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RESEARCH PAPER

Cooperation, competition and coopetition in innovation communities

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This study explores competitors' engagement in innovation communities. Some view working with competitors as a risky endeavour, some see it as potentially beneficial and others take it as something in-between. We address this issue by posing two questions: (1) why do rival firms cooperate, compete or 'coopete' (a syncretic approach); and (2) how do rival firms engage in these activities? To achieve this, we first review the relevant literature to construct conceptual arguments, and then investigate three innovation communities in the UK. The findings concern the importance of common and conflicting interests as fundamental drivers of a firm's cooperative and competitive stance in an innovation community. While a 'win–win' strategy has been over-emphasised, data reveal that the fear of 'lose–lose' is vital to drive firm cooperation. Finally, our study suggests that rival relationships link to a strategic incentive alignment between common and conflicting interests; that is, rivals cooperate when common interests are higher, and compete on other occasions. Data seem to suggest that in a conflicting situation firms often maximise their private benefits at the expense of common interests. Data also suggest that this alignment varies in different innovation stages and in both an inter-organisational and an intra-organisational setting. This paper contributes to the existing work on the competitive/relational strategy of firms in the innovation space.

Introduction

There is clear evidence (von Hippel, 2003; Corsaro *et al*., 2012) that innovation communities (also referred to as innovation networks) are becoming increasingly influential in a firm's decision-making process in order to create its competitive advantages. Over many years, a competitive strategy has dominated the strategic management literature (Lavie, 2006). The traditional competitive advantage, drawn from various theories, such as the resource-based view of the firm (Barney, 1991), emphasises that a firm's competitiveness is realised when it allocates scarce resources; or when it mobilises and deploys core competencies (Prahalad and Hamel, 1990). An alternative strategy emphasises the development of collaborative advantages (Dyer and Singh, 1998). It stresses that the business world is composed of a network of interdependent relationships developed and fostered through strategic collaboration with the goal of deriving mutual benefits (Miles and Snow, 1986; Lavie, 2006). It is recognised that competition and collaboration are distinct but

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interrelated dimensions (Lado *et al*., 1997; Chin *et al*., 2008). By investigating the complex relationships inherent in cooperation and competition, this paper explores rival firms' engagements in innovation communities.

Innovation is now widely acknowledged as a result of the cooperation between a wide variety of actors located both inside and outside the firm, among which the cooperation between rival firms is the most controversial (Salter and Gann, 2003; Corsaro *et al*., 2012). The traditional 'win–lose' approach was based on an assumption that inter-firm competition led to a loss of business opportunities (Dimitroff, 1991). However, by the mid-1990s the traditional scenario had become obsolete and it had become accepted that cooperation between rival firms leads to a 'win–win' scenario (Palmer, 2001). Jorde and Teece (1990) stress the benefit of better technological development through working with competitors. Zineldin (2004) sees the cooperation between rival firms as an effective way to combine R&D expenses and expertise.

Nevertheless, when some claim that competitors should cooperate with each other for various reasons, others argue differently. For example, Park and Ungson (2001) argue that trust and commitment in rivals' alliances are questionable. Bullinger *et al*. (2010) find that competition among rival firms often induces better innovation and that cooperation may produce adverse effects. Cooperation was therefore discouraged and competition encouraged. Beliefs have evolved about the importance of striking a balance between cooperative and competing activities among rival firms (Gnyawali and Park, 2009).

In recent years, scholars of 'coopetition' (defined as cooperating and competing simultaneously) (Nalebuff and Brandenburger, 1996), hold that rival firms may compete in some activities and cooperate in others (Bengtsson and Kock, 2000; Walley, 2007). On the grounds of coopetition, some authors (Gnyawali *et al*., 2006; Sanchez, 2008) suggest that firms may follow more than one of these approaches simultaneously with respect to different stages of their value chain. This is most often seen in respect of cooperation for technology development in the early stages of the value chain, and then competition in product markets (Sanchez, 2008). However, the practicality of coopetition has been questioned (Walley, 2007). Luo (2007) insists that simultaneous cooperation and competition and the consequences on firm performance are difficult to examine and measure.

