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Coopetition? Yes, but Who With? The Selection of Coopetition Partners by High-Tech Firms

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ABSTRACT

Coopetition can be said to be present only when two inherently contradictory inter-organisational dynamics – competition and cooperation – are occurring at the same time between the same entities. Two questions then arise: With whom are firms in coopetition relationships? With whom will they wish to institute coopetition in the future? The goal of this paper is to answer these questions. Research conducted using the Pen and Paper Interview technique on a sample of 235 high-tech firms found that the majority were engaged in multiple coopetition relationships, that is, that they were cooperating with more than one competitor. They chose their coopetition partners mostly from among their rivals in Poland and from the SME sector. That said, they most preferred to enter into coopetition with firms of a similar size and technological and market position, or with stronger and bigger firms. Their choices and preferences were, however, stratified not only in respect of firms' size, but also with regard to their territorial scope, degree of development and area of coopetition.

INTRODUCTION

Contemporary markets require firms to take an innovative approach to constructing competitive advantage. On the one side rapid technological advancement, increasing globalisation and open borders intensify competition, while on the other they compel firms to combine their strengths to take better advantage of the opportunities created by the changing environment. As a result, firms are finding themselves in simultaneous competition and cooperation ever more frequently. This state of affairs is defined as coopetition. Notwithstanding the increasing interest in coopetition, the fundamental questions associated with the relationship it defines continue to be discussed. This arises from attempts in Economics to examine coopetition from different theoretical standpoints. Their dominant strands are: game theory (Brandenburger and Nalebuff, 1996; Bengtsson and Kock, 2000; Okura, 2007), transaction costs theory (Dowling et al., 1996; Madhook, 2000; Ganguli, 2007) and resource-based theory (Levy et al., 2003; Gnywali and Park, 2009; Tong and Reuer, 2010; Zakrzewska-Bielawska, 2013a). We may also include two further theoretical platforms for coopetition created by researchers: the network approach (Gnywali et al., 2006; Czakon, 2009), as well as inter-organizational dynamics theory (Padula and Dagnino, 2007; Tidström, 2008). The multitude of theoretical approaches to coopetition, as well as its comparatively brief research history, has made this field of study very heterogeneous.

There are also those research initiatives that investigate coopetition from a variety of analytical levels and research perspectives. Their predominant strands may be identified as follows: studies of the features of coopetition (Bengtsson and Kock, 2000, Rusko, 2011; Tidström and Hagberg-Andersson, 2012), studies of the achievement of competitive advantage through coopetition (Garrette et al., 2009; Ritala and Ellonen, 2010; Thomason et al., 2013), studies identifying the benefits and threats connected with coopetition (Gnyawali et al., 2006; Ritala and Sainio, 2014), analyses of the complexity involved in relationships of coopetition in terms of the varying intensity of competition and cooperation (Lado et al., 1997; Luo, 2004; Czakon and Rogalski, 2014), directions of inter-firm linkages (Brandenburger and Nalebuff, 1996; Rusko, 2011; Kim et al., 2013) and studies from the perspective of the number of firms in the coopetition nexus and the number of levels in the value chain (Dagnino and Padula, 2002; Luo, 2007). There have, however, been no studies addressing the features of entities involved in coopetition or of the preferences of firms when selecting partners for such a relationship. The present study, whose aim is to identify the choices and preferences of high tech firms in the selection of coopetition partners, represents an attempt to fill this gap in the research. These choices and preferences were determined based on surveys conducted in 2012–2013 by the Pen and Paper Interview (PAPI) technique on a sample of 235 high-tech firms operating both in Poland and in the global marketplace.

