



# Journal of Applied Sciences

ISSN 1812-5654

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## Why Complex Organizations Cooperate with Competitors? An Systematic Perspective

Xing-Xiu Wang, Han-Min Liu and Chun-Xia Yang

Department of Business Administration, School of Management, Jinan University, 510632,  
Guangzhou, China

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**Abstract:** Existing theory and research on coopetition pays attention to its effect on organizational performance and innovation. However, the main reason why complex organizations cooperate with competitors is still in its infancy behind the hotspot. The purpose of this study is to scrutinize and analyze critical determinants from the point view of dynamic process. We propose that the coopetition relationship among complex organizations is a complex system with three subsystems. Present study shows that decision-makers in complex organizations should consider the degree of resource scarcity and market entry barriers they face, as well as the improvement of resource utilization and the expected market overlap in the selection subsystem, focus on communication skills of partners and their own managerial experience on coopetition in the organizational interaction subsystem and then take the new market appeal, the expected risk-sharing, the relative scope, strategic position to be some of most important factors to consider in the strategic interaction subsystem.

**Key words:** Coopetition strategy, complex system, complex organizations

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### INTRODUCTION

Over the last few decades, the interest in the complexity of large organizations has increased significantly. Complex organization has become a common concept in organization science. Cooperating with competitors as one of the most interesting phenomena occurs among complex organizations (“COs” for short), which is called “coopetition”. Existing theory and research on coopetition pays attention to its effect on the performance and innovation of COs. However, the main reason why COs cooperate with competitors is still in its infancy behind the hotspot.

Cos refer to large organizations, such as large hierarchical organizations, network organizations, virtual organizations, etc. Diverse paradigms, rationales and determinants give rise to the complexity of the coopetition relationship among COs. COs should balance both competitive and cooperative paradigm (Barretta, 2008), possess countering and converging forces and confront various determinants at different subsystems. It is difficult to implement coopetition strategy effectively for decision-makers. Thus, it is very important to distinguish and control critical determinants on coopetition in COs systematically.

The purpose of this article is to scrutinize critical determinants on COs’ coopetition relationship from the

point view of dynamic process, analyze the mutual effect of different determinants by the interpretative structural modeling method and give some advice to manage the coopetition strategy appropriately.

### THEORETICAL BACKGROUND

**Coopetition in COs:** Although the complex organization is ready for the concept of coopetition, not many researchers analyze the coopetition relationship in the context of COs. Even if they do, it is not defined clearly. In 1967, Thompson described a complex organization as a set of interdependent parts, which makes up as a whole that is interdependent with some larger environment (Thompson, 1967). The complex organization also be regarded as a complex and dynamic system (Christiansen, 2011). The coopetition among COs can be taken for granted as a complex system too, because COs interact with each other as interdependent parts, form a united whole to deal with the environmental uncertainty, so as to achieve business goals and earn high performance.

Cos should take the syncretic rent-seeking behavior to enhance the competitive position, improve strategic flexibility and sustain high performance by achieving a dynamic balance between competitive and cooperative strategies in a dynamic environment (Lado *et al.*, 1997). It is a huge gap between business scopes of

competitive alliance and that of its members upon most occasions. Therefore, the divergence of common and private benefits leads to the existence of the relative scope. The relative scope means the extent of activities in markets unrelated to the alliance as a proportion of all activities conducted by the firms (Khanna *et al.*, 1998). Consequently, firms with a lower relative scope are more likely to cooperate with each other because of common benefits (Khanna *et al.*, 1998).

**Rationales of COs' coopetition:** Many previous studies have shown that game theory and resource-based view can explain the main typical rationales.

Early scholars often use game theory to explain the principle of coopetition. Competition and cooperation paradigm are coexist in the interdependent relationship among competitors. The competitive paradigm refers to interaction behaviors among firms with the completely divergent interests which prompt them to follow a self-oriented action, while the cooperative paradigm indicates that convergent and fully aligned interests lead firms to exploit the opportunities for positive-sum games and elicit altruism, therefore coopetition can be defined as the game structure based on partially convergent and overlapped interests (Giovanna and Battista, 2007). Thus, the following logic underpin coopetition in COs: If partially overlapped interests were compared to business pie, cooperation is to expand the size of the business pie, competition is to apportion the pie (Brandenburger and Nalebuff, 2011). Compared to pure competition and cooperation, coopetition is a mutually beneficial relationship.