We suggest that this ambiguity reflects our imperfect understanding of the underlying practices between rival firms. This paper addresses these issues concerning innovation communities. We pose two questions: (1) why do rival firms cooperate, compete or coopete; and (2) how do rival firms engage in these activities? To do this, we first review the relevant literature to develop conceptual arguments, and then investigate three innovation communities from different industries in the UK. The paper provides a snapshot of various arguments on cooperation, competition and coopetition. Second, it contributes to the strategic alliances literature, focusing on competitors' coopetition in innovation networks. Furthermore, the research provides empirical evidence by investigating innovation communities/networks in three different industries. Finally, the study, from an innovation network perspective, augments the study of competitive/collaborative advantages. The paper is organised as follows. After reviewing the relevant literature, it describes the research method. It then presents findings from three case studies before discussing implications for theory and practice. It concludes by presenting its contributions to future research and the limitations of these contributions.

Theoretical background

Adam Smith argued that people of the same trade seldom met together without the conversation turning to conspiracy against the public. Smith's sentiments reflect what has been taken for granted by many who are interested in the theory and practice of competition: cooperation between rival firms is a vehicle for collusion. In recent years, the proliferation of alliance formation has drawn scholarly attention to the practical implications of simultaneous cooperation and competition (Bullinger *et al*., 2010). Smith's view of competitors cooperating has been questioned. The arguments of rivals' relationships are nowadays complex and somewhat paradoxical. We now review this literature.

The notion of cooperation emerges from numerous theoretical traditions. One research stream is rooted in social network theories; it has recently been applied to the study of inter-firm cooperation relationship and performance (Wasserman and Faust, 1994). Social network studies originate in the sociology literature and have made important contributions to the literature of various topics in firm cooperation; for example, the distinction between weak and strong ties (Granovetter, 1973), the related measure of embeddedness (Granovetter, 1985; Uzzi, 1996), and network density and social capital measure (Burt, 1997). A growing body of research in strategy is coming to terms with the economic consequences of firms participating in strategic networks (Gulati *et al*., 2000). Research on joint ventures (e.g. Harrigan, 1985; Kogut, 1988) was among the first in the field to pay systematic attention to the trend in the formation of inter-firm partnerships. Research on strategic blocks (Nohria and Garcia-Pont, 1991), strategic supplier networks (Dyer and Singh, 1998), learning in alliances (Hamel *et al*., 1989), inter-firm trust (Zaheer and Venkatraman, 1995) and network resources (Gulati and Gargiulo, 1999) has examined inter-firm cooperation relationships from a variety of perspectives.

Another stream of research is rooted in collaborative advantage from a relational view (Dyer and Singh, 1998). The research stream complements the resource-based view of the firm by arguing that the nature of relationships matters more than the nature of resources in the networked environments (Lavie, 2006). Dyer and Singh (1998) underscore that a common benefit accrues to alliance partners through cooperation, combination, exchange and co-development of idiosyncratic resources. Following the similar thread of thought, Lavie (2006) highlights the concept of 'relational rents' which rely on inter-firm complementarities in creating common benefits for alliance partners.

For innovation-specific research, the arguments for firms' cooperation can be found in the extensive literature on open innovation (Chesbrough 2006; Laursen and Salter 2006) and the plethora of papers on formal and informal innovation networks (Salavisa *et al*., 2012). For example, the traditional concept that working with rival firms is difficult and risky has been viewed as obsolete (Barney, 1986). Instead, a 'win–win' approach has taken its place: 'by pooling intellect in a system architecture, open invention and open coordination can produce superior products and services relative to those produced by a smaller number of minds huddled together in a single company …' (Chesbrough and Appleyard, 2007, p.64).