Though coopetition has been examined in a number of market sectors, it has been studied most frequently among high-tech firms. This sector requires continuous and intensive innovative initiatives and – one of the factors defining high-tech industries in the world (NACE, 2011) – extensive R&D expenditure. This sector is moreover identified by a short product and process life cycle, rapid diffusion of technological innovation, an increasing demand for highly-qualified personnel, high capital inputs and high investment risk (Zakrzewska-Bielawska, 2010) – all of which make international cooperation, including with the competition, a necessity. Coopetition in the high-

tech sector has so far been studied from the perspective of the strategy adopted, the nature of the relationships established (M'Chirgui, 2005; Shih et al., 2006; Ganguli, 2007) and value creation (Ritala and Hurmelinna-Laukkanen, 2009; Han et al., 2012). It has primarily been examined, though, in terms of the benefits obtained – especially increased innovativeness (Quintana-García and Benavides-Velasco, 2004; Gnyawali and Park, 2011; Bouncken and Kraus, 2013; Ritala and Sainio, 2014). Investigating the features high-tech firms seek in competitors they choose to cooperate with, and examining the future preferences of such firms for coopetition partners, should therefore add to and enrich the current state of knowledge of coopetition in a sector that is the cornerstone of innovativeness and competitiveness and hence vital to the economy of every country.

The first section of the paper discusses theories of coopetition with a focus on its features, dimensions and results. It then sets out the research methodology, the results obtained and the conclusions that may be drawn from them. The paper concludes by examining the limitations of the research and indicating possible directions for further enquiry.

COOPETITION: THEORETICAL BACKGROUND

Coopetition as simultaneous cooperation and competition

The term to define this trend towards simultaneous cooperation and competition – coopetition – was coined by Ray Noorda, who founded the network software company Novell. The word is derived from the words 'cooperation' and 'competition' and is used to define the complex, multidimensional business relationships that today's companies have with one another (Ganguli, 2007). Most scholars (e.g. Brandenburger and Nalebuff, 1996; Chen, 2008; Kim and Parkhe, 2009; Luo, 2007; Peng and Bourne, 2009) regard coopetition as a dyadic condition of simultaneous competition and cooperation. Coopetition therefore denotes cooperation with competitors (e.g. Bengtsson and Kock, 2000; Gnyawali and Park, 2009; Ritala and Hurmelinna-Laukkanen, 2009) in a way that can be likened to an aggressive strategy of 'sleeping with the enemy' (Quint, 1997). A further notable feature of coopetition is the mutual benefit that those pursuing it can derive. There have been a number of empirical studies examining the effect of coopetition on firms' performance by measuring from a single financial indicator to multiple measurements (e.g. Oum et al., 2004; Luo et al., 2006; Kim and Parkhe, 2009; Peng et al., 2012). A further important factor distinguishing coopetition is the complexity and changeability of the condition, which has formed the base for many of its typologies (e.g. Lado et al., 1997; Dagnino and Padula, 2002; Luo, 2007; Chin et al., 2008), and which is accounted for by the number of competitors involved, their geographical distribution, their involvement at different levels of the value chain and the intensity of the competition and cooperation. We may conclude that coopetition is a multidimensional and multifaceted concept that assumes a number of different forms and requires multiple levels of analysis.

Levels and areas of coopetition

Coopetition relationships are instituted at various levels. Here we can distinguish the micro level, at which the firms in coopetition are company-internal units, such as functional departments or strategic business units (Luo et al., 2006), the meso level, at which they are firms in industries or clusters (Dagnino and Padula, 2002), the macro level, at which they are clusters, industries, or sectors of the economy (Bouncken and Kraus, 2013) and the global level, at which they are national economies and integration groups (Luo, 2007). Some scholars also argue that there exists a level of coopetition at which its exponents are individual people. In this case the analyses first of all concern the personality traits of the individuals involved in competition and cooperation as well as the workplace atmosphere and organisational culture (Cygler, 2013). Inter-organisational coopetition, though, is the category that is researched most frequently. This refers to dyadic coopetition between two firms and to multiple coopetition between more than two firms – including intra-network and inter-network coopetition.

Coopetition relationships *per se* may also be described as vertical (the participants are suppliers, clients in the supply chain), horizontal, in which the participants are direct competitors, and mixed, in which a combination of vertical and horizontal relationships is found (Bengtsson and Kock, 2000; Kotzab and Teller, 2003; Czakon and Rogalski, 2014).

