i działań, które posiadają potencjał pozwalający na zapewnienie stabilności i bezpieczeństwa procesów oraz ograniczenie niepewności i ryzyka w łańcuchach dostaw. Szczególne znaczenie w tym zakresie odgrywa budowanie więzi między partnerami gospodarczymi. Podstawą takich partnerskich relacji w łańcuchach dostaw jest współpraca polegająca na zaufaniu. Jednocześnie tworzenie takich relacji stanowi nie tylko wyzwanie, ale także dodatkowe źródło ryzyka. Celem pracy jest wskazanie kluczowych aspektów kształtowania relacji w przedsiębiorstwach i ich roli w zapewnieniu bezpieczeństwa funkcjonowania łańcuchów dostaw. Osiągnięcie celu pracy wymaga identyfikacji istoty relacji i kapitału relacyjnego oraz prezentacji wyników badań dotyczących kluczowych aspektów relacji przedsiębiorstw w łańcuchach dostaw. Badania zostały przeprowadzone z wykorzystaniem autorskiego kwestionariusza ankietowego i obejmowały przedsiębiorstwa branży metalowej prowadzące swoją działalność na terenie Polski. Badane zagadnienia obejmowały takie elementy jak: kompetencje jakimi odznaczają się przedsiębiorstwa w zarządzaniu łańcuchem dostaw w zakresie kształtowania relacji: w ramach przedsiębiorstwa, z klientami, dostawcami materiałów i usług, pośrednikami (dystrybutorami), liczba kontrahentów, z którymi współpracują przedsiębiorstwa i poziomi ich relacji. na jakim współpracuj funkcjonują, zaangażowanie partnerów/kontrahentów w podejmowanie decyzji, koncepcje wykorzystywane w powiązaniach z kooperantami, rodzaj umów i tworzone relacje partnerskie, pomiaru/oceny współpracy i zakres kontroli współpracy z kontrahentami, elementy budowania zaufania, czynniki sprzyjające współpracy, bariery oraz przyczyny niepowodzeń w nawiązaniu relacji zarządzaniu łańcuchem dostaw. Teza badawcza brzmi: identyfikacja relacji przedsiębiorstw z kontrahentami wpływa pozytywnie na ich kształtowanie oraz zapewnienie bezpieczeństwa łańcuchów dostaw...

Nisza badawcza przedstawiona w artykule dotyczy zastosowania badania opinii i sądów w oparciu o autorski kwestionariusz ankiety, w środowisku przedsiębiorstw z branży metalowej. Uzyskanie wyników pozwoliły na identyfikację roli i zakresu relacji przedsiębiorstw w łańcuchach dostaw oraz istotnych czynników wpływających na ich kształtowanie. Podkreślono również rolę zarządzania relacjami z partnerami gospodarczymi jako istotnego elementu wpływającego na zapewnienie bezpieczeństwa funkcjonowania łańcuchów dostaw.

**Słowa kluczowe:** łańcuch dostaw, relacje, bezpieczeństwo łańcucha dostaw, partnerzy, współpraca

## Introduction

The important determinants shaping the sustainable competitive advantage of modern companies undoubtedly include such elements as (Ciesielski, 2009, p. 122): key competences, continuous improvement based on knowledge management, time compression regarding product development cycle, operations carried out, but above all the quality of cooperation between economic partners. At the same time, modern economic conditions and the desire to ensure an adequate level of safety in the processes being carried out and to meet expectations are prompting companies to look for opportunities to improve the efficiency of their operations. One of them is the creation of relationships with partners within integrated supply chains (Zhaoa, et al., 2011, pp. 17–32, cf. Aisyah, Sukoco, Anshori, 2019).

The modern economy, apart from the high level of competition between entities, is characterised by an extensive network of existing interconnections and dependencies, both formal and informal, permeating all spheres of economic life. However, due to the need to meet market competition, apart from such basic elements as strategy, human resources and technical infrastructure, the quality of relationships plays a special role. The relationship consists of a network of internal and external connections, and the increase in their importance is one of the most important development trends in contemporary mechanisms of value creation, competitiveness and innovation (Moczydłowska, Korombel, Bitkowska, 2017, cf. Bayraktaroglu, Calisir, Baskak, 2019; Madhavaram, at al., 2023, Shin, Park, Park, 2019).