The win–win approach is aligned with the idea of interdependence (Kotzab and Teller, 2003). For innovation, in-house development can be time-consuming and expensive. Brown *et al.* (1996) have shown that firms build cooperative relationships with rival firms that have complementary resources and capabilities. There is

a strong incentive to seek the necessary information from professional colleagues outside the firm (Liu and Hart, 2011). Logically enough, a competitor that makes similar products or uses similar processes is the one most likely to have that information and knowledge. Kim and Parkhe (2009) have shown the impact of similarity on strategic alliances. They have shown that alliances between similar firms are expected to be more successful than asymmetric partnerships. In other words, firm similarity is seen as an advantageous feature in firm alliances.

But are such external professional colleagues willing to reveal their proprietary knowledge and know-how to employees of rival firms? By interviewing managers from 10 mini mill steel firms in the US, von Hippel (2003) concludes that they are very willing to do this. He finds that the proprietary know-how trading involves informal trading 'networks' which develop between engineers with common professional interests. However, a key factor is that this behaviour involves an obligation to return a favour. A similar conclusion is reached by Allen *et al*. (1983): in a sample of 102 firms from three countries, approximately 23% of important information is acquired through some form of personal contact with apparent competitors. These studies suggest that cooperative behaviour takes place between existing and potential rivals either for complementary resources and capabilities or for future recompense.

Khanna *et al*. (1998) have shown that the cooperative aspect arises from the fact that each firm needs access to the other firm's know-how, and that the firms can collectively use their knowledge to produce something that is beneficial to them all. Several studies (e.g. Dyer and Singh, 1998; von Hippel, 2003) have reflected that common interest between allied actors plays an important role in their cooperative behaviour. Based on their longitudinal data collected from high technology markets, Mahnke and Overby (2008) have concluded that when common ground is developed and diverging interest is mitigated, the chances of collaborative success increase. More interestingly, they also find that allied partners often maximise their private benefits at the expense of the common ones, from which competition is derived.

Despite some authorities strongly advocating cooperation (e.g. Kotzab and Teller, 2003; Chesbrough, 2006), other researchers (e.g. Rindfleisch, 2000) argue that in reality the fear of short-term opportunistic behaviour may suppress the trust of interdependence among competitors. McAdam and McClelland (2002) have found that many companies simply copy their competitors' ideas in product innovation; rivals' cooperation has thus been questioned. This is echoed by Knudsen (2007), who highlights that the mechanisms for protecting core knowledge and innovations are especially critical in cooperation between competitors. Gulati and Gargiulo (1999) find that while resource dependency is important in vertical inter-firm relations (i.e. customer–supplier), it is not as important in horizontal alliances, as between rival firms. Mowery *et al*. (1996) also find that competitors in the same product line engage in low levels of interdependence and the need for cooperation is low. This group of researchers argues that rivals do not really cooperate.

While some studies see a less competitive environment as conducive to innovation (e.g. Khanna *et al*., 1998), there is a large body of literature which finds a positive relationship between competition and innovation (e.g. Bullinger *et al*., 2010). In the literature, intense competition has been viewed as a central driving force in pressuring and stimulating firms to innovate and upgrade their competitive advantage (Bengtsson and Kock, 2000). Porter (1990) considers that pressure

among competitors creates improvements and innovations. Luo (2007) also highlights that competition not only dilutes the pressure of anti-trust regulations and anti-monopoly demands, but also promotes technological advancement and product innovation.

In recent years, the single approach of either cooperation or competition has been questioned (Chin *et al*., 2008; Gnyawali and Park, 2009). For example, Day and Reibstein (1997) find that, although advantageous to the firm in the short term, pure competition may undermine the long-term viability of the firm. Despite its importance for new knowledge and different capabilities, Gnyawali and Madhavan (2001) show that pure cooperation alone can also be disadvantageous in that opportunism is pervasive and difficult to obviate. In view of the limitations of a single approach, an alternative – 'coopetition' – has proved attractive. In the literature, coopetition is defined as a situation where firms simultaneously cooperate and compete with each other (Nalebuff and Brandenburger, 1996). The notion that firms can cooperate as well as compete is widely recognised by practitioners; for example, Dell Computers developed a coopetitive relationship with IBM (Albert, 1999) and GM and Toyota assemble automobiles together (Luo, 2007).