However, heterogeneity in resources can also partly lead to the synthesis of competition and cooperation drawing from the resource-based view. Resource-based view implies two fundamental assumptions: (a) Firms are hetero- geneous in terms of the resource profile; (b) There are many barriers for those resources to flow across firms. Valuable, rare, inimitable and irreplaceable resources can produce competitive advantages. When unique resources enable firms to generate more economic rents, competing firms are fostered to access different resources and capabilities from alliance partners in order to achieve sustained competitive advantage. So, in many cases, the optimal partner of a firm is its strong competitor in an alliance (Inkpen and Tsang, 2005). The coopetition can also enable partners to reduce the costs and risks associated with the mobilization of such competencies, build and leverage idiosyncratic, rent-yielding competencies, especially the innovation ability. Thus, two competing firms with complementary resources can develop connections if they wish.

In addition, the intensive competition and other external pressures prompt COs to participate in coopetition, thereby maintain and enhance their strategic position and niche in the respective industry. Due to same external pressures, competing firms face similar resource constraints and market situation, they have strong incentives to get close to each other, understand each other's actions, build a benchmark and prepare for the consequences of coopetition (Peng and Bourne, 2009). The cooperation among competitors can also improve the ability to maintain both the structure of an industry and firm's position, or to obtain greater market power and reach better position (Tsai, 2002).

## DETERMINANTS ON COOPETITION IN COS

The two concepts of competition and cooperation are bound up with coopetition. When firms are producing the same or related products to the similar consumers and fighting for various kinds of resources, competition occurs. The boundaries between competitors are sharp and distinct in pure competition. Conversely, firms collaborate with each other frequently by strong ties, such as formal contracts and informal agreements, so as to across their boundaries, share complementary capabilities, assets, information and interests (Luo, 2005). Competition can generate positive externalities through innovation; cooperation is able to have a positive impact by complementary resources, etc. Therefore, the inter-organizational relationship which contains competition and cooperation enables firms to gain more advantages. Thus, coopetition relationships in COs are neither spontaneous nor exogenous but are actions that depend upon the contextual conditions (Oliver, 2004).

According to Giovanna and Battista (2007), coopetition relationships involve three stages: The selection process, the organizational interaction process and the strategic interaction process. In fact, each stage of the coopetition relationship can be taken as three subsystems. Each subsystem has different contents, as shown in Fig. 1.

Specifically, determinants for coopetition are different in the specific subsystem with distinct concerns.

**Selection subsystem:** COs evaluate the competence, reliability and trustworthiness of potential partners and choose whom to start cooperating with in the selection subsystem. Resource acquisition and cost savings are big considerations in the subsystem 1. The various determinants of partner evaluation and selection are as follows: (a) The level of resources scarcity, which means the inability to achieve firms' own objectives with their

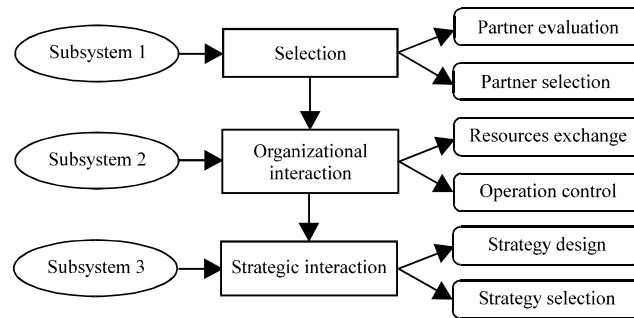


Fig. 1: Subsystems of COs' cooperation relationship

own resources, (b) The uncertainty of external environment, such as the growth of the market, the development of new technologies, changes in customer requirements. The probability of cooperation is to be larger in the rapidly changed and uncertain environment (Barretta, 2008), (c) The market overlap, which refers to the degree of market overlap in multiple market segments with competitors. Compared than the firm with low market overlap, the firm with high market overlap will be more likely to cooperate with their competitors (Gulati and Gargiulo, 1999), (d) Market entry barriers, such as capital requirements, switching costs, etc., (e) The bargaining power of stakeholders, especially that of consumers and suppliers, (f) Resource utilization, which refers to the situation that firms wish to use fewer resources, or use their current resources more efficiently to serve their existing market, for example, competing firms often marshal resources to reduce the duplication of resources in the aviation industry (Garrette *et al.*, 2009).

**Organizational interaction subsystem:** The organizational interaction subsystem defines the ways that firms structure their tasks, exchange resources, integrate activities and control over operations to accomplish goals of cooperating with other partners. The cooperation between COs and their competitors is based on trust and reputation. Factors related to organizational interaction subsystem include: (a) The difference of knowledge profile (Giovanna and Battista, 2007) which has a direct effect on the communication level between COs and their competitors, (b) Resource heterogeneity, (c) Managerial experience on cooperation (Chin *et al.*, 2008), (d) The level of product differentiation which means that the degree of difference of products or serve in the terms of quality, performance and consumer preferences, etc., (e) Partners' communication skills (Brandenburger and Nalebuff, 2011; Barretta, 2008).

