

Is Cooperation with Competitors a Good Idea? An Example in Practice

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Coopetition has become a heated issue in the last decade. In this study, a scrutinized review of previous research on coopetition is presented to clarify the research stream on coopetition, from which the implications are derived and a framework to analyse the phenomenon is proposed. Given the complex nature of coopetition, an in-depth case study was undertaken to investigate the competition–cooperation relationship and coopetition performance over a 15-year period in a Taiwanese supermarket network, which was formed by a focal company and its competitors. Performance was analysed before and after launching the coopetition strategy, in which 31 indicators were examined. The findings imply that competition (*Yang*) and cooperation (*Yin*) are reciprocally rooted in and mutually promoted by each other. The findings also confirmed that cooperation with competitors did lead to better performance, at least over a period, in two ways. The first was that the adoption of coopetition permitted the attainment of performance levels beyond what would otherwise have been possible; the second was that the adoption of coopetition changed the timeframe, permitting earlier achievement of higher performance levels. This study contributes to and extends knowledge of the dynamics and consequences of cooperation with competitors and demonstrates that coopetition has a significant temporary advantage.

Introduction

Coopetition is a strategy for ‘cooperation and competition’ and for ‘cooperation with competitors’. The term ‘coopetition’ was coined by Ray Noorda in the 1990s, and the concept of coopetition has been highlighted since the term was brought to mainstream business by Adam Brandenburger and Barry J. Nalebuff in their book *Co-opetition* in 1996. Most scholars consider

coopetition the phenomenon of simultaneous competition and cooperation (e.g. Brandenburger and Nalebuff, 1996; Chen, 2008; Gimeno, 2004; Kim and Parkhe, 2009; Lado, Boyd and Hanlon, 1997; Luo, 2007; Madhavan, Gnyawali and He, 2004; Peng and Bourne, 2009), under which two counter-actors could be either cooperators or competitors. In contrast, coopetition denotes cooperation with competitors (e.g. Bengtsson and Kock, 2000; Gnyawali and Park, 2009; Luo, Rindfleisch and Tse, 2007; Ritala and Hurmelinna-Laukkanen, 2009), which highlights an aggressive strategy of ‘sleeping with the enemy’ (Quint, 1997). In this study, we regard *coopetition* as cooperation with competitors in which they compete in the same market and cooperate in other areas. The phenomenon of cooperation

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with competitors had been noticed even earlier. For example, Jorde and Teece (1989) suggested that a re-conceptualization of competition and reassessment of horizontal cooperation with competitors were urgently needed.

In this study, we undertake a literature review on co-competition, going back to when the term was first proposed in 1996. The theoretical review finds that previous research has three veins, including the antecedents driving to co-competition, the co-competition dynamics and the outcome of co-competition. In order to extend previous research, we discuss the implications and propose a framework. As co-competition has become a heated issue both in practice and in research, it is clear that some questions remain unanswered. (1) What is the real nature of co-competition dynamics and cooperative strategy with competitors? (2) Does cooperation with competitors generate superior performance? If yes, how can we evaluate the co-competition performance in practice? The goal of this study is to reveal the dynamics and consequences of such a co-competition strategy and determine whether there are any significant temporary advantages of co-competition.

Given the complex nature of co-competition, this study is conducted through an in-depth case study. Data were collected from chief executive officers (CEOs) and top managers, with intensive efforts. We address the short-term strategy of co-competition and analyse the performance of a Taiwanese supermarket network over a 15-year period between 1991 and 2005. This covers the period of network formation and allows a comparison of performance both before and after co-competition strategy. This practice-oriented study has revealed rich data showing how cooperation with competitors has emerged and how performance has changed over time. We found that competition (denoted as *Yang*) and cooperation (denoted as *Yin*) are mutually rooted in and promoted by each other. The results confirmed that there is a significant temporary advantage with co-competition, which led to better performance, at least over a period of time.

We first address the literature review and the theoretical implications and framework. We then describe the methodology. This is followed by a demonstration of the co-competition network formation and its rationale and dynamics. We also analyse how the performance changes and then discuss the findings and implications. Lastly, we address the limitations and suggestions for future research.

Theoretical reviews

This study reviews the research on co-competition since 1996. Appendices A and B show the overview of empirical and non-empirical research. A focus on antecedents, dynamics and outcome is significant in understanding the research streams of co-competition.

Antecedents of co-competition

The first research stream focuses on antecedents of co-competition, emphasizing what determinants lead to simultaneous competition and cooperation. Empirical studies such as those of Bengtsson and Kock (2000) examine the areas where firms simultaneously competed and cooperated, and analyse the driving factors that influenced cooperation between competitors. They propose some antecedents such as heterogeneity in resources, closeness of an activity to the customer, competitors' position and the connectedness between them, and conflict and consensus about organizational goals. Gnyawali, He and Madhavan (2006) examine what determinants affect a firm's competitive behaviour in a co-competitive network, finding that highly centralized and structurally autonomous firms tend to be more competitively active and versatile. Chin, Chan and Lam (2008) determine the success factors for co-competition, including management commitment, relationship development and communication management.

In non-empirical research, Gnyawali and Madhavan (2001) develop a multilevel model of how the structural network properties influence competitive dynamics in co-competition network. They propose antecedents including centrality and structural autonomy, structural equivalence and network density. Further, Gnyawali and Park (2009) develop a conceptual model of co-competition for technological innovation in small and medium-sized enterprises (SMEs). They argue that short product life cycle, technological convergence and high R&D cost are the drivers to engage in co-competition. Small and medium-sized enterprises are more likely to collaborate with competitors with strong technological capabilities, complementary resources and technologies, and similar or overlapping resources. Zeng and Chen (2003) propose a framework to analyse the motives of competition and cooperation, indicating that some forces drive cooperation, such as low threat of

greed or fear, a high level of communication among partners, and the reciprocity principle in interaction with partners. Other factors, such as low level of identification, drive competition.

Alliance formation and dynamics of cooperation

The second research stream focuses on alliance formation and cooperation dynamics. In empirical studies, Bengtsson and Kock (1999) conclude that a firm could be involved in four types of horizontal relationships, including coexistence, cooperation, competition and cooperation. A relationship between a firm and a specific competitor can change over time, as the business context in which they are embedded normally is very dynamic. Gimeno (2004) examines indirect, third-party competitive influences on alliance formation by combining two networks of competitive and cooperation relations, finding that co-specialized alliances between rivals may involve exclusively precluding alliances with the rivals' partners, thus encouraging countervailing alliances, whereas non-specialized alliances are less exclusive and are used when rivals share the same partners. Moreover, Madhavan, Gnyawali and He (2004) explore the distinction between competitive motive and cooperative motive, concluding that competitive motive triads can be observed in technology blocks, while cooperative motive triads can be observed in geographic blocks.

Barretta (2008) analyses the competitive and cooperative relationships in a network of healthcare trusts, finding that financial mechanism was the main cause of competition between trusts within each network. Peng and Bourne (2009) examine the simultaneous competition and cooperation between two healthcare networks. They conclude that two organizations would compete and cooperate simultaneously when each organization has complementary but distinctly different sets of resources and when the field of competition is distinctly separate from the field of cooperation. In addition, two networks will find it easier to balance competition and cooperation when each network has compatible but distinctly different structures.

As for non-empirical studies, Lado, Boyd and Hanlon (1997) propose a syncretic model of competition and cooperation with a four-cell typology: syncretic rent-seeking behaviour (high competition and high cooperation), collaborative

rent seeking (low competition and high cooperation), competitive rent seeking (high competition and low cooperation) and monopolistic rent seeking (low competition and low cooperation). Following this typology, Luo (2007) proposes a framework to describe the rationality, behaviour, evolution and tactics of cooperation for multinational enterprises (MNEs). By linking the western and eastern thoughts, Chen (2008) develops a transparadox framework for transcending the competition-cooperation paradox. He proposed three generic conceptions of competition-cooperation relationships. First, *independent opposites* represent a common view that competition and cooperation are independent, even irreconcilable, opposites, implying independent and separate parts. Second, in *interconnected opposites*, the individual forces of competition and cooperation are connected in such a way that they may influence each other and shape the nature of competition (or cooperation) between firms, implying closely related but separate duplicates. Third, *interdependent opposites* encompass all possible situations of inter-firm dynamics, in which competition and cooperation together form the union of the two, implying inseparable interdependent elements which together form a whole.

The model proposed by Ritala and Hurmelinna-Laukkanen (2009) indicates that cooperation increases value-creation potential, but also decreases value-appropriation potential in innovation. In cooperation dynamics, the relationship between common knowledge and value creation potential is more likely to be enhanced by network externalities, but is more likely to be eroded by restricted knowledge sharing.

Outcome of cooperation

In the vein of cooperation outcome, Park and Russo (1996) use joint venture (JV) terminations (including failures and acquisitions) as an outcome measurement, finding that cooperation with competitors in a JV is more likely to fail. Silverman and Baum (2002) use exit rate and conclude that rivals' downstream alliances increase a firm's exit rate less than their upstream alliances do. Rivals' upstream alliances increase a firm's exit rate less than their horizontal alliances. Dussauge, Garrette and Mitchell (2000) use reorganize, takeover, continue and dissolve as alliance outcomes. Their results indicate that competing

partners are more likely to reorganize or take over link alliances than scale alliances. Link alliances and scale alliances are equally likely to dissolve at similar ages.

Oum *et al.* (2004) examine the effect of horizontal alliances on firm productivity and profitability, finding that horizontal alliances are positively associated with firm productivity, but have no significant impact on profitability. Luo, Rindfleisch and Tse (2007) investigate the effect of competitor alliances on financial performance, concluding that competitor alliance activities and competitor orientation have both financial advantages (return on equity (ROE)) and dark sides. Moreover, Kim and Parkhe (2009) measured alliance performance by five perceived items, showing that cooperating similarity has a positive effect on alliance performance, but competing similarity shows a negative effect.

As for non-empirical research, Park and Ungson's (2001) framework argues that alliances with strong rivalry are more likely to fail, because it is difficult to develop a trust-based relationship, to create an efficient governance structure, to share knowledge and skills, to resolve organizational dissimilarities, and to develop a coherent strategy. Gnyawali and Park's (2009) model addresses the benefits and costs of cooptation. The benefits refer to economy of scale (EOS), reduction of uncertainty and risk, and speed in production development, whereas the costs refer to technological risks, management challenges and loss of control.

Theoretical implications and framework

Some implications are derived from the theoretical reviews. We develop a framework to understand the rationale, dynamics and performance of cooptation.