Relational ability is the ability to initiate inter-organisational relationships, maintain and use relationships with various external partners in the context of shaping the results of cooperation. In addition, it reflects the efforts of the parties focused on the enrichment of knowledge and its diffusion and therefore plays a dual role: an integrator and a knowledge sharing stream between the enterprise and its external partners (Wójcik-Karpacz, 2012, 64. for Czakon, 2007, 45, Ralston, at al., 2017). However, as A. Kolemba notes, building relationships requires getting to know the environment and accompanying conditions in order to be able to indicate which of them stimulate and which inhibit the development of relationships that ensure the success of enterprises. It is also important to analyse and identify which relationships are potential sources of success (Kolemba, 2017, pp. 29–43; Ramírez-Solis, at al., 2022, Høgevold, Svensson, Otero-Neira 2019, Høgevold, Svensson, Otero-Neira, 2020).

This cooperation requires shaping relationships both within the enterprise and on the scale of the entire supply chain (Qu, Yang., 2015, pp. 911–918), which, on the one hand, may constitute an opportunity for the development and success of enterprises, and, on the other hand, a challenge and a source of risk. An important factor motivating the creation of bonds with partners within integrated supply chains is the striving to ensure an appropriate level of safety of the processes carried out and to ensure a high level of quality of actions taken to strengthen competitiveness (cf. Ficoń, Zięcina, 2020, Figurski, Niepsuj, 2021, Gądek-Hawlena, Heliosz, 2023).

The objective of this paper is to identify the key aspects of relationship formation within companies and their role in ensuring the security of supply chains. Achieving the purpose of the thesis requires the identification of the essence of relationships and relational capital, and the presentation of research findings on key aspects of corporate relationships in supply chains. The article is of a cognitive nature and is the basis for further research in the field of building business relationships in supply chains. Achieving the purpose of the thesis required the formulation of a research problem in the form of: What is the nature of cooperation and the level of relationships between enterprises in supply chains?

Achievement of the research goal was related to the following research questions:

- What competences of supply chain management do the analysed companies have in terms of shaping relationships: within the company, with customers, suppliers of materials and services, intermediaries (distributors)?
- What is the participation/involvement of partners/contractors in decision-making?
- What concepts and tools are used in the links with co-operators?
- What are the main barriers to forming partnerships?
- What factors are conducive to cooperation, building trust, and what are the causes of failures in shaping partnerships?

Obtaining answers to the indicated questions allowed to identify the nature of business relationships, important factors of their formation within supply chains and to put forward a research thesis: identification of business relationships with contractors has a positive impact on their formation and ensuring the security of supply chains.

## **Research methods**

The research method used was a proprietary questionnaire, consisting of questions about the characteristics of the analysed enterprises and the research issues undertaken. The research was conducted in 50 Polish companies operating in the metal industry (micro-enterprises were not included in the research). The structure of the analysed companies in terms of business size was determined according to the EU methodology). The research sample was selected randomly. The detailed structure of the analysed enterprises is presented in the paper (Staniewska, 2022, p. 118).

The questionnaires were completed by people occupying managerial positions, mainly in the area of supply chain management or other related ones, and the obtained results were subjected to quantitative and qualitative analysis.

## **The essence of the relationship**

Various organisations, including companies, are forced to establish relationships with other market players (even competitors) in order to create value for stakeholders and build their own competitive position. The growing market share of network companies demonstrates the need to seek out areas of interaction and actors to build relational capital.

A relationship constitutes a dependency between entities and of a connecting nature, and M. Mitreęa points out that the term has a broader meaning than terms such as bond and partnership (Mitreęa, 2005, 69). The relationships may have a

different form specified, among others, in the form of 4C where (Martin, Nolte & Vitolo., 2016, 621–643; Sienkiewicz-Małyjurek, 2018, pp. 43-49), i.e.:

- communication based on the transfer of information between the actors in the relationship,
- cooperation, which is a low-intensity, short-term relationship that does not require the adaptation of activities,
- coordination, which is permanent, requiring mutual alignment and formalisation in terms of policy definition, planning and decision-making,
- collaboration is a highly interdependent, long-term relationship that requires a significant alignment of activities.