**Strategic interaction subsystem:** The strategic interaction subsystem has to do with firms' effort to frame and reframe the strategic direction of the partnering activities. COs will focus on the anticipated benefits in the subsystem 3. The development of the cooperation relationship are also influenced by other factors which can be summarized as follows: (a) The expected risk-sharing when it participate in competitor's alliance, such as the risk of a new initiative, (b) The anticipated cost savings, which refers to share activities to obtain economies of scale, (c) The relative scope, (d) Organizational goals, (e) Market appeal which indicates that firms want to increase the size of the market or create a new one by the collaboration between competitors (Quintana-Garcia and Benavides-Velasco, 2004), (f) Strategic position, which means that firms want to protect their market share or to conquer a larger share of market by cooperation so as to improve their strategic position and support new technological innovations (Ritala, 2012).

## FRAMEWORK ON DETERMINANTS OF COOPERATION IN COS

Cos can obtain sustained competitive advantages by balancing two different and contradictory interaction logics of competition and cooperation, assigning dedicated resources to various parts of the inter-organizational relationship. However, the reasons for cooperation in COs are various, the mutual relationships between them are complex.

The interpretative structural modeling method (ISM for short) can divide those complex determinants according to the degree of impact and influence, find out the direct factors and indirect factors which can help decision-makers to focus on the critical factors to improve the efficiency of decision-making. Therefore, this study develops the framework on determinants of cooperation in COs by ISM.

**Table 1: Determinants of coopetition**

Criteria	Determinants	Criteria	Determinants
a	Coopetition in COs	k	New market appeal
b	Selection subsystem	l	External environmental uncertainty
c	Organizational interaction subsystem	q	Bargaining power of consumers and suppliers
d	Strategic interaction subsystem	n	Anticipated cost savings
e	Organizational goals	o	Expected risk-sharing
f	Difference of knowledge profiles	p	Resource scarcity
g	Resource heterogeneity	m	Partners' communication skills
h	Relative scope	r	Market entry barriers
i	Strategic position	s	Managerial experience on coopetition
j	Resource utilization	t	Market overlap

**Table 2: SSIM on determinants of coopetition**

V	V	A				V	V	V		e
V	V	A		V	V		V		V	f
V	V	A		V	V		V			g
V		V							h	
V		V				V		i		
V	V						j			
V	V		A			k				
V	V			A	V	V	V	l		
V	V	A				m				
V		V		A	X	n				
V		V			o					
V	V		A		p					
V	V		A	q						
V	V			r						
V	V		s							
V	V		t							
V		d								
V		c								
V	b									
a										

Based on the above-mentioned determinants, 19 important criteria can be identified ( Table 1). Then the contextual relationship among them should be analyzed, which means that one criterion leads to another.

Then a structural self-interaction matrix (SSIM) is developed (Table 2). In Table 2, “V” represents that elements in the line have direct or indirect effect on those in the column, “A” represents that elements in the column lead to that in the line, “X” indicates that line criteria and column criteria are strongly connected.

On that basis, the SSIM can be converted into the following adjacency matrix: “A” (Table 3). In Table 3, “1” indicates that there is a contextual relationship from, “0” refers to otherwise,  $I, j = 0, 1, \dots, 16$  which represents the subscript of the marker of elements.

The adjacency matrix “A” in Table 3 can also be converted into the reachability matrix with 6 steps. However, the hierarchy of determinants of coopetition in COs is not clear enough, thus the reachability matrix should be reduced to be the condemnation matrix by hierarchical processing.

Table 3: Adjacency matrix on determinants of coopetition in COs

	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t
a	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
b	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
c	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
d	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
e	1	0	0	1	1	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0
f	1	0	1	0	0	1	1	0	0	1	0	0	1	0	0	1	0	0	0	0
g	1	0	1	0	0	0	1	0	0	1	0	0	1	0	0	1	0	0	0	0
h	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
i	1	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0
j	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
k	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
l	1	1	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0
m	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
n	1	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
o	1	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
p	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
q	1	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	0
r	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0
s	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
t	1	1	0	0	1	1	1	0	0	0	0	0	1	0	0	1	0	0	0	1