Three theoretical streams provide the conceptual basis to understand coopetition. Scholars (e.g. Lado *et al*., 1997) who hold a resource-based view of the firm (including a knowledge-based view) focus on how dynamic capabilities are accumulated, mobilised and deployed to generate sustainable competitive advantage. For example, Lado *et al*. (1997) propose a syncretic model of rent-seeking strategic behaviour to explain how firms generate economic advantages through competition and cooperation. They make the point that when cooperative and competitive orientations are high, firms tend towards syncretic rent-seeking behaviour. They and others (Nelson, 1990; Lado *et al*., 1992) argue that firms which simultaneously adopt both competitive and cooperative strategies have a higher chance of succeeding than firms which do not.

Game theory provides a dynamic picture of the interactive process of cooperation and competition (Nalebuff and Brandenburger, 1996; Gnyawali *et al*., 2008). Nalebuff and Brandenburger (1996) show how a firm can use game theory to achieve positive-sum gains by changing the players, the rules of the game and the scope of the game. Academics in this research stream suggest that the coopetition approach creates and captures value so that a win–win approach creates a large business pie (Cairo, 2006). Park and Ungson (2001) emphasise that strategic alliances fail because of difficulties in coordinating independent firms (i.e. coordination costs), and in aligning operations at the alliance level with the long-term goals of parent firms (i.e. agency costs). A firm's private benefit and its alliance common benefit are interplayed with each other. Brandenburger and Stuart (2007) propose a hybrid non-cooperative–cooperative game model, which they called a 'biform game'. It formalises the notion of business strategy as making moves to shape the competitive environment in a favourable way.

Finally, network theory also provides useful insights. A central idea is that the coopetition approach enables firms to access network-based resources and to use them to pursue competitive advantage (Gnyawali and Madhavan, 2001). Gnyawali *et al*. (2006) show that firms are better able to develop competitive capabilities and advantages if they achieve superior network position in a coopetitive network. They demonstrate that firms, depending on their ability, extract competitive benefits from their coopetitive networks.

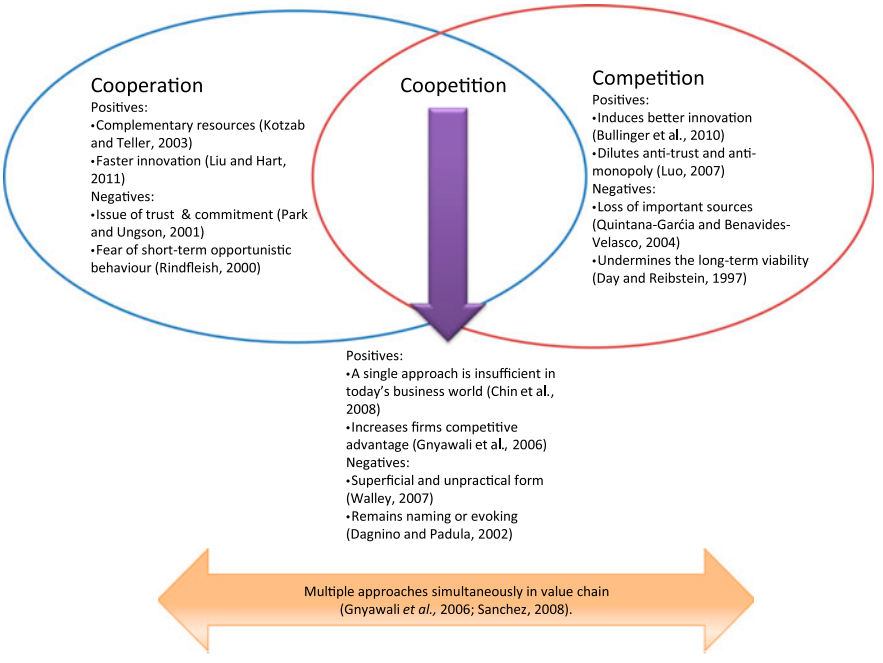

Figure 1. A snapshot of previous attitudes to cooperation, competition and competition

