Dynamics of supply chain relationships:

A qualitative study of logistics triads

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Abstract

In recent years, a growing number of organizations have outsourced logistics services to logistics services providers (LSPs). Consequently, the outcome of logistics outsourcing is significant in determining the outcome of contemporary supply chains. To account for greater interconnection between organizations, supply chain relationship is crucial for achieving successful logistics outsourcing. Because organizations need to continuously change their decision-making in outsourcing, relationships among organizations in outsourcing are dynamic. Further, because logistics outsourcing has created more SCRs among suppliers, LSPs, and customers, managers need to use a network perspective to manage multiple relationships in the process of outsourcing. The triadic relationship is recognized as the smallest network structure. Researchers have therefore suggested that studying triadic relationships can help expand the knowledge of managing network structures in supply chains. As a result, the primary goal of this research is to study dynamics of supply chain relationships in logistics outsourcing from a view of triadic relationship. This relationship is called a logistics triad and consists of a supplier, a logistics service provider (LSP), and their common customer.

Balance theory is a theory that was specifically developed for studying triadic relationships. Balance theory has been used in this thesis as a theoretical lens to develop a conceptual framework and research propositions in order to study logistics triads. Because only a few supply chain studies have adopted balance theory so far, there is a lack of a well-designed research instrument to investigate the research target that the present study explores. To rectify this paucity, qualitative research was conducted using multiple case studies to explore why and how a logistics triad transitions between different triadic relationship structures.

The present research was carried out in two stages. The first stage collected triadic cases from LSPs. To improve validity and reliability, the second stage used a deductive process to test findings of the first stage by collecting triadic cases from suppliers and customers. Results of the comparison between the two stages provided verified research findings because the two stages exhibited close similarity.

In stage one, the findings indicate that balance theory on its own is insufficient to explain the stability and dynamics of logistics triads. This led to the identification of factors that influenced the relationship dynamics in logistics triads. Among these factors, the combined effects of purchasing volumes, resource capability, and focal firm can override influences from other factors to determine stability and dynamics of logistics triads. The influence from the focal firm demonstrates

that the supply network model is more useful than balance theory to study logistics triads.

Overall, this thesis makes four major contributions to the knowledge of supply chain relationships: developing an integrative model of triadic relationship dynamics, identifying control approaches used by organizations to dominate triads, comparison between balance theory and supply network model, and demonstrating organizations' mediating effects on dyadic relationships within triads.

Glossary of terms in this thesis

To help reader follow this thesis, this section defines a number of terms that are used in the present study. In comparison with other studies, some major terms in this thesis may show different ideas or meanings because research backgrounds are different between the present study and previous studies.

Buyer power, supply power, power game, buyer dominance, and supplier dominance

In a typical dyadic relationship between one customer and one supplier, the customer can obtain *buyer power* from what they purchase from the supplier; while the supplier can obtain *supply power* from what they offer to the customer (Cox, 2001a; Sanderson, 2001). Either the customer or the supplier intends to control the other in the relationship (Petersen, Handfield, Lawson, & Cousins, 2008). They use power against each other. This phenomenon is called *power game*. When buyer power is greater than supply power, the customer shows *buyer dominance* to control the development of relationship. On the other hand, the supplier shows *supplier dominance* to control the relationship (Svahn & Westerlund 2007; Watson, 2001).

Independence and interdependency

When a customer and a supplier cannot significantly influence each other's business and profits, they do not show any interest in using power for controlling each other in a dyadic relationship. Accordingly, they show *independence* in the relationship (Doran, Thomas, & Caldwell, 2005). On the other hand, when a customer and a supplier are significant to each other in a dyad, their power is equal and they show *interdependence.* In this situation, they need to manage their relationship cooperatively (Cox, 1999; Watson, 2001).

Organization's attitude

Two people's attitude toward each other can influence their interpersonal relationships in a triadic relationship (Heider, 1958). Similarly, although organizations build SCRs according to business strategy, their attitudes can also

influence business relationships in a triadic relationship structure (Eggert, Henseler & Hollmann, 2012; Wu & Choi, 2005). This attitude is called *organizational attitude* or organization's attitude in the present study.

Inter-organizational triad

A traditional inter-organizational relationship means a dyadic relationship between two organizations (Choi & Wu, 2009c). To distinguish dyadic and network structures, Biermann (2008) indicates that a network formed by a number of organizations can be called an inter-organizational network. To study logistics triads in the present study, this thesis uses the *inter-organizational triad* to represent relationships among three organizations.

Embedded organizations and embedded dyads

All organizations in an inter-organization triad are called *embedded organizations* in this thesis. The dyadic relationships between these embedded organizations are called *embedded dyads*.

Power asymmetry

In a triadic relationship, three organizations have their own power. When their powers are not even, the power game among three organizations shows asymmetry in the triad (Bastl, Johnson & Choi, 2013; Caplow, 1956). This phenomenon is called *power asymmetry*.

Coalition and collective power

When organizations show power asymmetry in a triad, under pressure from one powerful organization, the other two organizations may ally with each other. This is called *coalition.* Two allied organizations combine their power against the powerful organization. The combined power is called *collective power* (Bastl et al., 2013; Wilson, 1996).

Focal firm and non-focal firm

Previous studies have identified that a network usually has one organization that can control other organizations and manage relationships between other organizations (Harland & Knight, 2001; Valkokari & Helander, 2007). This organization is called the leading organization, or focal firm, or centre firm in different network studies (Borgatti & Li, 2009; Buechel & Buskens, 2013). For consistency in the present study, the term *focal firm* is used. Other organizations controlled by the focal firm in a triad are called the *non-focal firms*.

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Chapter One: Introduction

1.1 Background

Beginning in the early 1990s, organizations faced difficult choices about how to provide cheap and fast supply chain services to customers (Stank & Daugherty, 1997). In this situation, logistics is a critical function to determine the organization's ability to survive in competition (Selviaridis & Spring, 2007). As many organizations lack strong logistics capability, a growing number of organizations have outsourced logistics services to professional companies (Halldorsson & Skjott-Larsen, 2004). These professional companies are called *logistics service providers (LSPs)* and this kind of outsourcing is called *logistics outsourcing* (van Laarhoven, Berglund & Peters, 2000).

Extant studies indicate that supply chain management (SCM) can be identified as a meaningful extension of logistics management (Bartels, 2006; Helmick, 2000). As a result, logistics outsourcing can be seen as a representative and simplified process of a supply chain. By outsourcing logistics services to LSPs, organizations can focus on their core competences and fulfil customers' requirements for a responsive delivery process at the same time (Marasco, 2008). Therefore, the outcome of logistics outsourcing is important in determining the outcome of contemporary supply chains (Bhatnagar & Viswanathan, 2000). Logistics outsourcing has highlighted the significance of relationship management in supply chains because suppliers and logistics service providers (LSPs) need to work together to serve customers (Sheen & Tai, 2006). As a result, the role of supply chain relationship (SCR) is crucial in determining outcomes of logistics outsourcing (Bowersox, Closs & Cooper, 2007; Lieb & Randall, 1996).

It is rare to see a static market because market uncertainty is unpredictable (Ellram, 1991). In this situation, organizations need to continuously change their decision-making in outsourcing (Dev, Swami & Caprihan, 2010). Accordingly, relationships among organizations in outsourcing are dynamic not static (Parker & Russell, 2004).

1.2 Importance of relationship dynamics

In logistics outsourcing, suppliers, LSPs, and customers can all change their strategy according to market uncertainty (Vinay, Kannan, & Sasikumar, 2009). Consequently, all organizations have difficulty in maintaining relationships without any change at all (Zineldin, 2002). Organizations should continuously assess whether they need to keep existing relationships, or enhance the relationships, or disconnect relationships to find new partners (Sawhney & Zabin, 2002). In this situation, managing development and change of supply chain relationships is crucial for all organizations in logistics outsourcing. This is why the present study will investigate logistics outsourcing by studying relationship dynamics.

Additionally, compared to the traditional supply chains, logistics outsourcing has created more SCRs among suppliers, LSPs, and customers (Chen, Goan, & Huang, 2011). All these SCRs can be dynamic. Further, because suppliers, LSPs, and customers have direct communications in logistics outsourcing, their SCRs can connect to form a network. With the development of modern SCM, many studies have also indicated the significance of network structure in managing SCRs (Holmen Aune, & Pedersen, 2013).

1.3 Significance of network structure

A network structure usually includes three or more organizations and multiple dyadic SCRs among these organizations (Harland, Lamming, Zheng & Johnsen, 2001). Figure 1.1 illustrates a simplified supply chain network formed by a number of organizations. The organizations are represented as the nodes in the figure, while the solid lines between organizations represent their direct relationships. The dotted line indicates that organization A in a network can mediate its indirect relationship that connects another two organizations B and C. This kind of mediating effect is a major difference between dyadic relationship structure and network structure (Choi & Wu, 2009b).
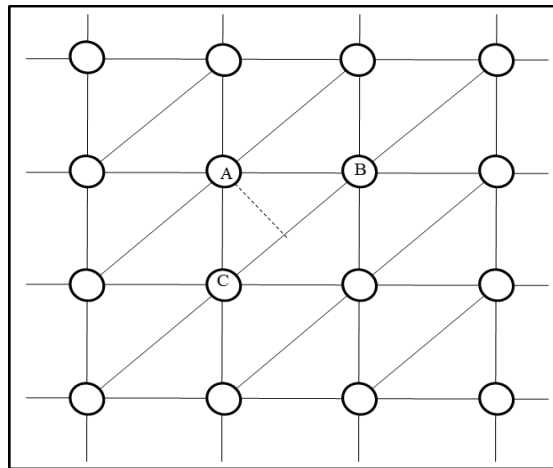
Figure 1.1: Simplified supply chain network and triadic relationship
(Source: Childerhouse, Luo, Basnet, Ahn, Lee & Vossen, 2013)

However, it is difficult to investigate a large number of organizations in supply chain networks in one piece of research (Dubois & Fredriksson, 2008). The solution to this problem leads to the study of triadic relationships. Therefore, researchers indicate that the triadic SCRs are significant to any further developments in supply chain networks in recent years (van der Valk & van Iwaarden, 2011; Wu, Choi & Rungtusanatham, 2010).

1.3.1 Triadic relationship structure

Simmel (1950) indicates that the triadic relationship is the simplest structure to help investigate the organizations and their dyadic links from a network perspective. Each triad contains three embedded dyadic relationships between three organizations (Nooteboom, 2006). Compared to other network structures, it is feasible to simultaneously study a sample triad formed by three organizations A, B, C, and three direct relationships between them. Further, as explained above, A can mediate the development of the dyad between B and C. This indicates that each organization is able to show a mediating effect to influence its indirect relationship in a triad (Wu et al., 2010).

In contrast, a dyadic relationship contains only two organizations and one direct link. Because of the lack of consideration of influences from other organizations in the same network, a dyadic relationship only focuses on how the two organizations interact with each other (Dubois, 2009). On the other hand, a triad includes three organizations, three direct connections between the organizations

and three indirect connections which imply the mediating roles of the organizations (Cartwright & Harary, 1956; Fawcett & Clinton, 1997). The influence from the mediating organization can be twofold: fostering a tight connection, or encouraging an arm's-length link between the other two organizations. The study of triadic relationships can explain the complexity of a network, while the view of dyadic relationships cannot (Choi & Wu, 2009c).

1.3.2 Triadic relationship in logistics outsourcing

The basic network of logistics outsourcing is also a triadic relationship structure which includes a supplier, an LSP, and their common customer (Gotzamani, Longinidis & Vouzas, 2010). This triad is called *logistics triad*.

The logistics triad is selected for the present study for two reasons. Firstly, a supply chain should include upstream suppliers and downstream customers (Chen & Paulraj, 2004; Mohanty & Deshmukh, 2009).

Another reason concerns differences between dyadic and triadic SCRs in logistics outsourcing. Although previous studies have investigated supply chains beyond dyadic relationships, they still separate rather than combine these dyads (Holmen et al., 2013; Wilhelm, 2011). In a logistics triad, besides the direct dyads among three organizations, each organization may influence the dyad between the other two organizations. For example, when the supplier introduces the LSP to the customer, if the LSP's performance and service quality are higher than the customer's expectation, the customer can offer rewards to the supplier and the LSP. In this situation, the supplier and the LSP tend to develop a closer relationship to enhance performance thereby serving the customer better to ensure long term business with the customer in the future (Liu, Xu, Li, Wang, & Wu, 2012).

Overall, concerning the characteristics of triadic relationship structure, the present study investigates supply chain relationships in logistics triads. Based on the significance of triadic relationship structure and the importance of relationship dynamics, the next section will introduce the research goal of the present study.

1.4 Research goal

Although previous studies have investigated logistics outsourcing, relationship dynamics, and triadic relationship structure extensively (Bhatnagar & Teo, 2009; Lieb, Millen & Van Wassenhove, 1993; Spekman, Kamauff & Myhr, 1998), little research has highlighted the connection among these areas. In this situation, organizations lack understanding about how to manage logistic outsourcing effectively in a network structure when they need to change supply chain relationships with partners (Lambert & Cooper, 2000). Consequently, LSPs have difficulty delivering services quickly. Suppliers are also challenged to fully satisfy customers' requirements. As a result, customers have difficulty finding high quality products and services. To solve these problems, the present study explores the knowledge of relationship dynamics in logistics outsourcing from the perspective of triadic supply chain relationships. Therefore:

> *the research goal is to investigate the evolution of relationships in logistics triads.*

In order to achieve the goal, the present study has been conducted in New Zealand (NZ) for several reasons, explained in the next section.

1.5 New Zealand location

The first reason concerns the convenience of collecting data. The researcher lives in the country, making it easier to collect information from organizations based there rather than from other countries.

The second reason relates to the business context of NZ. The NZ economy relies heavily on its exporting and importing businesses (Statistics New Zealand, 2008, 2009). From 2010 to 2012, both exporting and importing volumes exhibited gradual growth (Statistics New Zealand, 2010, 2011, 2012). The key difference between NZ importing and exporting products is the profit margin (Mollenkopf & Dapiran, 2005; Sankaran & Luxton, 2003). Most exported products are raw materials or semi-finished products where the profit margins are low (McAdam & McCormack, 2001). Because NZ organizations do not carry out manufacturing on a large scale, the imported goods, such as high-tech machinery and highly processed products, accrue significant costs (Statistics New Zealand, 2010-2012).

This situation indicates that NZ lacks business innovation in manufacturing industries.

Further, a majority of NZ organizations are SMEs with low levels of capital available to undertake innovation (Beverland, 2005; Birchfield, 2002; Myers, 2003). In businesses with low profit margins and low innovation, a great number of NZ organizations outsource logistics services to LSPs for focusing on their core competency and saving total costs (Campbell & Sankaran, 2005; Chopra & Meindl, 2007; Mollenkopf & Dapiran, 2005). Therefore, to ensure their profits, managing logistics outsourcing properly in supply chains is crucial for NZ organizations (Bohehme, Ma, Childerhouse, Corner, Seuring & Basnet, 2007; Mollenkopf & Dapiran, 2005). As logistics outsourcing includes multiple SCRs among organizations, NZ organizations need to know how to manage logistics outsourcing properly from a network perspective. As a result, studying logistics triads in NZ is worthwhile for NZ organizations to manage logistics outsourcing effectively.

For the two reasons explained above, research participants would be selected from NZ-based organizations.

1.6 Research methodology

A qualitative research method (multiple case studies) has been adopted in this research. The study conducted data collection and analysis to identify and verify research findings in two continuous stages. In the first stage, all data was collected from NZ-based LSPs. In order to triangulate the research findings from the first stage, additional data was collected in the second stage from suppliers and customers in NZ. Details of the research processes are described in Chapter Three (research methodology). The verified research findings from the two stages have brought both theoretical and empirical contributions to the management of relationship dynamics in logistics triads.

1.7 Thesis outline

Chapter Two reviews literature regarding logistics outsourcing, dynamics of supply chain relationships, triadic network structure, and balance theory to develop research questions, research propositions, and conceptual framework.

Chapter Three selects research methodology for the present study through reviewing and comparing studies of different research methodologies.

Chapter Four analyses data collected from LSPs. By testing collected logistics triads against research propositions and conceptual framework, this chapter identifies some limitations of balance theory in studying inter-organizational triads.

Data analysis in Chapter Five identifies significant influential factors that show combined effects to help organizations in managing relationship dynamics in logistics triads.

Chapter Six analyses the logistics triads collected from suppliers and customers to compare research findings between the two research stages. Because of close similarities between the two stages, the present study argues that all logistics triads are heavily affected by the combined effects of several influential factors. In addition, the supply network model is shown to be more effective than balance theory to explain the dynamics in logistics triads.

Chapter Seven discusses the limitations of balance theory. The combined effects of influential factors are also compared with previous studies. Results of the discussion are combined to develop an integrative model to explain the stability and dynamics of logistics triads.

Chapter Eight concludes this thesis by offering original theoretical contributions and empirical contributions. The research strengths and limitations are also addressed. Future research directions are proposed in the last section of this chapter.

1.8 Publications from this thesis

Following publications are based on the current research.

1: Childerhouse, P., Luo, W., Basnet, C., Ahn, H. J., Lee, H., & Vossen, G. (2013). Evolution of inter-firm relationships: A study of supplier-logistical services provider-customer triads. *International Journal of Industrial Engineering*, *20*(1/2), 126-140.

2: Luo, W. (2012). Dynamics of triadic relationships in logistics outsourcing context. Paper presented at 16th *Annual Waikato Management School Student Research Conference*. Hamilton, New Zealand.

Chapter Two: Literature Review

2.1 Preview

This chapter will review literature regarding logistics outsourcing, relationship dynamics, and networks. It is organized into six sections. The first section reviews studies relating to logistics outsourcing. This section will also highlight why relationship dynamics and network structures in logistics outsourcing are studied. The second section introduces different types of SCRs, the origins of relationship dynamics, and influential factors in SCRs. Further, this section compares previous network studies, presents the trend of studying triadic relationships, and introduces power games in supply chain triads. In order to select an appropriate theoretical lens for conducting the present study, the third section compares management theories that have been used in supply chain context. After comparison, the selected theory is reviewed in the fourth section. Based on the selected theory, research propositions and framework are developed in the fifth section. This chapter ends with the sixth section that combines research gaps, propositions, and framework to develop research questions for addressing the research goal that have been identified in the introductory chapter.

2.2 Logistics outsourcing

2.2.1 Defining logistics outsourcing

Logistics outsourcing is interchanged with other terms: third party logistics and logistics alliance (Marasco, 2008). Logistics outsourcing can be defined in various ways according to different research focuses: logistics services, relationship management, process in outsourcing, operations management, and performances measurement (Halldorsson & Skjott-Larsen, 2004; Vinay, Kannan, & Sasikumar, 2009). Therefore, it is difficult to find a standard definition for logistics outsourcing. However, there are some common characteristics of logistics outsourcing:

> [t]he use of external companies to perform logistics functions that
> have traditionally been performed within an organization. The

functions performed by the third party can encompass the entire logistics process or selected activities within that process. (Lieb et al., 1993)

LSPs, suppliers, and final customers in process of logistics outsourcing should provide enough top management support to work with each other. (Berglund, van Laarhoven, Sharman & Wandel, 1999)

Through joint effort, all organizations should share certain risks and benefits to make a long term win-win situation in their relationships. (Marasco, 2008; Skjoett-Larsen, 2000)

Based on these common characteristics, previous logistics outsourcing studies focus on four categories of research (see Figure 2.1). The first category studies why organizations need to outsource logistics service by comparing the pros and cons of outsourcing logistics services. After organizations make the decision to outsource, the second category investigates how to select proper LSPs according to different criteria. Once selected, the LSP and the customer need to work together to manage relationships for achieving successful logistics outsourcing to benefit both sides. This is the focus of the third category. The final category studies logistics outsourcing from a broad supply chain view. The four interconnected categories indicate the significance of logistics outsourcing in supply chain management. They are reviewed in detail in the following sections.
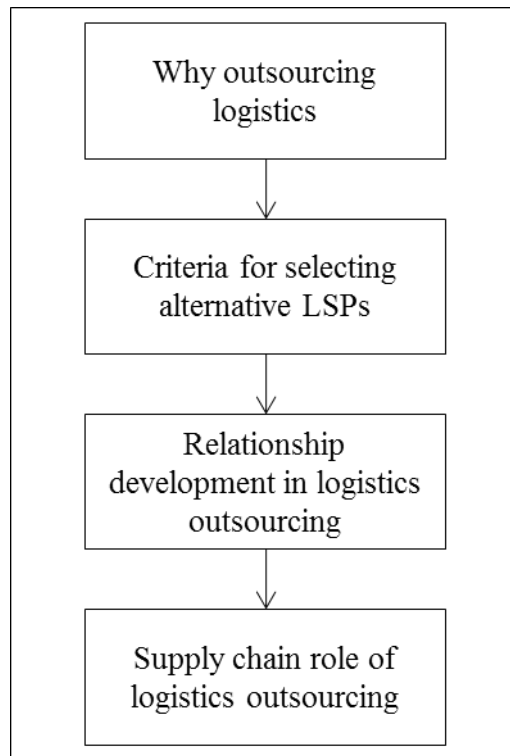
Figure 2.1: Existing research on logistics outsourcing

2.2.2 Reasons for logistics outsourcing

A large number of studies have assessed the benefits and risks of logistics outsourcing (Chen, Goan, & Huang, 2011; Bolumole, Frankel & Naslund, 2007). There are nine benefits frequently mentioned:

- Save total logistics cost (Chu & Wang, 2012; Selviaridis, Spring, Profillidis & Botzoris, 2008; Tsai, Liao & Han, 2008);

- Customers can focus on their core competency (Li, Li, Jin, Wang & Wang, 2012; Selviaridis & Spring, 2007);

- Enhance customer service level (Lai, Chu, Wang & Fan, 2013; Selviaridis et al., 2008; Sohail, Bhatnagar & Sohal, 2006);

- Improve return on asset and reduce fixed cost for infrastructure (Hofer, Knemeyer & Dresner , 2009; Marasco, 2008; Selviaridis & Spring, 2007);

- Increase inventory turnover rate and decrease inventory cost (Bhatnagar & Viswanathan, 2000; Xu & Wang, 2013);

- Improve productivity and efficiency through shortened lead time, order cycle, and access to professional skills (Sheen & Tai, 2006; Solakivi, Toyli, Engblom & Ojala, 2011);

- Run flexible operations (Arroyo, Gaytan & Luitzen, 2006; Liu, Xu, Li, Wang & Wu, 2012; Selviaridis et al., 2008);

- Obtain sophisticated technology and expertise with lower cost (Sahay & Ramneesh, 2006; Srabotic & Ruzzier, 2012); and

- Gain chances to access new markets (Juga, Juntunen & Grant, 2010; Sahay & Ramneesh, 2006).

Compared to benefits, previous studies have also presented a few drawbacks regarding outsourcing logistics to LSPs:

- Lose control of outsourcing activities (Lau & Zhang, 2006; Tsai, Lai, Lloyd & Lin, 2012);

- Lose responsiveness to the change of customer requirements (Beaumont & Sohal, 2004; Hilletofth & Hilmola, 2010);

- LSPs can not 100 per cent ensure the cost reduction and excellent customer service because of limited resources and lack of experienced skills (Beaumont & Sohal, 2004; Gonzalez, Gasco & Llopis, 2005; Lai, Tian & Huo, 2012);

- Logistics functions are not in-house, so customers need more energy and resource to manage relationships with selected LSPs (Chen, Tian, Ellinger & Daugherty, 2010; Gibson & Cook, 2001; Gonzalez et al., 2005); and

- Logistics outsourcing may inhibit the expertise and skills development of in-house capability (Chen et al., 2011; Razzaque & Sheng, 1998).

In conclusion, customers should consider both the pros and cons of logistics outsourcing before they go further. After they are sure that outsourcing can bring more benefits than potential risks, they start to consider assessing alternative LSPs and selecting the most appropriate. Consequently, the second category of research focuses on addressing criteria for selecting LSPs.

2.2.3 Criteria for LSP selection

In the early 1990s, cost and financial issues were taken as the most critical criteria in logistics outsourcing (Sheen & Tai, 2006). After 2001, more studies highlighted the significance of information technology, service level, and responsiveness (Chu

& Wang, 2012; Koh & Tan, 2005; Li et al., 2012; Vaidyanathan, 2005). When considering the importance of cost, there are strong disagreements between researchers. Some rank costs as the top factor for LSP evaluation, while others claim that service quality and performance are far more important than cost considerations (Lai et al., 2013; Hofer et al., 2009; Selviaridis & Spring, 2007).

In 2009, Qureshi, Kumar, and Kumar developed an integrated model to assess the significance and interrelationships of different criteria in the process of selecting LSPs. It is interesting to see connections among different criteria: service quality, trust and information sharing, global service coverage, broad service area, performance, financial stability, and cost (Qureshi et al., 2009; Xu & Wang, 2013). Therefore, customers should pay close attention to the cause-effect relationship between these criteria in their selection of the proper LSP. In general, the cost, service quality, performance, relationship management, IT, service area, and service delivery are vital in the selection of a suitable LSP. It is difficult to say which one is more important than others.

After selecting proper LSPs and signing contracts, LSPs will start to deliver logistics services. In the delivery process, LSPs need to develop and manage different relationships with customers according to their various requirements. Therefore, the third category of research highlights the significance of relationship management between customers and LSPs in logistics outsourcing.

2.2.4 Relationship development in logistics outsourcing

It has been proposed that efficient relationship management between customers and LSPs can result in optimal service quality, thereby achieving successful logistic outsourcing (Solakivi et al., 2011; Selviaridis et al., 2008). In the relationship between the customer and the LSP, both parties need to take care about a number of issues: information sharing, clarification of services levels and unique requirements, mutual trust and commitment, frequent communication, continuous service improvement, common goal, contract, compatibility of management styles and cultures, and top management support (Li et al., 2012; Selviaridis & Spring, 2007; Selviaridis et al., 2008).

How do these issues influence the relationship management in logistics outsourcing? Researchers have studied elements and benefits of relationship management intensively to address this question (Liu et al., 2012; Selviaridis & Spring, 2007; Srabotic & Ruzzier, 2012).

2.2.4.1 Elements of and benefits for relationship management

Table 2.1 shows several significant elements for LSP-customer relationship management. These elements indicate that high degree of mutual trust, commitment, and interdependency can foster collaboration between LSPs and customers (Hilletofth & Hilmola, 2010; Lai et al., 2012). In contrast, opportunistic behaviour, low reputation of partners and low reciprocity hinder the development of efficient relationships between partners (Chen et al., 2010; Tsai et al., 2012).

Table 2.1: Important factors for relationship management in logistics outsourcing

Factors	Description
Closeness	How close the relationship is between customers and LSPs.
Commitment	This can encourage companies to make more investment to keep strategic collaboration.
Communication	Good communication can be used to solve issues in process integration and cooperation.
Interdependency	This demonstrates that both companies can gain more profit from close relationship.
Opportunistic behaviour	This kind behaviour can reduce the mutual trust and hence weaken relationship.
Reciprocity	This means what the partners can provide to and share with each other. For instance, sharing cost, revenue, risks, and rewards, and joint problem solving.
Reputation	A good reputation makes LSPs more attractive to customers who want to find a service provider.
Satisfactory prior outcomes	It is feasible to provide customer confidence in the future collaboration.
Trust	This shows that both sides can be confident and fully rely on the partners.

Source: (Chen et al., 2010; Halldorsson & Skjøtt-Larsen, 2006; Hilletofth & Hilmola, 2010; Juga et al., 2010; Knemeyer & Murphy, 2005; Qureshi et al., 2009; Tsai et al., 2012)

Based on the elements introduced above, literature presents four benefits regarding collaborations between partners in logistics outsourcing (Lieb & Butner, 2007; Power, Moosa & Bhakoo, 2007; Wilding & Rein, 2004). The first is retention. Collaborative relationship management can help retain long term

business with customers (Chen et al., 2010; Murphy & Poist, 2000; Priluck, 2003). Secondly, collaboration can help LSPs to identify potential customers as well as help customers to find potential LSPs (Lai et al., 2012; Lieb & Bentz, 2005a). Further, the LSPs can provide successful service recovery through collaboration with customers. This will improve customer satisfaction and chances to keep long term business relationships (Halldorsson & Skjott-Larsen, 2004; Solakivi et al., 2011; Knemeyer, Corsi & Murphy, 2003). Finally, close relationship between customers and LSPs can improve the overall performance (Knemeyer & Murphy, 2005; Lai et al., 2013; Lieb & Bentz, 2005b).

In sum, in order to achieve benefits from logistics outsourcing, both customers and LSPs need to take care of different elements to develop and retain efficient relationships. From the perspective of supply chain, customers and LSPs also have their own suppliers and partners. Therefore, the relationship management between customers and LSPs is also significant to the supply chain (Chu & Wang, 2012). As a result, the fourth category investigates the supply chain role of logistics outsourcing.

2.2.5 Role of logistics outsourcing in the supply chain

Beyond dyadic relationship management, a few researchers began to consider the position and influence of logistic outsourcing in the whole supply chain management among more than two organizations (Gotzamani et al., 2010; Naim, Aryee & Potter, 2010). From the customers' view, studies have highlighted four items that directly influence the role of logistics outsourcing in the supply chain process: the organization's strategic focus; the organization's perception of influence from logistics outsourcing; relationship management; and extension of logistics outsourcing (Bolumole et al., 2007; Fabbe-Costes, Jahre & Roussat, 2009; Jayaraman, Taha, Park & Lee, 2014; Stefansson, 2006).