First, in the vein of cooptation antecedents, scholars have indicated multi-level factors which influence cooptation: at the firm level, inwardly, heterogeneous or complementary resources (Bengtsson and Kock, 2000; Gnyawali and Park, 2009; Peng and Bourne, 2009), similar or common resources (Ritala and Hurmelinna-Laukkanen, 2009) and management commitment, relationship development (Chin, Chan and Lam, 2008); outwardly, closeness of an activity to the customer, competitors' connectedness (Bengtsson and Kock,

2000), competitive position or pressure in the markets (Ritala and Hurmelinna-Laukkanen, 2009; Zeng and Chen, 2003), higher market diversity, and centrality and structural autonomy in the network (Gnyawali *et al.*, 2006) influence cooptation. At the industry level, short product life cycle, technological convergence and high R&D cost (Gnyawali and Park, 2009) may affect cooptation. The above-mentioned factors can be categorized into two types both inwardly and outwardly: resource similarity and market commonality.

The concept of resource similarity and market commonality were derived from the theoretical perspective of competitive dynamics in Chen's (1996) study. *Market commonality* is defined as the degree to which the presence that a competitor manifests in the market overlaps with the focal firm, whereas *resource similarity* is defined as the extent to which a given competitor possesses strategic endowments comparable with those of the focal firm (Chen, 1996, pp. 106, 107). Prior studies such as Gimeno (2004), Gnyawali *et al.* (2006), Luo (2007) and Silverman and Baum (2002) have taken the competitive dynamic perspective as the theoretical focus on cooptation. We contend that these two factors may affect not only competitive dynamics, but also cooptation dynamics.

Second, in the vein of cooptation dynamics, both competition and cooperation are integral parts of a firm's overall strategy. The relationship between competition and cooperation is very dynamic. However, the strategy literature has yet to investigate the fundamental question of the conceptual relationship between competition and cooperation (Chen, 2008, p. 289). Lado, Boyd and Hanlon (1997) began to propose a four-cell typology. Following their typology, scholars examined the cooptation in either two relations (e.g. Gimeno, 2004; Madhavan, Gnyawali and He, 2004) or four types (e.g. Bengtsson and Kock, 1999; Luo, 2007). Their typologies of competition-cooperation dynamics reflect the western thinking that competition and cooperation are regarded as two opposite ends on a spectrum, unlike the eastern polar thinking that the relationship between competition and cooperation is harmony (Peng and Bourne, 2009), interrelated or interdependent, and together they may form a new theoretical construct or phenomenon (Chen, 2008). We consider that the dynamics of competition-cooperation relationships in different periods can be depicted based on Chen's (2008)

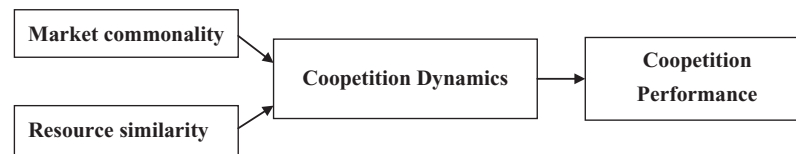


Figure 1. Conceptual framework

transparadox framework. In the early period, the competition dynamics represented as *independent opposites* in which competition and cooperation are regarded as two independent opposites and separate parts. In the later period, competitors identified a collaborative strategy regarding the common areas where competitors would work together, representing the *interconnected opposites* in which the individual forces of competition and cooperation are independent, but there is a common area where competition and cooperation connect and coexist between firms.

Third, in the vein of coopetition performance, in order to measure the coopetition outcome, some have focused on survival, such as failure rate (e.g. Park and Russo, 1996; Park and Ungson, 2001), exit rate (e.g. Silverman and Baum, 2002) and alliance outcome of reorganize, takeover, continue and dissolve (Dussauge, Garrette and Mitchell, 2000) rather than on performance. Ketchen, Snow and Hoover (2004) stress that, instead of using termination as an outcome measurement, intermediate outcomes may include variables such as trust levels achieved or the relationship's duration. Final outcomes may include perceived success, concurrent financial gain, coopetitive relationship goal achievement, product or process improvement and/or resource sharing. There are some empirical studies examining the effect of coopetition on firm performance by measuring from single financial indicator to multiple measurements (e.g. Kim and Parkhe, 2009; Luo, Rindfleisch and Tse, 2007; Luo, Slotegraaf and Pan, 2006; Oum *et al.*, 2004). They were limited to viewing performance in a wide variety of performance areas because of using archival data or surveys. However, the consequences of inter-firm competition-cooperation relationships encompass both social and economic outcomes, thus a broader view of performance than just the maximization of profits is necessary. To gain a multidimensional conceptualization of performance, researchers and managers must pay equal attention to various aspects of a firm's conduct

(Lado, Boyd and Hanlon, 1997). We therefore adopt a comprehensive view to examine the performance in some key areas such as cost/efficiency, quality, choice/convenience and sales volume.

Figure 1 shows a conceptual framework for analysing the relationships between resource similarity, market commonality, the competition-cooperation dynamics and performance. We argue that resource similarity and market commonality will affect the competition-cooperation relationship between competitors. Each firm has a unique market profile and strategic-resource endowment, and a pairwise comparison using these two dimensions (resource similarity and market commonality) will help to predict how they might interact in the market (Chen, 2009, p. 11). As Luo (2007) argued, market commonality contributed more to competition, whereas resource asymmetry contributed more to cooperation.

From the competition aspect, the degree of market overlap between two firms determines whether they are direct and immediate competitors. Two firms are head-on opponents and will experience great tension if they compete directly in many markets and if each is a key player in markets vital to the other. In addition, firms with similar resource bundles are likely to have similar strategic capabilities as well as competitive vulnerability in the marketplace. From the cooperation aspect, resource similarity helps to increase the EOS by pooling their resources and capabilities to pursue common projects and by having common interests in developing certain common technologies. Resource similarity is also important in sharing risk in technological development and essential for learning and knowledge exchange (Gnyawali and Park, 2009). As two competitors continuously confront similar problem sets in their end-product markets and use similar types of resources in addressing them, they are more likely to possess similar market and technological knowledge and, therefore, a large common knowledge base enhances cooperation between competitors to create value together (Ritala and

Hurmelinna-Laukkanen, 2009). In addition, from psychological and identity perspectives, competitors that are similar in resource or market profile may have similar 'valued identities' or identities they strive for, which in turn increase the psychological stakes of competition (Kilduff, Elfenbein and Staw, 2010).

The competition-cooperation relationship between rivals may affect performance. Although cooperation with competitors is more likely to fail when it is difficult to develop a trust-based relationship and to share resources, two competitors may benefit from cooperation because of the reduction in uncertainty, the enlargement of EOS, the speed of product development or market entry, and the increase in market power. Therefore, we propose a framework demonstrating that resource similarity and market commonality may have effects on the dynamics of competition-cooperation relationship between competitors, which may further affect cooperation performance.

Methodology

Research approach

Most of the previous studies in cooperation were conducted by quantitative methods. With regard to theory generalization, performance measurement would be more significant with large-sample survey studies, thus qualitative studies may not be robust. However, the use of quantitative methods is limited to depicting the whole picture of cooperation dynamics and to examine performance with multidimensional measurement. Given the novelty of the construct/phenomenon, appropriate and well-developed measures do not exist to perform large-sample studies of cooperation. In-depth case study could examine cooperation more systematically and deeply (Gnyawali and Park, 2009, p. 324) and provide additional understanding of the phenomenon (Dussauge, Garrette and Mitchell, 2000; Ritala and Hurmelinna-Laukkanen, 2009). Therefore, this research is conducted as a case study, which makes multifaceted descriptions of cooperation possible.

Research setting

The research investigates a focal supermarket company and its cooperative network in a specific geographic area. In central Taiwan, there are

eight major companies with a chain-store business model and approximately twenty hypermarkets and fifty grocery stores. Geographic proximity combined with density of chain stores reveals the highly intensive nature of competition among supermarkets in this area.

The focal company was established in 1955 and has diversified its business from a single business unit into multiple business units covering fertilizers, plastics, cement, distribution, restaurants, information technology products, imported house-keeping products and life insurance. The focal supermarket company was launched in 1988 and is operated on a chain-store business model. Currently, it owns 34 chain stores, which are all located in central Taiwan. Its competitiveness is characterized as an agricultural pesticide residue test centre, a distribution and food-processing centre that is qualified as the 'CAS (Chinese agriculture standard) Premium Food Processing Centre'.

To acquire more competitive advantages, the focal company formed a strategic network with 13 other companies, including competitors and other partners. The major partner, the X Supermarket, is its main competitor, which owns 278 chain stores island-wide. Three other smaller competitors also joined the network. In addition, vertical linkages incorporated strategic partners such as the Supermarket Association, the Software Association, two IT companies, the agricultural pesticide supply centre, and two other Japanese companies. The network formation dynamics is described in a later section.

Data collection

Data collection was executed over a two-year timeframe. We conducted intensive interviews with 14 CEOs and top managers, one from each network member, resulting in a total of 220 hours face to face and telephone interviews. The interviewees were senior managers who held top positions, including two board chairmen, one board director, five CEOs, one vice-CEO and five top managers. They were all representatives of their companies and involved in their firms' strategic decision-making. Appendix C lists the interviewees, showing their positions titles, interview frequencies and hours.

Accuracy and reliability in any study may have to be traded off against accessibility and resource

propensity (Chen, 1993). The best any can do is to deal with two of the research aims of accuracy, parsimony and generalizability (Weick, 1969). However, the field of strategy seems to pay more attention to generalizability and parsimony, but less to accuracy. Chen (1993, p. 1629) advocates that studies which have to rely on a small number of relatively inaccessible informants who are highly accurate and consistent should be encouraged. Insiders are generally considered more accurate than outsiders when the attributes are related to strategy implementation. In this study, the reliability of data collection relies on the insider judgement. The 14 CEOs and top managers are relatively inaccessible informants who are highly accurate because of their deep and frequent involvement in decision-making. Between 2000 and 2002, all of them had been involved in intensive meetings to identify the areas in which they can cooperate to create joint value. They together identified five cooperative strategies and 31 performance indicators for evaluating the outcome. The indicators were used for the following reasons.

Resource homogeneity between competitors provided the opportunity for sharing more commonality in procurement, food-processing, warehouse, transport and distribution. These are all important collaborative areas to enlarge the EOS and to reduce costs. Owing to the enlargement of EOS in co-procurement, the average purchase price is expected to decrease because of bargaining power. The average labour cost in procurement is expected to decrease through sharing human resources. In addition, the number of suppliers and the number of purchasing items are expected to increase because of attracting more suppliers. In total, five indicators are picked for the co-procurement area.