Nevertheless, the concept of coopetition has been questioned, particularly its practicality (Dagnino and Padula, 2002). Luo (2007) considers the idea of coopetition to be simply unrealistic. He argues that firms may give away more than they gain in the risk–return equation and that the contribution–payoff ratio is often difficult to measure and balance. Walley (2007) is even more critical, considering coopetition to be just another form of collusion, an interventionist response to protect the interests of firms during periods of difficult trading conditions. This echoes the view of Dagnino and Padula (2002), who claim that scientific investigation of the issue of coopetition has not done much more than naming, claiming and evoking.

In sum, the literature seeks to make sense of rival firms' cooperation and/or competition. On the one hand, 'win–win' cooperative relationships among rival firms sound ideal; on the other hand, they may sacrifice a strong drive for the better innovation that competitive relationships provide. Coopetition seems like a sensible way to describe rival firms' relationships; yet it has been challenged as just a superficial concept. The complexity is compounded by the view that firms may follow more than one of these approaches simultaneously (Gnyawali *et al.*, 2006; Sanchez, 2008). To better compare such views, we generate a snapshot of attitudes to cooperation, competition and coopetition. These are illustrated in Figure 1.

Research questions and methodology

The theory underpinning the cooperation and competition of rival firms is inconsistent. It would be useful to understand much better the underlying principles of these working relationships. To address the issue, we focus on what drives firms' cooperation and/or competition; and how rival firms engage in these activities. The

empirical research was conducted in the business-to-business (B2B) sector with three case studies in the UK. The case studies illustrate the drivers and processes described in the conceptual discussion. Each case started with a focal company and the study was then extended to three competitors of that focal company. Focal firms were chosen because they were members of at least one innovation community (or network) and they were willing to tell us about their competitors. As a result, three case studies were conducted in three industries in the UK: e-commerce, microelectronics and the gas and oil industry. Table 1 summarises the profiles of the three focal firms together with their networked organisations. The names of the three focal firms are all fictitious.

The case studies were conducted using two methods: (1) in-depth interviews with business leaders; and (2) comprehensive studies of company meeting minutes, and historical documents and records. For reliability, this study employed a semi-structured interview protocol to ensure that interviews were consistent. Three sets of case study data were developed from three studied cases. To ensure validity, all the interviews were tape-recorded, the tapes transcribed and the transcriptions sent to the interviewees for review and clarification. Open-ended interview questions were used to gain insights from the interviewees on the topic. The discussion focused on two major issues: why the relationships among competitors took place within innovation communities, and how these relationships work. Interviews lasted from 60 minutes to 110 minutes each.

Table 1. Case study samples

Company	Industry	Relationship with focal firm	Number of staff	Interviewee's position	Gender	Length of interview
A	e-commerce	focal	25	founder	male	90 min
A1	e-commerce	competitor	69	product development team leader	male	60 min
A2	e-commerce	ex-competitor / joint venture	35	managing director	male	60 min
A3	e-commerce	competitor / supplier	30	product manager	female	75 min
B	microelectronics	focal	10	CEO and marketing director	male	110 min
B1	microelectronics	competitor 1	80	marketing manager	male	90 min
B2	microelectronics	competitor 2	100	front desk manager	male	60 min
B3	microelectronics	competitor 3	150	general manager	female	60 min
C	oil & gas	focal	15	managing director	male	100 min
C1	oil & gas	competitor 1	97,000	operations engineer	male	70 min
C2	oil & gas	competitor 2	30,000	technology coordinator	female	80 min
C3	oil & gas	member	80,000	well operations engineer	female	60 min