Cooperation with rivals may take place at a number of levels, of which the following are paramount: R&D, supply, production and services, sales and distribution, logistics, human resources, marketing, finance and information technology. The prime goal of R&D cooperation with competitors is to limit the risks and costs of developing new technology. This form of joint action is found comparatively often in the high-tech sector. In analysing the coopetition relationships in this sector, Walley (2007) notes that cooperation takes place most often in R&D, supply and production, that is, in the so-called input activities; while sales, distribution, and marketing, that is, the so-called output activities, fall within the scope of competition.

Notwithstanding the level and area of the analysis, there is agreement that coopetition is designed to bring specific benefits to firms. On the other hand cooperation with rivals also involves certain risks.

The results of coopetition: benefits and losses

There are a number of grounds on which firms decide to cooperate with competitors. The most important is the desire to obtain benefits that would not be available to a firm operating alone. The benefits obtained by coopetition in the high-tech sector primarily refer to mutual learning, stimulation of innovativeness, the creation and refinement of new technologies, reductions in R&D costs and transaction costs, the benefits of specialisation (synergy), growth in the firm's value, access to resources, strengthened position compared to competitors not involved in coopetition, fuller exploitation of market opportunities, expanded scale of operation and access to new markets (Nemeh and Yami, 2012; Kim et al., 2013; Thomason et al., 2013; Liu, 2013; Pellegrin-Boucher et al., 2013). The appetite for obtaining these benefits is at the same time also the fundamental motivation for pursuing a strategy of coopetition.

This simultaneity of cooperation and competition may also be viewed, though, as generating certain threats, which we may agree to call 'coopetition losses'. The following are mentioned most frequently: the risk of knowledge and know-how leakage, which can lead to loss of control over technology, the opportunistic behaviour of coopetitors, conflicts between competitors, investment in specific resources, loss of the opportunity to cooperate with other firms due to exclusivity clauses, asymmetry in the coopetition arrangement, under-performance of jointly-executed processes and in achieving joint goals, and weakening of market position and of the firm's image (Ritala and Hurmelinna-Laukkanen, 2009; Ritala, 2012; Zakrzewska-Bielawska, 2013b). The parallelism of competition and cooperation that is the essence of coopetition always engenders a certain tension in view of its sometimes contradictory nature. It is therefore important in coopetition that the expected benefits outweigh the potential threats and that the results lead to growth for all of the parties pursuing it.

Having considered the nature and features of coopetition we may now turn to the central questions posed by the paper: Who are high-tech firms pursuing a strategy of coopetition with? Who do they wish to pursue such a strategy with? Are they choosing bigger or smaller partners? Are they regional, national or foreign competitors? Do they prefer a firm in a stronger market and technological position as a partner or one that is an equal in these terms? Do the choices and preferences of high-tech firms differ depending on the size of the firm, the stage of development and the territorial scope of activity?

In an attempt to answer these questions research was conducted in 2012-2013 on a sample of 235 high-tech firms pursuing coopetition and operating in Poland and on international markets. The following sections describe the data-collection methods and set out the basic findings.

METHODOLOGY

Sample

To be included in the sample the firms had to belong to the high-tech sector, which was determined by reference to the OECD sector classification and to the Polish Classification of Businesses. The Polish business classification system (PKD) corresponds to the European Commission's statistical business classification NACE (2011), which classifies the high-tech industries as manufacturers of basic pharmaceutical products and pharmaceutical preparations, manufacturers of computers, electronic and optical products and manufacturers of air, spacecraft and related machinery, while specifying telecommunications, computer programming, consultancy and related activities, information service activities and scientific R&D as high-tech, knowledge-intensive services. The research covered a group of 402 high-tech firms, which were representative for Poland in view of their size and the industry they were in. The high-tech sector structure was determined based on data from the Central Statistical Office, while the research operators were the '*Polskie firmy*' database and '*Panorama firm*'. It was found, however, that of the 402 firms surveyed, only 235 had instituted coopetition. The analyses that follow were therefore based exclusively on the data obtained from these 235 firms.

The majority of entities in the group of firms involved in coopetition relationships were operating in Poland (30% of them were operating on international markets). Of the whole group, 33.62% were manufacturing computers and optical and electronic products, while 36.17% were providing digital and telecommunications services. Small firms of 1 to 49 employees accounted for 55.32% of the group, medium-sized firms of 50 to 249 employees for 30.64% of the group and large firms of over 249 employees for 14.04% of the group.