In the co-distribution area, owing to the enlargement of EOS by sharing food-processing, warehouse, transport and distribution, all network members have benefited from timely delivery, shortening of product turnover, inventory cost reduction, ordering cost reduction and transport cost reduction. Therefore, four indicators were picked for the co-distribution area.

In the co-marketing and chain-store co-management areas, before the network formation, most of the competitors in the supermarket industry used to adopt a low-pricing strategy which not only hindered their marketing capabili-

ties, but also blocked them from so-called 'high-quality images'. Connecting with two Japanese companies and transferring know-how from them gave the focal company a good reputation in marketing and chain-store management. Thus, the competitors joined the network because they benefited from learning and knowledge transfer which escalated their exposure in the customer market. The co-marketing strategy also enlarged the EOS in human resource (HR) training, and thus the average labour cost in marketing is expected to decrease. In addition, the number of customer visits and average amount purchased per customer visit were also picked because the co-marketing strategy is designed to provide a variety of products for customers.

In the chain-store co-management area, to benefit from joint learning and knowledge transferring, a coaching team composed of experts from all the competing partners is responsible for mentoring various types of chain-store activities. Their goals are (1) to reduce chain-store operating cost, average labour cost, utility and maintenance cost; (2) to increase efficiency in employee productivity; (3) to improve service quality in expired products and default rate, and number of consumer complaints; (4) to deliver more choice and convenience for customers; and (5) to increase sales volume in sales gross profit and growth rate. Therefore, 18 indicators were picked for the chain-store co-management area. Moreover, an integrated information system was launched to execute and support the implementation of cooperative strategies. One indicator was picked for the integrated information system.

By forming the network, the network members can improve bargaining power over suppliers through volume purchases, which can be exerted by a *co-procurement* strategy. Moreover, they can achieve cost reduction through increased operational efficiency by improved EOS and cost/risk sharing, which can be fulfilled by *co-distribution* strategy and *integrated information system* strategy. They also benefited from learning and accessing greater resources and skills, which is attributed to *co-marketing* strategy and *chain-store co-management* strategy. Hence, the cooperation in five areas may lead to joint value creation in four groups: cost/efficiency, quality, choice/convenience and sales volume. Thus, they together picked 31 indicators for watching the outcome of co-competition, as shown in Appendix D.

Performance data for the focal company between 1991 and 2005 were collected. Five timeframes including 1991–1993 and 1993–1995 in the pre-network period, 1995–2000 in the network-formation period, and 2000–2002 and 2002–2005 in the post-network-formation period were used. Of particular interest was the change between each adjoining pair of timeframes. The data were collected from the focal company's internal database of financial and operating statistics and reports. In order to preserve confidentiality, absolute figures for each year are not disclosed, but are instead reported as changes in each timeframe and the differences between each pair of successive timeframes are analysed. Appendix E shows the performance changes between timeframes.

Results

Coopetition rational and dynamics

Following our framework, we demonstrate the rationale and dynamics in each of the three periods. Each period represents a different competition–cooperation relationship, which was driven by different rationale of market commonality and resource similarity.

1991–1995: Pre-network period. Competition and cooperation. During this period, supermarket players suffered intensive competition not only from their major supermarket rivals, but also from traditional markets, night markets and convenience stores. Geographic proximity, combined with density of existing stores, led to highly intensive competition. It became clear by observing the competition strategies in the battles of pricing, promotion campaigns, distribution channels and product delivery, and diversification.

In 1990, the focal company sent a top management team to visit a leading Japanese supermarket company. They learned that the division of labour among food-processing, logistics and sales activities enabled the supermarket to control costs. At that time, Taiwanese supermarket players suffered from high costs due to unintegrated logistics, delivery and transport activities. Therefore, learning from Japan facilitated the focal company's efforts in upstream diversification and integration. In 1991, the focal company established its transport centre and recruited suppliers to join a co-transport system, which inspired the focal

company to form a network. In the pre-network period, the competition between the focal company and its rivals was intensive. Cooperation existed only between the focal company and non-rival partners. Thus, the competition–cooperation relationship is represented as independent opposites.

Market commonality and resource similarity. During this period, the extent of market commonality between the focal firm and its competitors was high. As a result of intensive competition, the focal firm's network was confined to forming partnerships with vertical but not horizontal connections; the focal firm shared no market commonality with its vertical partners. However, the resources between the focal company and its competitors were highly homogeneous and symmetric, which led to intense competition. In contrast, the resources between the focal company and its vertical partners were heterogeneous and asymmetric, resulting in cooperation. This echoes the resource-based view (RBV) that firms acquire complementary resources from an alliance, which provides opportunities to create redeployable resources. In this case, the transport centre allows the focal firm to integrate suppliers into the network.

1995–2000: Network-formation period. Competition and cooperation. During this period, competing players widely adopted a low-pricing strategy, which not only reduced their profitability, but also blocked them from exerting a 'high-quality' strategy. However, the focal company was able to perform not low-pricing, but a differentiation strategy by improving its business model. Therefore, a small competitor, JJJ supermarket, joined the network in 1995, which then was followed by the joining of SC Supermarket in 1996, opening the gateway to cooperation with competitors, although they were not major rivals. In 2000, a large-scale competitor, the X Supermarket, joined the network with its 278 chain stores. The journey of 'coopetition' started. In this period, competition was still a dominant force in the marketplace despite the emergence of cooperation between competitors. The competition–cooperation relationship has been moving from independent opposites towards interconnected opposites.

Market commonality and resource similarity. Competition in this period was even more inten-

sive, inducing rivals to collaborate. Players with high market overlap are likely to cooperate more than those with low market overlap (Baum and Korn, 1999; Luo, 2005). It is important to interact with competitors and learn from them, because collaboration provides a way of getting close enough to rivals to predict how they would behave (Clarke-Hill, Li and Davies, 2003). They could also benchmark themselves and prepare for the consequences of competition. Rival partners' collaboration as a whole in the geographic market allowed them to strive for increased power over suppliers and to reach a better position in the market.

In addition, competitors can cooperate if they develop shared resources that tie them together to enhance their competitive advantage. Competitors are more likely to cooperate particularly when located in the same geographic market, because geographic proximity permits more frequent contact between them, facilitating knowledge transfer, coordination and sharing of activities (Madhavan, Gnyawali and He, 2004). Owing to the success of supplier integration in food-processing, distribution and transport activities, the focal firm and its competitors did benefit from cooperation. This reflects Luo's (2005) argument that resource similarity such as product similarity implies that competitors share more commonality in product development, process innovation and quality control, which are all important collaborative areas. Thus, intensive competition in this period did foster cooperation among competitors, which not only enhanced their powerful market positions, but also enlarged economic benefits by sharing similar resources.

2000–2005: post-network-formation period. Competition and cooperation. During this period, intensive competition still existed in the battle of pricing and promotion. The JJF Supermarket joined the network in 2002. The rival partners competed intensively in the geographic market while they worked closely together to identify activities where they could cooperate and areas where they remained in competition. To foster cooperation, a series of meetings were launched by network members. Together, they identified five cooperative strategies.

The *co-procurement* strategy was to enlarge the EOS in procurement and to control purchasing costs. A co-procurement committee was formed

and composed of representatives from all the members. They designed a procedure to collect and pool all the purchasing orders based on an information system. The committee was responsible for negotiation with suppliers on behalf of all the network members.

The *co-distribution* strategy was to reduce cost, to enlarge the EOS, and to increase efficiency in distribution, delivery and transport. All the stores could make their orders directly via the IT system, which were then pooled, and the orders placed with suppliers in the distribution centre.

The *co-marketing* strategy was to offer a variety of products and services for customers. They organize a co-marketing expertise team, responsible for creating and initiating joint campaigns. The team also selected product items for promotion and co-marketing activities.

The *chain-store co-management* strategy was to decrease operating costs, to increase sales profits and growth rate, to improve product layout and management, and to enhance chain-store staffs' capabilities. Similarly, they formed an expertise team responsible for mentoring and coaching various types of chain-store activities.

The *integrated information system* was designed to support the cooperative strategies and to manage joint programmes efficiently. Benefiting from the integrated information system, network members could not only control expenditure on hardware and software, but also access accurate and timely information.

In this period, competition was no longer the dominant force, and cooperation emerged as a stronger force, showing the *interconnected opposites*. The focal company and rival partners identified five cooperative areas, whereas they kept on competing in the marketplace other than the common areas.

Market commonality and resource similarity. Although competitors compete in the same geographic marketplace, they cooperate because of encountering similar market situations and resource constraints. Both resource heterogeneity and homogeneity can explain cooperation with competitors. With resource homogeneity, horizontal alliances involve the exchange, sharing or co-development of products, technologies or services among firms engaged at the same stage in the value chain (Gimeno, 2004). However, resource heterogeneity can foster cooperation, while unique resources can be advantageous for both

cooperation and competition (Bengtsson and Kock, 2000). In this period, the five cooperative areas were driven by resource similarity and asymmetry among partners.

Resource similarity among rival partners provides the opportunity for sharing more common activities of procurement, food processing, warehouse, transport and distribution. These are all important collaborative areas to enlarge the EOS and to reduce costs. In addition, joint HR programmes not only improve employees' skills and knowledge, but also enlarge the scale of HR training and development.

From a resource asymmetry perspective, the focal firm is characterized as R&D focused, particularly in agricultural pesticide residue testing. This advantage was shared with its partners. In addition, the focal firm used to be a powerful member of the supermarket industrial association and held a key position in designing the IT standardization, which made a fundamental base for cooperation strategies.

Performance

The research sought to answer two specific questions concerning the benefits of cooperation with competitors, these were:

- Whether the adoption of coepetition permits the attainment of performance levels beyond those possible with the conventional approach to competition and cooperation.
- Whether the adoption of coepetition merely changes the timeframe permitting the earlier achievement of higher performance levels.

Addressing the two questions above necessarily involved the analysis of trends and changes in the performance data over the 15-year period. To remove subjectivity, the data were initially analysed from a mathematical standpoint alone without reference to cause. If the first proposition were correct, an accelerated rate of improvement in the indicators would be seen. If the second proposition were correct, the nature of change would be such that extrapolated improvements from before network formation would eventually catch up with what actually occurred.