The organization's strategic focus represents how an organization considers relationships with other supply chain members (Bask, 2001; Hinkka, Kary & Tatila, 2013). The lower level is an internal focus where organizations lack consideration for other supply chain members (Barney, 2012; Li, Zhang & Fine,

2013). The higher level is an external focus which means the organization's strategy focuses more on the integration among supply chain members (Miocevic & Crnjak-Karanovic, 2012; van Hoek, 2000).

An organization's perception of influence from logistics outsourcing explains how the customers think about LSP's service (Jayaraman et al., 2014; Martinez-de-Albeniz & Simchi-Levi, 2013). Some organizations believe cost reduction is the key to what LSPs can do in supply chains (Juga et al., 2010; Srabotic & Ruzzier, 2012): others believe that LSPs' innovative offerings can make a huge difference in a supply chain (Bolumole et al., 2007; Liu et al., 2012).

Relationship management means the relationship between LSPs and customers (Hofer et al., 2009). Generally, they will start from an arm's length relationship through signing transactional contracts (Chu & Wang, 2012). With gradual development, the relationship may evolve to bilateral strategic alliances (Li et al., 2012). Finally, they may develop a strategic supply chain partnership to achieve long term success (Fabbe-Costes et al., 2009; Hilletofth & Hilmola, 2010).

Extension of logistics service outsourcing reflects the different importance level of outsourced logistics activities (Bask, 2001). It has been classified into three levels: operational, tactical, and strategic. These three levels directly correspond to organizations' outsourcing requirements in different durations: short, medium, and long term (Bolumole et al., 2007; Fabbe-Costes et al., 2009).

After identifying these four items, Bolumole et al. (2007) developed a model to consolidate them (see Figure 2.2).
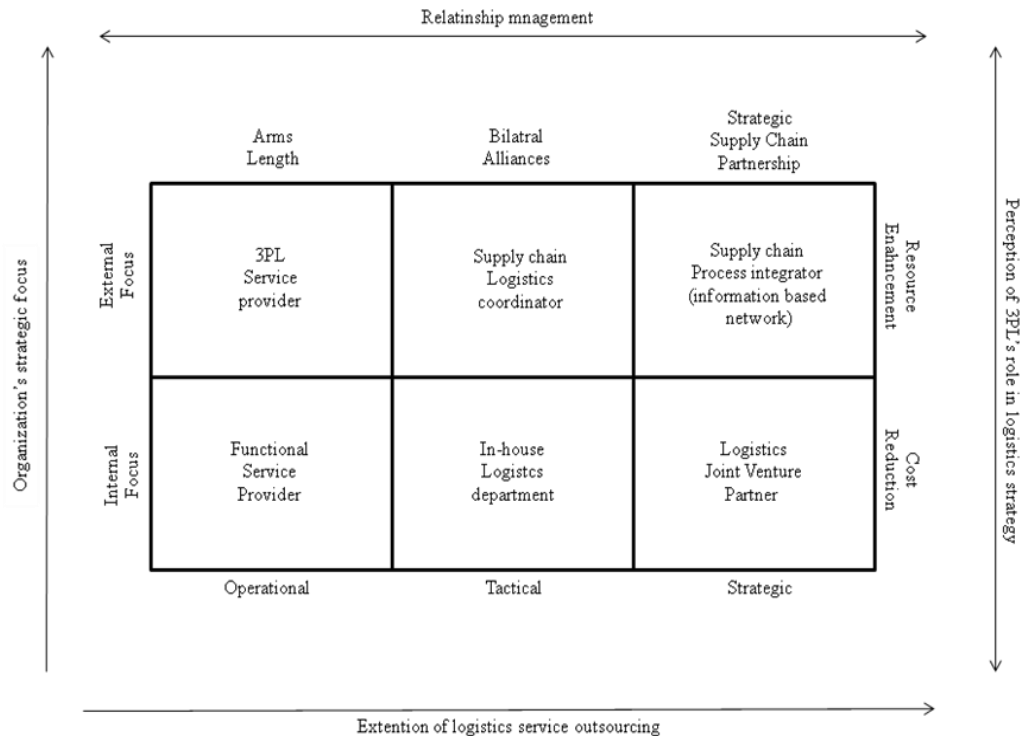
Figure 2.2: Framework: evaluating supply chain role of logistics outsourcing
(Source: Bolumole, 2003; Bolumole et al., 2007)

In Figure 2.2, with the different combinations of the four items, six kinds of LSPs provide unique contributions to supply chains by providing different logistics services. On one hand, if organizations focus on cost reduction and their own internal performance, LSPs can evolve from a functional service provider to a logistics joint venture partner (Juga et al., 2010; Lai et al., 2012). In contrast, if organizations change to an external focus (focus on the whole supply chain process) and try enhancing resources to offer innovative products or services for partners, LSPs will vary from basic logistics service providers to professional supply chain process integrators (Chen et al., 2010; Solakivi et al., 2011). The requirements of relationship development are different when LSPs act in various roles in a supply chain (Hofer et al., 2009; Qureshi et al., 2009). Consequently, logistics outsourcing can offer different value to a supply chain (Bolumole et al., 2007).

All four categories of studies reviewed above have highlighted the significance of logistics outsourcing, selection of LSPs, importance of relationship management between LSPs and customers, and the role of LSPs in supply chains. By

comparing them with other supply chain studies, the extant literature of logistics outsourcing shows several research gaps, discussed in the next section.

2.2.6 Research gaps in logistics outsourcing studies

The most significant research gap in logistics outsourcing studies is that research in this area is far less than other research areas in the supply chain context. As logistics outsourcing is also called *third party logistics* or *logistics alliances*, all these phrases were used as key words to search articles from scholarly journals in two well-known databases: ABI/INFORM and Proquest. Because these key words have apparently been used in supply chain research since 1990s, the publication data was set between 1990 and 2014. Five hundred and seventy articles were identified in total.

Figure 2.3 presents the number of publications relating to logistics outsourcing in three durations: 1990 to 2005, 2006-2010, and 2010-2014. The numbers of publications on logistics outsourcing after 2006 is triple the total number between 1990 and 2005. The significant difference of publication numbers is caused by logistics outsourcing becoming more significant in supply chains. With the increase in customer requirements for faster and cheaper services, the performance of logistic outsourcing determines whether the whole supply chain can survive in modern competitive markets (Vinay et al., 2009).
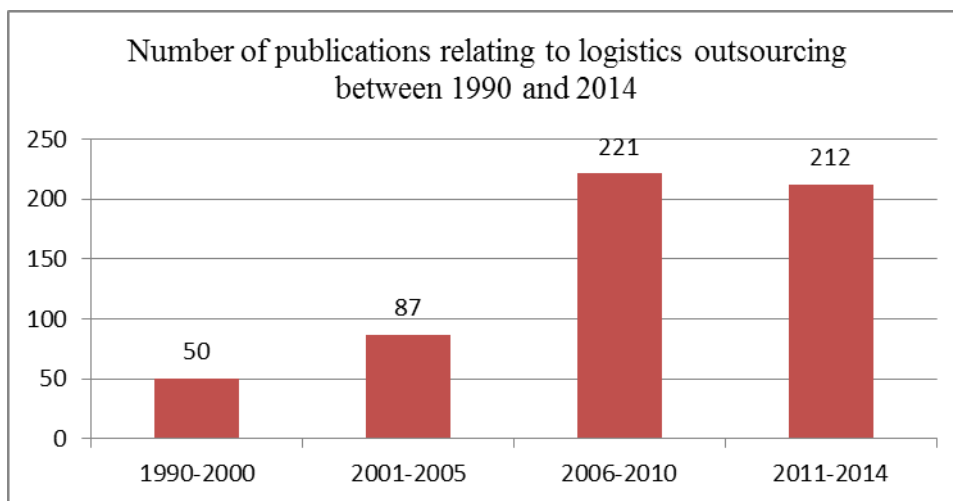
Figure 2.3: Number of publications relating to logistics outsourcing between 1990 and 2014

With the enhanced significance of logistics outsourcing in supply chain management, the research on logistics outsourcing increased sharply after 2006. However, at the same time between 2006 and 2014, all research relating to supply chain management has also increased significantly to a total of 11,807 articles. The number of publications of logistics outsourcing in the same time frame is less than 4 per cent.

The small proportion of research in logistic outsourcing makes it difficult to demonstrate why and how this area is important to managing supply chains. It is worth conducting more research regarding logistics outsourcing. As a result, this thesis selects this area as the research background.

In addition to the limited publication numbers of research on logistic outsourcing, the comparisons among existing outsourcing studies reflected two research gaps.

One gap concerns the connection between relationship dynamics and logistics outsourcing. Although a number of studies identify that LSPs and customers can have different kinds of relationships (Chu & Wang, 2012; Hofer et al., 2009; Lai et al., 2013), these studies do not investigate how customers and LSPs change their relationships from one type to another type in different situations (more details of different relationship types have been reviewed in section 2.3.2).

In contrast, other supply chain studies identify a number of factors and explain how these factors lead to dynamics of SCRs (Hartmann & Caerteling, 2010; Sambasivan & Yen, 2010; Sanzo, Santos, Alvarez & Vazquez, 2007). These studies suggest that understanding how to manage the dynamics of relationships is critical to develop long term business between supply chain partners in a competitive market (Huang, Gattiker & Schwarz, 2008; Prahinski & Fan, 2007; Song & Chatterjee, 2010). Therefore, it is believed that studying how LSPs and their partners change relationships in logistics outsourcing can expand the knowledge of this research area. Consequently, this thesis will focus on the dynamics of relationships in logistics outsourcing.

Another research gap relates to the network structures in logistics outsourcing. Although a few studies have identified that logistics outsourcing represents a specific network structure among the LSP, the LSPs' direct customer, and the final customer (the customer's customer) (Gotzamani et al., 2010; Jayaraman et al., 2014; Naim et al., 2010), these studies still used a dyadic relationship view to study the relationships among organizations in logistic outsourcing. Fewer studies have investigated how one organization mediates its indirect relationships (Hinkka et al., 2013; Miocevic & Crnjak-Karanovic, 2012). However, as suggested in other network studies, the major difference between dyadic and network structures is that one organization can mediate indirect dyadic relationships between the other two organizations. It is difficult to study the mediating effect in network structures from the dyadic relationship view (Choi & Wu, 2009b, 2009c).

Further, compared to research on dyadic SCRs, research on network structure can provide a more comprehensive view of supply chain management as a supply chain usually contains more than two organizations (Choi & Wu, 2009a; Wu et al., 2010). Logistics outsourcing is also a part in a wider supply chain network. In order to understand the role of logistics outsourcing in the wider network, it is necessary to investigate relationships from a network perspective. As a result, this research will study logistics outsourcing from a network perspective.

Overall, after reviewing logistics outsourcing literature, this thesis uses this area as the research background and tries to fill two identified research gaps by studying relationship dynamics in logistics outsourcing from a network perspective. Concerning relationship dynamics, research on SCRs has identified a great number of outcomes regarding origins and factors of relationship dynamics (Kamaruddin & Udin, 2009; Lamprinopoulou & Tregear, 2011; Prasad, Subbaiah & Rao, 2012; Wagner, Coley & Lindemann, 2011). These findings can be taken as a reference for this thesis to identify research instruments for studying relationship dynamics in logistic outsourcing.

Additionally, previous SCR studies have also investigated network structures extensively. A number of SCR studies have investigated how organizations develop and manage SCRs in network structures (Braziotis, Bourlakis, Rogers, & Tannock, 2013; Choi, Yan & Dooley, 2011; Hofmann, 2010; Miemczyk, Hohnsen, & Macquet, 2012; Tokman & Beitelspacher, 2011). As a result, reviewing these studies can provide ideas for the present study to investigate logistics outsourcing from a network perspective.

As extant research on supply chain relationships can provide ideas for this thesis to study relationship dynamics and network structures in logistics outsourcing, the next section will review the relevant literature in detail.

2.3 Supply chain relationships

The significance of SCRs is reflected in the definition of SCM. In 2002, the Council of Supply Chain Management Professionals (CSCMP) proposed a public definition for modern SCM covering managing supply and demand, sourcing raw materials and parts, manufacturing and assembly, warehousing and inventory tracking, order entry and order management, distribution across all channels, and delivery to the customer (Wisner, Leong, & Tan, 2005). This definition shows that the backbone of SCM is to connect all supply chain members to optimize the whole chain. As a result, in the last few decades a number of studies have investigated the relationship management among supply chain members (Choi et al, 2011; Miemczyk et al., 2012; Prasad et al., 2012).

Using the similarities and differences in previous SCR research, Figure 2.4 illustrates two categories of studies. All studies concerning dyadic relationship structure form one category. The other category (the category of network structures) includes all other relationship structures except dyadic SCRs.
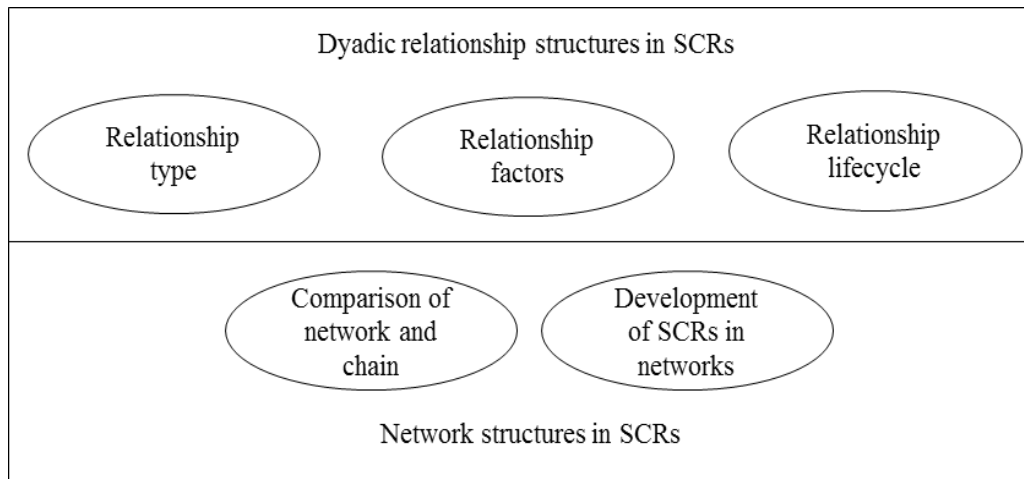
Figure 2.4: Classifications of research on supply chain relationships (SCRs)

The studies of dyadic relationships can be divided into three sub-categories. The sub-category of relationship type studies different characteristics in various types of dyadic SCRs, such as the type of transactional SCR and the type of collaborative SCR (Daugherty, 2011; Lorentz, 2008; Mehrjerdi, 2009). A dyadic SCR can be dynamic among different types (Fearon, Ballantine, & Philip, 2010; Vieira, Yoshizaki, & Ho, 2009). In another sub-category, researchers have identified a number of relationship factors that can develop, measure, or change dyadic SCRs (Lamprinopoulou & Tregear, 2011; Prasad et al, 2012; Wagner et al., 2011). The last sub-category investigates the dynamics of dyadic SCRs in the lifecycle because a few researchers indicate that a dyadic SCR can change in different stages of a relationship lifecycle (Ellram, 1991; Zineldin, 2002).

Compared to dyadic SCR research, network studies can be divided into two sub-categories. One concerns the comparison of similarity and difference between network and supply chain (Harland et al., 2001; Miemczyk et al., 2012; Tokman & Beitelspacher, 2011). The other investigates the development and dynamics of SCRs in different network structures (Barnes & Liao, 2012; Bastl et al., 2013; Coromina, Guia, Coenders, & Ferligoj, 2008).

As this thesis will to study relationship dynamics, the next section starts from reviewing the origin of dynamics in SCR—relationship life cycle.

2.3.1 Relationship life cycle

Ford (1980) first proposed the idea of relationship stages. The idea of relationship stages can be seen as the precursor of the relationship life cycle. Ford indicates that a dyadic business relationship between a supplier and a customer has five stages: pre-relationship; early; development; long-term; and final. In each stage, the customer and the supplier need to handle different relationship requirements, such as, the relationship experiences, the culture difference, the location, the uncertainty, and the resource (Ford, 1980).

Based on Ford's (1980) finding, the idea of relationship life cycle was introduced by Ellram in 1991. A business relationship is not static but dynamic in different stages in the life cycle. Although a number of studies define a business relationship life cycle in different words (Ellram, 1991; Spekman et al., 1998; Zineldin, 2002; Sawhney & Zabin, 2002), there are certain similarities between them.

Table 2.2 illustrates four business relationship life cycles developed in previous supply chain studies. Although only Ellram (1991) presents a dissolution stage, all four studies share similar ideas that a relationship lifecycle has sequential stages from the beginning to the end. Partners show different requirements in these stages to develop SCRs.

Table 2.2: Four kinds of life cycle in supply chain relationships

Author	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Ellram (1991)	Pre-partnering decisions	Development	Commitment	Integration	Dissolution
Spekman et al. (1998)	Open market negotiation	Cooperation	Coordination	Collaboration	
Zineldin (2002)	Discovery	Development	Commitment	Loyalty	
Mohanbir & Jeff (2002)	Creation	Retention	Extension	Leverage	

2.3.1.1 Different relationship life cycles

Ellram's model (1991) focuses on the development of a partnership in a supply chain context and has five stages. In the pre-partnering stage, partners make their

decisions about whether they need to develop a partnership or not by assessing potential benefits, risks, barriers, enablers, and other potential partners. After making a decision, the selected supply chain partners become familiar with each other in the development stage. Then, in the commitment stage, partners need to strengthen their partnership by enhancing mutual dependency and showing commitment to each other. If both sides find that the partnership cannot help them to gain more benefits, the business partners may stop developing partnership further. They sustain the business link from this moment onwards.

On the other hand, if the partners believe that they can gain more from a partnership, they will work together to build a stable and routine partnership process by enhancing mutual trust and mutual dependence. In the dissolution stage, partners stop their partnership if one party is not happy with the other's performance or if both parties do not see further necessity for retaining the partnership. The dissolution does not mean stopping development of relationships between partners. It is the start of another relationship development. Overall, the relationship between supply chain partners is dynamic because of various relationship requirements in five stages.

Spekman et al. (1998) developed another model to describe the relationship life cycle. This model has four stages. In the open market negotiation stage, partners lack trust in each other. They focus on their own costs and retain a distant relationship. If both sides believe that they can become key partners to each other, they can develop a long-term contract to lock in their relationship. This is the cooperation stage. If the partners intend to enhance their relationship further, they need to share more information and develop more business connections. This is the coordination stage. The two partners need to coordinate and match their business processes with each other. Finally, in the collaboration stage, partners need to make joint plans and integrate activities. This stage requires partners to develop the highest degree of mutual trust and commitment. Additionally, this model indicates that a collaborative supply chain relationship could be broken if one party cannot satisfy the other party's requirements.

Zineldin (2002) proposes another model to describe the supply chain relationship. The research indicates that the four stages of developing business relationships between two organizations are similar to the four stages of the development of a romantic relationship between two people. The characteristics of this model's four stages are highly similar to the stages in Ellram's model, the only difference being that Zineldin does not propose the dissolution stage. However, Zineldin's model suggests that a relationship at the loyalty stage could be destroyed if either party cannot fulfil the other party's expectation.

The last model has been developed by Sawhney and Zabin in 2002. Similarly to the second and the third models, this model divides the whole progress of relationship development into four stages. In the creation stage, the partners start to build a basic relationship and gradually increase interactions to enhance mutual understanding. Then, partners need to strengthen their relationship in the retention stage. The third step is the extension stage. The partners extend the relationship by increasing interactions and developing more relationship options. Finally, in the leverage stage, the partners reinforce their relationship by sharing existing relationship values and developing extra values from the relationship. As Sawhney and Zabin's model focuses on the whole supply chain rather than a sole dyadic relationship, they indicate that the different stages of the relationship life cycles in one dyad can impact other partners which are not directly linked to this dyad in a supply chain. Therefore, the idea of this model suggests that the partners should consider the development of business relationships in a supply chain from a network perspective.

2.3.1.2 Overview of relationship life cycles

To sum up, all four models have close similarities. Partners start to contact each other in the first stage (Ellram, 1991). They enhance mutual understanding and mutual trust in the second stage (Sawhney& Zabin, 2002). In the third stage, partners begin to develop a well-established relationship process through high mutual trust and commitment (Spekman et al., 1998). In the fourth stage, partners may collaborate more for developing and exploring more mutual relationship values (Zineldin, 2002).

Existing lifecycle research indicates that the type of a SCR between two partners can be changed according to various requirements in the progress of developing a relationship. In order to distinguish the difference between various relationship types, it is necessary to understand their characteristics. Therefore, the next section studies the characteristics of various relationship types identified in extant SCR research.

2.3.2 Types of supply chain relationships

In all relationship types identified, the type of transactional relationships indicates a win-lose situation where the linked supply chain partners remain distant and seek to extract benefits from each another. Compared to this type, other types of relationships exhibit different degrees of closeness between partners. These types of relationships exhibit overlaps (see Table 2.3). Researchers indicate that cooperation and coordination in SCRs arise from different degrees of collaboration (Cetindamar, Catay & Basmaci, 2005; Soosay, Hyland & Ferrer, 2008). Integration is a variable to help partners achieve collaboration (Lorentz, 2008; Mehrjerdi, 2009). Partnership and alliances are antecedents to foster collaboration between partners (Daugherty, 2011; Spence & Bourlakis, 2009). All types of closer relationships share more similarities than differences in managing the SCRs between collaborative partners. As a result, collaborations can be seen as representative of close relationships. Overall, transactional and collaborative types can be seen as two extreme and representative types of dyadic relationships in supply chains.

Table 2.3: Overlap between collaboration and other relationship types

Overlaps between collaboration and other supply chain relationships	Representative studies
Cooperation and coordination: defined as different degrees of collaboration	Cetindamar et al., 2005; Lemke, Goffin, &Szwejczewski, 2003 ; Mena, Humphries, & Wilding, 2009; Rose-Anderssen, Baldwin, & Ridgway, 2010; Soosay et al., 2008
Integration: a mediating variable to achieve collaboration	Lorentz, 2008; Mehrjerdi, 2009
Partnership and alliance: antecedents of collaboration	Bordonaba-Juste & Cambra-Fierro, 2009; Spence & Bourlakis, 2009; Daugherty, 2011; Janvier-James & Didier, 2011; Vieira et al., 2009; Fearon et al., 2010

Table 2.4 compares the characteristics of transactional and collaborative relationships. Transactional relationships help partners avoid supply chain risks and secure profits. This type of SCR concerns short term gain and the maximization of one organization's profits. On the other hand, collaboration focuses on joint effort and profit sharing. Partners work together to create a win-win relationship and foster stable links as long as possible. The characteristics of transactional and collaborative SCRs can represent different relationship requirements. A relationship has different requirements in various stages within a lifecycle (Zineldin, 2002; Sawhney & Zabin 2002). By comparing the characteristics of transactional and collaborative SCRs with relationship requirements in various stages, it can be assessed whether a SCR exhibits dynamics between the type of transactional relationships and the type of collaborative relationship (Ellram, 1991; Spekman et al., 1998). Therefore, in this thesis, the two representative types of relationships will be used to assess relationship dynamics in logistics outsourcing (Chapter Three will introduce more detail of how the two representative types are used to assess dynamics of dyadic SCRs in a network structure in the present study).

Table 2.4: Comparing transactional and collaborative relationships

Transactional	Collaborative
Keep distance (arm's-length) between partners	Get close to partners
Short term focus	Long term focus
Unstable	Stable
Focus on own cost	Focus on common profit
More for commoditized product and/or services	More for specialized or customized product and/or services
Less requirement for experience with or knowledge about relationship management	More requirement for experience with or knowledge about relationship management
Does not support sustainable relationship development very well	High support for sustainable relationship development
Powerful company leading relationship	Partners use joint effort to manage the relationship

Sources: (Cao et al., 2010; Harland et al., 2004; Simatupang & Sridharan, 2005)

Based on various characteristics of transactional and collaborative relationships, researchers have identified a number of relationship factors which can measure or determine the development of relationships (Cao, Vonderembse, Zhang, & Ragu-Nathan, 2010; McLachlin & Larson, 2011). These factors can be identified as the

sources that lead to relationship dynamics. The next section will review these factors in detail.

2.3.3 Relationship factors

In all relationship factors identified, sixteen factors show a greater impact than other factors to influence SCRs (see Table 2.5). These factors can be divided into three clusters. Trust and power form the first cluster. A number of studies indicate that trust and power are highly connected with other relationship factors because they are determined or impacted on by other factors (Hartmann & Caerteling, 2010; Huang et al., 2008; Prahinski & Fan, 2007; Sambasivan & Yen, 2010; Sanzo et al., 2007; Song & Chatterjee, 2010). Except power and trust, other factors are classified into two clusters: influential factors and relationship measures. Influential factors include all factors which drive the development and change of SCRs. Alternatively, relationship measures can be used to assess the types of SCRs. All relationship measures will be discussed in Chapter Three because that chapter introduces research methodology and explains how these relationship measures are used in this thesis.

Table 2.5: Factors identified in research on supply chain relationships

Clusters	Relationship factors	Description
Trust & power	Trust	Under influence from other factors, degree of mutual trust and commitment can influence the development of SCRs.
	Power	Power can be produced from different sources. Various power types can lead to dependency between partners and result in different relationship developments.
Influential factors	Business frequency	Continuous and discrete business leads to different requirements for developing SCRs between partners.
	Resource capability	According to different company sizes, their related resource capability can impact on whether partners will invest in and maintain collaboration.
	Organizational behaviour	Changes in organizational behaviour can determine the SCRs by affecting mutual trust and commitment between partners.
	Organizational culture	Compatibility and the consistency of culture are critical in determining the length and the dynamics of SCRs between partners
	Personal factors	Manager's personal relationships and preference can directly impact the development of business relationships between supply chain partners.
	Purchasing volumes	Size of purchasing volumes can determine the closeness between partners in SCRs.
	Relationship length	Long and short term relationship focus results in different requirements in SCRs.
	Uncertainty	Uncertainty can lead to a number of risks which may impede or slow down the development of SCRs.
Relationship measures	Communication	Degree and quality of communication can indicate the closeness between partners in SCRs.
	Contract	Different types of SCRs offer various requirements in contract design.
	Interdependence & joint efforts	Interdependence and joint efforts describe how the partners rely on each other in a relationship.
	Information sharing	Information sharing can indicate the closeness between partners, the power of information, the significance of supply chain visibility and the adoption of IT.
	Resource sharing	Degree and level of resource sharing is significant in representing the level of collaboration
	Sharing costs, risks, & gains	Degree of sharing costs, risks, & gains can reflect how close the partners are in SCRs.

Compared to Table 2.1(relationship factors identified from logistics outsourcing studies), most factors presented in Table 2.5 can be applied to assess or affect the factors that have been explained in Table 2.1. For example, the closeness (in Table 2.1) can be assessed by the six relationship measures presented in Table 2.5. The purchasing volumes and resource capability are important influential factors which impact the development of relationships in logistics outsourcing and other supply chain contexts. Previous studies of SCR and research about logistics

outsourcing share close similarity in explaining how these relationship factors are important to investigate relationships in supply chain context. The next sections will explain these factors in detail.

2.3.3.1 Trust and power

Trust

Figure 2.5 presents how the trust between partners in a supply chain is determined by a few influential factors. The development of trust is based on business frequency, relationship length, and the quality of communication (Hartmann & Caerteling, 2010; Prahinski & Fan, 2007; Song & Chatterjee, 2010). Further, market uncertainty, personal relationships, personal preferences, organizational culture, and organizational behaviour can determine the degree of trust between partners (Huang et al., 2008; Sambasivan & Yen, 2010; Sanzo et al., 2007). Additionally, the outcome of trust can be represented in the contract design, the degree of interdependency, and joint efforts between partners (Corsten & Felde, 2005; Katok & Pavlov, 2013; Parker & Russell, 2004).
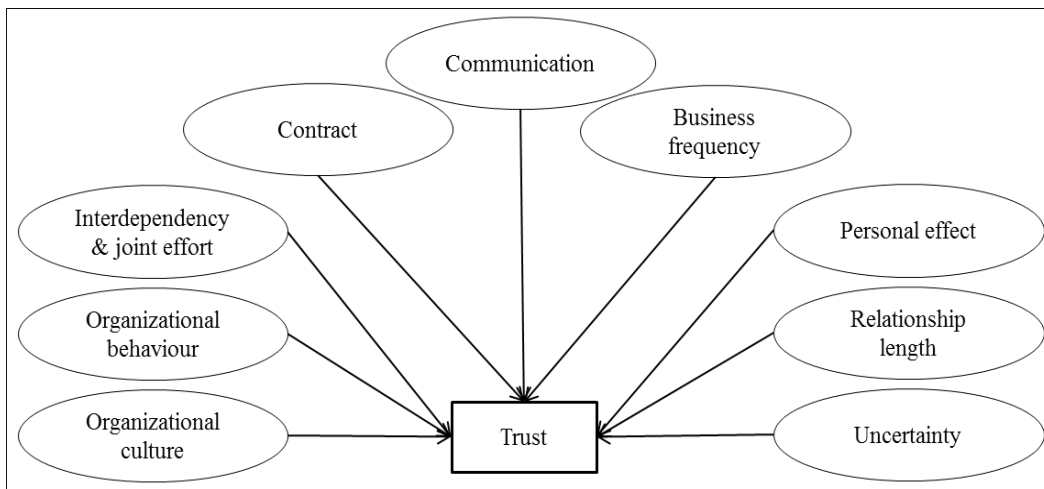
Figure 2.5: Connection between trust and other relationship factors

Although trust can influence change of SCRs, it is difficult to identify trust as a root cause of relationship dynamics because it is highly determined by other factors in different situations. Therefore, this thesis will not use trust as an independent factor to study dynamics of SCRs in logistics outsourcing. Similar to trust, in determining dynamics of SCRs, the influence from power also shows extensive connections with influential factors.