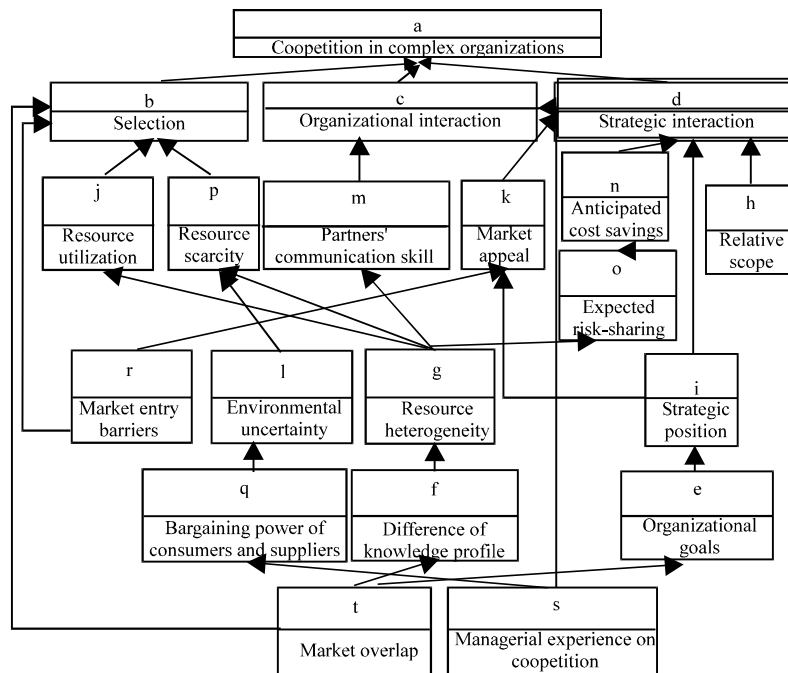


Fig. 2: Main framework for determinants of coopetition in Cos

Finally, the multilevel hierarchical directed graph can be drawn on the basis of condemnation matrix, then get the ISM model, which represents the main framework for determinants of coopetition in COs (Fig. 2).

From the framework, determinants of coopetition in COs can be divided into the following four levels with the except of three subsystems of coopetition relationships: (a) Resource scarcity, resource utilization, partners' communication skills, new market appeal, the anticipated

cost-savings, the expected risk-sharing and the relative scope were the top-level criteria. Resource scarcity and utilization had direct effects on the selection subsystem of coopetition. Partners' communication skills had important effects on the subsystem of organizational interaction. The last 4 elements had great influence on the subsystem of strategic interaction. The anticipated cost-savings was strongly correlated to the expected risk-sharing. The top-level criteria could be sub-classified into three categories: The pressure on resources, the

attractiveness of the market and the benefits of coopetition, (b) The second-level criteria were composed of market entry barriers, external environmental uncertainty, resource heterogeneity and strategic position. Market entry barriers, external environmental uncertainty and resource heterogeneity affected the first subsystem. Market entry barriers, external environmental uncertainty and strategic position also had influence on the third subsystem. Resource heterogeneity had indirect effect on the second subsystem by the effect on partners' communication skills, (c) Bargaining power of consumers and suppliers, difference of knowledge profile and organizational goals comprised the third-level criteria. The bargaining power of consumers and suppliers influenced external environmental uncertainty. Difference of knowledge profile also affected resource heterogeneity directly, meanwhile organizational goals had direct effects on resource utilization and indirect on the third subsystem of coopetition by strategic position, (d) The bottom-level criteria included two factors: the market overlap and managerial experience on coopetition. The market overlap had a direct effect on organizational goals, the difference of knowledge profile, as well as the selection progress. Managerial experience on coopetition also effected bargaining power of consumers and suppliers and the subsystem of organizational interaction. The bottom-level criteria as the basic and key determinants affect all other factors in addition to the relative scope and market entry barriers.

## CONCLUSION

Cos' coopetition relationship is a complex system with various determinants. The complexity on determinants for coopetition can lead to the difficult for senior executives to manage the coopetition relationship in COs. However, the framework indicates that relative scope, market entry barriers, market overlap and managerial experience on coopetition as independent variables are very important for coopetition development, while others as dependent variables have effect on coopetition formation significantly.

The coopetition relationship of COs contains three subsystems: The selection subsystem, the organizational interaction subsystem and the strategic interaction subsystem. Each subsystem has different contents, concerns and determinants. So, decision-makers in COs should consider different determinants in different subsystems. At the first subsystem, decision-makers in COs should give priority to the degree of resource scarcity and market entry barriers they face, as well as the improvement of resource utilization and market overlap

after coopetition. At the second subsystem, decision-makers in COs should focus on partners' communication skills and their own managerial experience on coopetition. At the last subsystem, new market appeal, the anticipated cost-savings, the expected risk-sharing, the relative scope and strategic position are some of most important factors which to consider need to be considered. In a word, the managers in COs should treat the coopetition relationship as a complex and dynamic system from a systematic perspective.

## ACKNOWLEDGMENTS

This research work was sponsored by the National Social Science Foundation of China (NO.11 and ZD153).

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