Although there were three distinct time periods, pre-network, network formation and post-network formation, it would be wrong to assume that the data should be analysed on that basis. In

Table 1. Characteristics of polynomial trend lines

	Order = 1	Order = 2	Order = 3
Mean of the R ² figures	0.8428	0.9268	0.9755
Standard deviation of the R ² figures	0.1854	0.0864	0.0266

order to look for patterns in the data, it was necessary to determine the trends in 31 performance measurements. Non-linear regression analysis was undertaken using polynomial best fit. As there were five longitudinal data points for each factor, polynomials of order 4 could always be found that would fit the data perfectly. However, lower-order polynomials were sought, since they are less prone to Runge's phenomena (Boyd, 2005), and will reduce the impact of rogue data and conform to the spirit of Occam's razor (Domingos, 1999). Furthermore, the data come from a longitudinal study, with each point, to an extent, dependent on the previous points through the causality of management. Thus, for several orders of polynomial, R² and, in the manner of 'studentized' residuals, the standard deviation in R² for the 31 data streams were also taken. Table 1 shows the data and that it is correct to analyse the data further using a third-order polynomial function.

Depending on the subject of the individual data streams, four types of curves are possible, two that show decreases, such as in costs, and two that show increases, such as in variety. These are illustrated in Figure 2 and are called 'Increasing Type 1', 'Increasing Type 2', 'Decreasing Type 1' and 'Decreasing Type 2'.

Figures 3–6 show the types and trend lines for all the indicators. In the diagrams and in the results presented later, each data stream is plotted with its initial point at 1. Since the experimental data were collected for the most part based on a percentage change between performance at one time and performance at another, there is no absolute starting value. To overcome this, a starting value of 1 was set arbitrarily, and the performance changes expressed relative to 1. The x-axis shows the changes in strategies over the period of the study. The changes are spaced to correspond with the dates at which those changes occurred.

Each performance attribute has an expected profile. For example, in the absence of other

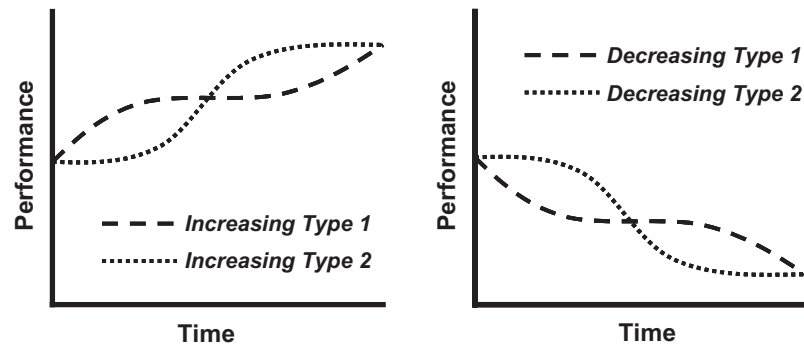


Figure 2. Generic curve types for third-order polynomial trend lines

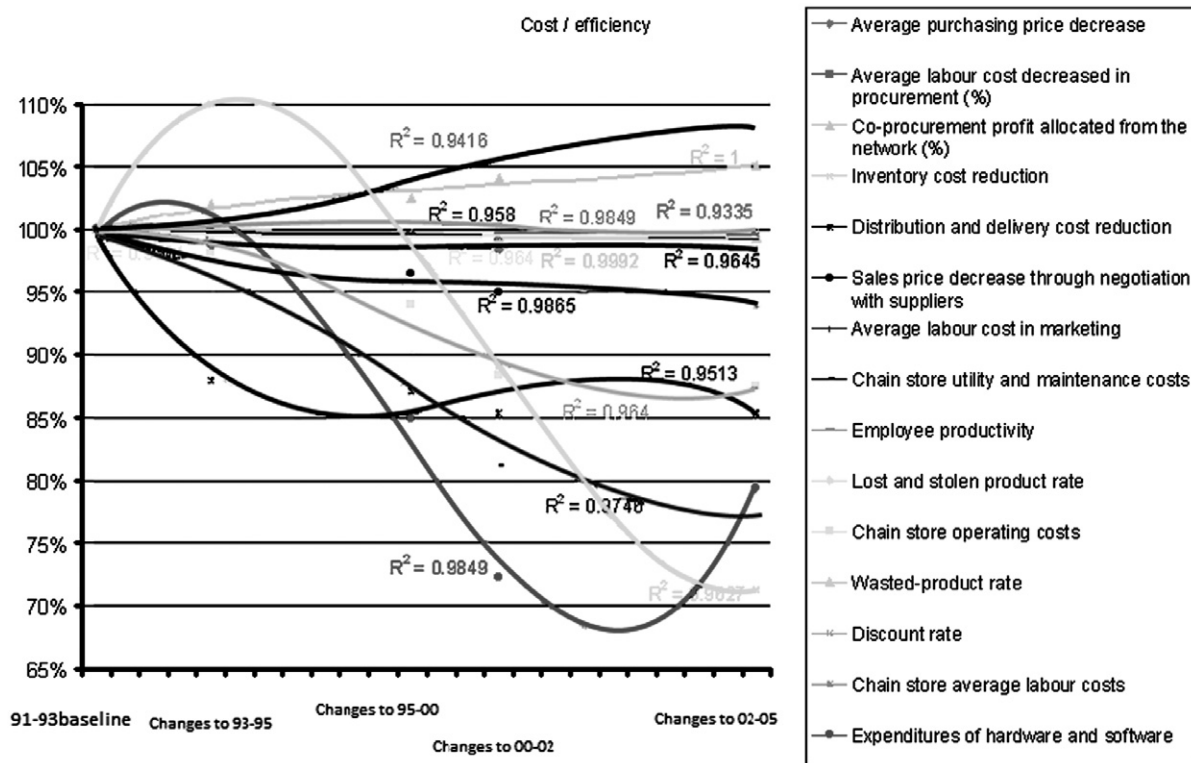


Figure 3. Cooperative performance for the cost/efficiency group

factors, it was expected that staff productivity would increase over time, as continuous but relatively minor improvements were made to processes. The adoption of cooperation can be seen as a major improvement in processes and could be expected to make a disproportionately large change in productivity. There are two scenarios that need exploration and which cover the results for the majority of the indicators. The first is that the adoption of cooperation permits the attainment of performance levels beyond those possible

with the conventional approach to competition and cooperation; the second is that the adoption of cooperation merely changes the timeframe permitting the earlier achievement of higher performance levels.

The case for the attainment of performance levels beyond what would otherwise have been possible is typified by the Type 1 profiles, where there is an early transition from the first section of the curve to the second section in which the gradient is small. This equates to stagnation in