Power

The influence from power in SCRs concerns power games between organizations. "…almost any relationship is mutuality (the sharing of power) and one important dimension of mutuality is found in the dependency of one party on another… in the inter-organizational relationship literature, power is an acknowledged but not often discussed parameter within the context of mutual relationship norms…" (Petersen et al., 2008, p.54). Therefore, power plays a vital role in SCRs (Touboulic, Chicksand & Walker, 2014).

Extant research on power shows two perspectives. One concerns the market channel and classifies power into several types: rewards, coercion, legitimate and referent (Gaski, 1986; Kahkonen & Virolainen, 2011). The other focuses on the sources of power (Doran et al., 2005; Ramsay, 1995). According to various power sources, organizations can use different power games to determine the development and dynamics of SCRs (Ryu, Lee & Lee, 2011). As previous studies of logistics outsourcing investigated power from the perspective of power sources (Giannakis & Croom, 2004; Lambert & Cooper, 2000), the present study will also apply power sources to study the dynamics of SCRs in logistics outsourcing.

As a few studies indicated, different kinds of power in SCRs are outcomes of influential actors (Crook & Combs, 2007; Ghosh & Fedorowicz, 2008; Williams & Moore, 2007). Table 2.6 matches power sources discovered in previous studies with five influential factors. In these factors, purchasing volumes is significant to determine customer's buyer power (Flynn, Zhao, Huo, & Yeung, 2008; Petersen et al., 2008); while resource capability is critical for the supplier to obtain supply power (Gligor & Holcomb, 2014; Storer & Hyland, 2011). Power from resource capability can be reflected in several aspects: firm size and offerings, switching cost and switching difficulty, uniqueness of resources, and type of products and services (Bates & Slack, 1998; Doran et al., 2005; Sanderson, 2004; Svahn & Westerlund, 2007). In addition to purchasing volumes and resource capability, supply chain uncertainty, length of relationship, and business frequency can also affect organizations' power (Gadde, Huemer, & Håkansson, 2003; Wiseman & Gomez-Mejia, 1998). Further, previous studies indicate that the influences from

purchasing volumes and resource capability are more significant than other factors to determine organizations' buyer power and supply power in relationships (Cox, Sanderson & Watson, 2001; Sanderson, 2001; Watson, 2001).

Table 2.6: Connection between power sources and influential factors

Influential factors	Power sources	
	Representative SCRs studies	Representative outsourcing studies
Purchasing volumes	Purchasing volumes or business volumes (Bates & Slack, 1998; Cox, 2001b; Ramsay, 1995, 1996; Sanderson, 2004)	Size of customer orders (Benton & Maloni, 2005Vickers & Waterson, 1991)
Resource capability	Firm size and offerings (Bates & Slack 1998; Ramsay 1996; Stannack, 1996)	Company size and offerings (Munson et al., 1999)
	Switching cost & alternatives (Cox et al. 2001; Gelderman & van Weele, 2005; Medcof, 2001)	Buyer switching difficulty (Boyle & Dwyer, 1995; Tangpong et al., 2008)
	Uniqueness of resources (e.g. financial, knowledge, information, technology) (Cox 1999; Ford et al., 1998; Svahn & Westerlund, 2007)	
	Type of products (Caniels & Gelderman, 2005, 2007)	Type of outsourcing (Benton & Maloni, 2005; Boyle & Dwyer, 1995)
Relationship length	Significance of long term relationship (Gadde et al., 2003; Doran et al., 2005)	relationship length & contract design (Benton & Maloni, 2005)
Business frequency		Business continuity (Wiseman & Gomez-Mejia, 1998)
Uncertainty	Market & economy (Cox, 2001a, 2001b; Thorelli, 1986)	Domestic or offshore market uncertainty (Mason et al., 2003)

In the comparison of buyer power and supply power in SCRs, Cox identifies four outcomes of power games between suppliers and customers in dyadic SCRs (see Figure 2.6).
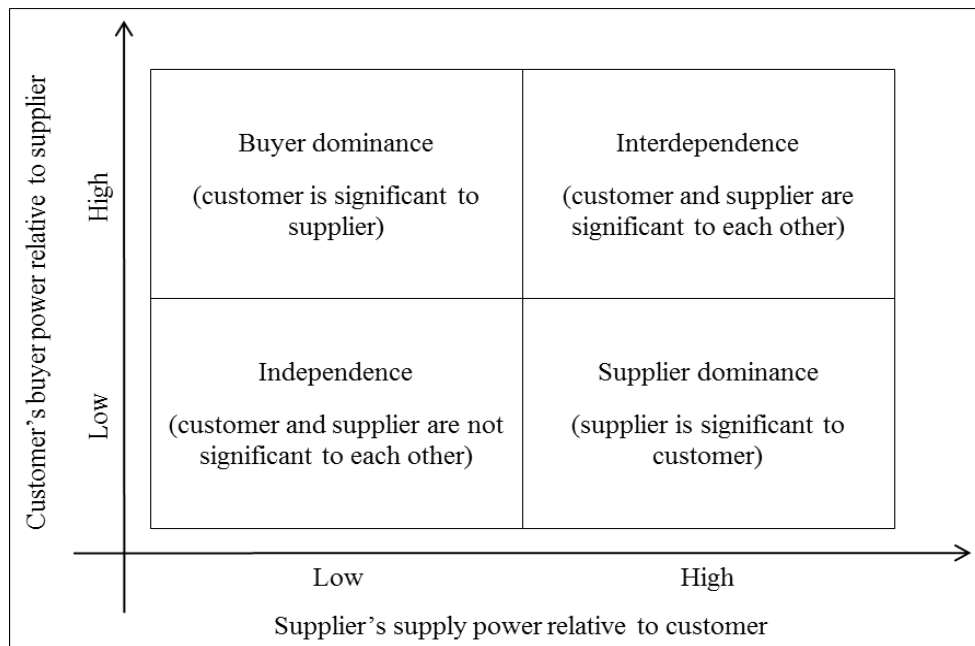
Figure 2.6: Power games between customer and supplier
(Source: adapted from Cox, 2001a, b)

The development of a SCR can be controlled by either the customer (buyer dominance), or the supplier (supplier dominance), or joint efforts between them (interdependence) (Cox, 1999, 2001c). If the customer and the supplier are independent from each other, the SCR can be disconnected at any time (Doran et al., 2005). Further, a change of influential factors can lead to dynamics in buyer power and supply power (Svahn & Westerlund, 2007; Tangpong et al., 2008). Consequently, the change of power games between customers and suppliers can lead to the dynamics of supply chain relationships (Watson, 2001).

In sum, influential factors are significant in determining the development and dynamics of SCRs between organizations because these factors are organizations' power sources and can influence power games in relationships (Crook & Combs, 2007; Ghosh & Fedorowicz, 2008; Williams & Moore, 2007). As this thesis will study relationship dynamics in logistics outsourcing, it is worth investigating the influence from different power sources (influential factors) and influences from power games between organizations in logistics outsourcing. The following sections will develop an overview of influential factors and review each factor in detail.

2.3.3.2 Classification of all influential factors

Figure 2.7 outlines all influential factors and classifies them into four categories. As purchasing volumes, resource capability, and uncertainty all concern the influence from business context, in the present study these three factors are grouped together and are called business context factors. Both relationship length and business frequency can reflect the continuity of SCRs between partners. They are called business continuity factors in this thesis. Further, organisational culture and organisational behaviour are categorized as relationship behaviour factors. Two personal factors (personal relationships and personal preference) form the last category.
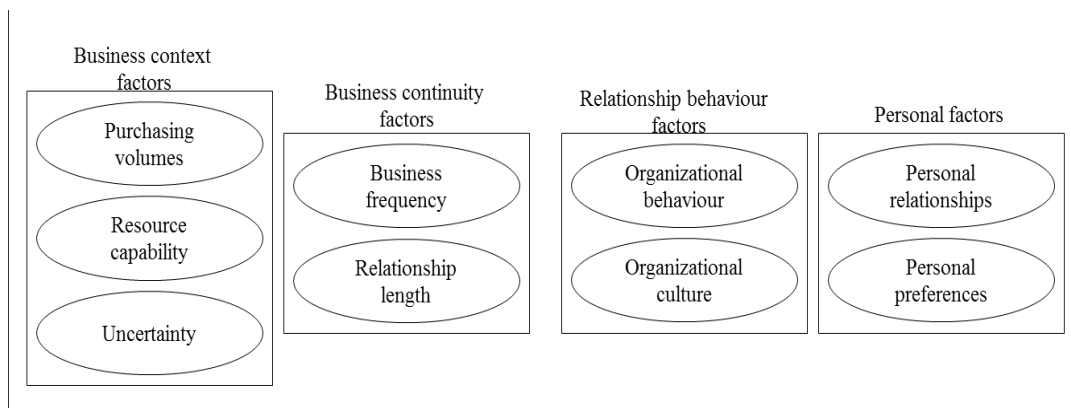
Figure 2.7: Categorization of influential factors

2.3.3.3 Business context factors

Purchasing volumes

The size of purchasing volumes can affect the dynamics of SCRs because it impacts on the partners' profits in supply chains. In order to satisfy the requirements of a large purchasing volume, suppliers need to foster closer SCRs to serve customers (Squire, Cousins, Lawson & Brown, 2009; Sohal & Perry, 2006). Therefore, customers can use buyer power from large purchasing volumes to control suppliers and dominate the development of SCRs. This situation is also called buyer dominance (Cox, 2001c).

The influences from the size of purchasing volumes vary in different organizations (Squire et al., 2009). A purchasing volume can be significant to influence the profits for a SME; while the same volume may be not important to a large organization (Jayaraman et al., 2014). In a dyad between a customer and a

supplier, large purchasing volume indicates that the customer's demand can significantly influence the supplier's profits (Cox, 2004). In this situation, the customer can gain strong buyer power to influence the supplier (Zhao, Huo, Flynn & Yeung, 2008). In contrast, if a customer's purchasing volumes are not significant to the supplier's profits, the buyer power is weak and the customer cannot control the supplier (Ramsay, 1995).

Additionally, because the customer can change demands in different situations, the size of customer's purchasing volumes is not static (Li et al., 2013). Consequently, the comparison between buyer power and supply power is dynamic (Kahkonen & Virolainen, 2011). In this situation, it is difficult to apply one type of SCR to manage relationships between suppliers and customers at all times (Handley & Benton, 2012). As a result, with the change of purchasing volumes, the power games between supplier and customer can influence the dynamics of SCRs (Meehan & Wright, 2012).

In all power sources, purchasing volumes and resource capability have been studied extensively because they are more important than other factors to determine the dependency between partners and influence dynamics of SCRs (Caniels & Gelderman, 2005; Doran et al., 2005). They can be seen as representatives of buyer power and supply power (Cox, 2001a; Kahkonen & Virolainen, 2011). Compared to purchasing volumes and resource capability, power from uncertainty in the market can also show a certain influence in the relationships between customers and suppliers.

Resource capability

The requirements of SCRs vary according to the organization's resource capabilities and offerings (Prasad et al., 2012). The dynamics of SCRs are also determined accordingly. Firms are considered large if their employees total more than 500 people (Kamaruddin & Udin, 2009). The other firms are identified as the small-and medium-sized companies (SMEs) (Prater & Ghosh, 2006). Large suppliers have more resources which enable them to adopt advanced technologies and streamline supply chain practices more effectively than the SMEs (Pearcy & Giunipero, 2008). When suppliers have strong and unique resources, they can

provide innovative offerings to their customers. In this situation, customers find it difficult to switch suppliers because the costs for switching suppliers are high. Consequently, suppliers can dominate relationships because they are more powerful than customers (Watson, 2001). On the other hand, SMEs have difficulty in dominating relationships because of limited resource capability (Howard & Squire, 2007).

High degrees of supplier dominance can facilitate closer relationships between suppliers and customers because strong resource capability can help suppliers serve customers effectively and efficiently (Humphries, Towriss & Wilding, 2007). As a result, large suppliers are more attractive to customers than SMEs in developing mutual trust and closer SCRs (Larson, Carr & Dhariwal, 2005; Wagner et al., 2011).

In contrast, SMEs lack resources and investment in advanced technologies and supply chain practices. This hinders the development of long term and close relationships between SMEs and their customers (Larson et al., 2005; Vaaland & Heide, 2007). However, researchers suggest that SMEs should attempt to develop closer relationships with partners in order to enhance performance and counter supply chain uncertainty (Lamprinopoulou & Tregear, 2011; Prasad et al., 2012). Towers and Burnes (2008) indicate that SMEs can facilitate faster alternations according to customer requirements because SMEs have more flexibility to change than larger suppliers. Therefore, large organizations and SMEs exhibit their own strengths and weaknesses in developing SCRs.

Overall, resource capability is important to determine powers of suppliers in supply chains. Based on various forms of supply power, suppliers can show different levels of influence to affect the development of SCRs. Compared to resource capability, purchasing volume is a power source for customers to obtain buyer power in relationships.

Uncertainty

Market uncertainty can lead to risks which may impede or slow down the development of SCRs (Chen & Paulraj, 2004; Yi, Ngai & Moon, 2011). Extant studies outline two major findings about market uncertainty and risk (see Table 2.7). The first finding emphasizes alignment between uncertainty and an organization's business strategy (Choi & Krause, 2006; Peck, 2005). Each organization needs to develop business strategies which can minimize the negative influences from uncertainties in the market (Cadilhon, Fearne, Tam, Moustier, & Poole, 2005; Wagner & Young, 2009). The requirements of SCRs are designed and developed according to strategic goals. Consequently, uncertainty in market can determine the development of SCRs (Azadegan, Patel, Zangoueinezhad, & Linderman, 2013).

Table 2.7: Uncertainty and risk in supply chain relationships

Major findings of uncertainty and risk	Representative studies
Business strategy should be matched with the environment's complexity and munificence to foster the development of collaboration.	Azadegan et al., 2013; Cadilhon et al., 2005; Choi & Krause, 2006; Peck, 2005; Pilbeam, Alvarez, & Wilson, 2012.
Degrees of different kinds of uncertainty are positively linked to the degree of the development of collaboration because related interdependence, trust, commitment, and IT alignment are different.	Cai & Yang，2008; Kull, Oke & Dooley, 2014; Min & Mentzer, 2000; Paulraj & Chen, 2007; Prater, 2005; Wiengarten et al., 2013; Yan & Dooley, 2013; Yi et al., 2011
High degree of uncertainty (market uncertainty) hinders development of collaboration	Baldwin, Rose-Anderssen, Ridgway, Allen, Lopez, Strathern, &Varga, 2006; Cadilhon et al., 2005; Pagell & Krause, 2004; Wong, Lai & Chen, 2011.

The second finding supports a connection between the degree of uncertainty and the degree of relationship closeness (Cai & Yang，2008; Kull et al., 2014). When an individual organization is not powerful enough to deal with high degrees of uncertainty and risk, partners can develop high degrees of trust, commitment, interdependency and IT alignment to mitigate uncertainty and related risk (Min & Mentzer, 2000; Paulraj & Chen, 2007). As a result, the relationship seeks higher degrees of collaboration between partners (Prater, 2005; Yan & Dooley, 2013). However, Cadilhon et al. (2005) suggest instead that a high degree of market uncertainty restricts the development of collaboration. If the supply chain operates with commoditized products which return low profits, it is difficult to develop

collaboration to mitigate uncertainty because the development of collaboration can cost more than the profits returned for partners (Baldwin et al., 2006; Pagell & Krause, 2004). The SCRs can only continue as transactional relationships in this situation (Wong et al., 2011). Therefore, the characteristics of products and services in supply chains are more important than market uncertainty to determine the development of SCRs (Harland et al., 2001; Tsai et al., 2008).

In sum, organizations need to develop different strategies under the influences from market uncertainty and risk. In this situation, the development of SCRs between organizations can be changed.

Overview of business context factors

Existing supply chain research has demonstrated that all influential factors related to business context can determine the development and dynamic of dyadic SCRs (Squire et al., 2009; Sohal & Perry, 2006; Caniels & Gelderman, 2005). The influences of purchasing volumes and resources are managed by organizations, while the influences from uncertainty come from the market. In addition to findings, previous research on business context factors has two limitations.

One limitation concerns the comparison of influences from three business context factors. Extant studies have already identified certain connections among them (Lamprinopoulou & Tregear, 2011; Prasad et al., 2012). However, they have not compared their influences in same SCRs. In this situation, it is difficult to determine which one is more significant than others to determine the development and dynamics of SCRs. In order to address this limitation, this thesis will compare influences from purchasing volumes, resource capability, and uncertainty in SCRs. This comparison will indicate the significant factors that determine dynamics of SCRs in logistics outsourcing.

Another limitation relates to the dynamics of business context factors. Previous studies have proposed that the three factors can influence dynamics of SCRs (Kull et al., 2014; Meehan & Wright, 2011; Wagner et al., 2011). However, little research has investigated the connection between dynamic business factors and the dynamics of SCRs. Organizations can change their purchasing volumes or

resource capability. Further, uncertainty is also dynamic in different markets. Therefore, it is worthwhile to study SCRs by investigating dynamic business context factors. So, in order to comprehensively study the dynamics of SCRs in logistics outsourcing, this thesis will investigate both stable and dynamic business context factors.

Three business context factors can determine types of supply chain relationships in different situations. Different relationship types usually indicate relationship length and business frequency between organizations. Therefore, business continuity factors are also important to study the development and dynamics of SCRs.

2.3.3.4 Business continuity factors

Business continuity factors emphasize the development of SCRs in a period (Cannon, Doney, Mullen, & Petersen, 2010; Paulraj & Chen, 2007). Figure 2.8 illustrates that relationship length and business frequency show unique influences to determine the development of SCRs. Continuous customer demand, long term relationship focus, and positive relationship history can foster collaborative SCRs. In contrast, discrete customer demand, short term relationship focus, lack of and negative relationship history hinder the development of collaboration between organizations.
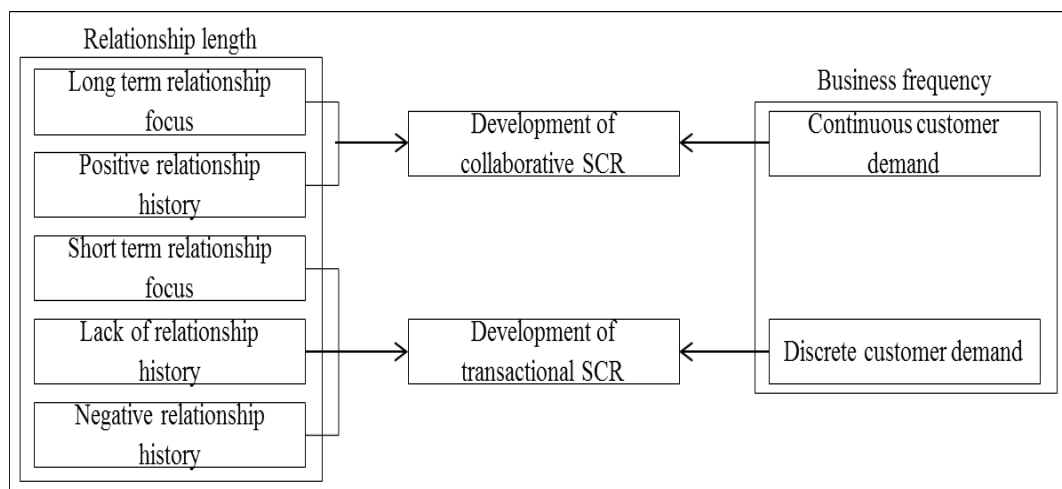
Figure 2.8: Business continuity factors and supply chain relationships

Concerning the influences of relationship length, organizations focusing on long term relationships have more patience to develop mutual commitment, enhance mutual trust, and align business culture through their joint efforts. Collaborations can be fostered under these circumstances (Cai & Yang, 2008; Cannon et al., 2010). On the other hand, organizations focussing on short term returns prefer to retain transactional relationships because they lack consideration of partners and long term return (Bode et al., 2011; Gopal & Cline, 2007; Paulraj & Chen, 2007).

From the perspective of relationship history, a positive history between partners indicates that the relationship is significant to partners and partners depend on each other (Paulraj, Lado, & Chen, 2008). Mutual dependency can facilitate the development of collaboration between partners in new businesses (Gadde et al. 2003; Doran et al. 2005). This finding also demonstrates that long term relationships exhibit a connection with collaboration (Pagell & Wu, 2009).

In contrast, a negative relationship history and/or a lack of relationship history only makes partners keep their distance and maintain transactional SCRs (Carter & Rogers, 2008). Nevertheless, several studies show contradictory outcomes about the influences from relationship history. Wagner et al. (2011) suggest that any change in resource and interdependency between partners can end collaboration despite their having a positive relationship history. Stading and Altay (2007) claim that continuous business volumes are more important than the length and history of a relationship to determine the development and dynamics of SCRs. Therefore, the influences from purchasing volumes and resource capability show more significant influences than relationship length to affect the dynamics of SCRs (Freeman & Browne, 2004; Van de Vijver, Vos & Akkermans, 2011).

The other business continuity factor, business frequency, reflects the continuity of customer demand in a relationship (Howard & Squire, 2007). The frequency of customer demands can indicate an organization's motivation and willingness to develop collaboration with partners (Salam, 2011). Discrete customer demand is not attractive to suppliers (Celuch, Bantham, & Kasouf, 2012). Therefore, customers and suppliers prefer to keep transactional links and may disconnect at any time (Pagell & Wu, 2009). In contrast, continuous customer demand can help

organizations gradually enhance interdependence, trust, and commitment (Hartmann & Caerteling, 2010). Further, compared to discrete customer demand, continuous demand can help customers gain more buyer power to develop and control collaboration with suppliers (Mena et al., 2013; Wiseman & Gomez-Mejia, 1998).

In sum, with the change of relationship length and business frequency, the degree of interdependency between organizations can be dynamic (Mena et al., 2013). SCRs will also be changed in this situation. Therefore, in this thesis, relationship length and business frequency will be used to study relationship dynamics in logistics outsourcing.

As SCRs can be changed according to influences from relationship length and business frequency, relationship cycle studies indicate that communication and interactions between organizations are also different (Ellram, 1991; Sawhney & Zabin, 2002). In order to achieve efficient communication and interaction, organizations show different behaviour to handle the change in SCRs.

2.3.3.5 Relationship behaviour factors

The two relationship behaviour factors (organizational culture and organization behaviour) show connection as a number of studies investigate them together (Autry, Skinner, & Lamb, 2008; Bachrach & Bendoly, 2011; Eckerd & Hill, 2012; Griffith, Harvey, & Lusch 2006; Saura, Molina, & Frances, 2008). By illustrating two groups of research on organizational culture and two types of organizational behaviour, Figure 2.9 illustrates that organizational culture and organization behaviour can influence each other in SCRs. These influences can be reflected at two points.
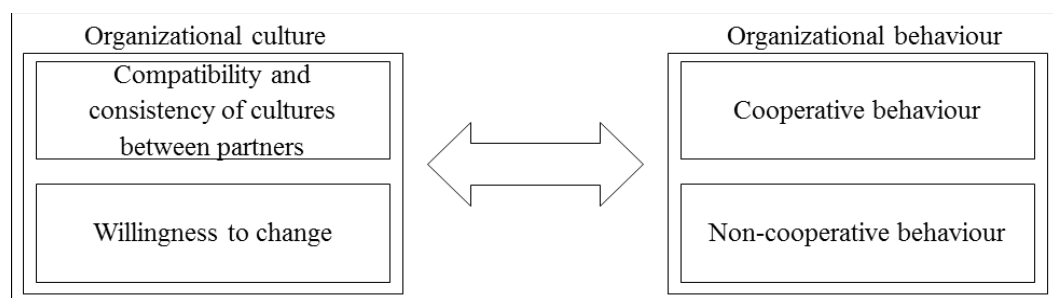
Figure 2.9: Connection between organizational culture and organizational behaviour

The first point concerns the link between the development of organizational behaviour and the compatibility of organizational culture (Eckerd & Hill, 2012; Griffith et al., 2006). Compatible organizational cultures can ease the process of changes in SCRs and facilitate collaboration by fostering cooperative behaviour between partners, such as making a common plan and sharing information and costs (Fawcett, Wallin, Allred, Fawcett & Magnan, 2011; Mello & Stank, 2005). In contrast, incompatible cultures make it difficult to foster mutual understanding and trust (Hofstede, Fritz, Canavari, Oosterkamp, & Sprundel, 2010; Liu, Ke, Wei, Gu, & Chen, 2010; McAfee, Glassman, & Honeycutt, 2002). In this situation, partners do not display cooperative behaviour and do not have an interest in developing collaboration (Fawcett, Jones & Fawcett, 2011).

The second point relates to the willingness to change organizational culture and behaviour (Wagner, Grosse-Ruyken, & Erhun, 2012). Organizations usually become accustomed to existing cultures and behaviour (Cheung & Rowlinson, 2011; House & Stank, 2001), therefore, it is difficult to change them (Whitfield & Landeros, 2006). However, the development of collaboration asks partners to make certain changes to build fluent supply chain processes (McIvor & McHugh, 2000; Tummala, Phillips, & Johnson, 2006). In this situation, partners need to change their existing cultures and behaviour (Carter & Rogers, 2008; Grawe, Chen, & Daugherty, 2009)., otherwise, the lack of change can inhibit the development of collaboration between them (Bachrach & Bendoly, 2011; Eckerd & Hill, 2012; Griffith et al., 2006).

Further, some influential factors (such as resource capability and personal relationships) may foster change of organisational behaviour to develop collaboration between partners (Cadden, Marshall, & Cao, 2013; Freeman & Browne, 2004). Therefore, in order to study dynamics of SCRs from the view of organization behaviour, researchers suggest integrating influences from behaviour and other influential factors (Fawcett et al., 2011; Preiss & Murray, 2005; Wagner & Lindemann, 2008).

In conclusion, two relationship behaviour factors can jointly influence the dynamics of SCRs (Grawe et al., 2009; Griffith et al., 2006). Further, in studying

relationship dynamics, the influences from relationship behaviours and other categories of influential factors cannot be separated because the change of relationship behaviour factors is strongly determined by other factors (Cadden et al., 2013). The next section will discuss personal factors, the last category of influential factors that can cause dynamics of SCRs.

2.3.3.6 Personal factors

Existing studies identify two major kinds of personal factor in SCRs: personal relationships and personal preferences (see Table 2.8). The enhancement of informal personal relationships can influence the development of formal business relationships because the quality and closeness of personal relationships impact on mutual understanding, commitment and joint effort between partners (Gligor & Autry, 2012; Parsons, 2002; Williamson, 2008). For example, the enhancement of personal relationships between senior managers can develop cooperative behaviour, decrease misunderstanding and reduce conflict between organizations (Preis, 2003). This phenomenon can help change organisational behaviour and develop collaboration (Song & Chatterjee, 2010; Wagner, Macbeth & Boddy, 2002).

Table 2.8: Personal factors in supply chain relationships

Major findings of personal factors	Representative studies
Personal relationships	
The development of personal relationships is critical in determining relationship closeness, adaptation, continuity, benefits sharing, dependency, communication, mutual trust and commitment, performance and relationship quality between business partners.	Bode et al., 2011; Gligor & Autry, 2012; Parsons, 2002; Preis, 2003; Song & Chatterjee, 2010; Wagner et al., 2002; Williamson, 2008
Personal preference	
Senior manager's personal preferences can determine the degree of top management support in the development of business relationships.	Anbanandam, Banwet, & Shankar, 2011 ; Chen et al., 2011; Chen & Paulraj, 2004; Hayat Abbas, Siddique, & Cheema, 2012 ; Liao et al., 2010; Sandberg & Abrahamsson, 2010; Wong et al., 2012

Personal preference is another factor that determines business relationships. The key people (senior manager or owner) can affect the degree of top management support in SCRs because they have their personal preferences in selecting partners

and managing SCRs (Liao, Hong, & Rao, 2010; Wong et al., 2012). Further, personal preference is highly determined by purchasing volumes and resource capability because these two factors directly influence profits and interdependency between organizations (Chen et al., 2011). Senior managers and owners usually prefer to have close links with partners that can offer large purchasing volumes or have strong resource capability (Hayat et al., 2012; Sandberg & Abrahamsson, 2010). Therefore, under influence from business context factors, personal preference is a fundamental to develop and manage SCRs (Anbanandam et al., 2011; Chen & Paulraj, 2004).

In conclusion, two personal factors show extensive connections with business context factors and relationship behaviour factors which affect SCRs. Therefore, in this thesis, studying personal factors can also help to understand the dynamics of SCRs in logistics outsourcing.

All studies about relationship life cycle, various relationship types, and influential factors can help understand dynamics of SCRs. However, these studies show certain research gaps which will be discussed in the next section.