Relationships based on the following ties can also be indicated (Czakon, 2007, p. 45):

- equity – based on capital ties and subordination,
- inter-organisational – involving mutual engagement and interaction.

As A. Zakrzewska-Bielawska points out, relationships can be classified according to various criteria and a detailed breakdown is provided in the paper (Zakrzewska-Bielawska, 2014, pp. 9-29). These may be criteria taking into account: the direction of the relationship, the purpose of the relationship, the subject of the relationship, the dependence of the entities, the evolution of the relationship, inter-organisational behaviour of companies, the nature of the relationship, relationship management, the dependence of the entities, obtaining benefits, the mechanism of coordination, the duration of the relationship, etc.

Relational ties are also a basic element of the functioning of inter-organisational networks, within which the following are distinguished (Chomiak-Orsa, 2014, Bengtsson, & Kock, 2000, pp. 411–426.):

- reverse vertical relationships (with suppliers) – with all entities that provide the enterprise with the necessary factors of production,
- vertical frontal relationships (with buyers) – with customers or intermediaries involved in distribution,
- direct horizontal relationships with other entities operating in the same industry, e.g. competitors,
- indirect horizontal relationships e.g. with the supply of complementary or substitute goods.

In the case of business entities, due to the need to trade, inter-organisational links can be based on relationships or transactions. The basic differences between these types of relationships are presented in detail in the thesis (Światowiec, 2006, p. 14). The results of the comparison indicate a number of benefits resulting from the exchange based on relationships, which relate to the cooperating entities, but also all links in the supply chain, in particular the final recipients. Relationships are therefore a specific determinant of the market success of companies (Kwiecień & Żak, 2013, pp. 263–276), as they accompany every activity of the organisation.

Due to the multifaceted nature of the subject of relationships, it is worth emphasising that it is also important in this case to consider the reasons for the formation of relationships, among which the following can be taken into account. (Wasiluk, & Tomaszuk, 2020, p. 14):

- pursuing common goals and interests,
- achieving stability, predictability and operational reliability (the creation of relationships is a response to the uncertainty of the environment and the desire to minimise risk),
- achieving higher efficiency.

At the same time, the subject of inter-organisational relationships allows the identification of two closely related approaches, to their explanation of the establishment of relationships, which are as follows (Wójcik-Karpacz, 2012, 64; Czakon, 2006, p. 156):

- relational approach – based on cooperation to achieve a relational annuity, i.e. higher results achieved jointly by the companies participating in a mutual exchange that cannot be achieved individually.
- resource approach – based on creating a valuable and difficult to imitate resource as a factor of competitive advantage as part of the relationship.

Establishing external relationships allows access to resources that are difficult for individual companies to obtain, e.g. knowledge resources. The resource approach takes into account the special role of key competences as a source of competitive advantage, and inter-organisational cooperation allows to obtain such relational competence, which is unique.

## **Relational capital in supply chains**

Relational capital is one of the pillars of corporate intellectual capital (alongside organisational/structural and social/human capital). It is also referred to as external structural capital, which consists of an organisation's external relationships (Hoffman-Bang & Martin, 2005):

- a network of suppliers, distributors, hobby organisations, where it is important to analyse the links focusing on the intensity and distribution of contacts that are essential to its operation and give access to additional resources and competences, etc.;
- a brand defining preferences and reputation resulting from trust and perceived as having a strong competitive advantage,
- customers being the main source of competitive advantage, resulting from market position, image in comparison with competitors, customer loyalty, ability to build close and strong relationships with customers based on trust and customer knowledge.