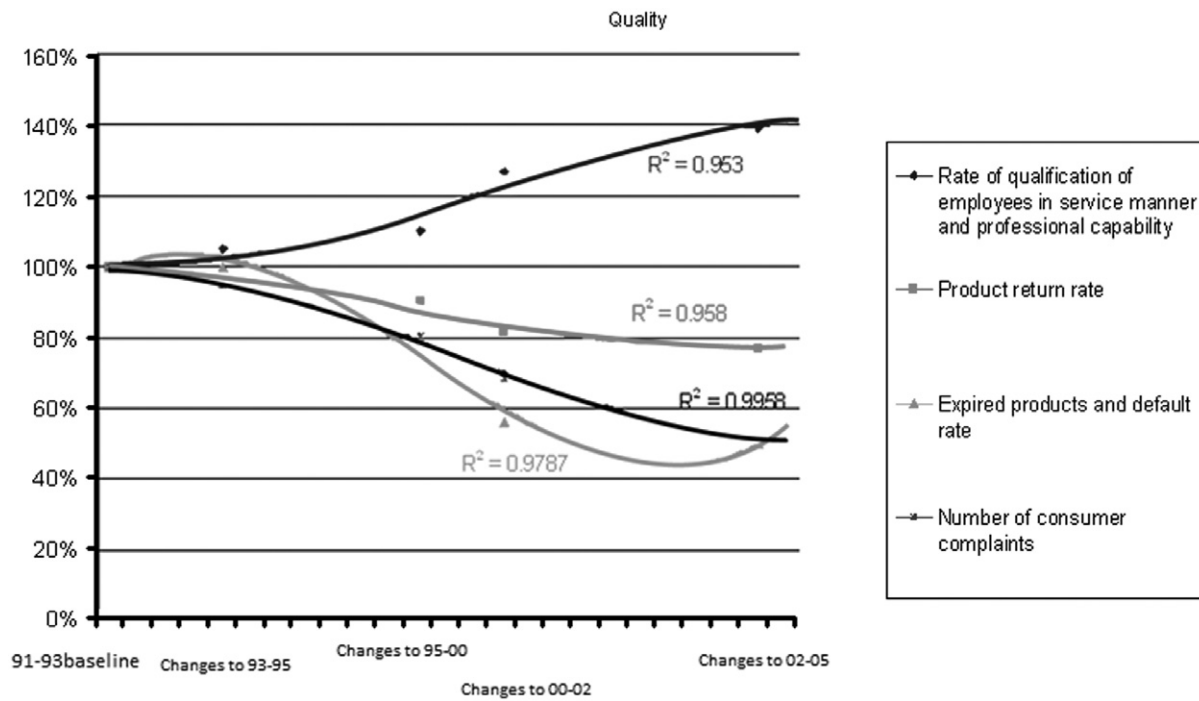


Figure 4. Cooperative performance for the quality group

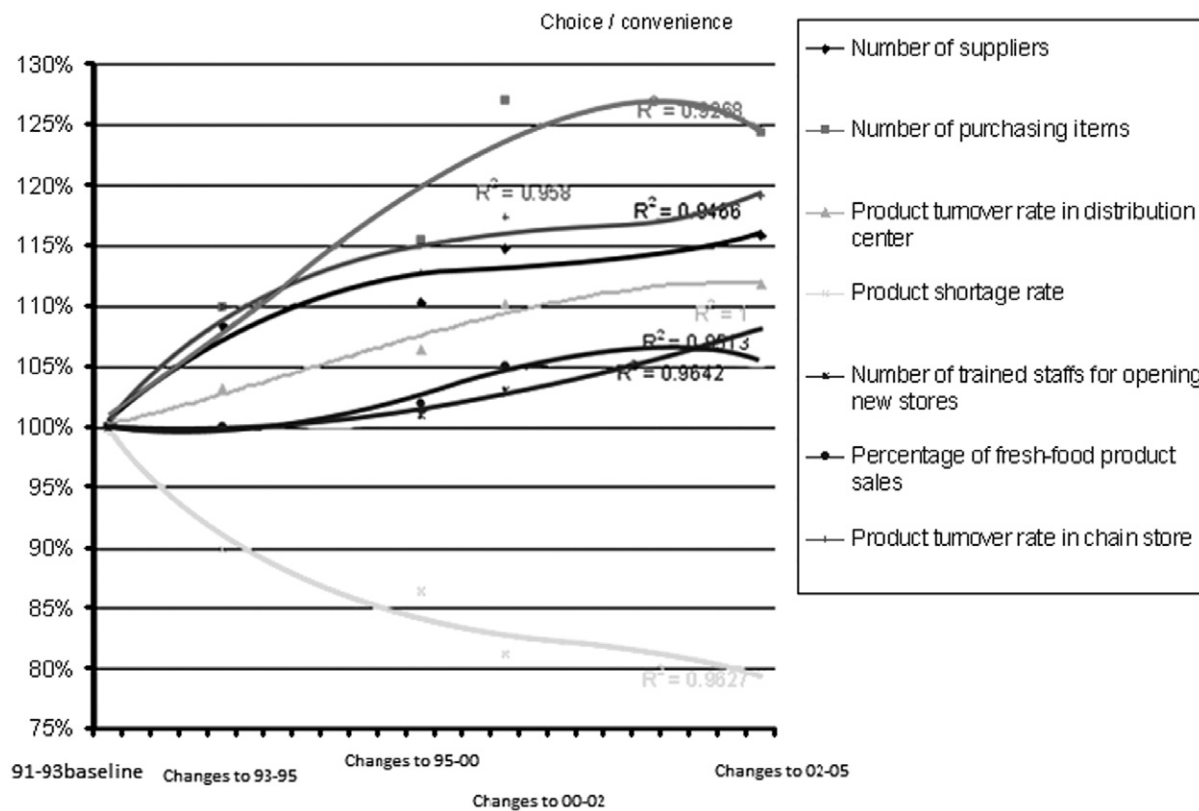


Figure 5. Cooperative performance for the choice/convenience group

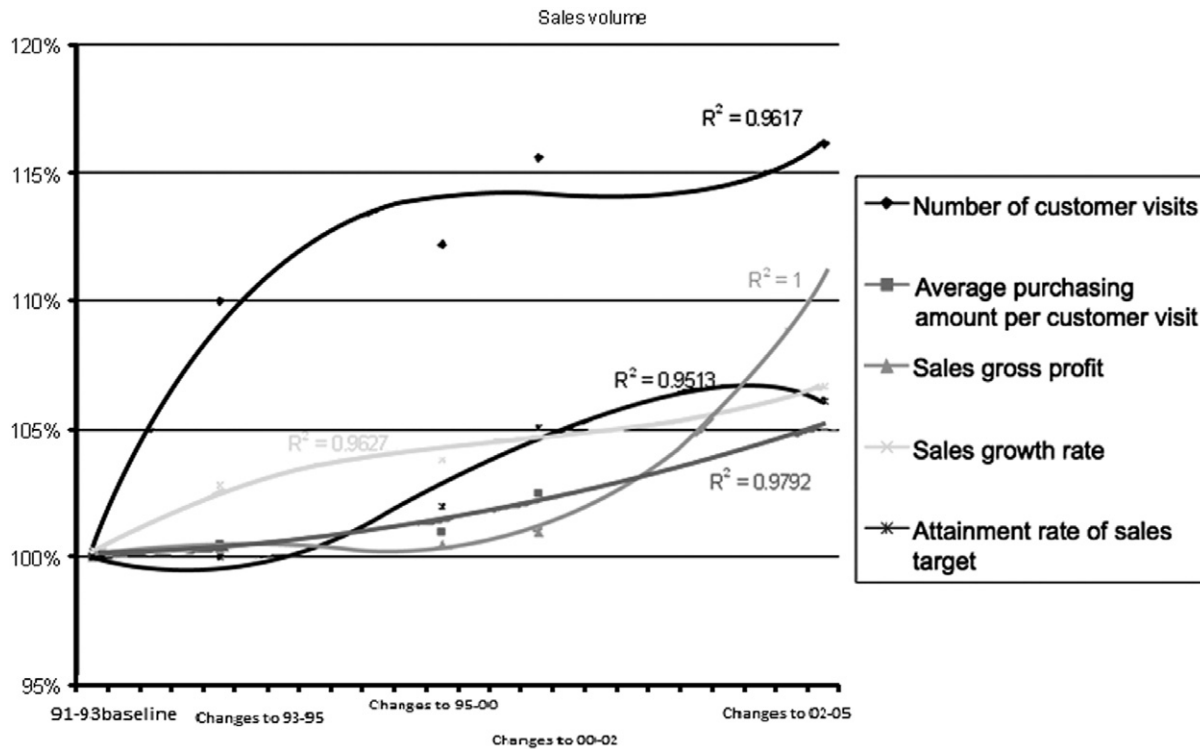


Figure 6. Cooperative performance for the sales volume group

performance levels. The final section of the regression curve then takes performance to the levels beyond those otherwise obtainable. The condition for this is that the first turning point, calculated from its first derivative, is less than average and corresponds to a time at or before the instigation of the coopetition arrangements.

The case for the early attainment of expected performance is a feature of Type 2 profiles only. Here, low gradients early in the study period, if produced, would yield similar performance levels to those achieved with coopetition, but at a later date. The time difference is calculated by producing a linear regression based on the first three points and finding the last point of intersection with the polynomial regression line.

With such a diverse set of measurements and subsequent grouping by strategic area or category, it is impossible to take any one group and give a general appreciation of the changes in performance levels. Instead, all that can be done is to treat measurements separately. For Decreasing Type 1 and Increasing Type 1 behaviours, Table 2 sets out the measure, its behaviour between 1991 and 1995, and compares this with the correspond-

ing data at 2000 and between 2000 and 2005. Note that the sign of the second derivative of the regression curve shows whether a maximum or a minimum has been encountered. From Table 2 it can be seen that the rate of change in the indicators was slowing down towards the end of the pre-network stage, but that the trend of improvements had in general been reinstated by the end of the network formation stage.

For Decreasing Type 2 and Increasing Type 2 behaviours, Table 3 sets out the same data as shown in Table 2, but in addition the comments column also contains an estimate of when (if ever) the pre-coopetition performance would have matched the performance with coopetition. It should be noted that, while a third-order polynomial regression curve has been used, it is unwise to extend predictions much beyond the data and dates shown. The reason for this is that there are many exogenous factors which are unknown and would affect the results. Thus to the results presented should be added the caveat that exogenous factors, while present, are ignored. From Table 3 it can be seen that the instigation of the coopetition network has led both to changes in rates

Table 2. Description of the behaviours of Type 1 performance curves

Measure	Performance 1992–1995	2nd derivative at 1995	2nd derivative at 2000	Performance 2000–2005	Comment
Average purchase price	Declining slowly	Upturn	Downturn	Level	Purchase prices had been declining, but showed an unwanted upturn in 1995. Post-cooperation, the increasing profile had levelled off
Average labour cost decreased in procurement	Declining slowly	Upturn	Downturn	Decreasing	Labour costs in procurement had been declining, but showed an unwanted upturn in 1995. Post-cooperation, the decreasing profile had resumed
Co-procurement profit allocated from the network	Increasing	Downturn	Upturn	Increasing	By 1995, the level of network profits was slowing, but post-cooperation had resumed their upward profile
Number of suppliers	Increasing	Downturn	Downturn	Increasing	While still increasing, the rate of supplier increase continues to slow. There are a finite number of suppliers
Distribution and delivery cost reduction	Decreasing	Upturn	Unchanged	Increase	Efficiency increases had run out by 1995, but cost reduction is increasing post-cooperation
Sales price decrease through negotiation with suppliers based on cost pricing	Decreasing	Upturn	Unchanged	Decreasing	The rate of sales price decrease was slowing, but cooperation appears to have halted the decline
Average labour cost in marketing	Decreasing	Upturn	Downturn	Decreasing	The decline in labour costs was slowing in 1995, but post-cooperation they have stabilized on a decrease
Number of customer visits	Increasing	Downturn	Downturn	Increasing	Throughout the period, the rate of increase in customer visits has slowed – see later for spend/visit
Lost and stolen product rate	Decreasing	Upturn	Unchanged	Level	The lost and stolen rate levels off through the period
Chain-store average labour costs	Decreasing	Upturn	Unchanged	Decreasing	Labour costs appeared to be levelling out, but continued down at a reduced rate post-cooperation
Product shortage rate	Decreasing	Upturn	Upturn	Decreasing	Throughout the period, the rate of shortages has continued to decrease but at a decreasing rate
Product turnover rate in chain store	Increasing	Downturn	Unchanged	Increasing	The turnover rate appeared to be levelling off, but post-cooperation has maintained the increase
Gross sales profit	Decreasing	Upturn	Upturn	Increasing	Gross profit was declining pre-cooperation but may have been levelling; it is now increasing
Sales growth rate	Increasing	Downturn	Upturn	Increasing	Sales growth was levelling off pre-cooperation, but is now an increase has been re-established

Table 3. Description of the behaviours of Type 2 performance curves

Measure	Performance 1991–1995	2nd derivative at 1995	2nd derivative at 2000	Performance 2000–2005	Comment	Time (Years)
Number of purchasing items	Increasing	Upturn	Downturn	Increasing	Choice had begun to increase more strongly with cooperation, but the rate of increase has now slackened. Equivalent to a 0.5 year advantage	0.5
Inventory cost reduction	Level	Downturn	Upturn	Decreasing	Inventory costs had been rising, but decreased during cooperation and have since steadied on a downward path	3.5
Product turnover rate in distribution centre	Increasing	Upturn	Downturn	Increasing	The turnover rate increased strongly during cooperation formation and has resumed the previous rate	1.5
Average purchasing amount per customer visit	Increasing	Upturn	Unchanged	Increasing	The amount spent per customer increased strongly during cooperation formation and continues to grow strongly	4.75
Chain-store utility and maintenance costs	Decreasing	Downturn	Unchanged	Decreasing	Cooperation has led to reduced maintenance costs, and the rate of decrease has been maintained	1.5
Employee productivity	Increasing	Upturn	Downturn	Increasing	The already increasing productivity was further increased by cooperation, but the rate has slackened, but is still above pre-cooperation	3.75
Chain-store operating costs	Decreasing	Downturn	Upturn	Decreasing	Cooperation has resulted in a downward step in the cost of opening stores	1.75
Wasted-product rate	Decreasing	Downturn	Upturn	Decreasing	Cooperation has resulted in a downward step in the waste rate.	2.5
Discount rate	Increasing	Downturn	Downturn	Decreasing	Despite the upturn around 2000, the down rate has increased	3.5
Rate of qualification of employees in service manner and professional capability	Increasing	Upturn	Downturn	Increasing	The discount rate was increasing, but through cooperation has first levelled and is now decreasing to the benefit of profit	3
Product return rate	Decreasing	Downturn	Upturn	Decreasing	Despite the recent slowdown, the rate post-cooperation is still well in excess of the pre-cooperation level	2
Expired products and default rate	Decreasing	Downturn	Upturn	Decreasing	Despite the recent slowdown, the rate of product return post-cooperation is still well in below of the pre-cooperation level	2.5
Number of trained staffs for opening new stores	Increasing	Upturn	Upturn	Increasing	The current rate of returns is below the pre-cooperation rate, and the formation of the network has put a down-step in the profile	7.5
Percentage of fresh-food-product sales	Increasing	Upturn	Unchanged	Increasing	The ability to open new stores has continued to increase and is doing so much more strongly post-cooperation	3.25
Attainment rate of sales targets	Increasing	Increasing	Unchanged	Increasing	Although strongly dependent on exogenous factors, cooperation has increased the ability to sell and the volume of sales	3
Expenditures on hardware and software	Decreasing	Downturn	Upturn	Decreasing	Although dependent on the targets set, there has been an increasing ability to meet the targets set post-cooperation	2
Number of consumer complaints	Decreasing	Downturn	Upturn	Decreasing	Cooperation has led to a downward step in the expenditure necessary on both hardware and software	3
					Cooperation has led to a downward step in the number of complaints received. The final rate is lower than the pre-cooperation rate	

of improvement and to a step change in value. On average, this is equivalent to a three-year advancement in performance.