2.3.3.7 Research gaps in relationship dynamics studies

Concerning the characteristics of logistics outsourcing, previous studies regarding relationship dynamics reflect three research gaps. Lack of research on dynamics in network structure is the first gap. A majority of studies focused on how dyadic SCRs change and how various influential factors affect the dynamics of dyadic SCRs (Flynn et al., 2008; Kahkonen & Virolainen, 2011; Petersen et al., 2008; Touboulic et al., 2014). A few studies investigate dynamics of dyadic SCRs in network structures (Coromina et al., 2008; Qiang, Ke, Anderson, & Dong, 2013); however, they have not studied the connection between the dynamics of dyadic SCRs and the change of whole network structures.

In contrast, logistics outsourcing includes multiple SCRs among LSPs, LSPs' customers, and final customers (Naim et al., 2010). All of these SCRs may show influences on each other (Gotzamani et al., 2010). If studying the dynamics of

these dyadic SCRs separately, it is difficult to comprehensively understand relationship dynamics in the whole process of logistics outsourcing. Therefore, this thesis will study the connection between the dynamics of dyadic SCRs and the change of network structures in logistics outsourcing.

The second research gap relates to the combination of influential factors. A number of studies indicate that the four categories of influential actors show connections between each other (Barney, 2012; Jayaraman et al., 2014; Li et al., 2013). Through these connections, some factors can influence other factors (Hinkka et al, 2013; Touboulic et al., 2014). Therefore, all influential factors should show a different significance in determining the dynamics of SCRs. However, little research has compared these factors in one research project. In this situation, it is difficult to identify the root cause of relationship dynamics. As a result, in order to study relationship dynamics in logistics outsourcing comprehensively, this thesis will test all of these factors and compare their significance.

Finally, similarly to the discussion in the overview of business context factors, fewer studies have investigated how the dynamics of influential factors lead to the change in SCRs. Most previous studies identify static connections between factors and SCRs (Gligor & Holcomb, 2014; Hunt & Davis, 2012; Storer & Hyland, 2011). For example, unique resource can foster collaboration between partners; while limited resources and commoditized offerings can only develop transactional SCRs (Svahn & Westerlund, 2007). However, little research investigates the dynamics of SCRs when the supplier changes from limited resources to unique resource. As a result, the present study will also investigate the connection between the dynamics of influential factors and dynamics of SCRs in logistics outsourcing.

In conclusion, review of studies regarding relationship dynamics helps reveal three research gaps. These gaps specify the research direction of this thesis. This thesis will study the dynamics of SCRs from a network perspective by comparing influences from different influential factors and studying dynamics in these

factors. Given there are a number of findings regarding network structures in previous studies, it is difficult to apply all of these findings in this thesis. Therefore, the next section will review research on networks to further specify research direction for the present study.

2.3.4 Network studies

The research findings of network studies have two groups. One compares supply networks and supply chains: the other studies the development of SCRs in networks.

Researchers show two different perceptions of networks in the first group of research. A number of studies claim that the supply chain and supply network are the same and the term "supply chain" should be replaced by "supply network" because all connected organizations function like a web rather than a linear chain (Bhatnagar & Teo, 2009; Choi et al., 2011; Hofmann, 2010; Tokman & Beitelspacher, 2011). In contrast, from the second perception of networks, a number of studies indicate that the supply chain and supply network share more differences than similarities (Braziotis et al., 2013; Miemczyk et al., 2012). While the supply chain focuses on delivering the products and services to the final customers; the supply network emphasizes the SCRs among all organizations in networks (Moser, Kern, Wohlfarth, & Hartmann, 2011; Svahn & Westerlund, 2007). The second perception of networks is adopted in this thesis because the present study seeks to investigate the dynamics of multiple SCRs among organizations rather than the products or services in a network of logistics outsourcing.

Another group of network studies reveals that the development of SCRs among all organizations in a network can be connected to different influential factors (reviewed in section 2.3.3) (Barnes & Liao, 2012; Bastl et al., 2013; Bernardes, 2010). Through their purchasing volumes, resource capability, relationship history, or continuous customer demand, organizations can obtain different power to influence the development of multiple SCRs in supply networks (Coromina et al., 2008; DeWitt, Giunipero, & Melton, 2006). For example, the final customer in a

supply network can apply purchasing volumes to affect the SCRs in terms of suppliers and distributors (Lee & Qualls, 2010; Li et al., 2006; Qiang et al., 2013). In all organizations, the most powerful usually shows more influence than other parties to determine the development of SCRs among organizations in a network (Borgatti & Li, 2009; Choi & Wu, 2009a; Harland et al., 2001; Mena et al., 2013; Peck, 2005; Pilbeam et al., 2012; Wathne & Heide, 2004). This kind of party is called the focal firm, or centre firm, or leading firm in previous studies (Borgatti & Li, 2009; Harland et al., 2001) (for consistency, the term "focal firm" will be used hereafter in this thesis).

In sum, multiple SCRs in a network can be determined by power games between all organizations in the network (Bastl et al., 2013; Mena et al., 2013; Qiang et al., 2013). Further, the most powerful organization can dictate to a network by using power to manage SCRs (Harland et al., 2001; Lamming, Johnsen, Zheng, & Harland, 2000). However, in extant research, because of restrictions regarding research time and research resources, it is difficult to study all SCRs in a network which contains a great number of organizations. Therefore, these studies focus on how the focal firm controls its direct connected organizations (McKone-Sweet & Lee, 2009; Skjoett-Larsen, Thernoe, & Andresen, 2003; Valkokari & Helander, 2007). They lack consideration of how the focal firm mediates indirect connections between other organizations in a network.

Compared to other network structures, the triadic relationship is a simplified network that researchers are able to use to investigate the dynamics of all SCRs in one research project (Simmel, 1950; Caplow, 1959; Mills, 1958). In a triadic relationship structure, in addition to study direct links among all organizations, researchers can also investigate how one organization mediates its indirect link between the other two organizations (Hummon & Doreian, 2003; Li & Choi, 2009). As a result, studying SCRs from a triadic structure view is a meaningful attempt to understand the development and dynamics of SCRs from a network perspective (Dubois & Fredriksson, 2008; Fawcett & Clinton, 1997). Consequently, there is a trend of academic interest in research on triadic SCRs in recent years (Choi & Wu, 2009b).

The trend of studying triadic SCRs helps specify the research direction for this thesis, to study logistics triads. Although current research acknowledges the existence of logistics triads and recognizes the significance of logistics outsourcing in supply chain context (Hinkka et al., 2013; Li et al., 2013), little research has investigated the dynamics of logistics triads. Therefore, it is worth studying this area in the current research. As a triadic SCR can have different structures among three organizations (Li & Choi, 2009; Mena et al., 2013), the next sub-section reviews existing research on triadic SCRs to identify the triadic relationship structure for studying logistics triads in the present study.

2.3.4.1 Triadic relationship structures

Extant studies classify triadic SCRs into three structures (see Figure 2.10). The first is the customer-supplier-supplier triad (Choi & Kim, 2008; Li & Choi, 2009; Salo Tähtinen, & Ulkuniemi, 2009). In this structure, two suppliers serve one customer at the same time and the products and services from the two suppliers may overlap (Mena et al., 2013; Wu & Choi, 2005). Since the two suppliers occupy an equal position in the triad, there is only one hierarchical level in this structure (Wu, Choi, & Rungtusanatham, 2010).
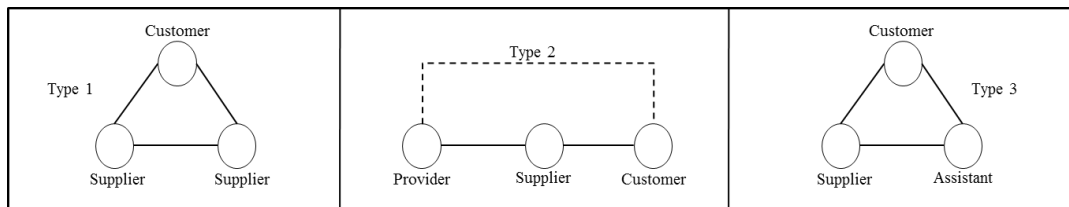
Figure 2.10: Three structures of triadic supply chain relationships

The second structure is the provider-supplier-customer triad (Min & Mitsuhashi, 2012; Dubois & Fredriksson, 2008). Here a provider offers products to the supplier and the supplier provides products to the final customer (Phillips Liu, & Costello, 1998; Gammelgaard & Larson, 2001). In this triad, there are two levels of hierarchy: the provider-supplier level and the supplier-customer level (Wuyts, Stremersch, Van Den Bulte, & Franses, 2004). The provider and the customer lack direct communication because the supplier acts as a bridge between them (van der Valk & van Iwaarden, 2011).

The last structure is the supplier-assistant-customer triad (Gammelgaard & Larson, 2001; Mena et al., 2013). This triad shares certain similarities with the first structure because both the supplier and the assistant communicate directly with the final customer (Holma, 2012). Moreover, their products and services are complementary to each other (Eggert et al., 2012). However, the supplier and the assistant do not hold an equal position. The supplier is the assistant's direct customer because the supplier outsources products or services to the assistant. Therefore, this structure contains two hierarchical levels. One level has two dyads connected with the final customer and the other level is between the supplier and the assistant.

Compared to the characteristics of logistics triads, the third structure is more applicable than the other two structures to help the present research. In a logistics triad, the LSP works as an assistant of the supplier to serve the customer (Gotzamani et al., 2010). This kind of triad usually contains two hierarchy levels: the two dyads connected with the customer are one level and the dyad between the supplier and the LSP is another level (Naim et al., 2010). Furthermore, both the supplier and the LSP have direct communication with the customer in the triad. In contrast, the first structure in Figure 2.10 contains only one hierarchical level. In the second structure, the provider does not have direct communication with the customer. Only the third structure in Figure 2.10 shares a number of similarities with the logistics triad. The next section provides details about the third structure.

2.3.4.2 Structure of supplier-assistant-customer triad

This structure highlights the significance of the supplier in a triad (Gentry, 1996; Ravindranath, Gnyawali, & He, 2004). The supplier and the assistant are not competitors in this structure because they do not have similar business capabilities (Eggert et al., 2012; Gammelgaard & Larson, 2001). The supplier focuses on core competency and outsources unimportant product and services to the selected assistant in the triad (Dubois & Fredriksson, 2008; Min & Mitsuhashi, 2012). The supplier and the assistant make a joint effort to satisfy their common customer in the triad (Gadde & Hulthén, 2009). Accordingly, the assistant and the supplier tend to cooperate rather than compete in the triad (van der Valk & van Iwaarden, 2011). If the supplier does not take responsibility jointly with the assistant for

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enhancing performance and competency, and if the customer is not satisfied with product and service, the customer may replace one or both of the partners in the triad (Choi & Wu, 2009b; Mena et al., 2013). This phenomenon demonstrates the mediating effect that the customer can have on the dyad between the supplier and the assistant despite this link being an indirect link of the customer (Eggert et al., 2012).

In the structure of the supplier-assistant-customer triad, the customer shows more power than the supplier and the assistant because the customer can determine all embedded dyads in the triadic structure (Bastl et al., 2013). Consequently, power games are important in influencing a triadic structure. Concerning the influence from power games in a triad, previous studies have identified that a change of power games between organizations can determine the development of coalitions in triad (Crook & Combs, 2007; Palsule-Desai, Tirupati & Chandra, 2013; Pilbeam et al., 2012). This can result the in dynamics of triadic relationships.

2.3.4.3 Power games and coalition in triads

Power games are common in both dyadic and triadic relationship structures (Kahkonen & Virolainen, 2011). In dyadic SCRs, power games can determine whether SCRs have buyer dominance or supplier dominance (Cox, Watson, Lonsdale, & Sanderson, 2004). The effect of power games is more complex in a triadic structure because it can lead to the dynamics of a triad by fostering or impeding coalitions between three organizations (Bastl et al., 2013).

In order to address power games and achieve a balance of power in a triad, organizations usually seek to form different coalitions (Caplow, 1956; Stevenson, Pearce & Porter, 1985). In this situation, different power distributions among three organizations can produce four types of coalition in a triad (see Figure 2.11). In the first type of coalition, a triad has one strong organization and two weak organizations. The two weak organizations have equal power. If the collective power from two weak organizations is stronger than that of the strongest organization, the two weak organizations will form a coalition (Bristor & Ryan, 1987). In contrast, if two organizations have equal power and the third one is

weaker, the weaker organization will form a coalition with one of the two stronger organizations (Bastl et al., 2013).
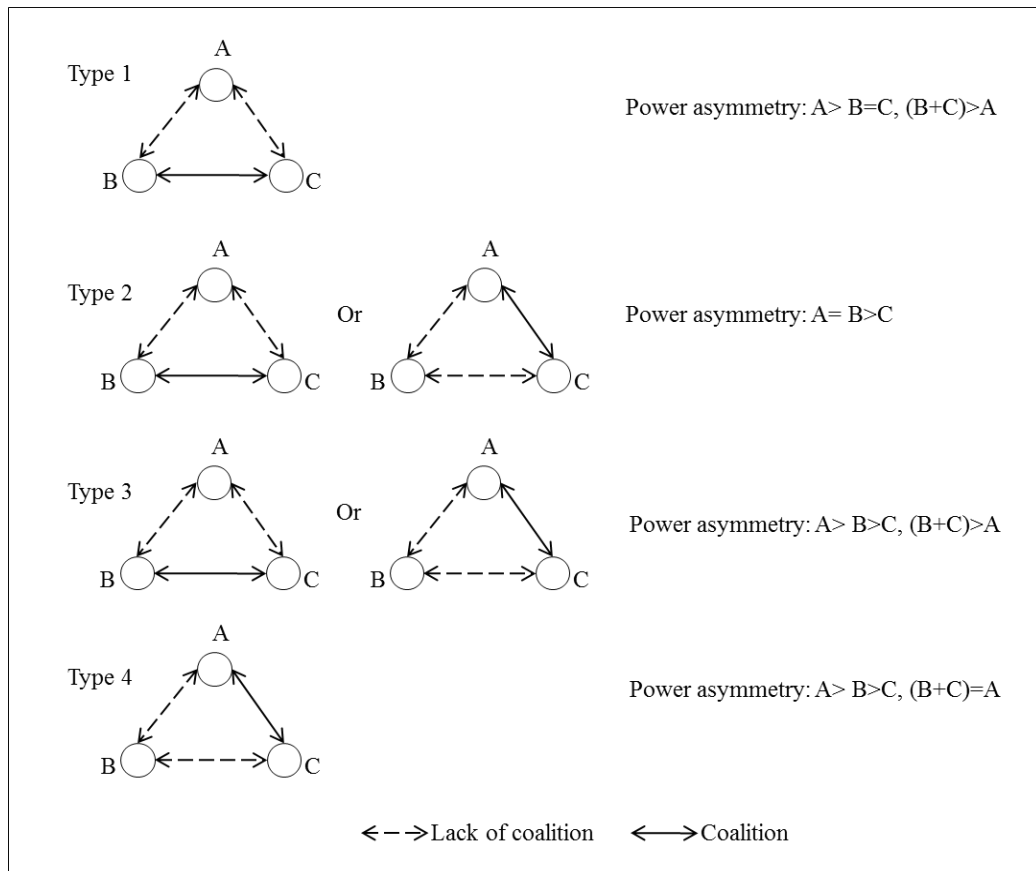
Figure 2.11: Four types of coalition in supply chain triads
(Sources: Bastl et al., 2013; Caplow, 1956; Stevenson et al., 1985)

When three organizations have different powers in a triad, if the strongest organization's power is weaker than the collective power from the other two organizations, the weakest organization can choose to have a coalition with either of the other two (Gamson, 1961). Three organizations also have different powers in the fourth type. However, in this type, the two weaker organizations' collective power is equal to the strongest organization. In this situation, the weakest organization will only chose to have coalition with the strongest organization (Stevenson et al., 1985).

In conclusion, four types of coalition between organizations in a triad indicate that power games can be dynamic in a triadic structure in a supply chain (Bastl et al., 2013). These findings share similarity with dyadic SCR research. Therefore, power games can change in both dyadic and triadic relationship structures.

However, although previous studies have already identified influences from power games in triads (Mena et al., 2013; Wu & Choi, 2005), they also show research gaps. The next section will discuss these gaps and explain how these gaps help specify research direction for the present study.

2.3.4.4 Research gaps in triadic relationship studies

Existing supply chain research exhibits two research gaps in studying the dynamics of SCRs from the view of triadic relationships. One gap is related to the connection between business relationships and power games. Although triadic relationship research has proposed the ideas of coalition (Bastl et al., 2013; Stevenson et al., 1985), they have not explained how to match the power games and coalition of power with the development of SCRs in a triad. A few triadic relationship studies indicate that power games and coalition among organizations keep changing in a triad because every organization intends to control the other two organizations as much as possible (Autry, Williams, & Golicic, 2014; Nooteboom, 2006); while business relationships should be long term stable connections between organizations (Bristor & Ryan, 1987; Gamson, 1961). In this situation, these studies do not match the change of power games with the development and change of SCRs in a triad. Therefore, even though some studies mention the dynamics of SCRs in a triadic relationship structure (Choi & Wu, 2009c; Dubois & Fredriksson, 2008; Mena et al., 2013), they do not identify the connection between power games and development of SCRs.

Power games show extensive connections with the development and dynamics of SCRs in dyadic relationship studies (Cox, Watson, Lonsdale, & Sanderson et al., 2004; Kahkonen & Virolainen, 2011). For example, when the customer's buyer power is stronger than the supplier's buyer power, the customer can use power asymmetry to control the supplier and determine whether they need to develop a transactional or a collaborative relationship (Sanderson, 2001). Therefore, in comparison with research on dyadic SCRs, it is valuable to investigate how organizations can combine power games with dynamics of SCRs to influence the stability and dynamics of a triadic relationship structure.

Another research gap concerns the source of power in a triad. Dyadic SCRs studies have identified a number of influential factors as power sources that can lead to power games and development of SCRs (Gligor & Holcomb, 2014; Hunt & Davis, 2012; Storer & Hyland, 2011). In contrast, little research has investigated how these influential factors affect power games in a triad. As each organization can potentially mediate the dyad between the other two in a triad, the power from different influential factors can be used by the organization to show a mediating effect and thereby influence the dynamics of the triad (Choi & Wu, 2009c; Wu et al., 2010). As a result, in order to study the dynamics of triadic SCRs from the perspective of power games, it is worth studying the influence from different power sources—the influential factors.

Overall, in relation to the two research gaps explained above, this thesis seeks to study the dynamics of logistics triads by studying connections among influential factors, power games, and the development of SCRs.

Having reviewed the SCR research, the next section will provide an overview to connect all research gaps identified.

2.3.5 Overview of research gaps in supply chain relationship

The review of literature has revealed three research gaps in relationship dynamics and two in triadic relationship structures. These gaps concern comparison among influential actors, change of influential factors, change of power games, and dynamics of SCRs in triadic relationship structure. This thesis seeks to fill these gaps by investigating logistics triads. In order to effectively study triadic relationships in a supply chain context, researchers select different theoretical lenses to conduct their studies according to their research backgrounds. The next section will review and compare management theories that are widely applied in existing SCR research. The comparison will help this thesis identify a suitable tool to study logistics triads.

2.4 Theoretical studies of supply chain relationships

Table 2.9 shows ten theories which have been widely applied to investigate SCRs. Balance theory and structural hole theory emphasize the triadic relationship structures. In the other eight theories, four are generally used to study dyadic SCRs; the other four are applied to network structures.

Table 2.9: Theories in studies of SCRs

Theory	Description	Representative literature
Agency Theory	How one party (the agent) works on behalf of another party (the principal) to run the activities requested by the principal. The focus is on the dyadic relationship between the agent and the principal.	Fayezi, O'Loughlin, & Zutshi, 2012; Tate, Ellram, Bals, Hartmann, & van der Valk, 2010
Transaction Costs Analysis	Focuses on how a company/ organization should coordinate its relationships to minimize its own costs. The focus is on dyadic relationships.	Madhok & Tallman,1998
Resource Dependency Theory	Collaborative organizations engage with each other to share unique resources in dyadic SCRs.	Das & Teng, 1998
Structural Hole Theory	One party may act as a bridge to help the information exchange between two other parties in a triadic supply chain relationship	Li & Choi, 2009
Balance Theory	A triad formed by three actors can be dynamic between balanced and unbalanced structures according to changes of embedded dyadic links.	Choi & Wu, 2009a; Heider, 1958
Social Capital Theory	"A valuable asset that stems from access to resource made available through social relationships."	Lawson, Tyler & Cousins, 2008 (p. 447)
Network Centrality	Every organization needs to cooperate with its direct partners and the partners' partners. Each firm has direct and/or indirect relationships with all the other actors.	Buechel & Buskens, 2013
Supply Network Model	Supply network is a widely connected inter-organizational network. A supply network can be varied according to the characteristics of process and the influence from the focal firm in the network.	Harland et al., 2001
Game Theory	Collaboration and competition exist at the same time between multiple suppliers when they serve a common customer.	Mena et al., 2013; Wu et al., 2010
Social Network Analysis	The social connections between groups of organizations provide meaning to the network structure. Networks are considered to be multi-layered, based on social interactions.	Borgatti & Li, 2009; Borgatti, Mehra, Brass & Labianca, 2009; Galaskiewicz, 2011

2.4.1 Agency theory

Agency theory proposes that:

> … one party (acting as principal) delegates work to another party (the agent), who performs the work…the principal and agent do not always coincide and the principal is not able to control the agent completely, which causes information asymmetries. It is assumed that both parties are driven by self-interest... (Wiese & Toporowski, 2013, p. 97)

This theory suggests that the agent company works on behalf of the principal company to contact other supply chain members (Fayezi et al., 2012) (see Figure 2.12). The agents usually seek to maximize their own profit and make the influence from the principals as weak as possible (Fayezi et al., 2012). In contrast, the principals seek to minimize the agents' profit and influence the agents as much as possible (Fleisher, 1991). Figure 2.12 indicates that agency theory emphasizes the dyadic SCR between the agent and related principle.
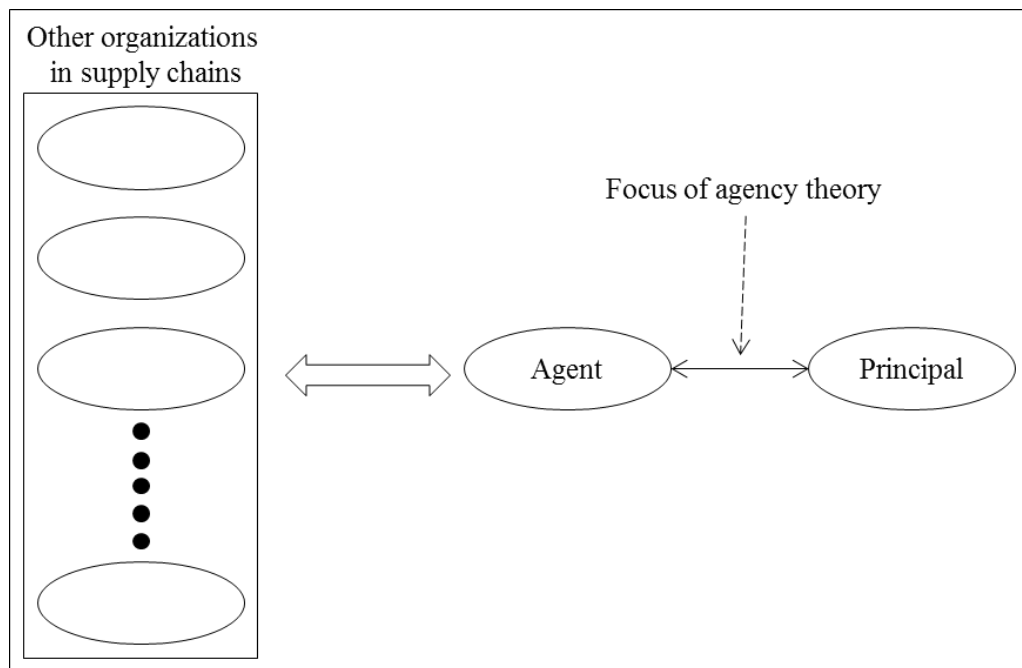
Figure 2.12: Focus of agency theory in supply chains

In sum, agency theory models the relationship dynamics of power games between agents and their principals (Wiese & Toporowski, 2013). There are a number of

influential actors in a supply chain network (Fayezi et al., 2012). The power of the agents and the principals may change because of the influential factors (Cheng & Kam, 2008). In certain situations, the agent and the principal even swap roles (Eisenhardt, 1989). For these reasons, the relationships among organizations in a network structure are too complex to be explained by agency theory. Because the triadic relationship structure is also a network, agency theory is not an effective theoretical lens for the current research.

2.4.2 Transaction cost economics

Transaction cost economics (TCE):

> …uses the concept of transaction costs to explain the organization of firms and the method of their interactions along a supply chain by providing a conceptual framework for investigating some of the organizational challenges and economic risks that firms face. (Garfamy, 2012, p. 141)

TCE indicates that a number of organizations want to minimize their own costs in dyadic SCRs (Bajari & Tadelis, 2001; Williamson, 1975). Accordingly, an organization considers three kinds of costs: economic, control and monitoring, and legal (Madhok & Tallman, 1998; Poppo & Zenger, 1998). The economic costs concern the prices of product and services sourced by the organization. The control and monitoring costs relate to the expenses for managing partners and securing profits (Dyer, 1997). The legal costs represent the costs of contract issues in a transactional relationship (Welch & Nayak, 1992). TCE also suggests three types of relationship management in addition to three kinds of costs. These types are the transactional relationship, the vertical integration between different activities, and the combination of the previous two relationships (Poppo & Zenger, 1998).

TCE emphasizes costs, but does not explain the influences from other influential factors in SCRs. In order to mitigate the limitation of TCE, resource dependency theory was introduced to study SCRs (Halldorsson, Kotzab, Mikkola & Skjøtt-Larsen, 2007; Shook, Adams, Ketchen, & Craighead, 2009). In terms of this thesis, other than the influences from costs, TCE cannot assist in discovering other

potential influential factors which may affect triadic SCRs in logistics outsourcing. Therefore, TCE is not a suitable theory for this thesis.

2.4.3 Resource dependence theory

This theory explains the power-seeking behaviour of organizations according to how the supply chain partners interact with their resources in dyadic relationships (Chatterjee & Wernerfelt, 1991; Wernerfelt, 1995). An organization develops and retains its resources in order to keep its competitive advantage. Organizations need to outsource to other organizations if they lack resources (Boyd, 1990). In this situation, the resources give rise to interdependency between partners in dyadic SCRs because they rely on each other to achieve common supply chain goals (Cao, Vonderembse, Zhang, & Ragu-Nathan, 2010). The more specific resources are shared, the higher interdependency develops between partners (Wernerfelt, 1995).

Because a supply chain usually consists of more than two parties, resource dependency theory is not entirely useful to explain the SCRs beyond the dyadic structure (Medcof, 2001). Consequently, this theory is not suitable to study a triadic structure for this thesis. To deal with the limitations of this theory, scholars adopt other theories, such as structural hole theory, to explain multiple relationships in a triad.

2.4.4 Structural hole theory

A structural hole:

> is defined as the lack of connections between agents or groups that are not directly linked together. The structural hole concept is closely related to the concept of a bridge. A bridge is the agent that is positioned on a structural hole. In the absence of a connection between two isolated agents, a bridge acts as a go-between and the gatekeeper of information. (Li & Choi, 2009, p. 29)

According to structural hole theory, an organization becomes the bridge in a triad if it operates between the other two organizations while the other two

organizations in the triad lack direct communication (Borgatti & Li, 2009; Choi & Wu, 2009a). As shown in Figure 2.13, because the other two organizations only communicate with the bridge, the bridge can extract its profits and affect the development of SCRs within the triad by applying the structural power coming from the asymmetric information exchange (Autry & Griffis, 2008).
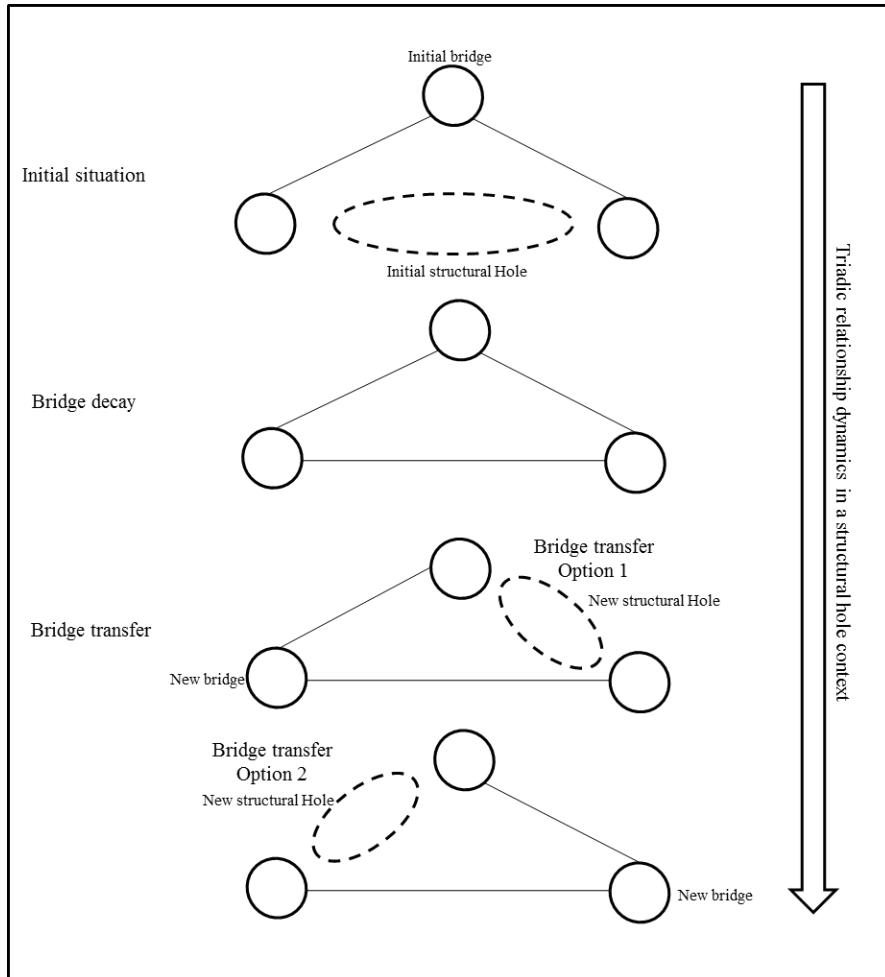
Figure 2.13: Dynamics of triads in a structural hole context

Structural power is not static and may become weak if the other two organizations gradually develop and enhance direct communication (Autry & Griffis, 2008; Li & Choi, 2009). In this situation, it is difficult for the bridge to retain structural power in the triad by manipulating information exchange as before (Gassenheimer, Hunter, & Siguaw, 2007). This phenomenon is referred to as the 'bridge decay effect' and gives rise to two outcomes (Borgatti & Li, 2009). Firstly, the original bridge still keeps exchanging information between the other two organizations. However, the structural power is significantly weakened because all organizations have direct communication in the triad (Carter, 2011; Li & Choi, 2009). Secondly,

a bridge transfer effect may occur (Li & Choi, 2009). Here, one of the two organizations may replace the original bridge to control the information exchange in the triad. The dyad between the original bridge and the other organization breaks up in this situation. As a consequence, the new bridge gains structural power by controlling the exchange of information in the triad (Alvarez, Pilbeam, & Wilding, 2010; Li & Choi, 2009).