The respondents were also requested to specify the point their firms were at in the organisational life cycle. For this purpose, the firms were given an exact explanation of the particular stages of growth of the firm and asked to indicate which of them best reflected their specific situations. The life cycle that employs biological metaphors to describe the growth of the organisation and that is used throughout the literature (Salman and Yazdanfar, 2012) was adopted for the purposes of the research. Of the entities investigated, 8.09% declared their organisation was at the birth stage, 34.04% that it was at the growth stage, 51.91% that it was at the mature stage and 5.53% that it was at the stage of decline.

The most frequent areas in which the firms cooperated with rivals were production or services (68.94% of the firms), sales and distribution (58.72%), supply (55.74%) and R&D (45.11%). Cooperation with competitors was considerably less frequent, however, in marketing, finance, human resources and information technology. This confirms Walley's thesis (2007) that cooperation with rivals at high-tech firms is concentrated on input activities. The study therefore proceeded to focus precisely on these activities, that is, on R&D, supply and production. Sales and distribution, an output activity, was also taken into account because the respondents stated they cooperated with competitors in this area as often as they did in input activities. However, as they were reported comparatively infrequently as areas of cooperation with competitors, the remaining areas of activity of the firm were excluded.

Data collection and analysis

The survey was conducted by the PAPI technique and entailed personal interviews conducted by a researcher with the aid of a structured and standardized questionnaire. The respondents, of whom 31.5% were owners and 68.5% were CEOs, were people responsible for making decisions at firms, including decisions concerning whether, and in which areas, to cooperate with competitors. Coopetition relationships at the meso level were investigated (the firms involved in coopetition relationships were in direct competition for the same end-consumer). The following tools were used to organize, group and analyse the data obtained: incidence rates and Pearson's Chi-squared test for independence, which were used to examine the relationship between the variables, as well as Phi-squared and Cramér's V coefficients, which were used to illustrate the strength of the relationships.

This paper presents partial results of research concerning high-tech firms' choice of coopetition partners and their preferred area (s) of coopetition as this relates to their size, territorial scope and growth stage. The research was carried out as part of Ministry of Science and Higher Education Project No N N115 006040: Determinants and Dynamics of Coopetition in the Development of High-Tech Firms.

FINDINGS AND DISCUSSION

The choices of high-tech companies: areas and coopetition partners

The high-tech firms in the study included entities that were in dyadic coopetition (between two firms) and entities in multiple coopetition (between more than two firms). However, the number of competitors with whom cooperation was undertaken varied according to the area of cooperation and the firm's size, territorial scope and growth stage. The data is presented in detail in Table 1.

Table 1. The number of competitors with whom cooperation was instituted depending on the area of cooperation and the firm's size, territorial scope and growth stage

Characteristics of the high-tech firms surveyed	Total 235=100%			R&D 106=100%			Supply 131=100%			Production/ Services 162=100%			Sales/ Distribution 138=100%		
	numbers of competitors														
	1	2-5	>5	1	2-5	>5	1	2-5	>5	1	2-5	>5	1	2-5	>5
	in %														
Size of firm:															
- small (1 to 49 employees)	2.1	17.8	8.5	13.2	12.3	4.7	4.6	16.8	6.9	6.2	18.5	7.4	5.1	15.2	8.0
- medium (50 to 249 employees)	0.4	11.9	5.9	3.8	16.0	2.8	3.1	15.5	0.8	1.8	14.2	4.9	2.9	18.8	2.9
- large (over 249 employees)	0.9	4.2	3.0	0	4.7	2.8	0	7.6	1.5	0	5.6	1.2	0.7	4.3	2.2
Territorial scope:															
- in Poland	3.4	23.8	14.0	14.2	22.6	4.7	6.9	29.8	5.3	8.0	27.8	10.5	6.5	28.3	7.2
- in the global marketplace	0	10.2	3.4	2.8	12.2	1.9	0.8	9.2	3.8	0	10.5	3.1	2.2	10.1	5.8
Stage in organizational life-cycle:															
- birth	0.4	1.3	0.8	0.9	0.9	0.9	0	1.5	0.8	1.9	0.6	1.2	0.7	0	0.7
- growth	1.3	12.3	4.3	6.6	16.0	1.9	3.1	13.0	3.1	2.5	13.0	4.3	3.6	13.0	4.3
- maturity	1.3	20.0	10.2	9.4	17.9	3.8	4.6	23.7	3.8	3.7	25.9	8.0	3.6	24.6	6.5
- decline	0.4	0.4	2.1	0	0.9	0	0	0.8	1.5	0	0.6	0	0.7	0.7	1.4