The results of 31 performance indicators by analysing their Increasing Type 1 and Type 2, and Decreasing Type 1 and Type 2 behaviour confirms that cooperation with competitors did lead to better performance at least in a period of time in the following ways: (1) adoption of cooptation permits the attainment of performance levels beyond what would otherwise have been possible; (2) adoption of cooptation changes the timeframe permitting the earlier achievement of higher performance. On average, the time advantage was three years, but ranged from 6 months to 7½ years; and (3) adopting cooptation can reinvigorate performance improvement when indicators show pre-network performance improvements to be slowing down.

Discussion and implications

By investigating a focal company and its cooptation network, this study describes the dynamics and performance from the focal firm's perspective. We found that firms benefited from cooptation. We also discuss how market commonality and resource similarity can be used to explain competition-cooperation dynamics.

The presence of competition dynamics demonstrates that, in the pre-network period, the focal company cooperated with vertical but not horizontal partners, owing to competition. The competitive advantages obtained from vertical cooperation further attract small-scale competitors to join the network. The cooperative scale was enlarged by collaboration between the focal firm and its small competitors, which then in turn forced the large competitor to cooperate in the next period. Previous study on the competitive dynamic (e.g. Chen, Su and Tsai, 2007) asserts that relative scale is one of the important contingent variables affecting firms' action-response strategies. The greater the relative scale, the greater the perceived competitive tension. Large-scale firms are more likely to initiate massive attacks on their rivals. Here, we extend their argument from competitive dynamics towards cooptation dynamics. We argue that, while the major competitor perceived competitive tension from the enlarged collective scale constituted by the

focal firm and its smaller rivals, X Supermarket reacted not by launching head-on attacks, but by cooperating with competitors. This demonstrates the importance of keeping strategic balance between rivals. Under intensive competitive tension, instead of competing to the dead end, cooperation is obviously a better strategy to keep balance and to stay alive for both parties. This phenomenon reflects the *Yin–Yang* philosophy in Ancient Chinese culture, in which the coexistence of *Yin* and *Yang* is the core ontological statement. *Yin* (cooperation) and *Yang* (competition) are reciprocally rooted in and mutually promoted by each other, unlike polar eastern thinking in which patterns such as good or bad are predominant. What we observed in this case shows that competition triggers cooperation between the focal company and its vertical partners and small competitors, enlarging the collaborative scale, which then escalates competitive tension between the focal firm and its major competitor. This tension further triggers the major competitor to react by cooperation rather than head-on competition. As the traditional *Yin–Yang* philosophy suggests, opposites define and are defined by each other. Any action or relationship may contain the seeds of its opposite. A competitive action may elicit a cooperative response, and similarly, cooperation will often provoke competition, demonstrating an array of competition-cooperation interplays (Chen, 2008, p. 299). We therefore derive the first implication.

Implication 1: Competition and cooperation are mutually rooted in and promoted by each other. Cooperation increases the relative scale of market power, resulting in higher intensive competition. Conversely, intensive competition fosters more cooperation between rivals.

In the post-network-formation period, the cooptation dynamics moves from balancing market power between rivals toward balancing strategies between competition and cooperation. Despite the ongoing competitive battles, competitors work together to find common areas for cooperation. Chen, Su and Tsai (2007) indicate that two major opponents would experience greater competitive tension if they relied on similar resources for operation. We argue that the greater the dependence on the same resources for both opponents, the greater the possibility of cooperation and coordination for resource sharing, because

they are both confronted with similar resource constraints. The best partner for a firm is its strong competitor in many cases (Inkpen and Tsang, 2005). In this case, by cooperating with a strong competitor, the focal company and its rivals not only can maintain both their market power and position, but also can initiate organizational change by pooling and sharing resources from competitors. However, in the circumstance of cooperation, the balance between competition and cooperation becomes a more significant and challenging strategic issue. Here competitors' coordination of common cooperative areas leads to the strategies for balancing competition and cooperation, which is fostered by the prior cooperative experiences and balancing market power between rivals. The analysis of 15 years' performance demonstrates how the focal firm can maintain a temporary balance between competition and cooperation to generate better performance in the short term.

This reflects the interaction between *Yin* and *Yang*, which concerns the dynamic balance between two forces. Accordance to *I-Ching: Book of Changes*,¹ sustainability could never be forever, but can exist only in a certain period of time. Here, we argue that the change between cooperation (*Yin*) and competition (*Yang*) concerns the temporary or dynamic balance and harmony. It appears that there is always a new equilibrium point where cooperation will work, at least for a period, until the dynamics are disrupted again by other endogenous and exogenous forces (Peng and Bourne, 2009). The results of this case confirm that a firm can achieve better performance in the short term by using a temporary cooperation strategy and maintaining a balance in the changes between competition and cooperation. Thus, we can derive a second implication.

Implication 2: Coopetition strategy and balancing competition and cooperation lead to better performance in a certain period by (a) permitting the attainment of performance levels beyond what would have been possible; (b) changing the timeframe permitting the earlier achievement of higher performance.

¹This book has been translated by James Legge (1814–1897); Legge (1966).

Conclusions

Coopetition has attracted more attention from both practice and research. This study explores a series of temporary or dynamic strategies between 1991 and 2005 to reveal the temporary change and advantage of cooperating with competitors. The results based on the analysis of 15 years' performance confirm that cooperation with competitors leads to better performance than would have been expected. Our findings imply that competition and cooperation are mutually rooted in and promoted by each other. Cooperation increases the relative scale of market power, resulting in higher intensive competition. Conversely, intensive competition fosters more cooperation between rivals. We also found that coopetition strategy leads to better performance at least for a certain period. Cooperating with competitors can permit the attainment of performance levels beyond what would have been possible, by changing the timeframe to permit the earlier achievement of higher performance, and by reinvigorating performance improvement when indicators show that pre-network performance improvements are slowing down. However, our findings have evoked two critical issues.

First, does cooperation with competitors involve anti-competitive policy issues? When competitors collaborate mainly for price-discriminating behaviours, it is considered a collusive problem, because coopetition breaks the perfect competition model and thus hinders consumers' benefits (Levin and McDonald, 2006). However, the proliferation of coopetition challenges the anti-competitive policy. Coopetition could be beneficial to consumers through lowering costs and improving the value of market offerings (Levin and McDonald, 2006). Coopetition in price-discriminating conducts is problematic, but coopetition in R&D and technological innovation may not be problematic, because it is likely to help bring unique products and create new markets for consumers (Gnyawali and Park, 2009). Here, what we observed is that cooperation between competitors focuses on value creation rather than on collusion. They cooperate in the activities of co-procurement, co-marketing, co-distribution, chain-store co-management and integrated information systems to create value for customers by lowering costs, increasing efficiency, improving quality and providing convenience and choices. However, they remain in inter-store competition

in variety of goods offerings, price, customer services and geographic coverage. Therefore, in this study, competition triggers vertical cooperation, which enhances the focal company's value creation, which then escalates competitive tension between the focal firm and rivals. This tension further evokes rivals to react by cooperation for joint value creation rather than pricing collusion. Thus, coopetition in this supermarket setting does not violate the antitrust issue, but is more beneficial to customers.

Second, are performance changes accountable to coopetition only? Key benefits of coopetition include a pooling of expertise and resources to create synergy, to enlarge the economies of scale, to reduce cost and risk, to develop products and deliver better services by learning and working together. In this study, the 14 top managers together chose 31 performance measures in five key cooperative areas. These indicators are considered very important and relevant to gauge the performance of cooperation with competitors. The reasoning behind picking these measures (as described earlier) is based on the strategic goals of the cooperative areas. However, we found that coopetition did lead to better firm-level performance. There must be other contingencies or strategic activities that are responsible for firm-level performance changes across time. This reflects that the motivation and benefit of the engagement in alliances is to acquire external resources and to combine them with internal resources in order to gain competitive advantages, therefore generating firm performance. Thus, coopetition might not be the only factor accounting for better performance, but it did influence a firm's resource combination and synergy acceleration to the attainment of superior performance.

As an extension to previous research on coopetition, this research contributes to current research in both theoretical and practical ways. Theoretically, this study provides a scrutinized review of recent research on coopetition regarding three veins, from which we derived the implications and proposed a framework to analyse the phenomenon. The analysis of coopetition dynamics and performance and the discussions based on Chinese *Yin–Yang* philosophy has derived two implications which extend our knowledge of coopetition. Practically, this study demonstrates the evolutionary picture of coopetition dynamics and examines the performance by multidimensional

measurement. This practice-oriented study provides rich data and a reference for executives to understand the coopetition benefits and to gauge coopetition performance. However, the study is also limited, and the need for further research remains.

First, trade-offs are inevitable in data disclosure. This study does not disclose the absolute performance figures for each year, but uses data related to the changes between each pair of adjacent time-frames, because it is necessary to preserve confidentiality. In addition, deciding how to measure performance across networks rather than within organizations is a substantial issue in performance measurement (Neely, 2005). This study examines only the performance of the focal company and not those of the other partner companies. Future research may also determine the nature of coopetition at different levels, such as intra-organizational, dyadic level and network level.

Second, given the complex nature of coopetition, the field research method is useful for determining coopetition performance (Ketchen, Snow and Hoover, 2004). This research is exploratory. However, we do not intend to generalize the findings. The goal of this study is more limited and is confined to demonstrating how coopetition works and how to know it works well in practice.

Lastly, some issues related to coopetition merit further research. These include determining the nature of any drawbacks in coopetition. Despite the proliferation of coopetition in practice, previous research has shown that coopetition is detrimental to performance. For example, cooperation with competitors in a JV has a significant chance of failure (Park and Russo, 1996). There are dark sides of coopetition, such as technological risks, management challenges and loss of control (Gnyawali and Park, 2009). Therefore, future research should examine not only the positive influence, but also the negative effects on performance.