In the literature on the subject, relational capital is defined as (Żukowska, Kołodziejczyk, & Mechło, 2018, pp. 9-21):

- knowledge embedded in inter-organisational relationships, built by using external organisational connections, market relationships, relationships with customers, suppliers, power centres and industry, as well as technological networks that are available in the environment (Ujwary-Gil, 2009, p. 198),
- a set of partnerships based on trust and shared values (Camagni, Caragliu & Perucca, 2011),
- a network whose development is determined by the interaction of entities (Przybylska, 2015, pp. 217-226),
- a network of the company's connections with the business environment (García-Merino, García-Zambrano & Rodriguez-Castellanos, 2014, pp. 1-8.),
- the ability to create and maintain close and lasting relationships based on trust and cooperation (Chomiak-Orsa, 2013, 109), depending on the level of transparency of relationships between entities and the frequency of interactions (Liu, Ghauri & Sinkovics, 2010, 237-249), as well as on responsibility and respect between entities of relationships (Chen, Huang & Davison, 2017, pp. 219-248),
- the value created on the basis of the exchange of tangible and intangible resources between the enterprise and stakeholders (Chomiak-Orsa, 2014, p. 31).

Summing up the considerations regarding the essence of relational capital, it can be stated that cooperation and inter-organizational interaction, and above all its quality, are the basis for the creation of relational capital, which is reflected in the possibility of achieving jointly defined goals. Relational capital is an intangible asset/intellectual capital covering the entirety of connections with the economic environment, reputation, customer loyalty, brand or distribution channels or in the context of inter-organizational connections (networks, supply chains) (Danielak, 2012, p. 16). It arises as a result of the evolution of the company and the individual network of contacts developed in its traction with various partners, which can be unique and difficult to copy by competitors. Shaping the network of relationships and relational capital of the enterprise constitutes:

- a positive consequence of proper relationships with customers, distributors, suppliers and other entities close to the company (Urbanowska-Sojkin, 2004, p. 355).
- an important element that creates a company's unique value, which impacts its competitive advantage (Wąsowska, 2009, pp. 4-7),
- determinant of the development of the organisation and the generation of the so-called relational annuity, constituting additional benefits (synergic

effect) generated by entities within the framework of cooperation (involvement of complementary resources, combination of competences, knowledge sharing, reduction of transaction costs), which are impossible to achieve by partners alone (Mitręga, 2010, p. 32).

Among the key determinants of organisational success, K. Perechuda and I. Chomiak-Orsa list many relating directly to the relationship with partners and the resulting benefits such as (Perechuda & Chomiak-Orsa, 2013, pp. 293-307):

- maintaining close and direct relationships not only with customers, but also with suppliers, partners entering alliances and competitors, which enable quick response to still weak stimuli from the market, which are potential predictions of upcoming threats, but also market opportunities,
- minimising the time, it takes to reach a sought-after resource located in the partners' resources,
- shortening the time of informing partners and sales markets about new products or services offered and about implementation possibilities,
- constant monitoring of the relationships taking place,
- responding rapidly to the need for change in the products or services provided through flexible allocation of resources.

However, a prerequisite for the benefits of relationship building is proper relationship management to identify those with the greatest potential for growth and value creation. It forms the basis for the formation of relational capital, which is determined by the dependencies between entities and the mutual commitment of partners (Danielak, 2012, p. 16). Creating inter-organisational relationships is perceived as an effective strategy for building competitive advantage, based on the process of mutual learning, complementarity of resources and increased bargaining power thanks to the combination of partners' forces (Chrupała-Pniak & Sulimowska-Formowicz, 2016, p. 124).

Establishing collaborations that are characterised by trust, good communication, an effective flow of information/knowledge and the willingness to bring key competences to the relationship provides the basis for increased added value as a result of more efficient use of resources and synergies between the partners. Close cooperation with partners and their inclusion in the value creation chain (often through outsourcing of selected functions) is the basis for editing costs and the potential for increasing flexibility. It can also be an element of prevention, in the context of ensuring safety, allowing for the preparation for possible crisis situations and the implementation of an effective recovery program (cf. Walecka & Zelek 2017, pp. 167-182, Yeh, Pai, Wu, 2020, Loury-Okoumba, Mafini, 2021).



## Results of the study

The analysed companies cooperate with many external stakeholders, but the survey included: suppliers, recipients, commercial intermediaries and service providers. The estimated average number of contractors with whom enterprises of the studied industry cooperate is, respectively:

- suppliers – approx. 94 (large companies – 155, medium companies – 70, small companies – 54),
- recipients – approx. 568 (large companies – 1214, medium companies – 291, small companies – 199),
- intermediaries – approx. 17 (large companies – 36, medium companies – 8, small companies – 6),
- service providers – approx. 33 (large companies – 77, medium-sized companies – 15, small companies – 7).