Data analysis

In carrying out exploratory case studies, data analysis is a critical and complex process and is at the heart of building theory. The researcher employed the process of analysing within-case data, followed by searching cross-case patterns to shape propositions as suggested by Eisenhardt (1989). Within-case data were content processed using the methods suggested by Glaser and Strauss (1967) and Miles and Huberman (1994), and cross-case patterns were searched through cross-case or multi-case analysis methods suggested by Eisenhardt (1989) and Yin (2003). Nvivo 7 (a computer-aided text analysis software package specifically designed to enable coding for qualitative data analysis) was used to help the researcher code and categorise the large amounts of narrative text collected from the semi-structured interviews, and extracts from documents and archives.

The three focal companies

Company A is based in Scotland, specialises in e-business and e-commerce, search engine technology and search engine optimisation. With eight years in web development, the company helps its clients to use new media and e-commerce. Its web development company is based in Glasgow. Its clients and their competitors come from all over the UK. The company has won a number of awards and has received plaudits for the quality and technical competence of its innovations.

Company B is a member of an association in the British microelectronics industry. The association's members are semiconductor manufacturers, design houses, vendors and research organisations. The association provides a mechanism for collaboration, business development and growth across the sector, involving the supply chain, regional bodies and government.

Company C is an organisation sponsored by 17 oil and gas operating companies. The organisation's main functions are: to provide its members with innovative, cost-saving technologies developed from the latest science and engineering advances; to support technology suppliers by communicating the industry's technology needs and providing a route through which projects can be funded; and to stimulate dialogue between all players to ensure the industry is working on the technologies needed to extend the economic life of the UK oil and gas reserves located on the continental shelf. Company C provides an intensive network for suppliers and buyers in the British oil and gas industry. The relationships among its members can be buyers/suppliers as well as competitors.

Findings

The empirical research asked why firms work with rival firms. Our case study results suggest that several economic and strategic factors contribute to the relationships among competitors in innovation communities. The importance of fusion and inspiration is highlighted by our Respondent A3:

> It is a rich fusion approach that drives us to work with our competitors because we work and compete together at the same time. … There is no one else better inspires you for better innovation …

The data suggest a coopetitive business model in innovation communities, within which interdependence plays an important role (Dyer and Singh, 1998; Gulati and Gargiulo, 1999). This point was affirmed by Respondent C:

> We (the firm and its competitor) recognise cooperation could be useful in a number of areas. The rationale is basically for skills development, and for cooperative projects in this industry … for example; for carbon form, we arranged a forum and got carbon engineering managers to sit together. They are all open and they share information and new ideas … To be honest with you, this kind of cooperation is heavily based on their shared common interests.

The theme of common interests is highlighted throughout This reflects the concept of win–win in the literature (Cairo, 2006; Gnyawali and Park, 2009). While the notion that win–win drives rivals' coopetition was confirmed, a different concept emerged from our study, vividly described by Respondent A1:

> … Because it is how much you give, then how much you get back! … It is about 80% you can talk with competitors, by sharing that 80%, and they are expected to share with you their 80%. Why is this working? That is because they are all searching for a win–win scenario. More importantly, if competitors don't speak to each other, that is lose–lose and nobody wants to lose …

The data seem to suggest that coopetition is not only encouraged by the hope of win–win, as suggested in the literature, but also by the fear of lose–lose. Moreover, the concept of future recompense, suggested in the literature (von Hippel, 2003), is revealed in our case study.

Competing and cooperating similarity (Kim and Parkhe, 2009) is an important feature in strategic alliances. This point is repeatedly reflected in our three case studies, as Respondent B1 emphasised:

> We (competitors and the company) had more in common than we had in difference … surrounding these innovative products, there are all kinds of other things that everybody has to do. And we share those things. For example, we were working on a contract for our new product, and the customer requested a local contact and you wanted to know what sort of cost it would take. Then, through a business meeting, I talked to people who were basically our competitors. I was describing the problems to them, and one of the competitors said 'Oh, we were in that situation, and we found a very cheap and fast way to solve it …'.