* The percentage values do not add up to one-hundred in the particular categories because some respondents gave no answers regarding the number of competitors they were cooperating with.

Taking into consideration the overall number of competitors, the high-tech firms surveyed were, in the main, in multiple relationships, most of which involved between two and five rivals. Coopetition with only one partner was less likely the bigger the firm. A similar tendency was noted with respect to territorial scope. Only firms operating on the domestic market instituted dyadic relationships, while firms operating on the global market tended to have a greater number of partners. Turning to the organisational life-cycle, a greater number of cooperation partners were chosen at the growth and mature stages (which was probably a result of the predominance of firms at these stages in the sample), while the most frequent number of cooperation partners for firms at the stage of decline was more than five. When analysing the number of coopetition partners in relation to the area of activity, however, it may be noted that dyadic R&D relationships were primarily the domain of small firms (none of the large firms was involved in R&D coopetition with only one partner), while a choice of between two and five partners predominated in the remaining areas of activity.

A Chi-squared test was carried out to determine whether there were statistically significant differences ($p<0.05$) in the choice of the number of coopetition partners depending on firm size, territorial scope, growth stage and area of cooperation. Its results, along with the figures set out in Table I, confirm that the number of coopetition partners changes depending on the size of the firm. The larger the firm, the greater the number of competitors it cooperates with – especially in R&D (Cramér's V coefficient of 0.47). No statistically significant differences were found in relation to the firms' territorial scope. A statistically significant relationship was demonstrated, though, between the growth stage of the firm and the number of partners chosen in supply, production and services, and sales and distribution. The relationship was, however, one of moderate strength (Cramér's V coefficient hovering around 0.3–0.4). This means that firms cooperate with a greater number of competitors the further along they are in the stages of the life cycle.

The respondents were then asked to specify the size of their firms (small, medium, large) and the origin of their coopetition partners in the specific areas of cooperation (regional, national, foreign). The results are presented in Table 2.

Table 2. The size and origin of competitors with whom cooperation was instituted depending on the area of cooperation

Size and origin of coopetition partners	R&D 106=100%	Supply 131=100%	Production/ Services 162=100%	Sales/ Distribution 138=100%
Size of coopetition partner:				
- small (1 to 49 employees)	48.11	45.80	50.62	55.80
- medium (50 to 249 employees)	25.47	30.53	33.33	26.09
- large (over 249 employees)	17.92	9.92	11.73	11.60
Origin of coopetition partner:				
- regional coopetition partner	26.41	23.67	29.63	23.91
- domestic coopetition partner	55.66	54.96	56.17	62.32
- foreign coopetition partner	22.64	15.27	14.81	11.59

* Because the respondents had a choice of firm sizes and origins of coopetition partners in the case of cooperation with many competitors, and because some gave no answer, the percentage values do not add up to one-hundred in the particular categories.

The firms in the study pursued coopetition mostly with small firms as these entities form the majority both in the Polish and in other economies. Coopetition with large firms and foreign partners was more frequent in the case of R&D than in that of other areas. However, the most frequent form of cooperation in all of the areas of activity under consideration was with domestic rivals – a tendency that was particularly noticeable in sales and distribution.

Chi-squared tests confirmed statistically significant differences in the choice of cooperating competitor in relation to the size and territorial scope of high-tech firms. Meanwhile, none of the relationships involving their growth stages were found to be statistically significant. In all of the analysed areas of cooperation with competitors domestic firms cooperated most readily with other domestic firms and with regional firms, while firms operating internationally chose foreign firms as coopetition partners more frequently. Similar relationships were detected with regard to the size of coopetition partners. Small firms cooperated considerably more often with smaller competitors, while large and medium-sized firms cooperated significantly more often with larger ones (more than 50 employees). It should be noted that all of these relationships were of moderate strength (Phi-squared and Cramér's V hovering around 0.2 and 0.5 respectively).