Despite the significant number of contractors with which enterprises carry out transactions, this does not mean in every case shaping partner relationships, therefore the first of the issues studied was the identification of supply chain management competences that the enterprise has in the field of shaping relationships. The results are presented in Figure 1.

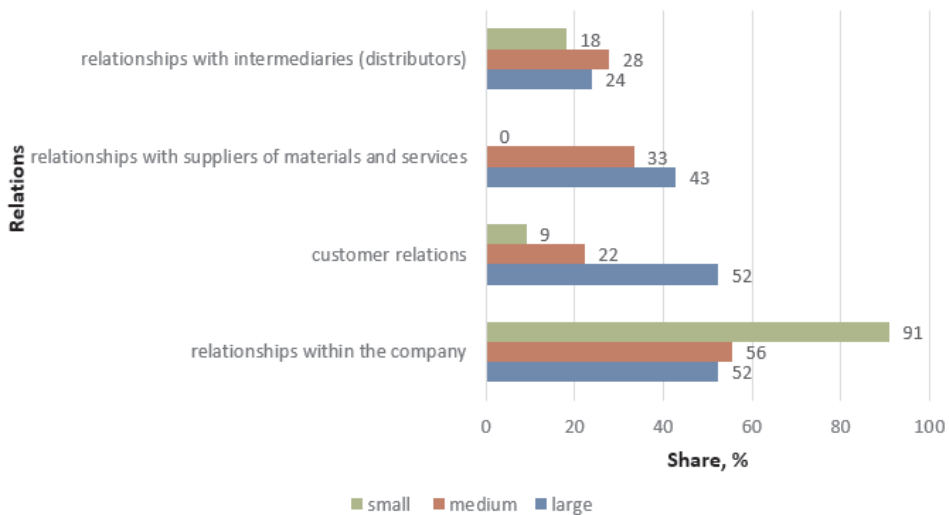


Fig. 1. Relational competence of companies

Source: Own study

The respondents' indications allow to state that the shaping of relationships mainly refers to activities within the organisation (especially in small enterprises). However, for about half of the large enterprises analysed, relationships with suppliers of materials and services and final recipients are not insignificant.

Another issue was the relationship between partners in supply chains. The results of indications are presented in Figure 2.

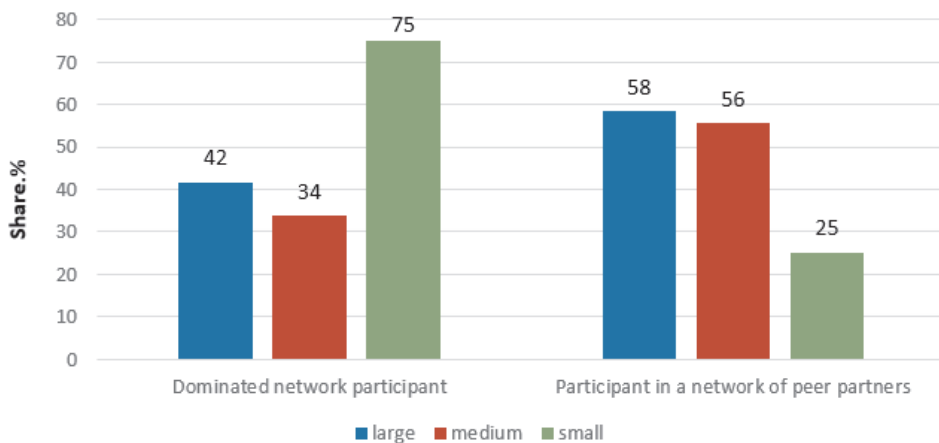


Fig. 2. Network relationships of companies  
Source: Own study

It is also worth noting that more than half of the large and medium-sized companies indicated partnerships occurring within the supply network. At the same time, as many as 75 per cent of small businesses indicate that they operate in a dominant network and therefore far from the principles of partnership.

Another of the areas examined was the assessment of the level of cooperation with contractors the companies surveyed operate. The results obtained are shown in Figure 3.