We find that rival firms have more in common than in difference; that is, they share similar pressures and problems. Moreover, because they have more in common, our respondents suggest that working with rival firms solves problems better, cheaper and faster. Our data indicate a complex, multi-level model when coopetition is involved in international markets, a phenomenon described by Respondent B:

> The traditional existing logic of competitors' relationships is not valid now … Although companies in the UK may not be competitors, they might be competitors in another country, such as in the United States, or in Asia. So, the competition or cooperation might be better elaborated at a site level and not at the corporate level …

Respondent B was asked to provide an example:

> Let's say, firm X and firm Y are competitors in the UK. In the international market, cost is crucial. Without question, customers are always asking for a better (i.e. lower) price. To satisfy this need (i.e. to lower cost), firm X and firm Y decide to cooperate with each other. For each new product design, they look at what process is available in both companies so that cost can be reduced. Now, firm X has a site in the UK, a site in Germany, one site in Japan and a site in China. Firm Y has sites in the UK, France, Thailand and the USA. To demonstrate this case, I produced some numbers here (see Table 2).

Respondent B's example illustrates a multi-level business model. At a corporate level, firms X and Y are competitors in the UK market. At a site level, firm X's UK site competes with its own sites in Germany, Japan and China on the cost of developing processes for an innovative product; and firm Y's UK site competes with its own sites in France, Thailand and the US. A firm's site may take the form of a joint-venture, a factory or a branch office. In order to create competitive advantage (i.e. lower cost) for the innovative product, firm X cooperates with firm Y for process X and firm Y cooperates with firm X for process Y. Thus, firm X–UK (unit cost £6) beats the price of firm X–China (unit cost £8). The job is now moved back from China to the UK factory. The same scenario applies to the case of firm Y's process Y. Interestingly, despite the successful cooperation between firm X and firm Y, both companies continue to compete vigorously in the market.

Understanding of the key drivers of rival firms' coopetition allows us to analyse how rivals engage in these activities in that a key phenomenon is repeatedly revealed. When asking how competitors work together, common and conflicting interests have repeatedly appeared. Our data suggest that conflicting interests arise when a firm's own private benefits are higher than common ones. In this situation, private benefits are more important. To understand the mechanism, Respondent B was asked to elaborate on how the decision was made in the case he gave of firm X and Y:

> One important thing is firm X and firm Y will never cooperate for technology; never cooperate for the core business. In fact, they would not give up any cooperative benefits if that conflicts to their core business. Why? Because that is how you compete in the market. You have to protect yourself before you cooperate. In fact, your own benefits go beyond your shared ones. That is your one key advantage … you would never

Table 2. Competitors cooperate/compete in international markets

Firm X for process X		
Site	Unit cost	Unit cost after cooperating with Firm Y
UK	£10	£10 → £6
Germany	£15	
Japan	£20	
China	£7	
Firm Y for process Y		
Site	Unit cost	Unit cost after cooperating with Firm X
UK	£12	£12 → £8
France	£12	
Thailand	£8	
US	£20	

> share … Say, firm X may produce product XYZ; and firm Y will produce XY and 2Z! The chances are competitors will never cooperate, but only compete on technology, especially when they are selling in the same market to the same people.