The effect of a structural hole in a triad demonstrates that a supply chain triad can be dynamic (Li & Choi, 2009). The relationship dynamics can be affected by information power arising from the structural hole (Borgatti & Li, 2009; Li & Choi, 2009). However, as presented in the introductory chapter, each logistics triad is a fully connected triad where three organizations have direct communications, making it difficult for any organization to manipulate information exchange in this situation. Therefore, in a logistics triad, the power resulting from the structural hole is not obvious. In order to study this kind of triad in supply chains, some researchers use balance theory.

2.4.5 Balance theory

Balance theory was developed for studying relationships between three individuals in the area of behavioural psychology (Choi & Wu, 2009b; Heider, 1958). It has been applied to study triangular relationships between three organizations since the 1990s (Madhavan, Gnyawali, & He, 2004). The foundations of balance theory were developed by Heider (1958), Cartwright and Harary (1956), and Newcomb (1961). Three actors A, B and C, form a triad with three embedded dyadic links between them. Using the actors' attitudes to each other in a triad, balance theory divides each dyadic link into two types: positive and negative (Phillips, Liu, & Costello,1998). In a positive dyad, two actors like and trust each other; in a negative dyad two actors dislike and do not trust (Nooteboom, 2006). With three embedded dyadic links and two types available in each dyadic link, balance theory presents four balanced structures and four unbalanced structures (Choi & Wu, 2009a). All balanced structures are stable and can be retained without change over the long term. In contrast, all unbalanced structures are unstable and should transit to balanced structures as soon as

possible. Additionally, a triad can vary between the eight structures through changes in its embedded dyadic links (Choi & Wu, 2009c).

Actors' different attitudes toward each other lead to power games in a triad (Nooteboom, 2006). The power games can change one or more dyadic links in the triad. For example, if actors A, B, and C dislike each other and A is powerful enough to bully B and C, in order to resist A's power, B and C will change to liking each other and develop a coalition against A. So, balance theory can use the change of dyadic links to explain the dynamics in a triad (Choi & Wu, 2009a; Heider, 1958).

In a logistics triad, each dyadic link between actors can also be changed according to power games between them. Therefore, in this thesis, balance theory is a potential tool to investigate SCRs in logistics triads. In addition to theories developed for dyadic and triadic relationship structures, some theories, such as social capital theory, have been applied to study broad network structures.

2.4.6 Social capital theory

Social Capital Theory (SCT) is:

> one approach for understanding how firms obtain resources that exist outside their boundaries and access the benefits of developing closer ties with other parties. The emphasis on social processes and collective action aligns with the need to include the effect and importance of social context on a firm's actions. (Carey, Lawson & Krause, 2011, p.119)

This theory can examine both the dyadic SCRs and the supply chain networks. It suggests that both formal and informal social exchanges can help people and organizations influence other parties in the supply chain (Gligor & Autry, 2012). Uncertainty, and an organization's position in a supply chain, can determine the development and degrees of social capital between partners (Carey et al., , 2011). Because of embedded relationships, organizations in higher network positions can gain more social capital than other organizations in the same network (Bernardes, 2010). The degrees of social capital can affect the development of personal

relationships and impact on the degree of trust and integration between partners (Petersen et al., 2008; Carey et al., 2011).

Social capital theory has its limitations. There is a lack consideration of influence from business context factors (purchasing volumes, resource capability, and market uncertainty). However, this thesis seeks to study relationship dynamics by testing influences from different influential factors in logistics triads. Therefore, social capital theory is limited for use in studying all potential influential factors for the present study. To overcome the limitation in this theory, researchers began to adopt other theories to study SCRs in networks. Network centrality theory is an option to help researchers to investigate networks by studying influences from the focal firm in a network.

2.4.7 Network centrality

Network centrality relates to how important an organization's network position is in managing the SCRs (Buechel & Buskens, 2013). Any organization with a higher degree of centrality is the focal firm and can impact on other organizations in a network if the organization has more direct links than other organizations in the same network (see Figure 2.14) (Everett, Sinclair, & Dankelmann, 2004). The focal firm fulfils more requirements (such as the requirements of lower cost, better quality, faster speed, and higher flexibility) for other organizations by holding power from its central position (Buskens & Yamaguchi, 1999). The focal firm can also accrue more profit than other organizations through its central position (Hult, Ketchen, Cavusgil, & Calantone, 2006).
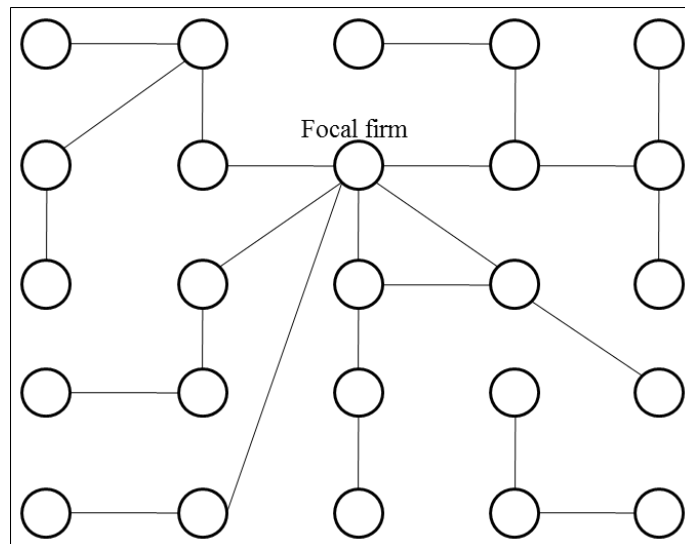
Figure 2.14: Example: Focal firm in a network

However, a supply chain network is not only determined by the organization's position in the network. In terms of this thesis, triadic SCRs can be influenced by a number of factors, not only an organization's position. Therefore, the network centrality concept cannot work alone to investigate dynamics of SCRs in logistics triads. To investigate more influential factors in the supply networks, Harland et al. (2001) developed a supply network model.

2.4.8 Supply network model

Harland et al. (2001) claim "Supply networks are nested within wider inter-organizational networks and consist of interconnected entities whose primary purpose is the procurement, use, and transformation of resources to provide packages of goods and services" (p. 22). A supply network is more complex than a supply chain because a network can contain multiple supply chains and the focal firm of the supply network needs to pay attention to both direct and indirect links among all organizations (Valkokari & Helander, 2007) (see Figure 2.15).
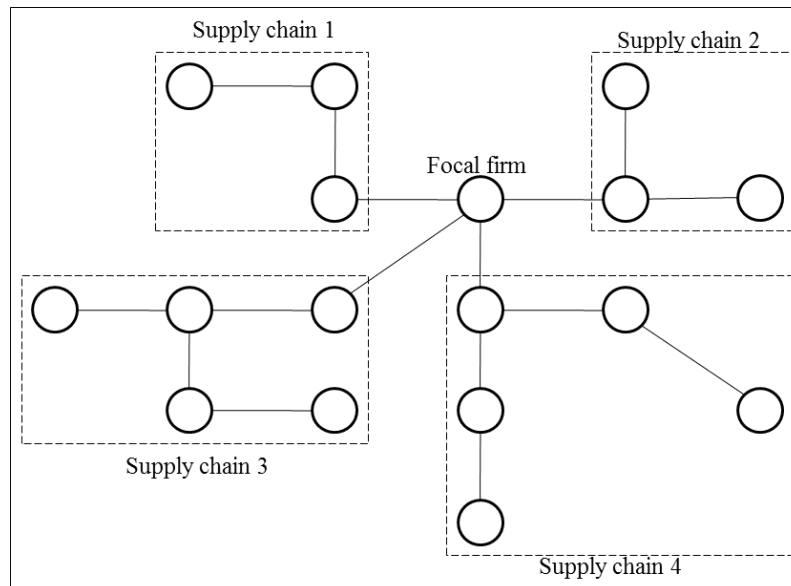
Figure 2.15: Example: Supply network model

According to the characteristics of the process in a network and the degrees of a focal firm's influence in the network, a supply network can have four types (see Figure 2.16) (Harland et al., 2001). When the focal firm can significantly influence relationships among all organizations, a supply network shows high degree of focal firm influence and the network can be of two types (Lamming et al., 2000). In one type, the network has a routine process which operates with commoditized products and services. In the other type, the network has a dynamic process which operates with innovative products and services (Harland, Zheng, Johnsen, & Lamming, 2004). When the focal firm does not significantly influence relationships among all organizations, a supply network shows a low degree of focal firm influence. In this situation, the network can also be of two types according whether it operates with a routine process or a dynamic process (Kaipia, Korhonen, & Hartiala, 2006; Skjoett-Larsen et al., 2003).
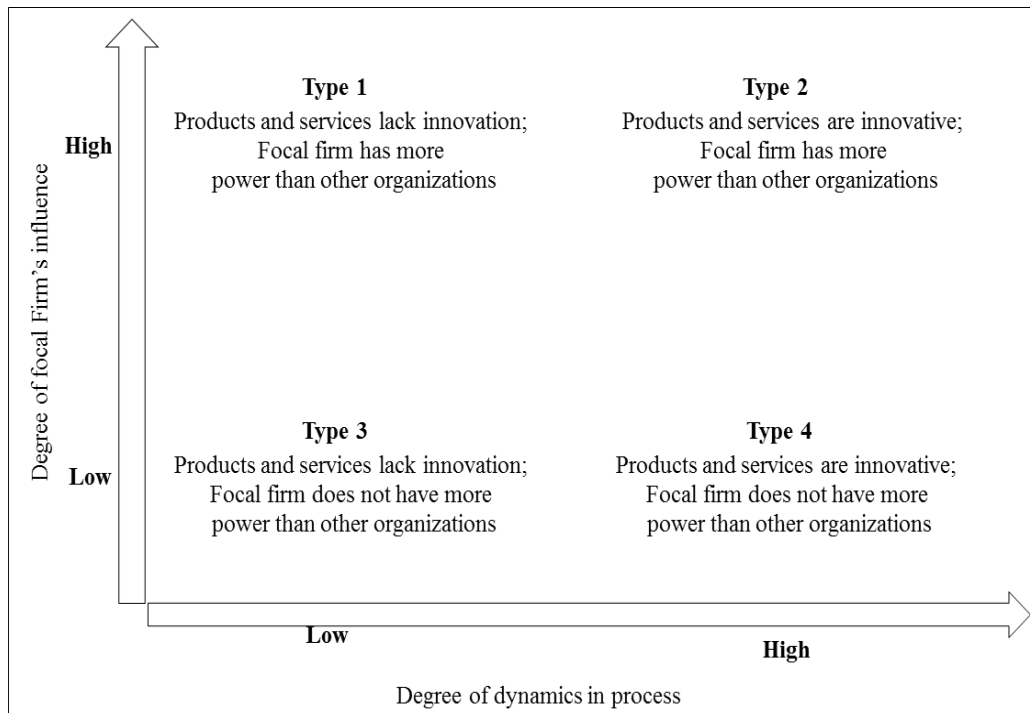
Figure 2.16: Four types of supply network
Source: (Adapted from Harland et al., 2001)

The supply network model includes a number of influential factors, such as volumes of products, or resource capability (Kim, Choi, Yan, & Dooley, 2011). Therefore, the model is also a potential tool for the current research to investigate dynamics of logistics triads. One limitation of the supply network model is that it lacks consideration of competition among organizations in a network. Concerning the competition issue in a network, game theory introduces a new idea—co-opetition—to illustrate how to simultaneously manage competition and cooperation among organizations in a network (Ahmadi & Hoseinpour, 2011).

2.4.9 Game theory

Game theory suggests "…that competing parties, individuals or organizations, being mindful of potential retaliatory actions of their counterparts in future interactions, are willing to engage in collaboration." (Wu et al., 2010, p. 116). This theory indicates that all organizations in a network can, at the same time, have cooperation, competition, and power games among coalition partners (Bengtsson & Kock, 2015; Buchen, 1994; Myerson, 1977). Although game theory is not specifically developed for triadic relationships, it has been applied to study of triadic relationships between two suppliers who serve a common customer (see

Figure 2.17) (Mena et al., 2013). According to game theory, under the influence from the customer, two suppliers in the same supply chain need to develop collaborative SCRs to satisfy their common customer although the two suppliers are competitors (Esmaeili, Aryanezhad & Zeephongsekul, 2009). Neither of the two suppliers can work alone to serve the customer. In this situation, collaboration and competition exist at the same time between suppliers (Ahmadi & Hoseinpour, 2011).
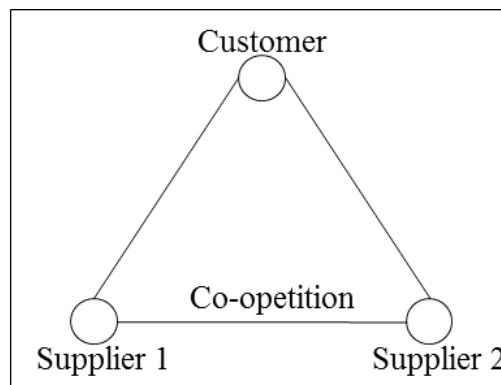
Figure 2.17: Co-opetition between two suppliers in triad

Although game theory explains that one organization can obtain power to influence SCR between the other two organizations in a triadic SCR, little research has investigated how organizations obtain power from different influential factors. Therefore, for the present research, game theory is insufficient to study power sources (influential actors) in logistics triads. Moreover, extant research indicates that game theory is more suitable to use in a modelling approach to investigate the connection among different research instruments (Cachon & Netessine, 2006; Esmaeili et al., 2009). However, it lacks the tools to investigate the dynamics of logistics triad. It is difficult to find well-defined research instruments for a modelling approach in this situation. Therefore, game theory is not a proper theoretical base for this study. Compared to game theory, the concept of social network analysis not only studies competition and collaboration between organizations; it also investigates behaviour interactions among organizations in a network (Pryke, 2004).

2.4.10 Social network analysis

Social network analysis is an extension of the supply chain (Wu & Choi, 2005). It signifies that the nature of a network can be impacted by the connections among all organizations: "… what gives networks a dynamic quality and what makes networks 'work' are the underlying social meaning of the relationships" (Galaskiewicz, 2011, p. 5). Social network analysis can be adopted at both the individual and organizational level. In a social network, Borgatti and Li (2009) propose four kinds of connections among organizations: similarities, relations, interactions, and flows (see Table 2.10). Some researchers have also applied this theory to study the behavioural interactions between partners in networks (Kim et al., 2011; Pryke, 2004).

Table 2.10: Four types of link in social network analysis

Type of link	Sample
Similarities	Joint membership in the same network
Relations	Joint venture or alliances between organizations in network
Interactions	One organization purchases products or services from another organizations; competition between organizations
Flows	Information leaking from one organization to another organization

However, the concept of social network analysis is not applicable in this thesis for two reasons. Firstly, this theory is not specifically designed for studying triadic relationships. Secondly, as social network analysis is complex to use; Kim et al. (2011) argue that it is difficult to define metrics for conducting social network analysis. Overall, because of the complexity of social network analysis, it is not suitable for investigating the dynamics of logistics triads.

2.4.11 Overview of theories

The ten theories outlined above show unique strengths and limitations. It is crucial to select an appropriate theory to study SCRs in varying situations. Table 2.11 compares these theories by outlining their uniqueness. In these theories, agency theory, TCA and resource dependency theory are more suitable for studying dyadic SCRs. Social capital theory and social network analysis emphasize how the social interactions among organizations impact on dynamics of SCRs and networks. Network centrality concerns the influences from organizations' network

positions. Game theory lacks consideration of influential factors. None of these theories can work alone to investigate the dynamics of logistics triads by studying all potential influential factors.

Table 2.11: Comparison of the balance theory and other management theories

Theory	Suitable relationship	Theoretical focus
Agency Theory	Dyadic	Agent role
Transaction Cost Analysis	Dyadic	Transactional cost
Resource Dependency Theory	Dyadic	Resource impacts on the interdependency between partners
Structural Hole Theory	Triadic	Structural power concerning asymmetric information exchange
Balance Theory	**Triadic**	**Triadic structure is dependent on the formations of different dyadic relationships.**
Social Capital	Dyadic; Triadic; Broad network;	Social relations can be adopted as resource to manage relationship
Network Centrality	Triadic; Broad network	Network position, direct and indirect links between actors can impact the network structure.
Supply Network Model	Triadic; Broad network	Focal firm's influences and characteristics of process
Game Theory	Triadic; Broad network	Power games between strong and weak actors in a network
Social Network Analysis	Triadic; Broad network	Social interactions are the base to form and manage networks

In contrast, the supply network model can explain influences from all influential factors. However, this model is not specifically developed for studying triadic relationships. Compared to the supply network model, although structural hole theory is developed for studying triadic relationships, this theory is effective to study a triad only when two organizations do not have direct connection and rely on the third organization for that. As all organizations in a logistics triad have direct connections between each other, it is a challenge to use the structural hole theory in this thesis.

Compared to the other nine theories, balance theory is the only one that emphasizes how the dynamics of a triad are affected by its three embedded dyadic links when all three actors have direct connection among each other in the triad.

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Similarly, in a logistics triad, the supplier, customer, and LSP have direct connections among each other. Therefore, balance theory is more suitable than other theories outlined in Table 2.11 to develop research propositions for this study.

As a coin has its two sides, balance theory also has limitations. It defines two extreme perspectives of dyadic links, positive and negative, in a triad. In a supply chain context, it is difficult to define a dyadic SCR in such a simplified approach. Although balance theory has its own limitation, its characteristics indicate that it is still useful to apply this theory to study both relationship dynamics in logistics outsourcing from the perspective of triadic relationship structure. Therefore, balance theory will be adopted as the theoretical lens for this thesis. The next section will discuss this theory in more detail. Later, research propositions and conceptual framework will also be developed based on the theory.

2.5 Developments in balance theory

Balance theory proposes eight possible structures in a triad and suggests the transition between unbalanced and balanced structures (see Figure 2.18). Structure 1 is unbalanced because the three actors are in conflict. Tensions exist in all embedded dyads making actors dissatisfied with the structure. In order to achieve a balanced triad, the embedded actors have three options to transit the triad. In the first two options, actor B can enhance the relationship with actor A (structure 8) or actor C (structure 6). In the third option, actor C can enhance the relationship with actor A (structure 7). There are similarities in structures 6, 7 and 8: two actors collaborate while rejecting the third actor. In these structures, the triad is balanced and stable despite the third actor suffering from negative relationships with the other two actors. If any one of the three options is not applied, the triadic relationship rapidly dissolves. Contrary to structure 1, it is feasible to form a balanced and stable structure when three actors in the triad like each other (structure 5).
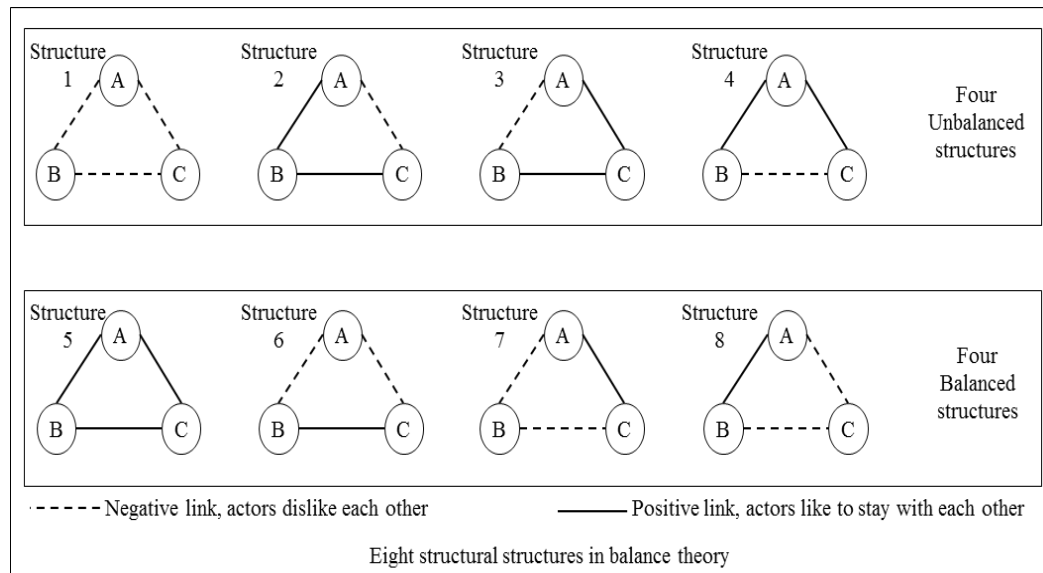
Figure 2.18: Balance theory: Eight triadic structures

Structures 2, 3 and 4 in Figure 2.18 share one similar characteristic: one actor holds two positive relationships with the other two actors simultaneously while the other two hold a negative relationship. The two actors with a negative link resemble the third actor. Each wants the third actor in the triad to remain friendly. To mitigate tension in the negative link, the third actor is asked to become an enemy to one of the other two. As a result, to make the structure balance, structure 2 can transit to structure 6 or structure 8. Structure 3 can transit to structure 6 or 7; while structure 4 can transit to structure 7 or 8. In addition to the options described above, the two actors who originally held a negative relationship can now develop a positive relationship. In this situation, all three actors form the triad seen in structure 5. If three actors do not adopt any one of the options outlined, the two actors holding a negative relationship both abandon the third actor, meaning the triad no longer exists. Overall, balance theory suggests that the four unbalanced structures should transit to the four balanced structures to stabilize the triadic relationship. The main research limitation of Heider's balance theory is the lack of consideration about triads formed by social groups or organizations.

Cartwright and Harary (1956), and Newcomb (1961) tested balance theory broadly by investigating triadic relationships among social groups. Newcomb (1961) indicates that communication, attractiveness, and uniformity among groups can impact on the structural balance of a triad. In general, Newcomb notes that a

triad formed through individuals and social groups can be explained by balance theory. However, Cartwright and Harary criticize Heider's balance theory. Heider suggests that three embedded dyadic links within a triad bring about symmetry. These dyadic relations can become asymmetrical according to changes in the actors' requirements. Cartwright and Harary argue that the asymmetry of dyadic links in a triad can also be influenced by actors outside the triad. Therefore, the application of balance theory is limited and needs to be adjusted according to research backgrounds.

In sum, overlaps in balance theory studies show research limitations, especially the dynamics of triadic business relationships among organizations. The business relationships among organizations are different to the social relations among people or social groups (Choi & Wu, 2009b). However, balance theory provides new ideas about how to study relationship dynamics in supply chains from the perspective of triadic relationship structure. Therefore, the next section reviews previous supply chain research using balance theory.

2.6 Supply chain research on balance theory

Table 2.12 outlines three supply chain studies using balance theory, given this theory has not been widely adopted to investigate SCRs.

Table 2.12: Previous supply chain studies using balance theory

Study	Research focus
Phillips et al. (1998)	The interaction concerning mutual loyalty and satisfaction between three actors in a customer-distributor-manufacturer triad.
Eggert et al. (2012)	The spill-over effect of loyalty between three actors in a customer-distributor-manufacturer triad.
Choi & Wu (2009a)	The relationship dynamics between three actors in a buyer-supplier-supplier triad.

Phillips et al. (1998) propose that when the dealer is loyal to the manufacturer, the customer loyalty to the manufacture is positively linked to the loyalty between the dealer and the manufacturer. If the customer shows high loyalty to the dealer, the manufacturer shows high satisfaction to the dealer as well. Finally, if both the customer and the dealer show high loyalty to the manufacturer, the manufacturer achieves high satisfaction with the customer and the dealer simultaneously.

Overall, there are positive interactions of loyalty and satisfaction among the three organizations. This study also exhibits two research limitations. Firstly, the loyalty and satisfaction are measured using organizations' attitude and perceptions. This study did not study any relationship activities, such as information sharing and joint effort. Secondly, the data was collected only from business students and the research questions were designed for a virtual scenario. In this situation, the result is difficult to be applied to study of actual triadic relationships in supply chains.

Eggert et al. (2012) investigate the spill-over effect of loyalty in a manufacture-distributor-customer (M-D-C) triad. This study proposes indirect influences between three embedded dyads in an M-D-C triad. In this situation, the distributors' loyalty to customers and the manufacturers' loyalty to customers should not be considered independently in a triad. Either the distributor or the manufacturer may extract more benefits if either gains more loyalty from the final customer in the triad. With the purpose of achieving a balanced triad, the customer may switch distributor or manufacturer if they perceive unequal loyalty exists between the manufacture and the distributor. Managers should distinguish manufacturer loyalty and distributor loyalty to analyse the spill-over effect in a triad rather than treat these two kinds of loyalty separately. Further, this study applies the principle of minimum effort to explain how a customer switches the distributor or the manufacturer in a triad. However, this study lacks links to connect the research findings about balance theory and the findings about the principle of minimum effort. Additionally, the structure and the outcomes of this study are too complex to be fully understood.

Compared to the first two studies, Choi and Wu (2009a) test balance theory in a supply chain triad by using characteristics of inter-organizational relationships. They apply two business relationship types to represent positive and negative connections between organizations in a triad. Researchers suggest that two organizations having a positive dyad are cooperative partners (Morgan & Hunt 1994;), trust each other (Griffith et al., 2006), and rely on each other (Uzzi 1997). On the contrary, in a negative dyad, two organizations are adversarial and do not trust each other. Further, they are ready to leave each other at any time (Johnston,

McCutcheon, Stuart, & Kerwood, 2004). Based on this classification, Choi and Wu (2009a) used adversarial and cooperative dyads to represent positive and negative links between organizations in a customer-supplier-supplier (C-S-S) triad. Using balance theory, Choi and Wu propose that a balanced C-S-S triad could be retained in the long term without dynamics; while an unbalanced C-S-S triad should transit to a balanced structure as soon as possible. This study also suggests that one organization in a C-S-S triad may act as a mediator to influence the dyadic link between the other two organizations. However, because this study has not collected data to examine the propositions yet, it is difficult to assess the research quality and contributions.

In conclusion, in addition to research outcomes in these three studies, their research limitations indicate that researchers need to conduct more research to test the effectiveness of balance theory in studying the dynamics of triadic supply chain relationships. Therefore, this thesis will use balance theory as a tool to study the dynamics of SCRs in logistics triads. The next section develops research propositions according to balance theory.

2.7 Development of research propositions

As balance theory introduces two distinctive types for dyadic links within a triad, this section is in two parts. The first explains the settings of types regarding dyadic relationships in this thesis: the second develops research propositions for different triadic structures according to balance theory.

2.7.1 Defining dyadic relationship in logistics triads

Previous literature review has identified two basic types of dyadic SCRs: collaborative and transactional relationships (Cao, Vonderembse, Zhang, & Ragu-Nathan, 2010). A transactional relationship is an adversarial link exhibiting low mutual trust and commitment. The relationship outcome is usually a win-lose situation for two linked organizations as organizations seek to extract profits from each other (Harland et al., 2004; Simatupang & Sridharan, 2005). In balance theory, a negative dyadic relationship also exhibits a lack of trust between two individuals within a triad. In order to test balance theory in supply chains, this

study maps the transactional dyadic SCR as a negative link between organizations within a triadic structure. In contrast, the collaborative dyadic SCR is set as the positive link in logistics triads because the partners in both collaborative and positive relationships trust each other and seek to develop a win-win relationship.