Strategic partnerships, characterised by long-term cooperation and the exchange of information to make joint decisions, were not a very frequently indicated form of relationship. The largest number of indications related to a cooperation consisting in simultaneous access to information and use of the same IT systems and tools, integration of many process functions. At the same time, from 30% of small enterprises to almost 40% of large and medium-sized enterprises indicate the existence of relationships consisting in one or two-way exchange of information in order to carry out current transactions and the involvement of selected functions of the enterprise.

Another issue was to obtain information on which of the contractors the analysed companies form partnerships with and the type of contracts. The results of the respondents' indications are shown in Figure 4.

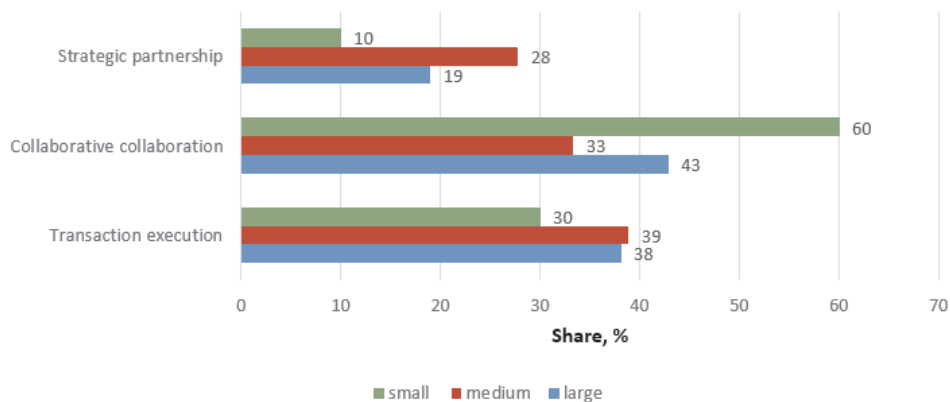


Fig. 3. Level of cooperation with contractors

Source: Own study

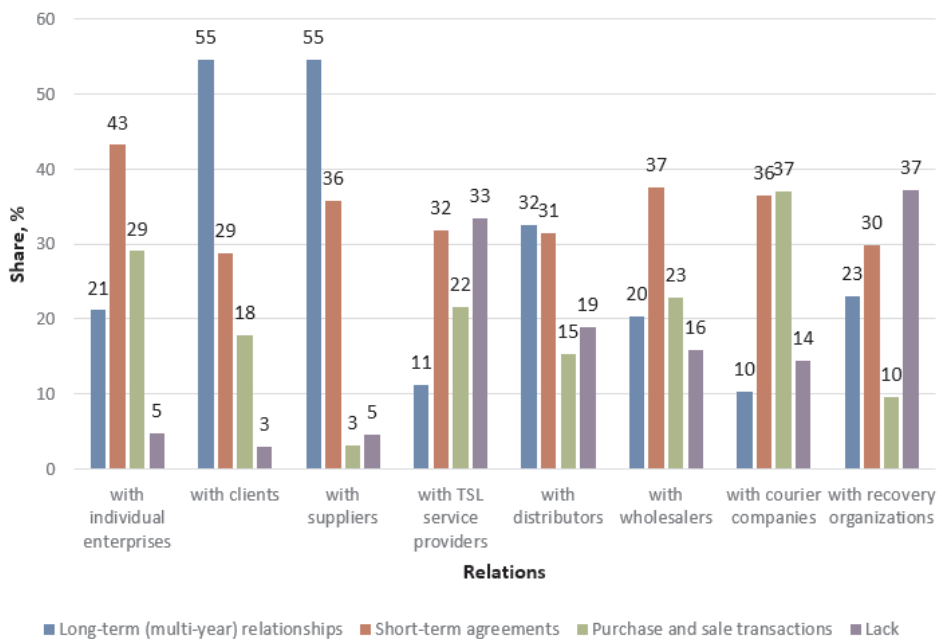


Fig. 4. Partnership relationships and type of contracts with contractors

Source: Own study

Based on the results obtained, it can be concluded that partnerships based on long-term contracts most often regard customers, suppliers and distributors, while in the case of other contractors, short-term agreements or purchase and sale transactions are a popular form of contracts.