The theme of common and conflicting interests is repeated throughout our study. Despite rich common benefits from cooperation with rivals, our findings suggest that firms will never sacrifice their private benefits for common interests. Firms maximise their own private benefits at the cost of common interests (Mahnke and Overby, 2008): 'your own benefits go beyond your shared ones'. Respondents were probed to explain how they worked with rivals who had common and conflicting interests. The evidence of Respondent C2 indicates a strategic alignment model:

> It depends. For example, you developed a piece of technology which helps you to find a location in the vast ocean where nobody has ever explored, nobody has done any drilling; nobody has done any kind of investigation. This piece of technology can tell you exactly where the location is. And you have it. Then, you pretty much would like to keep it to yourself … The other extreme case would be that we (the company and its competitors) all have the issue of corrosion, say, on their pipe works. And we all need a platform for inspecting and assessing. We have all got the same problem. Then, we don't really mind sharing the development of the solution, you see … How do we decide what can and cannot work with competitors? It depends … yesterday's competition may become today's cooperation and today's cooperation may become tomorrow's competition … You never know.

We find that firms interplay strategically between common and conflicting interests. That is, firms cooperate when common interests are higher, and compete when conflicting interests are higher: 'yesterday's competition may become today's cooperation and today's cooperation may become tomorrow's competition'.

Discussion

It seems that firms' cooperation is driven by common interests for interdependence and win–win. Our data suggest the pursuit of win–win and the fear of lose–lose drive rival firms into cooperation. Our respondents insist that they cooperate because of their similarity. Two important themes emerge from this study: common interests and conflicting interests. Common interests promote cooperation and conflicting interests induce competition among rivals. Finally, our study suggests that rival firm relationships link to strategic alignment between common and conflicting interests; that is, rivals cooperate when common benefits are higher than private benefits. Our data seem to suggest that in a conflicting situation, firms often maximise their private benefits at the expense of common interests. Our evidence indicates that this alignment occurs in different innovation stages and in both an inter-organisational and an intra-organisational setting.

Win–win strategy has been over-emphasised in the literature. Our findings suggest that a fear of lose–lose drives firms to cooperation. Interdependence and the pursuit of win–win have long been emphasised in the literature on cooperation among firms, particularly in innovation-specific research, such as open innovation (Chesbourgh, 2006; Salavisa *et al*., 2012). The fear of lose–lose suggested by this study broadens the traditional view. Our study also re-affirms the theme of competing and cooperating simultaneously (Kim and Parkhe, 2009) and shows that rival firms have more in common than in difference. Alliances between similar firms

may be expected to be more successful than asymmetric partnerships, as suggested in the literature. Nevertheless, it is the similarity of firms that drives them to compete in the same product markets. Our incentive alignment model may provide an explanation for this paradoxical situation. Firms demonstrate common/conflicting interests at different stages of innovation. For example, in order to shape the competitive environment in a favourable way, firms cooperate in the early stages (with higher common interests) of the value chain and then compete (with higher conflicting interests) in product markets (Sanchez, 2008). Indeed, as one respondent noted, 'yesterday's competition may become today's cooperation and today's cooperation may become tomorrow's competition'.

We also link rival firms' relationships to a strategic incentive alignment between common and conflicting interests. The concept of incentive alignment is in line with the game theory literature, which underscores the notion of shaping the competitive environment in a favourable way (Brandenburger and Stuart, 2007). To our knowledge, game theory has not been applied to innovation networks. It is traditionally applied in the field of business strategy to maintaining alliances and cheating within alliances (e.g. Park and Ungson, 2001). This suggests an important area for further research. Finally, for commercial audiences, we suggest that firms follow more than one of the approaches (cooperation, competition and coopetition) with respect to strategic alignment between common and conflicting interests.

Conclusion

There is a growing body of research in strategy that is coming to terms with the economic consequences of firms participating in strategic networks. This paper contributes to the literature on competitive and relational advantages in innovation. The findings concerning the importance of common and conflicting interests as fundamental drivers of a firm's cooperative and competitive stance are not unsurprising, but are unique given the context of innovation. The paper has several limitations. First, the fieldwork of this study is limited to only one country. Our study suggests that the dynamics of incentive alignment may rest in an interactive process in both inter-organisational and intra-organisation settings. This phenomenon seems to be especially prominent when it concerns strategic alliances in international markets. Second, as suggested earlier, the proposed strategic incentive alignment model aligns with game theory. More research in this area is recommended.

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