As far as the coopetition strategy is concerned, this study answered the question: is cooperation with competitors a good idea? We argue that, while there may be even better strategies to follow, coopetition is a good idea in practice. Cooperation with competitors generates a temporary improvement in performance, at least for a certain period. This study uses a rich and in-depth database, contributing a more complete exploration and explanation for coopetition in both practice and research.

Appendix A: Recent empirical research on competition

Author(s)	Main concept	Theoretical focus	Research approach	Research setting	Unit of analysis	Findings
Park and Russo (1996)	<ul style="list-style-type: none"> To examine the predictors of joint venture failure The outcome of joint venture between direct competitors 	Transaction cost theory	Quantitative study by archival data	204 joint ventures in the electronics industry between 1979 and 1988	Firm (JV)	<ul style="list-style-type: none"> Cooperation with competitor in a joint venture is significantly more likely to fail
Bengtsson and Kock (1999)	<ul style="list-style-type: none"> Proposing four types of horizontal relationships between competitors in networks 	Social embeddedness	Case study by primary data	16 interviewees in the lining industry and 10 in the rack and pinion industry	Firm/industry	<ul style="list-style-type: none"> A firm can be involved in four different types of horizontal relationships at the same time, including coexistence, cooperation, competition and cooperation A relationship between competitors can change over time Competitors cooperate with activities far from the customer and compete in activities close to the customer Heterogeneity in resources, closeness of an activity to the customer, competitors' position and the connectedness between them, conflict and consensus about organizational goals influence the cooperation between competitors Competing partners are more likely to reorganize or take over link alliances than scale alliances Link alliances and scale alliances are equally likely to dissolve at similar ages Link alliances lead to greater levels of learning and capability acquisition than do scale alliances
Bengtsson and Kock (2000)	<ul style="list-style-type: none"> To examine competition in business networks How the competition and cooperation can be divided and managed 	<ul style="list-style-type: none"> RBV Social embeddedness Conflict management 	Explorative case study by primary data	21 interviewees from the lining industry, brewery industry, and dairy industry	Firm/industry	<ul style="list-style-type: none"> Competitors cooperate with activities far from the customer and compete in activities close to the customer Heterogeneity in resources, closeness of an activity to the customer, competitors' position and the connectedness between them, conflict and consensus about organizational goals influence the cooperation between competitors Competing partners are more likely to reorganize or take over link alliances than scale alliances Link alliances and scale alliances are equally likely to dissolve at similar ages Link alliances lead to greater levels of learning and capability acquisition than do scale alliances
Dussauge, Garrette and Mitchell (2000)	<ul style="list-style-type: none"> To examine two types of competitor alliances (link and scale) and their effects on alliance outcome (reorganize, takeover, continue and dissolve) 	<ul style="list-style-type: none"> RBV Evolutionary perspective 	Secondary source: industry reports, manufacturer associations' publications, and journals	227 alliances formed in a range of manufacturing industries (automobiles, aerospace, and telecommunications/electronics) from North America, Western Europe, or Asia	Alliance	<ul style="list-style-type: none"> Competitors cooperate with activities far from the customer and compete in activities close to the customer Heterogeneity in resources, closeness of an activity to the customer, competitors' position and the connectedness between them, conflict and consensus about organizational goals influence the cooperation between competitors Competing partners are more likely to reorganize or take over link alliances than scale alliances Link alliances and scale alliances are equally likely to dissolve at similar ages Link alliances lead to greater levels of learning and capability acquisition than do scale alliances

Appendix A: Continued

Author(s)	Main concept	Theoretical focus	Research approach	Research setting	Unit of analysis	Findings
Silverman and Baum (2002)	<ul style="list-style-type: none"> To examine the effects of a focal firm's rivals' alliances, and its rival partners' alliances, on patterns of firm survival 	<ul style="list-style-type: none"> Competitive dynamics Transaction cost theory RBV 	Quantitative study by archival data	613 biotechnology firms between 1991 and 1996	Firm	<ul style="list-style-type: none"> Rivals' alliances are often, but not always, harmful to a focal firm Rivals' downstream alliances increase a firm's exit rate less than their upstream alliances. Rivals' upstream alliances increase a firm's exit rate less than their horizontal alliances
Oum <i>et al.</i> (2004)	<ul style="list-style-type: none"> To examine the effect of horizontal alliances on firm productivity and profitability 	<ul style="list-style-type: none"> Resource dependency Organizational learning Market power Transaction cost theory 	Quantitative study by secondary source: ICAO Annual Report	22 airlines with 108 horizontal alliances	Alliance	<ul style="list-style-type: none"> Horizontal alliances are positively associated with firm productivity but have no significant impact on profitability The level of cooperation strengthens the effect of horizontal alliances on both productivity and profitability
Gimeno (2004)	<ul style="list-style-type: none"> To examine indirect, third-party competitive influence on alliance formation and partner selection 	<ul style="list-style-type: none"> Network perspective Competitive dynamics 	Quantitative study by archival data	67 international airlines between 1994 and 1998	Alliance (dyad)	<ul style="list-style-type: none"> The effects of competitive embeddedness on alliance formation are contingent upon the level of cospecialization of alliances Cospecialized alliances by rivals may involve exclusivity, precluding alliances with the rival partners and thus encouraging countervailing alliances Non-specialized alliances are less exclusive and are used when rivals share the same partners
Madhavan, Gnyawali and He (2004)	<ul style="list-style-type: none"> How prevalent is triadic structure in competitor alliance network? What factors determine firms' likelihood of engaging in transitive triads? To distinguish competitive motive from cooperative motive 	<ul style="list-style-type: none"> Network structure 	Quantitative study by archival data	45 global steel producers entering into 72 alliances between 1979 and 1994	Triad	<ul style="list-style-type: none"> Firms have a tendency to form transitive triads with both regional and technology blocks Competitive motive triads can be observed in technology blocks, while cooperative motive triads can be observed in geographic blocks

Appendix A: Continued

Author(s)	Main concept	Theoretical focus	Research approach	Research setting	Unit of analysis	Findings
Gnyawali, He and Madhavan (2006)	<ul style="list-style-type: none"> How cooperation, centrality, and structural autonomy affect firm's competitive behaviour 	<ul style="list-style-type: none"> Network structure Competitive dynamics 	Quantitative study by archival data	45 global steel producers up to and including 1995	Firm	<ul style="list-style-type: none"> Highly central and structural autonomous firms tend to be more competitively active and versatile Firms with higher market diversity benefit more from structural positions in the cooperative network
Luo, Stotegraaf and Pan (2006)	<ul style="list-style-type: none"> To examine the association between cross-functional cooperation and performance and whether this association is mediated by market learning 	<ul style="list-style-type: none"> Social embeddedness 	Survey by primary data	163 firms with 326 informants in China	Intra-organizational	<ul style="list-style-type: none"> Cross-functional cooperation has a positive and significant effect on customer performance and on financial performance Market learning mediates the influence of cross-functional cooperation on performance Competitor alliance (CA) activities and competitor orientation (CO) have both financial advantage (ROE) and dark sides CA intensity has an inverted U-shaped relationship to firm's ROE CO strategies have positive effect on ROE and also strengthen the relationship between CA intensity and ROE CO objectives have negative effect on ROE and also weaken the relationship between CA intensity and ROE
Luo, Rindfleisch and Tse (2007)	<ul style="list-style-type: none"> To examine the effect of competitor alliances on financial performance 		Survey and archival data	228 firms in the US covering a wide variety of industries 159 firms in the computer industry	Firm	<ul style="list-style-type: none"> Competitor alliance (CA) activities and competitor orientation (CO) have both financial advantage (ROE) and dark sides CA intensity has an inverted U-shaped relationship to firm's ROE CO strategies have positive effect on ROE and also strengthen the relationship between CA intensity and ROE CO objectives have negative effect on ROE and also weaken the relationship between CA intensity and ROE
Chin, Chan and Lam (2008)	<ul style="list-style-type: none"> The success factors for competition strategy 	<ul style="list-style-type: none"> Cooperation 	Survey by primary data and expert interview	149 firms in Hong Kong manufacturing industry and 6 experts interviewees	Firm	<ul style="list-style-type: none"> Cooperation success factors include three categories: management commitment, relationship development and communication management, which are composed of 7 factors and 17 sub-factors

Appendix A: Continued

Author(s)	Main concept	Theoretical focus	Research approach	Research setting	Unit of analysis	Findings
Barretta (2008)	<ul style="list-style-type: none"> The determinants of competition in a network of healthcare trusts To examine the actual competitive relationships, cooperative relationships, and the interaction between the competitive and cooperative stimuli 	<ul style="list-style-type: none"> Coopetition 	Case study by interview	Interviews with general managers of 4 Tuscan healthcare Trusts	network	<ul style="list-style-type: none"> PPS Financial mechanism was the main cause of conflict among trusts Inter-trust cooperation is necessary in guaranteeing more effect service provision
Peng and Bourne (2009)	<ul style="list-style-type: none"> To examine the simultaneous competition and cooperation between networks 	<ul style="list-style-type: none"> Network structure RBV 	Case study by primary data	2 healthcare networks	network	<ul style="list-style-type: none"> Two organizations will compete and cooperate simultaneously when each organization has complementary but distinctly different sets of resources and when the field of competition is distinctly separate from the field of cooperation Two networks will find it easier to balance competition and cooperation when each network has compatible but distinctly different structures
Kim and Parkhe (2009)	<ul style="list-style-type: none"> The effects of competing similarity and cooperating similarity on alliance performance The moderating effect of relational efforts on the relationship between cooperating similarity and alliance performance 	<ul style="list-style-type: none"> Coopetition 	Survey by primary data	70 global strategic alliances	Specific GSA	<ul style="list-style-type: none"> Competing similarity has a significant negative effect on performance Corporate culture and management practice of cooperating similarity have positive effects on performance Training programme has moderating effect on the correlation between cooperating similarity and performance