Further relationships can be found when considering the results of coopetition (benefit, zero effect, loss) in terms of the specific areas of cooperation and the size and origin of competitors (Table 3).

Table 3. The results of coopetition and the origin and size of coopetition partners depending on the area of cooperation

Origin and size of coopetition partners	R&D 106=100%			Supply 131=100%			Production/Services 162=100%			Sales/Distribution 138=100%		
	L	EZ	B	L	EZ	B	L	EZ	B	L	EZ	B
Size of coopetition partner:												
- small (1 to 49 employees)	4.72	8.49	34.91	3.05	8.40	34.35	1.23	5.56	42.59	1.45	3.62	50.0
- medium (50 to 249 employees)	0	4.72	20.75	0.76	7.63	21.37	0.62	8.02	24.07	2.17	3.62	18.84
- large (over 249 employees)	0	0.94	16.98	0.76	0	8.40	0	1.23	9.26	0	0.72	10.14
Origin of coopetition partner:												
- regional coopetition partner	0	3.77	22.64	0	1.53	22.14	0.62	1.85	25.93	0.72	1.45	21.01
- domestic coopetition partner	3.77	8.49	43.40	4.58	11.45	38.17	1.23	9.26	44.44	2.17	5.80	52.17
- foreign coopetition partner	0.94	2.83	18.87	0	3.82	10.69	0	3.70	11.11	0	0.72	10.87

* L – loss; EZ – zero effect (no benefit, no loss); B – benefit. Because data were absent in some cases, and because it was possible to specify the results of coopetition in respect of different coopetition partners, the percentage values do not add up to one-hundred.

Irrespective of the size and origin of the cooperating competitor, coopetition delivered benefits in the majority of cases. All firms pursuing a coopetition strategy with a large or medium-sized partner in R&D benefitted from it. The zero effect, that is, no gain and no loss, was more common in production and services than elsewhere when a medium-sized partner was chosen. The general tendency is that the risk of a loss from pursuing coopetition diminishes as the size of partner increases, while the chance of securing the benefits sought by pursuing that strategy is correspondingly greater. The risk of a loss from pursuing coopetition is smaller with a foreign or regional partner than it is when cooperating with a domestic partner. In the majority of cases the cooperation of high-tech firms with competitors involves the following major risks: under-performance in executing processes and in achieving goals, the opportunistic behaviour of the partner, loss of the opportunity to cooperate with other firms due to exclusivity clauses and loss of control over technology. However, the most frequently mentioned key benefits are access to resources, cost reductions, strengthened market position compared to rivals, fuller exploitation of market opportunities, expanded scale of operation and the acquisition of special knowledge (Zakrzewska-Bielawska, 2013b).

The preferences of high-tech firms regarding the size and position of coopetition partners

The respondents were next asked to indicate which partners they would like to coopete with in the future in terms of size, and of market and technological position. The results are presented in Table 4.

Table 4. The preferences of high-tech firms when choosing coopetition partners

Origin and size of coopetition partners	R&D 106=100%	Supply 131=100%	Production/ Services 162=100%	Sales/ Distribution 138=100%
Size of coopetition partner:				
- larger	39.62	29.01	27.78	33.33
- smaller	12.26	16.79	12.96	14.49
- of comparable size	40.57	54.20	48.14	40.60
Technological position of coopetition partner:				
- stronger	40.56	34.35	30.86	28.98
- weaker	16.06	14.50	11.73	17.39
- of comparable strength	34.90	39.69	46.30	42.03
Market position of coopetition partner:				
- stronger	33.96	35.88	34.57	32.61
- weaker	16.98	12.98	14.20	15.94
- of comparable strength	39.62	40.45	41.97	39.86

* The percentage values do not add up to one-hundred in the particular areas because some of the respondents did not indicate a preference for a coopetition partner in respect of some of the features.