In this thesis, the triad outlined in Figure 2.19 illustrates the normal situation of a logistics triad. This triad includes three parties (the supplier, the LSP and their common customer) and three embedded dyads between them.
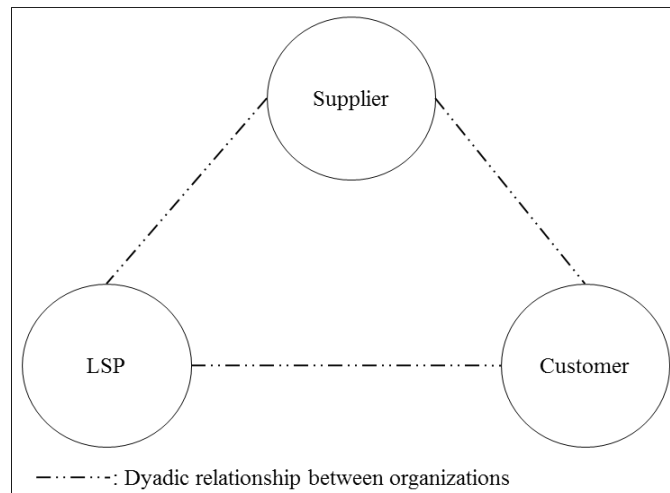
Figure 2.19: General structure of logistics triad

According to the balanced and unbalanced triadic structures explained in section 2.5, Table 2.13 outlines eight triadic structures of logistics triads and different types of embedded dyads. The letter 'C' means two organizations hold a collaborative dyad; while 'T' indicates a transactional dyad between organizations. There are four kinds of triadic structure in Table 2.13. When all dyadic relationships are collaborative, the triad is named a "cluster" triad (structure 1). When all dyadic relationships are transactional, the triad is named a "transactional" triad (structure 8). In addition to these two structures, a triad is named "partnership" triad if it has two transactional and one collaborative dyadic relationships. Because the collaborative dyad can be between any two organizations within a triad, this kind of triad includes three alterative structures (2, 3, and 4). Finally, when a triad has two collaborative and one transactional dyadic relationships, it is named a "collaborative" triad. This kind of triad also includes three alterative structures (5, 6, and 7) because the transactional dyad can exist between any two organizations within a triad. According to balance theory,

the partnership triad and the cluster triad should be balanced structures while the transactional triad and the collaborative triad should be unbalanced structures. The next section provides more detail concerning these triads.

Table 2.13: Eight triadic structures in logistics outsourcing

Structure number	Dyad			Triad	
	Supplier-Customer	LSP-Supplier	LSP-Customer	Structure	Type
1	C	C	C	Balanced	Cluster
2	T	C	T	Balanced	Partnership
3	T	T	C	Balanced	Partnership
4	C	T	T	Balanced	Partnership
5	C	T	C	Unbalanced	Collaborative
6	T	C	C	Unbalanced	Collaborative
7	C	C	T	Unbalanced	Collaborative
8	T	T	T	Unbalanced	Transactional

There are four kinds of triadic structure in Table 2.13. When all dyadic relationships are collaborative, the triad is named a "cluster" triad (structure 1). When all dyadic relationships are transactional, the triad is named a "transactional" triad (structure 8). In addition to these two structures, a triad is named "partnership" triad if it has two transactional and one collaborative dyadic relationship. Because the collaborative dyad can be between any two organizations within a triad, this kind of triad includes three alterative structures (2, 3, and 4). Finally, when a triad has two collaborative and one transactional dyadic relationship, it is named a "collaborative" triad. This kind of triad also includes three alterative structures (5, 6, and 7) because the transactional dyad can exist between any two organizations within a triad. According to balance theory, the partnership triad and the cluster triad should be balanced structures while the transactional triad and the collaborative triad should be unbalanced structures. The next section provides more detail concerning these triads.

2.7.2 Cluster Triad

Figure 2.20 shows a cluster triad in a logistics outsourcing context. As balance theory suggests, if actor C holds two positive relations with actors A and B and

treats them equally in a triad, then C can encourage A and B into closer relations with each other (Heider, 1958; Newcomb, 1961). In a logistics triad, if the customer collaborates with the supplier and the LSP, the customer may treat them equitably to encourage collaboration because the supplier and the LSP provide complementary services to the customer rather than competing with each other. Each party prefers to retain their collaborative relations with the other two because each party can gain more from this win-win-win triad. This triadic relationship may last in the long term because of the collaborative efforts in the triad (Choi & Wu, 2009a). Extant supply chain studies indicate that the long term business relationship is usually over three years while a short term relationship is less than three years (Frascatore & Mahmoodi, 2008; Ren, Cohen, Ho, & Terwiesch, 2010). This study uses this timeframe to distinguish between long and short term. The cluster triad explained above leads to the first research proposition.

Proposition 1:

In a cluster triad, the collaborations between the supplier, the customer, and the LSP form a balanced structure which can be retained over a long period in logistics outsourcing.
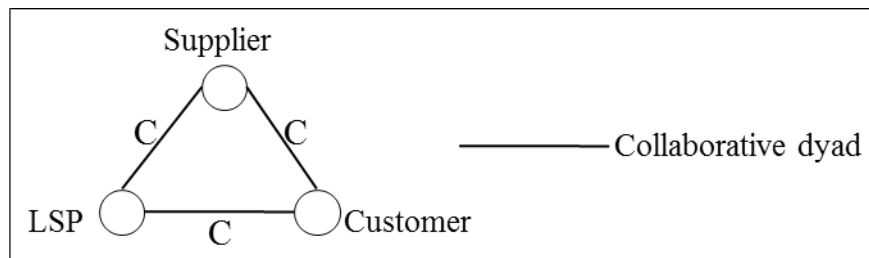
Figure 2.20: Cluster triad

Similarly to the cluster triad, the three structures in the partnership triad are also balanced structures.

2.7.3 Partnership triad

Three alternative structures in the partnership triads share the same rationale although the position of the only embedded collaborative dyad differs in three structures (see Figure 2.21). In each partnership triadic structure, one organization has transactional dyads with the other two organizations, whereas the other two organizations have a collaborative dyad. According to the positioning of the

collaborative dyad, the three structures are separately named as the supplier-LSP collaboration triad, the supplier-customer collaboration triad and the customer–LSP collaboration triad.
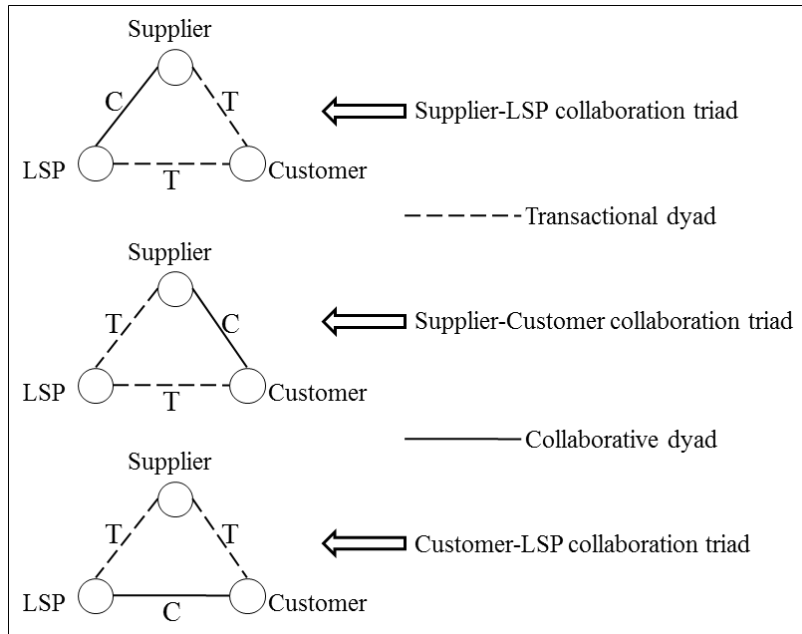
Figure 2.21: Partnership triad: Three structures

At the beginning of a partnership triad, the two collaborative organizations may have a positive relationship history spanning other businesses, while the third organization is not familiar with them and therefore focuses on short term and low cost goals. Because the third organization needs time to understand the other two organizations, this partnership triad and the three embedded dyads may not change in the short term. Similarly, as found in balance theory studies, when three individuals have a partnership triad, the triad is balanced and can be stable without change in the long term (Newcomb, 1961). According to balance theory, it can be derived that the logistics triad is balanced in this situation.

Proposition 2:

The partnership triad with only one collaborative dyad would be balanced without change in logistics outsourcing over the long term.

In addition to the four balanced structures outlined above, there are four unbalanced structures in logistics triads. Based on balance theory, when three actors hold an unbalanced structure, they should transit to a balanced structure as

soon as possible. Otherwise, the triad will dissolve (Heider, 1958; Choi & Wu, 2009a). The next section introduces detail concerning unbalanced structures in collaborative triads.

2.7.4 Collaborative triad

Three alternative structures of collaborative triads share the same rationale. In each structure within the collaborative triads, one organization has collaborative dyads with the other two organizations whereas the other two organizations have a transactional dyad. According to the position of the transactional dyad, the three structures are separately named as the supplier-LSP transaction triad, the supplier-customer transaction triad and the customer –LSP transaction triad (Figure 2.22).
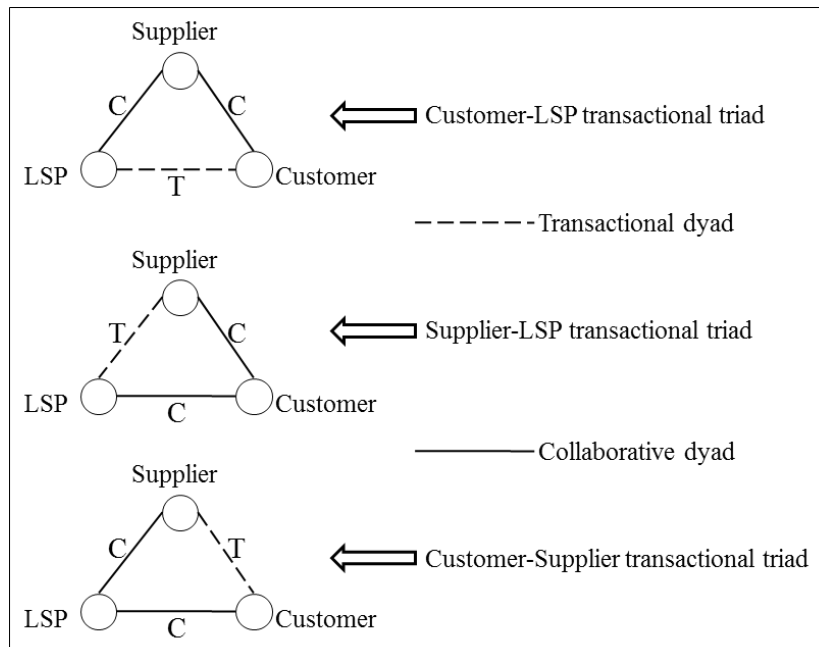
Figure 2.22: Collaborative triad: Three structures

One organization can gain benefits by collaborating with the other two simultaneously if the other two organizations hold only a transactional relationship in a logistics triad. This not only reduces the organization's risks in logistics outsourcing but also gives this organization access to complementary resources and expertise from the other two organizations. In this situation, the two organizations who have a transactional relationship may hesitate to retain their collaborative relationships with the third party in the triad. The triad becomes unbalanced whenever any one of the two organizations changes their

collaboration with the third one. In balance theory, similarly, when two actors both like the third actor, the triadic structure will be unstable and dissolve rapidly if these two actors dislike each other (Choi & Wu, 2009b; Hummon & Doreian, 2003). The reason is that the third actor can extract advantages through the competition between the other two within the triad. In sum, three actors can apply two options in order to make the triad balanced.

One option is to transit from a collaborative structure to a cluster structure. The organization which holds two collaborative dyads can encourage collaboration between the other two organizations and create a win-win-win situation. The triad therefore transits from a collaborative triad to a cluster triad. After transition, the three organizations seek to retain the new structure for a long period because each organization can gain more than previously.

Proposition 3a:

A collaborative triad in logistics outsourcing may transit to a cluster triad in the short term if all organizations are prepared to collaborate.

The other option is that the collaborative structure can transit to the partnership structure. When two actors A and B do not want to develop a positive relation in a collaborative triad, the third actor C is usually asked to keep a positive relationship with only one of them (Nooteboom, 2006). If this is impossible, the third actor may lose connection with the other two actors and the triad dissolves. Similarly, two organizations in a transactional dyad may be reluctant to collaborate because of their own business requirements in a logistics triad. In this situation, the third organization may be asked to retain only one collaborative dyad with one of them and keep a distant transactional relationship with the other. Accordingly, the collaborative triad can transit to a partnership triad. After transition, the triad retains only one embedded collaborative dyad. Based on balance theory, the logistics triad can be retained without further change in the long term after transiting to the partnership structure.

Proposition 3b:

In logistics outsourcing, a collaborative triad will transit to a partnership triad if two organizations holding a transactional relationship do not want to develop their collaboration and ask a third organization to reduce the degree of collaboration with one of them rapidly.

The last unbalanced structure relates to the transactional triad.

2.7.5 Transactional Triad

This kind of logistics triad is formed by three transactional dyads (Figure 2.23). Each organization takes a negative attitude toward the other two and seeks to extract their own profits out of the triad. If the actors do not develop positive relations in a triad, the transactional triad may dissolve rapidly because each actor experiences tension and lacks trust. This brings a new proposition for studying the logistics triads.

Proposition 4a:

A transactional logistics triad is an unbalanced structure which may dissolve in the short term if each organization fails to develop collaboration with others.
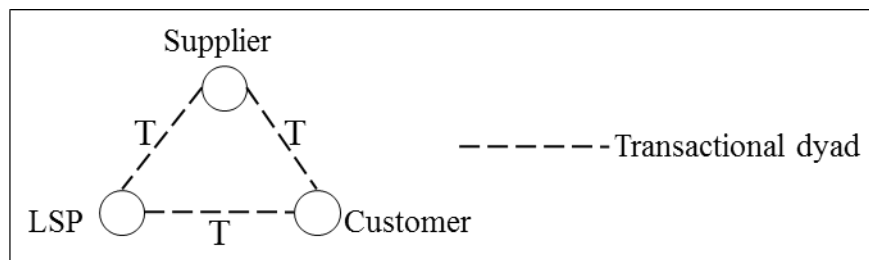
Figure 2.23: Transactional triad

Once any two of the three actors share negative attitudes towards the third actor in a transactional triad, they tend to develop a collaborative relationship against the third actor (Newcomb, 1961). As a result, the triadic structure can transit to the partnership structure (Cartwright & Harary, 1956). Similarly, after transitioning to the partnership structure, a logistics triad may become static because the two

organizations holding a collaborative relationship can easily control the third one within the triad.

> ***Proposition 4b:***
> To achieve a balanced triad in logistics outsourcing, two organizations may foster collaboration against the third one in the short term and the transactional triad therefore transits to a partnership triad.

The four research propositions developed predict how a triadic relationship structure evolves over time in logistics outsourcing. These research propositions can be integrated because the eight triadic structures exhibit interconnections in balance theory. The next section outlines a conceptual framework by integrating these propositions to study relationship dynamics in logistics triads.

2.8 Conceptual framework

Figure 2.24 presents a conceptual framework by integrating the four research propositions. In the transactional triad, the dashed lines between the three organizations (nodes) indicate that they have transactional dyads and the triad is unbalanced. This structure will break down or transit to the partnership structure in the short term. The collaborative structure is located next to the partnership structure in the framework. It is another unbalanced structure which will transit to one of the other two balanced structures—partnership structure or cluster structure—as soon as possible. In a collaborative triad, if no organizations have an interest to transit, the triad will dissolve rapidly. In the framework, the solid line with arrows indicates the directional transitions between different structures. Because balance theory indicates that balanced structures are stable and can be retained in the long term without change, the conceptual framework does not present transitions from the partnership and the cluster structure to other structures.
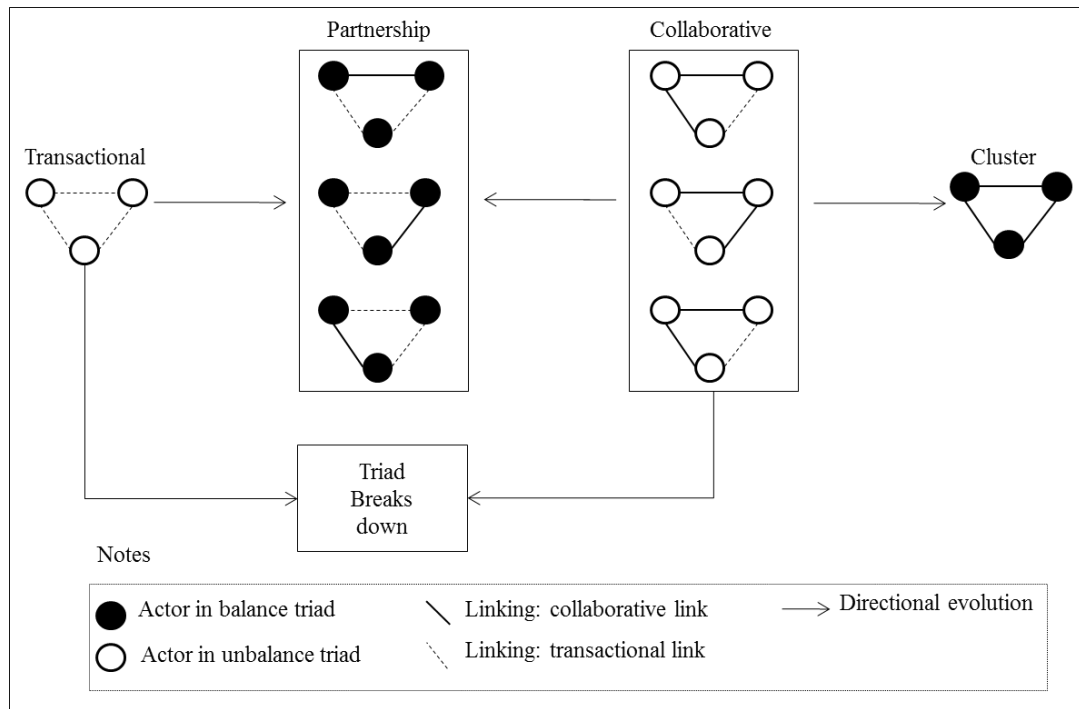
Figure 2.24: Conceptual framework: Dynamics in logistics triad
(Source: Adapted from Childerhouse et al., 2013)

The next section will combine the conceptual framework, four research propositions, and all research gaps identified previously to derive research questions for addressing the research goal of this thesis.

2.9 Research questions

The introductory chapter has clarified that the research goal of this thesis is to *study the evolution of relationships in logistics triads*. To address this goal, the present study needs to study both the stability and the dynamics of triadic relationship structures in logistics outsourcing. Using balance theory, sections 2.7 and 2.8 have presented different triadic relationship structures by developing propositions and conceptual framework. The propositions and framework have proposed the stability of these structures and have suggested potential transition between these structures. In order to study logistics triads, it is necessary to test these propositions and the conceptual framework by studying how logistics triads transit between different triadic relationship structures. This leads to the first research question.

Research question 1: How do the relationship structures within a logistics triad transit over time?

In addition to studying transition, it is also important to study the reasons for stability and dynamics of logistics triads. Previous studies have already identified that organizations can gain power from different influential factors and the power games between organizations can influence the development and dynamics of SCRs (Bastl et al., 2013; Cox, Watson, Lonsdale, & Sanderson, 2004; Kahkonen & Virolainen, 2011). However, these studies do not identify which influential factors are more significant in determining organization's power. Further, little research has studied influences from the dynamics of influential factors. Additionally, from the perspective of triads, limited research has studied how different influential factors help organizations obtain power. There is also a lack of research on the connection between power games and the dynamics of SCRs in triadic relationship structures. By integrating these gaps, it can be seen that organizations can obtain power from different influential factors to manage the dynamics of relationships in a triad through power games between all organizations in the triad (see Figure 2.25). As a result, in order to study the dynamics of logistics triads, it is worth identifying factors that can show significant influence on power games and determine development of relationships.
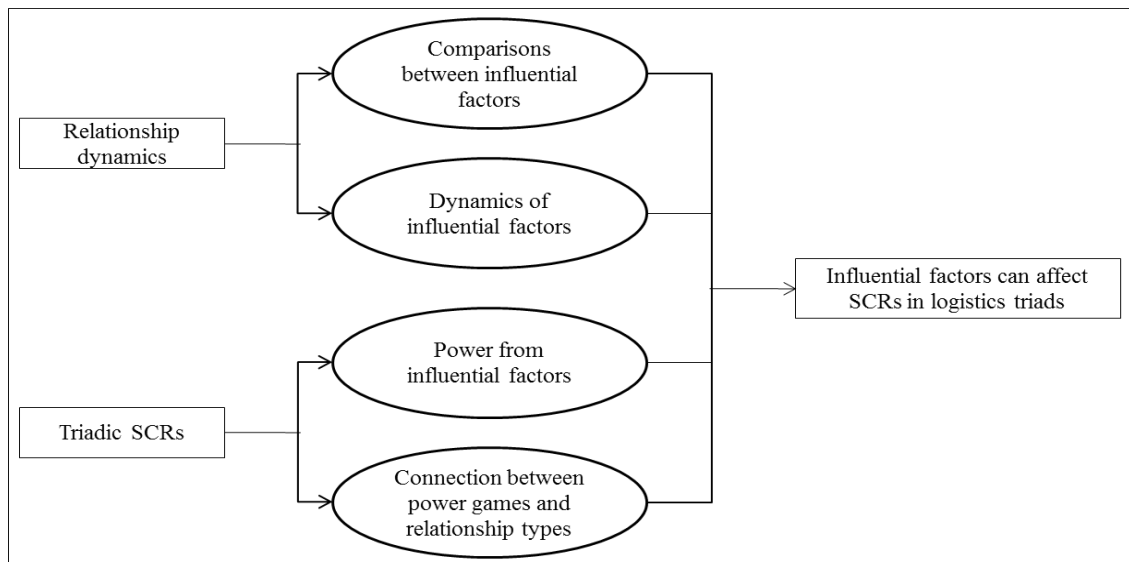
Figure 2.25: Integrating research gaps to develop the second research question

Research question 2: What are the factors that significantly influence the stability and dynamics in SCRs within a logistics triad?

Figure 2.26 shows how the researcher will analyse all collected logistics triads to address the two research questions. The results will then be combined to address the research goal for this thesis.
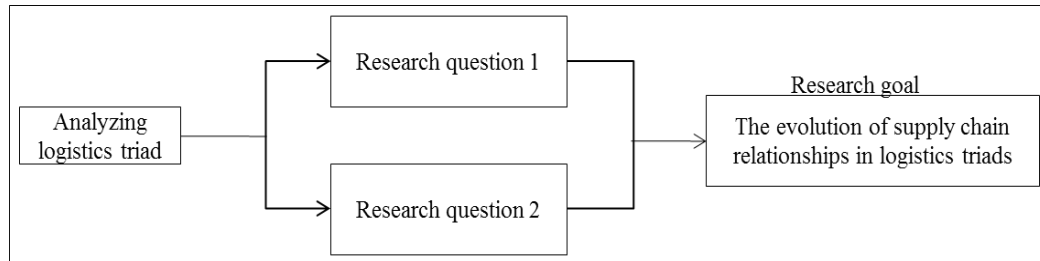
Figure 2.26: Investigating dynamics of logistics triads to address research questions and research goal

2.10 Conclusion

This chapter has reviewed the literature and has described how this research is connected to, and expands upon, the literature on logistics outsourcing, relationship dynamics, triadic structures, and management theories. In existing studies of logistics outsourcing, little research has investigated the dynamics of relationships in this growing area from a network perspective. The current research attempts to bridge this gap by studying the dynamics of the triadic relationship structure in the process of logistics outsourcing. Further, four categories of influential factors identified in the literature will be studied to investigate their influence on the dynamics of logistics triads. This thesis seeks to use empirical data and theoretical perspectives to reach its conclusions. The present chapter has also reviewed a number of management theories and explained why balance theory is most suitable for this research. Finally, four research propositions, one conceptual framework, and two research questions have been developed to address the research goal: the evolution of relationships in logistics triads.

The next chapter presents the particular research methodology adopted for this empirical research and discusses the processes used in data collection and data analysis.

Chapter Three: Research methodology

3.1 Preview

This chapter discusses the qualitative research methodology used in this study. Philosophical ideas relating to the research methodologies are reviewed in regard to their relevance to this study. The selection of a qualitative research methodology and related tools for data collection are discussed and the design of the research process is introduced with an explanation of the research quality. Detail surrounding the collection of the empirical data is followed by data analysis which includes selecting the tools for examining the data collected for the present study. Finally, this chapter explains how the data analysis fits with the research propositions and the conceptual framework developed in previous chapters.

3.2 Research paradigm

There are two basic approaches to any research: quantitative and qualitative (Mouton, 2001; Tuckman, 1978). Other people further classify these two approaches into two research paradigms: positivism and interpretivisim (Creswell, 2009; Hallebone & Priest 2009). A research paradigm represents the fundamental assumptions of the researcher's world views which affect the conduct of research (Jonker & Pennink, 2009). Beyond these two paradigms, studies highlight four interrelated theoretical ideas based around research philosophy: ontology, epistemology, axiology, and methodology (Humphrey & Lee, 2004; Creswell, 2003). Ontology concerns the nature of existence and epistemology concerns understanding research phenomenon (Creswell, 1998). Axiology presents the research value, while methodology presents the detailed methods and processes which are adopted by researchers to achieve the research goals (Saunders, Lewis & Thornhill, 2011; Neuman, 2000).

It is crucial to understand the unique characteristics in these research paradigms and theoretical ideas before conducting research (Mouton, 2001; Weber, 2004). Table 3.1 compares how the four philosophical ideas vary in two basic research paradigms. As shown in the table, for the quantitative researchers, the external world is open to measurement, unlike for the qualitative researchers, who seek to

adopt a philosophical framework which does not rely on measurement to study social science questions (Brannen, 1992; Chandra & Sharma, 2013). For qualitative researchers, the world is constructed around interrelated social factors where the preference is for understanding ideas through the researchers' own perceptions and interactions with the research targets (Saunders et al., 2011; Lincoln & Guba, 2013; Hallebone & Priest, 2009).

Table 3.1: Philosophical concepts in two research paradigms

Philosophical Concept	Positivism (quantitative)	Interpretivism (qualitative)
Ontology	Separate, external reality, single	Interrelated, socially constructed, multiple
Epistemology	Objective, excluded from research reality	Subjective, interaction between researcher and the phenomenon
Axiology	Truth & prediction	Understanding from different views
Methodology	Observation, quantitative research, statistical analysis	Interactive, qualitative research, dialectical analysis

Source: (Adapted from Creswell, 2009; Gray, 2004; Lincoln & Guba, 2013; Hallebone & Priest, 2009)

In addition to the differences in four philosophical ideas, quantitative and qualitative research exhibit unique strengths and weakness (see Table 3.2). Quantitative research is suitable for investigating a large number of samples quickly while qualitative research is appropriate for studying limited samples in depth. The findings of quantitative research are relatively easier to generalize than qualitative research outcomes. However, qualitative research is more suitable to investigate complex samples and develop new theories. Therefore, no single research can fully replace the other one. Understanding these characteristics helps researchers to choose the appropriate approach for their own research. The next section explains how the philosophical ideas and research method were selected for this study.

Table 3.2: Comparison of quantitative and qualitative research approaches

		Quantitative Research	Qualitative Research
Main Advantages		Aims to obtain high credibility and validity.	Helps to understand dynamic situations.
		Outcome can easily be generalized	Helps to gain in-depth understanding with rich data.
		Outcome can be used to predict in similar contexts.	Ideal for investigating complex cases.
		Process and data analysis is quicker	Useful to help build new theories.
		Numerical data is easy to analyse statistically & compare.	Can help to understand interviewee's personal perception of the research phenomena
		Useful for investigating reality with large numbers.	Can help gain quick responses to the changes through the interaction with interviewee.
Main Disadvantages		Outcome may lack complete understanding.	Outcome is difficult to generalize
		Lack of direct sense of the research because of lack of interaction between researcher and research target.	Difficult to use the outcome as prediction for other contexts.
		Researcher may have a research bias because the research only tests certain hypotheses of a theory.	Difficult for use in testing hypotheses.
		Outcome may not be useful for specific guidance because the research outcome is very abstract	Easily influenced by personal perceptions and experiences.
		Not useful help in understanding complex situations.	Research and data analysis are time consuming.

Source: (Adapted from Brannen, 1992; Chandra & Sharma, 2013; Thomas, 2003; Welman, Kruger, Mitchell, & Huysamen, 2005)

3.2.1 Selection of methodology

The selection of a research method for this study had four steps. As explained in Chapter One, the researcher's personal background played an important part in the selection of this research topic. Subsequently, explanations about the selection of philosophical ideas proved critical, as was setting parameters to the research paradigm. Finally, exploring methodological approaches and selecting a suitable research method related to research quality was undertaken.