Appendix B: Recent non-empirical research on cooperation

Author(s)	Main concept	Theoretical focus	Proposals/findings
Lado, Boyd and Hanlon (1997)	<ul style="list-style-type: none"> • A syncretic model of competition and cooperation • How firms generate economic rents through a four-cell typology of rent-seeking behaviours 	<ul style="list-style-type: none"> • RBV • Game theory • Socio-economics 	<ul style="list-style-type: none"> • Firms that exhibit syncretic rent-seeking behaviour will achieve sustained superior performance relative to those that predominantly emphasize competitive rivalry (competitive rent-seeking), cooperative strategies (collaborative rent-seeking), or monopolistic rent-seeking • Managerial cognitive systems that emphasize variety (or heterogeneity), embrace conflict, and promote organizational renewal will more likely engender syncretic rent-seeking behaviour compared to those that emphasize homogeneity, eschew tensions, and promote stability • Firms that maintain balanced investments in stocks of internalized, relational, and market resources will be more likely to engage in syncretic rent-seeking behaviours compared to those that invest disproportionately in one of those resource sets. In turn, investments in these resource stocks will engender syncretic rent-seeking behaviour
Khanna, Gulati and Nohria (1998)	<ul style="list-style-type: none"> • How tension between simultaneously competition and cooperation affects the dynamics of learning alliances 	<ul style="list-style-type: none"> • Alliance learning dynamics • RBV 	<ul style="list-style-type: none"> • Alliances with different ratios of private and common benefits are likely to exhibit different optimal resource allocation patterns • A higher ratio of private to common benefits leads to more competitive behaviours
Park and Ungson (2001)	<ul style="list-style-type: none"> • A conceptual framework of alliance (cooperation with competitors) failure 	<ul style="list-style-type: none"> • TCE • Game theory • RBV • Agency theory 	<ul style="list-style-type: none"> • Alliances with strong rivalry and high managerial complexity are more likely to fail • Cooperation with competitors is difficult to develop a trust-based relationship, to create an efficient governance structure, to share knowledge and skills, to resolve organizational dissimilarities, to manage cooperative process, and to develop coherent strategy
Gnyawali and Madhavan (2001)	<ul style="list-style-type: none"> • A multilevel model of how the structural network properties influence competitive dynamics 	<ul style="list-style-type: none"> • Structural embeddedness perspective • Competitive dynamics 	<ul style="list-style-type: none"> • The centrality, structural autonomy, and structural equivalence of a focal firm increases a firm's action likelihood and response likelihood • The network density increases any firm's action likelihood and response likelihood • The network density will weaken (a) the positive relationship between centrality and action likelihood and (b) the negative relationship between centrality and response likelihood • The network density will strengthen (a) the positive relationship between structural autonomy and action likelihood and (b) the negative relationship between structural autonomy and response likelihood • The network density will weaken (a) the negative relationship between structural equivalence and action likelihood and (b) the positive relationship between structural equivalence and response likelihood

Appendix B: Continued

Author(s)	Main concept	Theoretical focus	Proposals/findings
Zeng and Chen (2003)	<ul style="list-style-type: none"> The mix motives of competition and cooperation A framework of partner dynamics 	<ul style="list-style-type: none"> Social dilemma 	<ul style="list-style-type: none"> Some forces lead to more cooperate: (1) Large difference between the payoff for universal cooperation and the payoff for universal defection. (2) Low threat of greed or fear. (3) High level of communication among partners. (4) A high impact of contribution on alliance success. (6) A long-term goal within the alliance. (7) Partners' better understanding the social dilemma nature. (8) More partners use the reciprocity principle in interactions Some factors lead to less cooperate: (1) A competitive rather than a cooperative norm within the alliance. (2) A low level of identification with the alliance Greater market power can be attained through cooperative strategies Cooperation between firms permits resources pooling and organizational learning Cooperation and competition are inherent in the interdependent partner relationship within strategic alliances. Neither of the opposites can be removed from the game Cooperation is fortified by the coexistence of market commonality and resource asymmetry between global competitors. Market commonality contributes more to competition whereas resource asymmetry contributes more to cooperation The competitive and cooperative element mix is not static but rather dynamic in response to changing parameters in both external and internal environments Competition-cooperation relationships can be depicted as three generic conceptions: independent opposites, interrelated opposites and all-inclusive interdependent opposites 'Independent opposites' (<i>two</i>) represents a commonly view that competition and cooperation are independent, even irreconcilable, opposites In the 'interrelated opposites' (<i>win</i>), the individual forces of competition and cooperation are connected in such a way that they may influence each other and shape the nature of competition (or cooperation) between firms 'Interdependent opposites' (<i>both</i>) encompasses all possible situations of interfirm dynamic, in which competition and cooperation together form the union of the two, implying inseparable interdependent element that together form a whole
Clarke-Hill, Li and Davies (2003)	<ul style="list-style-type: none"> The paradox of cooperation and competition in strategic alliances 	<ul style="list-style-type: none"> Strategic positioning RBV Game theory 	
Luo (2007)	<ul style="list-style-type: none"> A framework to analyse the rationality, behaviour, evolution, and tactics of cooperation for MNEs in global competition 	<ul style="list-style-type: none"> Competitive dynamic MNE management 	
Chen (2008)	<ul style="list-style-type: none"> A transparadox framework for transcending the competition-cooperation paradox by converging the western and eastern thoughts 	<ul style="list-style-type: none"> Transparadox perspective Chinese 'middle way' perspective <i>Yin/Yang</i> philosophy 	

Appendix B: Continued

Author(s)	Main concept	Theoretical focus	Proposals/findings
Gnyawali and Park (2009)	<ul style="list-style-type: none"> A conceptual model of competition for technological innovation in SMEs 	<ul style="list-style-type: none"> RBV Game theory Network theory 	<ul style="list-style-type: none"> SMEs with short product life cycle, technological convergence and high R&D cost are more likely to engage in cooperation SMEs with strong technological capabilities, complementary resources and technologies, and similar or overlapping resources are more likely to collaborate with competitors The benefits of SMEs' cooperation are: to achieve economies of scale, to reduce uncertainty and risks, and to speed up the product development process The dark sides of SMEs' cooperation are: technological risks, management challenges, and loss of control Cooperation increases value-creation potential in innovation because of the common knowledge base concerning markets and technologies Cooperation decreases value-appropriation potential because of the competitive pressure in the markets
Ritala and Hurmelinna-Laukkanen (2009)	<ul style="list-style-type: none"> A conceptual model of innovation-related competition and the contingent factors on value creation and value appropriation 	<ul style="list-style-type: none"> RBV Game theory TCE Network theory 	

Appendix C: Informants list and interview inputs

Company	Position title	Interview (frequency)	Interview (time hours)
Sinon Supermarket	CEO	10	30
Shen Ching Supermarket	Board Chairman	10	30
X Supermarket	Vice CEO	10	30
Ji Ji Lung Supermarket	Store Manager	10	30
Sinon Catering Division	CEO	2	4
Jia Jia Fu Supermarket	Board Chairman	10	30
E. Corporation, Ltd (Sinon's supplier)	General Manager	4	8
W. Food Corporation, Ltd (Sinon's supplier)	General Manager	4	8
Sinon Agricultural Pesticide Supply Center	CEO	4	8
Knowledge & Service Information Co., Ltd	CEO	2	6
A. Information Technology Company	Deputy Chief of Inspector	2	10
G. Information Technology Company	Group Leader	3	6
Zen-Nippon Shokuhin Co., Ltd (Japan)	Minister (CEO)	2	8
Retail Consulting Organization for Strategic Marketing & Operation Inc. (Japan)	Board director	2	12
Total		75	220

Appendix D: Performance indicators picked by five cooperative strategies and four groups

	Cost/efficiency	Quality	Choice/convenience	Sales volume
Co-procurement	<ul style="list-style-type: none"> • Average purchasing price decreased • Average labour cost in <i>procurement</i> • Co-procurement profit allocated from the network • Inventory cost • Distribution and delivery cost • Sales price through negotiation with suppliers based on cost pricing • Average labour cost in <i>marketing</i> 		<ul style="list-style-type: none"> • Number of suppliers • Number of purchasing items 	
Co-distribution			<ul style="list-style-type: none"> • Product turnover rate in <i>distribution centre</i> 	
Co-marketing				<ul style="list-style-type: none"> • Number of customer visits • Average purchasing amount per customer visit • Sales gross profit • Sales growth rate • Attainment rate of sales target
Chain-store co-management	<ul style="list-style-type: none"> • Chain-store utility and maintenance cost • Employee productivity • Lost and stolen product rate • Chain-store operating cost • Wasted-product rate • Discount rate • Chain-store average labour cost • Expenditures of hardware and software 	<ul style="list-style-type: none"> • Rate of qualified employee's examination in service manner and professional capability • Product returned rate • Expired products and default rate • Number of consumer complaints 	<ul style="list-style-type: none"> • Product shortage rate • Number of trained staffs for opening new stores • Percentage of fresh-food-product sales • Product turnover rate in <i>chain store</i> 	
IT				

Appendix E: Performance changes between timeframes

Performance indicators	% Difference between 1993–1995 and 1991–1993	% Difference between 1995–2000 and 1993–1995	% Difference between 2000–2002 and 1995–2000	% Difference between 2002–2005 and 2000–2002
Cost/efficiency				
Average purchasing price decreased	-1.20	-0.10	-0.20	-0.10
Average labour cost in procurement	-0.40	0	-0.10	0
Co-procurement profit allocated from the network	2	0.50	1.50	1
Inventory cost	10	-10	-10	-20
Distribution and delivery cost	-12	-1	-2	0
Sales price through negotiation with suppliers based on cost pricing	-3	-0.50	-1.50	-1.00
Average labour cost in <i>marketing</i>	-0.30	-0.10	-0.10	-0.20
Chain-store utility and maintenance cost	-5	-5	-10	-5
Employee productivity	1	2	3	2
Lost and stolen product rate	-0.50	0	-0.10	0
Chain-store operating cost	-2	-4	-6	-1
Wasted-product rate	-0.10	-0.20	-0.30	-0.10
Discount rate	0.80	-0.20	-0.30	-0.10
Chain-store average labour cost	-0.30	-0.10	-0.10	-0.10
Expenditures of hardware and software	0	-15	-15	10
Quality				
Rate of qualification of employee's examination in service manner and professional capability	5	5	15	10
Product return rate	-5	-5	-10	-5
Expired products and default rate	0	-20	-30	-10
Number of consumer complaints	-5	-15	-15	-25
Choice/convenience				
Number of suppliers	8.50	1.70	4	1
Number of purchasing items	10	5	10	-2
Product turnover rate in distribution centre	3.30	3.10	3.50	1.50
Product shortage rate	-10	-4	-6	-2
Number of trained staffs for opening new stores	0	1	2	5
Percentage of fresh-food-product sales	0	2	3	0.50
Product turnover rate in chain store	10	2.60	4	1.50
Sales volume				
Number of customer visits	10	2	3	0.50
Average purchasing amount per customer visit	0.50	0.50	1.50	2.50
Gross sales profit	0.30	0.20	0.50	10
Sales growth rate	2.80	1.00	1.20	1.50
Attainment rate of sales target	0	2	3	1

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