Respondents' indications of the barriers to establishing partnerships suggest that an important one for approx. 90 per cent of large, 80 per cent of medium and more than 70 per cent of small businesses lack the confidence to work in partnership with contractors.

An important element in the analysis of relationships in supply chains was the use of modern concepts in connection with co-operators, the implementation of which allows for streamlining processes, increasing the level of quality of cooperation with contractors and strengthening relationships. The obtained results are shown in Figure 5.

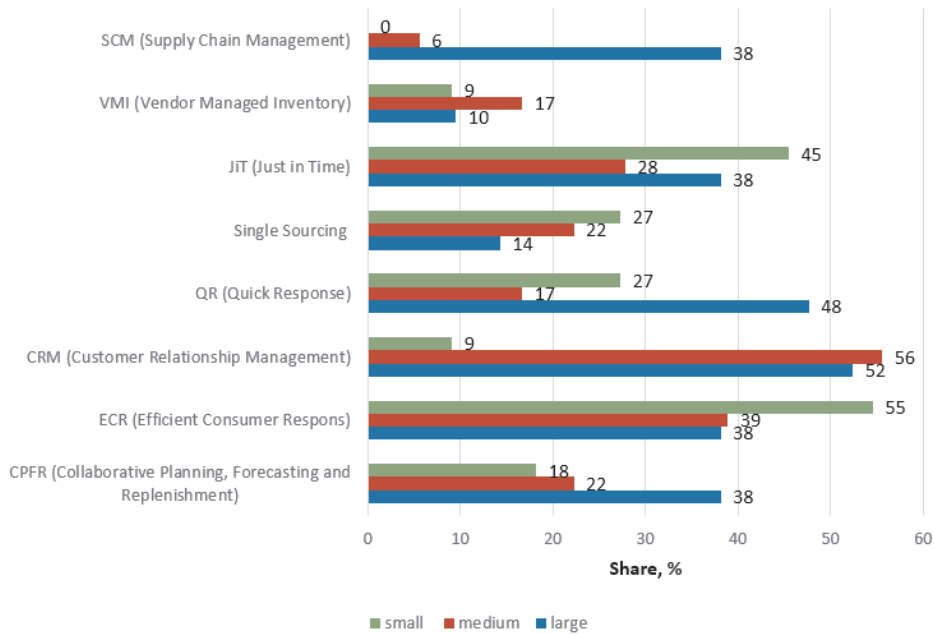


Fig. 5. Concepts used in links with co-operators

Source: Own study

The use of effective tools and concepts in business practice are the domain mainly of large companies. However, customer service concepts and tools were the most frequently mentioned ones.

## Conclusions

Skilful relationship formation and the use of relational capital can be classified as key competences and is the basis for building a competitive advantage of enterprises.

The creation of relationships with supply chain partners is becoming a necessity, however, it is not only the basis for successfully competing in the market but also the potential for reducing uncertainty and risk. The network of relationships between enterprises is the basis for risk sharing as an integral part of the functioning of the supply chain.

Understanding the determinants of inter-organisational relationships is an essential element of risk management in supply chains and ensuring their security.

The results obtained suggest that relationship building continues to be a significant challenge for many companies. The relational competence of companies is rated low, with close cooperation mainly referring to customers and suppliers for about half of the large companies surveyed. At the same time, strategic partnership, characterised by long-term cooperation and joint decisions, was not indicated very often. The predominant relationship was one of information exchange for the purpose of day-to-day transactions. The occurrence of relationships based on long-term contracts with customers, suppliers and distributors was also pointed out. The lack of conviction about the possibility of cooperation on a partnership basis with contractors was indicated as the main obstacle to establishing partnership relationships. The obtained results may form the basis for further research on the factors constituting the main barriers and limitations of creating partnerships, which undoubtedly constitute the attitude of competitiveness as a factor determining the economic security of enterprises. Therefore, it can be concluded that the obtained results significantly verify the hypothesis formulated in the introduction about the importance of relationships for the security of supply chains, but the research should be deepened by using qualitative methods.

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