3.2.2 Personal background

A number of studies indicate that a person's background and beliefs can influence perceptions and decision making (Chandra & Sharma, 2013; Saldana, 2011; Thomas, 2003), making it necessary to be aware of value judgements and the

nature of subjective and objective thought when critically analysing the theoretical material and data which arises from data collection. The research methodology in this study is influenced by the author's personal beliefs formed while growing up in China and the influence of both Confucianism and Buddhism. Although these two beliefs systems are different, their core values are similar (Ming Cheng Temple, 2003). Both hold that all people and elements in the universe are interconnected. These connections are not static but dynamic. The influence of Confucianism and Buddhism motivated the author to address the research goal by studying dynamics of connections among organizations in triads. Table 3.3 illustrates the author's personal perceptions around the four philosophical constructs. The next section explores the selection of philosophical concepts and the research paradigm.

Table 3.3: Author's perceptions of the four philosophical concepts

Philosophical Concepts	Author's Perceptions
Ontology	All things are connected and dynamic.
Epistemology	Subjective interpretations are unavoidable because different researchers have different interactions with the research targets.
Axiology	People may interpret the same research target in different ways because of different personal perceptions.
Methodology	Interactive and qualitative research methods are more suitable to study interconnections between the research targets.

3.2.3 Selection of philosophical concepts and research paradigm

Philosophical concepts help to identify the nature and scope of suitable research methods (Crotty, 1998; Lincoln & Guba, 2013; Sekaran, 2003). In this study, which focuses on the relationship dynamics in the logistics triad, business-based SCM interactions were examined involving NZ companies. While objectivity was sought in analysing the data, the author's personal interviewing style and perceptions were used to elicit participants' opinions about relationship dynamics in order to explain how managers manage SCRs in logistics triads. Previous studies did not provide sufficiently robust frameworks which were useful for the present study. Because it became clear that wider interactions with participants were required to unravel perceptions concerning logistics triads, the researcher adopted an interpretivist paradigm which allowed a broader understanding of

perspectives to emerge (Collis & Hussey, 2003; Denzin & Lincoln, 2005). Research around interpretivism is an inductive process (Boyatzis, 1998; Romanelli, 1991). Accordingly, this study moved the research target from a specific pattern (at the beginning of the research) to a more generalized pattern (at the end of the research). After selecting the research paradigm, the next step was to choose an appropriate research methodology. A qualitative approach suits the interpretivist research paradigm (see Table 3.1). The next section gives more detail of the selection of the research method.

3.2.4 Selection of research method

The type of research question posed offers a guide for selecting the research method (Gray, 2004; Creswell, 2009). The main research questions in this study concern the 'why' and 'how' of the dynamics of triadic SCRs related to logistics outsourcing. Case studies allow these questions to be answered, so they formed the basis of the research method for this study (Denzin & Lincoln, 2000; Eisenhardt, 1989). Yin explains this approach:

> A case study is an empirical enquiry that (1) investigates a contemporary phenomenon within its real life context, especially when (2) the boundaries between phenomenon and context are not clearly evident. (1994, p. 33)

The case study suits contextual factors and allows flexibility in the research process (Voss, Tsikriktsis, Frohlich, & Sridhar, 2002). Case studies serve three research purposes: they help researchers to define and refine research questions; present comprehensive descriptions of research targets in the context of the study; and assist researchers in understanding the cause-effect relationships in depth (Hennink, Hutter & Bailey, 2011; Yin, 2013). The latter two purposes have been served in the present study.

There are two basic types of case study: single, and multiple (Eisenhardt, 1989; Neuman, 2000). To select a suitable type for different research situations, there are three conditions to be considered (see Figure 3.1). When a research study needs a long period to study a case, it is difficult to find multiple cases with

similar situations. When the research does not need to identify convergence from different cases, a single case study is a suitable approach (Dyer, Wilkins & Eisenhardt, 1991; Yin, 2013). Otherwise, it is appropriate to use multiple case studies (Creswell, 2009; Denzin & Lincoln, 2013).
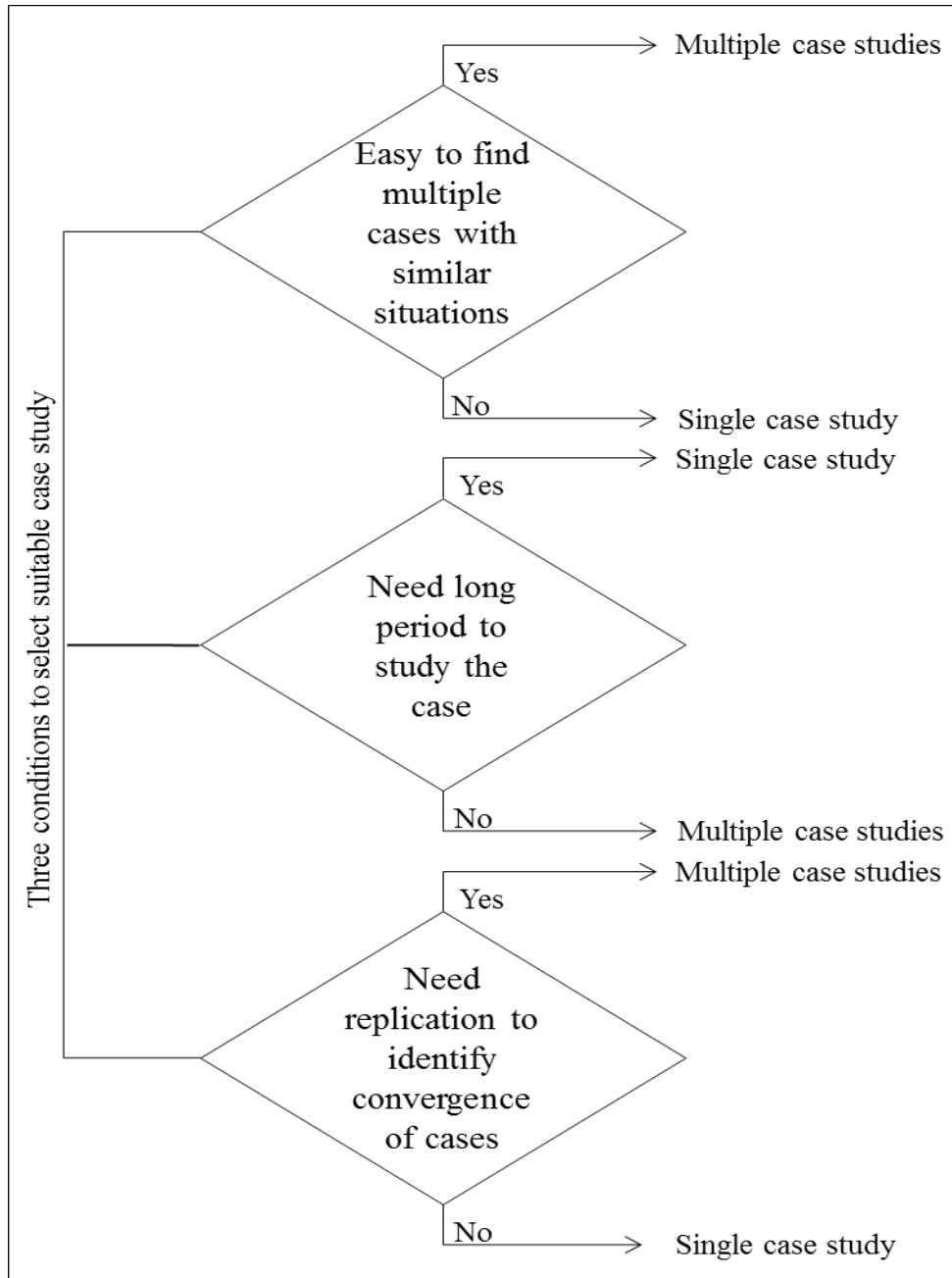
Figure 3.1: Selecting an approach for case study

Researchers usually face a trade-off between the single case study and multiple case studies. The single case study is more appropriate if the research requires in-depth understanding of issues; while multiple case studies suit researchers who need more compelling research outcomes (Sekaran, 2003; Yin, 1994).

Because previous studies had not offered well-developed research instruments and frameworks for studying logistics triads, a single case study was deemed insufficient to answer all the research questions. As a result, the method of multiple case studies was selected for this research. The next section presents the data collection tools selected for this study.

3.2.5 Data collection tools

Qualitative research adopts three common tools for data collection: interviews, focus groups, and observations (Brannen, 1992; Grbich, 2013).

3.2.5.1 Interview

Interviews help to investigate research targets by collecting interviewee opinions (Chandra & Sharma, 2013). The main purpose of the interview is to understand the interviewee's personal experiences and behaviour (Seidman, 1998). An interview usually lasts between 30 and 90 minutes (Welman, Kruger, Mitchell, & Huysamen, 2005), depending on the research questions and the availability of the interviewee (Hennink et al., 2011). Increasing the number of interviews and interviewees is useful to enhance the accuracy of data (Brannen, 1992; Thomas, 2003). Interviews have been widely used for studying different topics in supply chain management, such as SCRs, and organizational behaviour in the supply chain context (Kvale & Brinkmann, 2009).

3.2.5.2 Focus group

Focus groups are a special kind of interview used to gather information from a group of individuals at the same time and place (Welman et al., 2005). The group usually includes five to eight people. Researchers can choose one or more groups of participants according to their research goals and questions. People in the focus group should share certain similarities (such as background or experiences) (Sekaran, 2003). When interviewing the participants in a focus group, researchers face more challenges than with normal interviews because each participant holds a unique opinion (Thomas, 2003). The researchers should ensure that the discussion in the focus group is not dominated by any one individual. In addition, everyone in the focus group can contribute (Hallebone & Priest 2009; Jonker & Pennink, 2009). Before conducting a focus group, the researchers need to expend more

effort on finding participants according to their capabilities. The focus group is not an easy tool for data collection as it needs all participants to be available when called upon (Seggern & Young, 2003).

3.2.5.3 Observations

Observations are used to monitor personal and organizational behaviour and activities in particular settings (Chandra & Sharma, 2013; Welman et al., 2005). This method can provide information which other data collection tools cannot offer (Miles & Huberman, 1994). Thomas (2003) notes observation allows researchers to obtain a comprehensive description of participant's activities and behaviour, and can be carried out at single or multiple sites (Gummesson, 2000). The challenge with observation is that researchers usually become involved in long term observations to meet research targets and secure the credibility of data (Hennink et al., 2011; Saldana, 2011).

The interview is the selected method for data collection in this research because both the focus group and observation have limitations. Firstly, this study needed to collect data from a large number of participants to investigate the underlying factors in influential relationship dynamics and their implications for logistics outsourcing. It was also necessary to collect data from multiple companies which made gathering all participants from these companies difficult. Accordingly, the focus group was not a suitable option. Interviews allowed data collection from participants individually and resulted in more robust interactions between the researcher and participants (Kvale & Brinkmann, 2009; Sekaran, 2003). Finally, to secure the accuracy of data, it is relatively straightforward to increase the number of interviews, making it the most suitable tool for this study.

There are three kinds of interviews: unstructured, structured, and semi-structured (Brannen, 1992; Chandra & Sharma, 2013; Thomas, 2003). Table 3.4 lists the characteristics of each. A lack of sufficient studies around the relationship dynamics in logistics triads made using a structured interview a poor choice because it was difficult to develop a standardized list of interview questions based on predefined research instruments. In an interview, the conversation should focus on the information which can answer the research questions, making unstructured

interviews difficult (Creswell, 2009; Crotty, 1998). The semi-structured interview has fewer limitations than the other two kinds (Denzin & Lincoln, 2013). So, the semi-structured interview was selected for data collection in this study for its flexibility.

Table 3.4: Main characteristics of different interviews

Interview Type	Characteristics	Research type
Unstructured	- brief topic guide - great freedom within the process of interview - informal style - conducted by the interviewee - hard to set interview list and schedule	Qualitative
Semi-structured	- key research questions to guide the process - potential follow up questions help to gain in-depth understanding, - reasonable flexibility - conducted by the interviewer - easy to set interview list and schedule	Qualitative
Structured	- fully structured - identical questions - no potential follow up questions - needs statistical analysis	Quantitative

Source: (Brannen, 1992; Chandra & Sharma, 2013; Thomas, 2003)

3.2.6 Overview of research method selection

As explained above, qualitative research is the most suitable methodology for the present study. The current research goal, in addition to research limitations in previous studies, indicates that the method of multiple case studies is more suitable than single case study in this research. After selecting the proper research method and data collection tools, the next step is to design the process of data collection, which is discussed below.

3.3 Design of the research process

There were two continuous stages related to the research questions and goal (refer Figure 3.2). In the first instance, the data was collected from LSPs. As each LSP works with a supplier and a customer to form a logistics triad, the LSP developed simultaneous communications with them. This made it feasible to collect data from the LSPs. The conceptual framework and propositions were tested after data analysis. As explained, there is little research on the dynamics of logistics triads. Therefore, after developing research propositions and a framework according to balance theory, the study at this stage used a deductive process to investigate the

dynamics in logistics triads and attempt to identify all potential causes leading to the dynamics. The findings at this stage represented only the data collected from the LSPs.

In order to ensure research validity, it was necessary to collect data from the customer and the supplier also. Therefore, in the second stage, potential participants were selected from the suppliers and the customers in logistics triads. The second stage also used a deductive process and compared the research findings between the two stages. Given the findings in the first stage were strongly supported by the findings in the second stage, it was unnecessary to collect more triads and the collection of empirical data ceased after the second stage, i.e., saturation was achieved. In each stage, as suggested in previous studies concerning research methodology and data collection, the data collection in the present research continued until the participants failed to provide any new ideas to address the research goal and questions (Creswell, 2009; Hardy & Bryman, 2004). At this point, the collected data ensured a comprehensive view of the dynamics of relationships in the logistics triads. It was also clear that the research findings could be generalized within the broader supply chain context. Having designed the research process, the next step before data collection is the consideration of ethical issues in research.
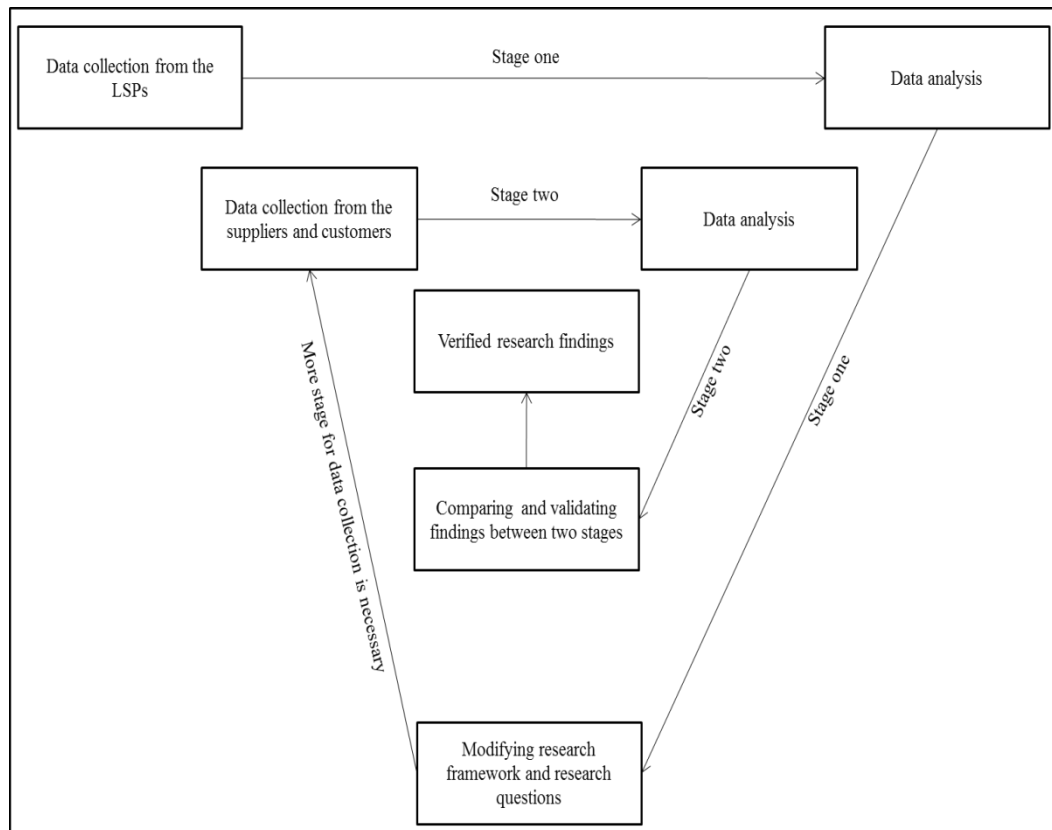
Figure 3.2: Research process: data collection and analysis

3.3.1 Ethical issues

In qualitative research, to use interviews to collect data from people, the researcher is required to obtain ethical approval from the University of Waikato. The ethical approval requires the researcher to follow rules to show respect to participants, to protect their human rights and the confidentiality of their personal and organizational information. The approval also requires the research proposal, tools for data collection, a copy of interview questions, the invitation letter for organizations, and the consent form for the protection of confidentiality for participants. All necessary documents listed above and the application forms were submitted to the Waikato Management School Ethics Committee in July 2010 and the ethical approval was granted in August 2010. (See Appendix V for invitation letter and sample consent form.)

Before collecting data, the researchers need to understand the decisive dimensions for securing research quality (how rigorous the research is). The next section explains the detail of research quality.

3.4 Research quality

The research quality is secured by three considerations: validity, reliability, and generalizability (Hardy & Bryman, 2004; Yin, 2013). The research validity and reliability are especially important for ensuring rigorous qualitative research (Grbich, 2013).

3.4.1 Validity

Collis and Hussey (2003) argue that validity indicates the extent the findings can accurately explain what really happened in the research. It is a measure of the research instrument and how trustworthy the research outcomes are (Creswell, 2009). There are three kinds of validity in the case study method: construct, internal, and external (Yin, 2013).

3.4.2 Construct Validity

Construct validity indicates the accuracy of research instruments, their design and adaption to fit the research framework. Researchers must test and confirm the instruments to ensure construct validity (Hennink et al., 2011; Saldana, 2011; Yin, 1994). The accuracy and consistency of constructs are important. Scandura and Williams (2000) indicate "it is valid to assert that a given operation taps a particular construct only if it can be shown that that operation produces results that agree with those achieved with alternative operationalization of the same construct" (p. 1252). The research questions and instruments for this study were developed according to balance theory. Pilot case studies were conducted with nine companies before the formal data collection began. This proved useful for continual monitoring of the research questions, and instruments were adjusted according to participants' feedback from these pilot studies. Construct validity was secured by the internal refining of the research questions and instruments.

3.4.3 Internal Validity

Internal validity concerns the causality of a research project (Chandra & Sharma, 2013). In a qualitative research study, data can be misinterpreted or discounted (Grbich, 2013). A solution to overcome this is to repeat the interpretation of collected data (Boeije, 2010). Another solution is to ask participants to check the

researcher's interpretation of the data (Hardy & Bryman, 2004; Yin, 2013). In this study, to ensure internal validity, all data collected was discussed fully with participants face-to-face or by email. After the participants had checked and confirmed the interpreted data, the material was used in the final data analysis.

3.4.4 External validity

External validity concerns the extent of the research. It measures how the research data can be generalized in terms of other research (Saldana, 2011; Thomas, 2003). External validity is close in meaning to generalizability (Dunnette & Hough, 1990). In qualitative research, the external validity can be achieved through multiple case studies which can reduce research bias in the process of comparing data and testing it against the theory adopted in research (Brannen, 1992; Chandra & Sharma, 2013; Welman et al., 2005). The multiple cases should show certain similarities (Payne & Williams, 2005). To secure robust external validity, the method of multiple case studies (more than 30 cases) was selected that reflected issues around relationship management in the logistics triad.

3.4.5 Reliability

Reliability refers to how stable a research outcome is (Chandra & Sharma, 2013). In qualitative research, the key measure of reliability is the triangulation of data collection (Collis & Hussey, 2003). Researchers need to collect data from multiple sources (Boeije, 2010; Welman et al., 2005). In logistics triads, the three sides (the LSPs, the suppliers and the customers) perceived the triadic relationship differently. To secure the triangulation of data sources and reliability, data was collected from all three parties. Although the participants from the three parties indicated several different opinions; they shared similar ideas about relationship dynamics in logistics triads.

Another point of research reliability is the process of data analysis and consistency in data coding for data analysis (Grbich, 2013; Hardy & Bryman, 2004). Consistency can effectively decrease research biases that are caused by the researchers' interpretation of collected data (Eisenhardt, 1989; Hallebone & Priest, 2009). To secure consistency of data coding in this study, all coded data were cross matched. In the comparisons, the coded data with similar meanings were

grouped together and assigned a common code. This approach helped secure consistency in the data coding. More detail about data coding is presented later (in section 3.7.2).

3.4.6 Generalisability

Generalisability means that the researcher can predict and conclude one thing according to findings from another thing (Vogt, 2005). In qualitative research, researchers can generalise the context of selected research findings (Hennink et al., 2011). Before generalizing the findings, researchers should analyse the dynamics of the research targets in the processes of data collection and analysis (Denzin & Lincoln, 2013; Payne & Williams, 2005). Beyond that, researchers need to comprehensively understand research targets (Collis & Hussey, 2003; Yin, 2013). To gain a comprehensive view of the dynamics of relationships in logistics triads, all information from the three sides and related dyadic relationships in logistics triads were collected. This study had two continuous stages for data collection to secure generalizability (details are shown in sections 3.5 and 3.6).

After discussing the requirements to ensure research quality, the next two sections explain data collection in these stages.

3.5 Stage 1: data collection from the logistics service providers

3.5.1 Selection of organizations

Carefully selecting participating organizations was critical to the research design. In qualitative research, the sample is not chosen randomly as in quantitative research (Chandra & Sharma, 2013; Welman et al., 2005). The selection strategy in the first stage was developed according to the definition of LSP in previous studies. Academic definitions helped to identify the organizations which were selected as valid potential participants. Accessibility and relevant organizational characteristics were the two next most important reasons for selecting participants (Neuman, 2000; Sekaran, 2003; Yin, 1994).

The literature review indicated a lack of clear and unique definitions of an LSP. However, certain common ideas and characteristics around LSP were broadly recognized in a majority of studies. The key point is that the LSPs are the organizations which supply the whole or part of logistics services to the customers. The logistics services can be roughly classified into three main categories (Gooley, 2000; Sink & Langley, 1997; Sink, Langley, & Gibson, 1996): information coordination; physical transportation and delivery; and warehousing and distribution.

All organizations which can provide any one of the three kinds of services were considered as potential participants in the first stage. After searching NZ government statistical reports, more than 300 organizations were selected (Statistics New Zealand, 2009, 2010). In these companies, the top 50 LSPs share more than 75 percent of NZ's logistics market (Statistics New Zealand, 2010). The government report indicates that these companies are sound representatives of the logistics outsourcing industry. Scholars suggest that large, well-branded companies can provide models for other companies in the same industry (Bruton, Ahlstrom, & Li, 2010; Weerakkody, Dwivedi, & Irani, 2009). In this situation, these LSPs could be identified as representative LSPs and useful participants in the NZ market.

Research participation invitations were sent in October 2010. Twenty one companies agreed to join in the research. Another 29 companies rejected the invitations for two main reasons: business confidentiality or a lack of time to participate in the research. The 21 participating companies were appropriate samples since their service areas covered all three logistics services outlined. Besides the 21 companies, a LSP which was not one of the top 50 companies was selected as the sample organization. The main reason was that the LSP offered well trained logistics people to clients rather than other kinds of logistics services. This kind of service is special as it is hard to find similar LSPs. Therefore, the company was included in order to cover the population diversity of different kinds of LSPs. Population diversity is desirable in qualitative research (Chandra & Sharma, 2013; Creswell, 2009; Mouton, 2001). Population diversity facilitates the discovery of different aspects and links between LSP's service strategies and the

triadic dynamics. This is why participating companies were not selected from the same type of LSPs. Table 3.5 describes the business context of these 22 companies. The company names were replaced by single letter identification for maintaining business confidentiality.

The 22 companies were categorized into six types based on their services areas. There were six logistics and supply chain organizations, seven freight companies, four courier delivery companies, two port and shipping service providers, two distributors, and one special logistics service supplier which supplied professional logistics personnel to clients. The interview length ranged from 30 to 90 minutes as suggested by previous studies (Chandra & Sharma, 2013; Welman et al., 2005). This interview length gave the researcher sufficient conversation time and an understanding of the companies interviewed (Hennink et al., 2011; Saldana, 2011). The first nine organizations became part of the pilot study which developed and refined the interview protocols. In order to answer the research questions developed in the introductory chapter, all interview questions were tested, confirmed and modified in the pilot study and adopted in the two research stages. Because the interviews were semi-structured, some open-ended questions were slightly altered according to interviewees' requirements and feedback (Interview questions are attached in Appendix D).

Table 3.5: Stage 1: Participating organizations

Organization ID	Organization Type	Logistics services			Ranking in NZ market	Interview length (minutes)
		I	II	III		
A (Pilot study)	Logistics & Supply Chain	1	1	1	Top 10 LSP Company	45
B (Pilot study)	Freight	1			NZ based, Top 15 Freight company	55
C (Pilot study)	Ports			1	NZ based, Top 3 Ports	60
D (Pilot study)	Logistics & Supply Chain		1	1	Top 10 LSP Company	40
E (Pilot study)	Freight	1		1	NZ based, Top 15 Freight company	40
F (Pilot study)	Distributor		1	1	NZ based, Top 10 Distributor	35
G (Pilot study)	Distributor			1	NZ based, Top 10 Distributor	60
H (Pilot study)	Logistics & Supply Chain	1	1	1	Top 10 LSP Company	45
I (Pilot study)	Couriers		1	1	Global group, Top 10 Couriers in NZ	45
J	Couriers		1	1	Global group, Top 10 Couriers in NZ	60, 30
K	Couriers		1	1	Global group, Top 10 Couriers in NZ	75, 30
L	Ports			1	NZ based, Top 3 ports	90,45, 50
M	Delivery				NZ based	60
N	Logistics & Supply Chain	1	1	1	Top 10 LSP Company	45, 30
O	Logistics & Supply Chain	1			Global group, Top 5 in NZ	90
P	Freight	1		1	Global group, Top 15 in NZ	45
Q	Freight	1			Global group, Top 15 in NZ	60
R	Freight	1			Global group, Top 15 in NZ	45
S	Freight	1	1	1	Global group, Top 15 in NZ	60
T	Freight	1			NZ based, Top 15 Freight company	60
U	Couriers	1	1	1	NZ based, Top 10 in NZ	30, 75
V	Logistics & Supply Chain	1	1	1	Top 10 LSP Company	60

3.5.2 Selection of interviewees

The selection of interviewees is critical to qualitative research with all interviewees having certain experiences in relationship management in logistics or supply chains. To enhance the external validity for this research, all interviewees were selected from the level of general managers, managing directors, senior logistics/supply chain managers, and senior supplier/ customer relationship managers. These managers had an important role in the whole process of logistics outsourcing. Moreover, they held institutional knowledge about the whole supply chain compared to internal operations managers who were not so broadly well informed. In sum, these interviewees were selected to provide valid and useful information for studying the dynamics in the logistics triads.

3.5.3 Coding collected triad cases

The cases collected from organizations J to W were coded for data analysis. In total, there were 35 triadic cases in this stage. Table 3.6 shows the number of cases from each participant. Each triadic case was coded by a unique number.

Table 3.6: Stage 1: Case coding

Organization ID	Number of cases	Case coding
J	3	J1, J2, J3
K	4	K1, K2, K3, K4
L	5	L1, L2, L3, L4, L5
M	1	M1
N	3	N1, N2, N3
O	3	O1, O2, O3
P	3	P1, P2, P3
Q	2	Q1, Q2
R	2	R1, R2
S	2	S1, S2
T	2	T1, T2
U	3	U1, O1, U3
V	2	V1, V2

The research findings from these cases were taken as a base to guide data collection in the second stage. Ideally, the participating suppliers and customers in the second stage would have been selected from the cases provided by the participating LSPs in the first stage. These customers and suppliers could effectively ensure the validity of the data collection. However, to protect commercial secrets and privacy, most participating LSPs did not want the researcher to contact their suppliers and customers. They indicated that suppliers and customers may not want to be drawn into this research. As a result, in the second stage, the participants were selected from a broad area, as discussed below.

3.6 Stage 2: data collection from the suppliers and the customers

3.6.1 Selection of organizations

The process of selecting potential participants in the second stage was similar to the process in the first stage. As noted, about 100 companies were selected from NZ government statistical reports and included a number of industries (Statistics New Zealand, 2010, 2011). This helped secure population diversity and build a comprehensive picture of how the LSPs are used by suppliers and customers in these industries. With 29 companies showing an interest in participating, the interviews were organized and conducted between December of 2011 and September of 2012.

Table 3.7 illustrates the business context of the 29 companies. Each company was recognized by a unique ID. The 29 companies were selected from 17 industries. All were currently ranked as the top 100 in their respective industries. The interview length ranged between 45 and 90 minutes, as in the first stage.