In the area of R&D, almost 40% of the firms in the study would like to cooperate with competitors of a similar size or larger, of a stronger technological position and of a comparable market position. In the remaining areas of activity the high-tech firms would prefer to cooperate with firms of similar size and of comparable market and technological position. In stating this it should be noted that in the case of supply these firms are more inclined to cooperate with a partner that is stronger in market and technological terms, while in the case of sales and distribution the preference is for a partner with a stronger market position. The majority of the small proportion of firms that preferred a smaller firm with a weaker market and technological position as a coopetition partner (from 11.73% to 17.39%) were small businesses operating on the domestic market at the stage of growth or early maturity who had hitherto pursued coopetition with small and medium-sized partners mainly from Poland or the region. It was found following Chi-squared tests between the preferences of high-tech firms and their size and territorial scope that a significant portion of the dependencies were statistically significant – though with a weak strength of

influence (Cramér's V of 0.2–0.3). What is more, firms with a preference for partners with a stronger technological position also selected partners whose market position was stronger. And, conversely, firms that would prefer to cooperate with technologically weaker entities chose firms of a weaker market position than their own (Cramér's V of 0.7). Even though high-tech firms have diverse preferences, the majority of them prefer to pursue coopetition with partners of a similar size and of a comparable market and technological position. To a certain extent, this counters the threats associated with coopetition and minimalizes the risk of asymmetry in the relationship.

CONCLUSION

It should be stated in summing up the research results that, in the main, the high-tech firms instituted multiple coopetition relationships. The influencing factors in these decisions were the size of the firm (the larger the high-tech firm the rarer was dyadic coopetition) and the growth stage (the more advanced was the firm's growth stage, the greater number of competitors it cooperated with). Furthermore, entities operating exclusively in Poland were more ready to cooperate with domestic and regional competitors, while firms of global reach more often chose foreign firms as coopetition partners. Coopetition brought benefits to the firms in the study in the majority of cases; while the larger the partner the smaller was the risk of loss. In evaluating the preferences of the high-tech firms with regard to selecting a coopetition partner in the future, they would mainly be disposed to cooperate with rivals of comparable size, and market and technological position or, also, with stronger and larger firms. These general tendencies with regard to the choices and preferences of high-tech firms are subject to certain changes depending on the area and goals of the coopetition. It is therefore necessary to undertake further study of the phenomenon of parallel cooperation and competition to gain a better understanding of the complexity of contemporary business.

LIMITATIONS OF THE STUDY AND FUTHER RESEARCH

The quantitative research described in this paper and conducted on a sample of 235 high-tech firms advances our knowledge of coopetition in this sector. The research has revealed the number and characteristics (size and origin) of the partners with whom technologically advanced firms – intent on innovation and knowledge development – institute coopetition. At the same time, the research has shown the preferences of high-tech firms with regard to selecting a cooperating competitor. Nevertheless, the research has its limitations. Firstly, the research shows only the tendencies for a whole group of firms and omits any penetrating analysis at the level of the individual firm. Secondly, the study concentrates on selected features of the partners (size, origin, the technological and market position of the rival) while not taking other of their attributes into consideration. Thirdly, it refers to the high-tech sector as a whole without taking account of its stratification. Fourthly, it focuses first of all on the choices that have been made and preferences declared without probing for the reasons behind them or taking account of the circumstances that influenced them.

To define the coopetition partners based on qualitative research (for example in the form of a case study), in which the choices and preferences with regard to partners would be investigated at the level of the individual firm, would therefore be an interesting direction for future research. It would then be possible to produce a case-by-case definition of each of the cooperating competitors and to take into account the specific nature of the sector, and the causes, effects and dynamics of the relationship, as well giving a broader account of the entities pursuing a coopetition strategy (apart from an analysis of the features of these entities' competitors, it would be possible to bring such questions as previous experience in coopetition relationships, the innovative capacity of the partners and the resources of the firm into the scope of enquiry). To define the features of the partners not only in terms of horizontal relationships, but also in terms of vertical ones – with account taken of the criteria of intra-network and inter-network coopetition – would appear a further promising direction for future research. We may be certain that coopetition – as it is a complex phenomenon that remains under-researched and poorly-understood – will continue to attract the attention of contemporary researchers.

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