Table 3.7: Stage 2: Participating organisations

Organization ID	Business area	Interview length (minutes)
BA	Super market	50
BB	Wood producer & exporter	90
BC	Super market	60
BD	Food producer & exporter	45
BE	Food producer & exporter	60
BF	Chemical material producer & importer	50
BG	Farm equipment producer & exporter	60
BH	Food producer & exporter	75
BI	Food producer & exporter	60
BJ	Wood producer, exporter & importer	60
BK	Fish wholesaler & exporter	60
BL	Fish wholesaler & importer	60
BM	Stationary wholesaler & retailer	60
BN	Fish wholesaler & exporter	45
BO	Food importer and wholesaler	45
BP	Casual product wholesaler & importer	60
BQ	Stationary wholesaler & importer	45
BR	Construction material producer & wholesaler	60
BS	Designer & producer	45
BT	Super market	60
BU	Medical equipment importer & wholesaler	70
BV	Air conditioner producer & importer	60
BW	Construction material producer & wholesaler	75
BX	Academic suits designer & wholesaler	45
BY	Cosmetic product importer & wholesaler	45
BZ	Fabric wholesaler	45
CA	Wine producer & exporter	75
CB	Commodity product importer & wholesaler	60
CC	Chemical material producer & wholesaler	45

3.6.2 Selection of interviewees

As in the first stage, all the interviewees selected for the second stage were general managers, managing directors, senior logistics/supply chain managers, and/or senior supplier/customer relationship managers in the participating organizations. These managers often held important roles in each organization

with more in-depth knowledge about external business relationship management than internal operations managers.

3.6.3 Coding collected triad cases

Table 3.8 illustrates the number of cases from each organization interviewed. Each triad was coded by a unique number. The research findings in this stage were compared with the outcomes from the first research stage. This comparison provided a holistic view of how the three sides in triads understand and manage the relationship in logistics outsourcing. Along with case coding, the next section provides more detail about data analysis.

Table 3.8: Stage 2: Case coding

Organization ID	Number of cases	Case coding
BA	1	BA1
BB	1	BB1
BC	2	BC1, BC2
BD	1	BD1
BE	3	BE1, BE2, BE3
BF	1	BF1
BG	2	BG1, BG2
BH	2	BH1, BH2
BI	1	BI1
BJ	2	BJ1, BJ2
BK	2	BK1, BK2
BL	2	BL1, BL2
BM	2	BM1, BM2
BN	1	BN1
BO	2	BO1, BO2
BP	2	BP1, BP2
BQ	2	BQ1, BQ2
BR	2	BR1, BR2
BS	2	BS1, BS2
BT	3	BT1, BT2, BT3

BU	1	BU1
BV	2	BV1, BV2
BW	2	BW1, BW2
BX	1	BX1
BY	2	BY1, BY2
BZ	1	BZ1
CA	3	CA1, CA2, CA3
CB	1	CB1
CC	2	CC1, CC2

3.7 Data Analysis

3.7.1 Tools for data analysis in qualitative research

There are a number of tools for analysing qualitative data (Grbich, 2013). In this thesis, content analysis is adopted more often than other tools. "Content analysis is a systematic examination of text (field notes) for identifying and grouping themes and coding, classifying and developing categories" (Pope, Ziebland & Mays, 2000, p. 115). Content analysis can help researchers to transfer unorganized data and turn it into meaningful content without losing significant information (Hardy & Bryman, 2004). Content analysis can be used for single and multiple case studies. In multiple case studies, content analysis is effective for conducting cross-case comparisons (Yin, 2013). This study collected information on logistics triads from multiple organizations and compared these cases to identify their differences and similarities.

3.7.2 Main steps of data analysis

There are a number of processes for content analysis in qualitative research (Collis & Hussey, 2003; Grbich, 2013; Yin, 1994). These processes have three main steps: data transcription and interpretation, data coding, and categorizing core information. The data analysis in this research followed these steps.

3.7.2.1 Step 1: Data transcription and interpretation

In the preparation of data analysis, notes are taken to record key information in interviews (Hardy & Bryman, 2004). After the interview, the researchers

transcribe notes and data from other sources (such as audio record and video record of the interview) into text files (Yin, 2013). All the transcription files are compared with the notes once more to secure the accuracy of information (Grbich, 2013). Once the accuracy is confirmed, all confidential information (such as people's names, the organization's name and confidential business information) is replaced by specific terms or names to protect participants' secrets and privacy (Yin, 1994). After finishing the transcription, all texts are interpreted according to the research goal (Collis & Hussey, 2003). Information not related to the goal is abandoned (Creswell, 2009).

Data transcription and interpretation in this research

In this research, all recorded data was transcribed into text and stored as files according to the process outlined above. Because English is not the author's first language, interview notes and key ideas were given to participants after the researcher finished the data transcription. This approach helped check whether the author's perceptions and the participants' opinions were the same. This can ensure and confirm the validity of collected data. After transcription and interpretation, the next step was data coding.

3.7.2.2 Step 2: Data coding

Data coding is critical to ensure excellent qualitative research (Grbich, 2013; Yin, 1994). It is a bottom-up technique assigning words and sentences to meaningful codes (Hardy & Bryman, 2004). The codes help researchers differentiate and classify the collected information (Yin, 2013). The codes can be adjusted in the process of data analysis (Collis & Hussey, 2003). Effective data coding helps researchers to gain a systematic view of all information collected (Boeije, 2010; Boyatzis, 1998).

There are two phases in data coding. The first phase is open coding (Yin, 1994). In this phase, a code is assigned when a meaningful idea is reflected in a word or a sentence (Yin, 2013). Similar meaningful information in different cases may be assigned different codes. In this situation, to keep consistency in data analysis, a meaningful code is assigned to all similar information (Hardy & Bryman, 2004). Once all data has been coded, the second phase is to classify these codes. This

phase can help the researchers to gain more understanding of the data collected (Thomas, 2003). In the second phase, all codes and data are restructured to narrow the focus in data analysis (Grbich, 2013). All codes are classified into different conceptual groups according to their meaning. These conceptual groups are the basic elements for later data analysis (Collis & Hussey, 2003).

Data coding in this research

This research followed these two phases of data coding. For example, if the interviewee indicated that a business relationship was lacking mutual understanding and communication, this relationship was coded as 'transactional relationship' and 'less mutual understanding'. After coding, it was cross-referenced to verify similarities and differences. In this process, different codes containing similar meanings were unified with one meaningful code. The second phase was to narrow the focus of data analysis by classifying codes into different conceptual groups. For instance, the codes 'confirming order delivery' and 'confirming order reception' were classified into one conceptual group which was named 'order confirmation'. Each conceptual group reflected a relationship activity between partners in logistics triads. In total, 32 conceptual groups were identified. The core information in some conceptual groups was similar. For instance, the conceptual groups of 'contract agreement' and 'sharing strategic goal' exhibited the same core information—goal congruence. The next step was to categorize all conceptual groups according to their core information.

3.7.2.3 Step 3: Categorizing core information

Researchers categorize core information through continuous cross comparisons between different conceptual groups and coded data (Grbich, 2013). Continuous comparisons help identify the similarities and differences of different conceptual groups (Hardy & Bryman, 2004). The categories with core information can be detected through assessing similarities and differences (Hennink et al., 2011). In the process of categorizing core information, it is possible to modify certain initial codes or conceptual groups making categorizing core information an iterative process (Yin, 1994). Once all categories of core information are identified and confirmed, the next step is to compare the core information with research goals

and questions to derive a discussion and deliver research findings (Creswell, 2009).

Categorizing core information in this research

Continuous cross comparison between conceptual groups was adopted to categorize the core information in this study. Conceptual groups in all cases were divided and conceptual groups which shared the same core information were categorized together. All 32 conceptual groups were categorized on the basis of six different relationship measures briefly mentioned in Chapter Two. These relationship measures are widely adopted in the assessment of the degree of collaboration between partners in supply chain studies (Cao et al., 2010; Cao & Zhang, 2010; McLachlin & Larson, 2011). In this study, these measures were adopted to identify the types of all dyadic SCRs in logistics triads. Before assessing the triadic structure of each case according to their dyadic relationship types, the following section presents a review of the six relationship measures.

Measures of supply chain relationship

Existing SCR research has a number of measures to assess the type of SCRs. Table 3.9 presents the six representative measures which have been widely used in previous SCR studies. Most studies highlight the significance of information sharing, communication, and joint effort. Variation around the significance of goal congruence, incentive alignment, and resource sharing is demonstrated in different studies (Cao et al., 2010; Ha, Park & Cho, 2011).

Table 3.9: Relationship measures for assessing the type of SCRs

Relationship studies	Relationship measures					
	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communications
Barratt, 2004; Fawcett et al., 2012	√	√	√			√
Cao & Zhang, 2010; McLachlin & Larson, 2011	√	√	√	√	√	√
Fawcett, Magnan & Fawcett, 2010; Fawcett et al., 2008	√	√	√	√		√
Ha et al., 2011	√		√	√	√	√
Simatupang & Sridharan, 2005	√		√	√		√
Vieira et al., 2009	√		√			√

In terms of this study, given the relationship structure of each logistics triad is determined by three related dyadic SCRs, the six relationship measures outlined in the table can help assess the type of each dyadic SCR in logistics triads. As explained in Chapter Two, each of these measures indicate different degrees of trust. Therefore, trust will not be taken as an independent measure to assess dyadic SCR in the present study. The following sections provide more detail about each relationship measure.

a. Information sharing

In an information age, the type of information being shared is a manifestation of the SCR type (Chopra & Meindl, 2007). Information sharing in transactional relationships is described as the discrete communication of basic business orders (Min et al., 2005; Sheu, HsiuJu, & Chae, 2006). With collaboration, on the other hand, information sharing is more proprietary and systematic (Angeles & Nath, 2001; Gosain & Palmer, 2004). For example, partners can access each other's confidential information when it is necessary. Similarly, high degrees of information transparency can help partners obtain fluent processes and reduce uncertainty and the 'bullwhip effect' in supply chains (Lee & Whang, 2000; Uzzi, 1997). Higher degrees of information sharing usually indicate the development of collaboration between partners (Caridi, Crippa, Perego, Sianesi, & Tumino, 2010;

Li et al., 2006). The connections between information sharing, supply chain visibility and the application of IT are significant in determining the operational effects of SCRs.

Figure 3.3 illustrates two findings about the connections. Firstly, the degree of alignment between partners' IT can indicate the degree of information sharing in the SCRs (Sanders & Premus, 2005; Kull, Ellis, & Narasimhan, 2013; Stevenson & Spring, 2009; Hall & Saygin, 2012). Secondly, the degree of information sharing can affect the degree of mutual trust, commitment, interdependency between partners and related relationship behaviour by increasing or decreasing the supply chain visibility (Caridi et al., 2010; Krause, Handfield, & Tyler, 2007; Simatupang & Sridharan, 2005; Wong et al., 2011). These two connections determine the collaboration development between partners.
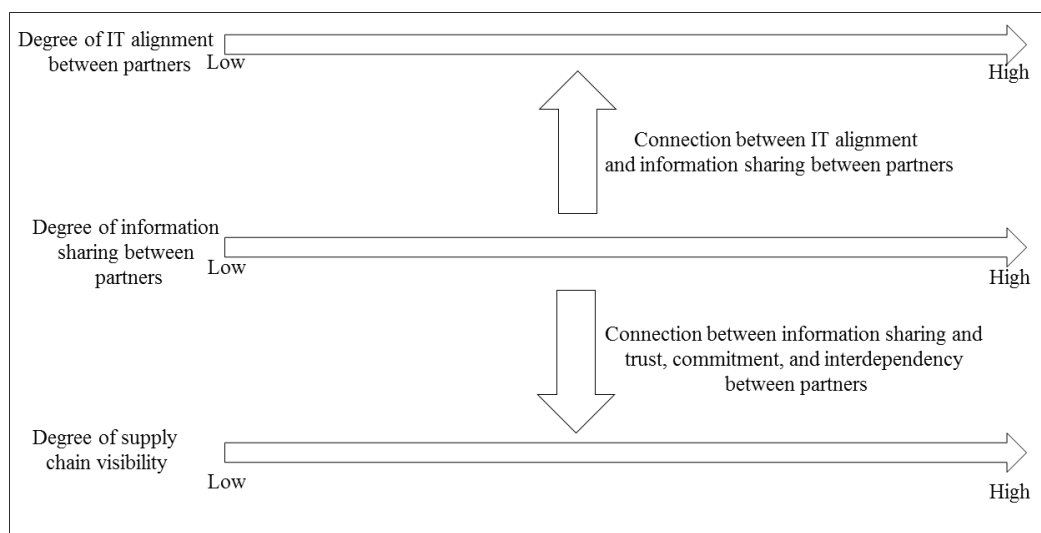
Figure 3.3: Connections among information sharing, supply chain visibility, and IT

The barriers and drawbacks of information sharing cannot be ignored, although high degrees of information sharing bring benefits to partners (Lumsden & Mirzabeiki, 2008; Williams & Moore, 2007). Table 3.10 outlines the major barriers and drawbacks of information sharing. The unstable demand and the abuse of information power can decrease an organization's willingness to share information with partners in the SCR. Low degrees of information sharing lead to unstable transactional relationships. From the perspective of drawbacks, improper information sharing and IT alignment may result in the leaking of business secrets.

Supply chain managers need to be careful to achieve a balance between the benefits and potential risks of information sharing.

Table 3.10: Barriers and drawbacks of information sharing

Barriers	Drawbacks	Representative studies
Unstable demand: abuse of information power	Restricts information sharing: leads to a long term transactional relationship.	Bhatnagar & Teo, 2009; Ferrer, Santa, Hyland, & Bretherton, 2010; McDowell, Harris, & Zhang, 2009; Williams & Moore, 2007
Business secrets, balance between benefits & risks need to be protected	Different levels of information sharing and IT alignment should be adopted for different relationship forms	Li, Wang, Yan, & Yu, 2005; Lumsden & Mirzabeiki, 2008; Richey, & Autry, 2009

In sum, the degrees of information sharing vary in transactional and collaborative relationships through connections with IT application, supply chain visibility, barriers and drawbacks. Scholars apply these variances to assess the dyadic SCRs. This thesis applies these variances of information sharing to examine the type of dyadic SCRs within logistics triads.

b. Goal congruence

Goal congruence is a standard of agreement and compatibility concerning business goals between supply chain partners (Angeles & Nath, 2001). In a collaborative relationship, partners' goals can be aligned to obtain a common goal (Lejeune & Yakova, 2005). To achieve goal congruence, collaborative partners must foster mutual understanding and common agreement on the final expectations in supply chains (Jap, 2001). Partners also need to share a common vision of the whole supply chain. This vision should include business processes, outcomes, strategic planning and interactions (Stank, 2001). In contrast, partners within a transactional relationship focus only on their own business goals. They do not pay attention to other organizations' strategies or the overall supply chain goals because they lack sufficient mutual understanding and commitment (Goffin, Lemke, & Szwejczewski, 2006). In both the transactional and collaborative relationships, practitioners apply contracts to achieve goal congruence. As a result, relationship contracts can represent achievable degrees of goal congruence in dyadic SCRs.

A contract can determine the type of SCRs because the design of a contract directly represents the degree of goal congruence between partners and can impact on relationship behaviours (Ghosh & Fedorowicz, 2008; Wagner & Lindemann, 2008). Consequently, a contract between partners must, at the very least, address three basic requirements: cost, schedule and performance (Forslund, 2009). These requirements vary between transactional and collaborative relationships. Subsequently, the development of contracts also varies within the two types of SCRs.

Two studies exhibit opposite findings when assessing a contract in SCRs. One highlights the completeness of a contract in determining the type of SCRs (Wiengarten, Pagell & Fynes, 2013). However, Handley and Benton (2012), do not agree, and claim instead that the completeness of a contract is only an antecedent of relationship development in outsourcing. The type of relationship and related outcomes are determined by relationship behaviours rather than the completeness of a contract in the process of outsourcing.

In conclusion, contracts can be applied to assess the type of SCR by indicating the degrees of goal congruence between partners. Accordingly, to assess the type of dyadic SCRs in logistics triads, this research will examine business relationship contracts to distinguish the degrees of goal congruence between partners in logistics triads.

c. Joint effort

Joint effort means partners reaching common decisions in order to optimize their overall relationship performances (Simatupang & Sridharan, 2005). The degree of joint effort is a key consideration when assessing the success of SCRs (Harland et al., 2004). From a resource based view, McCarthy-Byrne and Mentzer (2011) indicate that the degree of joint effort expended is connected to the degree of interdependency between partners as they come to rely on one another. In transactional relationships, each organization makes its own decisions without the consideration of partners (Cao, Thompson & Triche, 2013). Consequently, the degree of interdependency and joint effort is low which can waste resources, create goal conflicts, and result in process mismatches (Cao et al., 2010). Through

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collaboration, partners learn to rely heavily on each other and put a high value on trust. High degrees of joint effort can help partners align planning and processes, solve conflicts and other problems in the supply chain process through related relationship activities (Corbett, Blackburn, J. D., & Van Wassenhove, 1999). In sum, the overall supply chain responsiveness and profitability can be enhanced through high degrees of joint effort (Lee, Padmanabhan, & Whang, 1997).

Figure 3.4 presents the major findings associated with joint effort in SCRs. First, a number of antecedents can impact on degrees of joint effort between partners. The characteristics of market uncertainty, purchasing volumes, relationship history, resource dependency, and business compatibility can all determine the degrees of interdependency and joint effort between partners in SCRs (Carr, Kaynak, Hartley & Ross, 2008; Ferrer et al., 2010; Petersen et al., 2008; Sanzo et al., 2007; Scheer, Miao & Garrett, 2010; Terpend, Krause & Dooley, 2011). Then, the degrees of joint effort can positively impact on the degrees of trust, commitment and relationship continuity (Sandberg & Bildsten, 2011; Terpend, Tyler, Krause & Handfield, 2008; Zhang & Huo, 2013). In turn, the type of SCR can be affected (Corsten & Felde, 2005; Jonsson & Zineldin, 2003; Kull et al., 2013).
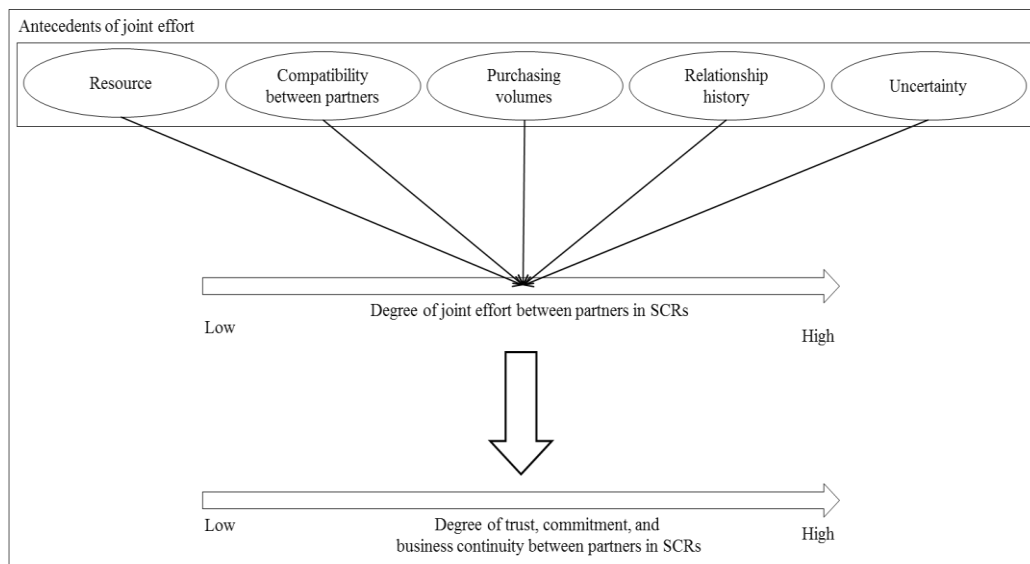
Figure 3.4: Joint effort in supply chain relationships

In conclusion, the degrees of joint effort and interdependency can determine the type of a dyadic SCR. In order to examine the type of a dyadic SCR, this study

uses the degree to which joint effort exists between partners to measure the closeness of their SCR in logistics triads.

d. Incentive alignment

Incentive alignment concerns the sharing of benefits and risks between partners (Cao & Zhang, 2010). Partners within a transactional relationship focus on minimizing their own costs and risks, making it difficult to establish incentive alignment (Simatupang & Sridharan, 2005). However, in collaboration, partners attempt to develop fair schemes and build trust to achieve incentive alignment by sharing risks and benefits (Lee & Whang, 2000; Manthou, Maro, & Folinas, 2004). It can be said that sharing benefits and risks is the expression of incentive alignment in dyadic SCR.

Existing studies exhibit two contradictory findings about sharing benefits and risks in SCRs. One group of studies argues that the degrees of benefit sharing and risk management can indicate the degrees of collaboration between partners (Bititci, Marinez, Albores & Parung, 2004; House & Stank, 2001; Rajagopal, Zailani & Sulaiman, 2009). Incentive alignment appears unique to collaborations (Harland et al., 2004; Wagner & Lindemann, 2008). However, other studies argue that incentive alignment is not only a measure to assess the benefit and risk sharing in a collaborative relationship (Hartmann & Grahl, 2012; Yao, Yue & Liu, 2008). A transactional relationship can also have certain degrees of benefit and risk sharing between partners (Ha et al., 2011).

Two reasons can be offered for the differing research findings. Firstly, the two groups in these studies used different targets and research settings, and because of this, their findings failed to show high degrees of consistency. Secondly, the balance of organizational power between partners is an antecedent to fostering collaboration by sharing benefits and risks (Yao et al., 2008). When the power is asymmetrical between partners, sharing of benefits and risks may be denied by the most powerful party in the relationship. Subsequently, the weaker party is prevented from developing a meaningful collaboration under the pressure of power exerted by the dominant party (Hartmann & Grahl, 2012). Overall, it can be said that sharing benefits and risks is a valid measure to assess the type of SCR.

This measure can also be affected by other relationship factors, such as the organizational power existing between partners.

In this thesis, the degree of benefit and risk sharing is used to measure the degrees of incentive alignment. Subsequently, the degree of incentive alignment is employed to assess whether dyadic relationships are transactional or collaborative SCRs within a logistics triad. Unlike risk and benefit sharing in incentive alignment, resource sharing is only found in collaborative SCRs, as discussed below.

e. Resource sharing

Resource sharing signals the degree of collaboration in a SCR. As identified by a number of scholars, most collaborative SCRs are supported by the sharing of financial and non-financial resources (Harland et al., 2004; Wu, Yeniyurt, Kim & Cavusgil, 2006). In the process of resource sharing, partners need to collaborate to assist mutual growth (Min et al., 2005). It is, therefore, difficult to find resource sharing in a transactional SCR (Cao & Zhang, 2010).

Previous studies on resource sharing show two research focuses. One discovers that the degree of resource sharing indicates a degree of collaboration (Bititci et al., 2004; Lai et al., 2013; Halldorsson et al., 2007; Holcomb & Hitt, 2007; Kim et al., 2011). Sharing resources can help partners counter the supply chain uncertainties by fostering long term win-win relationships between partners (Koufteros, Vickery & Droge, 2012; Paulraj & Chen, 2007; Sanders, Autry & Gligor, 2011). The other cites the difficulties in the process of sharing resources between partners (House & Stank, 2001; Rajagopal et al., 2009). Both findings highlight the positive connection between resource sharing and the development of collaborative SCRs.

In comparison with other relationship measures, resource sharing is unique because it can only be found in collaborations. As a result, this thesis applies resource sharing to assess the type of dyadic SCRs in logistics triads.

f. Communication

Communication refers to the process of information transmission and personal contact between partners in a SCR (Goffin et al., 2006). Information sharing focuses more on the quality of information which can be exchanged and shared between partners. In contrast, communication emphasizes the approach which partners apply to contact with each other (Cao et al., 2010; Ha et al., 2011). In a transactional relationship, the communications can vary in frequency from very low to extremely high according to the requirements of customer demands. In the communication process, transactional partners focus on transmitting basic information about business orders (Prahinski & Benton, 2004). Here, communication is more like a one-way transmission. Whether the frequency of communication is high or low, one way communication in a transactional relationship impedes partners from adding value or benefit to the relationship (Ballou, Gilbert & Mukherjee, 200; Talluri, Vickery, & Narayanan, 2008). Consequently, the transmission of information is different from information sharing. On the other hand, collaborative communication often contains intensive and bi-directional confidential messaging transmissions and a high degree of interpersonal connections between key managers (Mohr & Nevin, 1990).

There are two groups of studies about communications in SCRs. One concerns the connection between the degree of communication and the type of relationship (see Figure 3.5). Collaboration seeks more effective and higher degrees of communication between partners than transactional relationships (Parker & Russell, 2004; Ryu, So & Koo, 2009; Luo, Liu, Zhang, & Huang, 2011). The degree of communication can enhance one partner's willingness to collaborate with the other, solve relationship conflicts, and align business cultures and IT systems (Claycomb & Frankwick, 2005; Collyer, 2000; Freeman & Browne, 2004; House & Stank, 2001; Sambasivan & Yen, 2010; Zhang et al., 2009). In addition, the quality of informal personal communication can affect a relationship by influencing the effectiveness of formal communications between organizations (Bode et al., 2011; Gligor & Autry, 2012; Large, 2005).
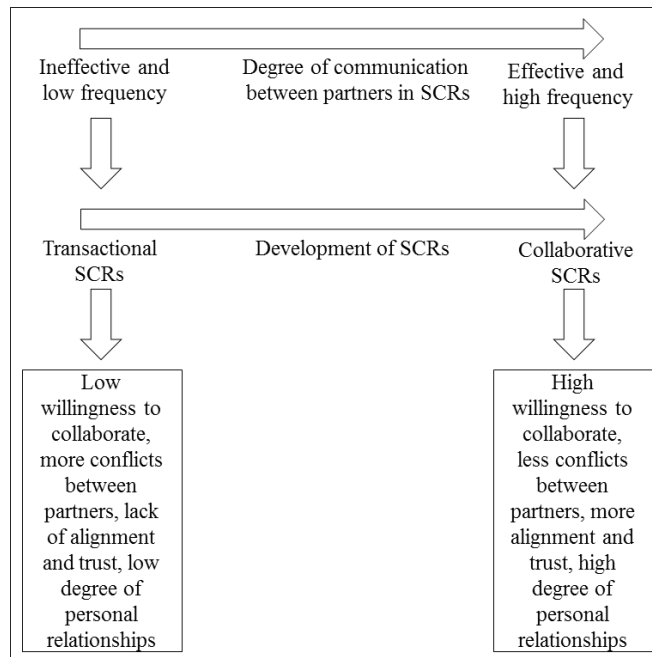
Figure 3.5: Communication, types of relationship, and relationship factors

Another group of studies highlights the barriers to achieving effective communication in SCRs. In a supply chain, low degrees of fairness, trust and commitment can impede the development of collaborative SCRs (Forslund & Jonsson, 2009; Oosterhuis, Van der Vaart & Molleman, 2012; Prahinski & Fan, 2007; Yan & Dooley, 2013). It is difficult for partners to achieve effective communication and develop collaborative SCRs if partners do not have a positive relationship history (van de Vijver et al., 2011).

In conclusion, depending on relationship circumstances, the degree and effectiveness of communication can vary and determine the type of SCR which emerges between partners. Along with extant studies, this research analyses the degree and effectiveness of communication to assess the type of dyadic SCRs in logistics triads.

Applying six relationship measures in the present study

The present study employs the six measures to test the type of each dyadic SCR within a logistics triad. The 32 conceptual groups identified from data analysis have been classified into six categories. These six categories are matched with the six relationship measures (see Table 3.11). After categorizing all conceptual groups, the next step is to assess the type of each dyadic link. Then, the triadic

relationship structure of each case can be identified according to its embedded dyads.

Table 3.11: Classification of relationship measures and conceptual groups of collected data

Relationship measures	Identified conceptual groups (relationship activities)
Information sharing	Order information Performance reports Sharing certain confidential information More customized information sharing Sharing all business information
Goal congruence	Contract agreements Sharing strategic goals Long term goal congruence Setting up common goals Sharing expectations
Joint effort	Visiting each other Joint problem solving Joint design for whole process Joint decision for order delivery Joint effort for cost reduction Joint logistics process design Joint design for all relevant supply chain issues
Incentive alignment	Sharing risks Sharing inventory costs Sharing cost reductions Sharing markets Sharing rewards
Resource sharing	Cross team management Sharing warehouse resources Sharing financial resources Sharing infrastructures IT system integration
Communication	Few senior manager's communication Order confirmations Frequent senior managers' communications Senior managers always have conversations Full communication between senior managers & boards

3.7.2.4 Step 4: Assessing structure of collected triads

The research propositions guided assessments of the triadic structures. In each triad, every related dyadic relationship contained all or part of the six measures, which were combined to show the type of each dyadic relationship. The structure of the triad could be determined through assessing the types of its three embedded dyadic relationships.

Table 3.12 shows all relationship measures and related activities classified into three types: transactional, collaborative, and medium (between transactional and collaborative). The medium type means the related activities were stronger than

transactional activities. However, the influences of these activities were not strong enough to be assigned as collaboration activities in the dyadic relationship.

Figure 3.6 shows the process of triadic case analysis in this study and explains how the six relationship measures are applied together to assess the type of each dyadic link in a logistics triad. Activities were assessed firstly as shown in Table 3.12. If one relationship measure contained more collaborative activities than the other two types, the relationship measure was assigned as a collaborative type. Otherwise, the relationship measure was a transactional type. Previous studies indicate that the resource sharing occurs only in collaborative SCRs (Cao et al., 2013; Cao & Zhang, 2010; Ha et al., 2011; McLachlin & Larson, 2011). In this study, all participants argued that only collaborative partners exhibit an incentive alignment because shared risks and benefits are dangerous to transactional relationship partners who do not trust each other. The other four measures may contain both transactional and collaborative types of relationship activities. After confirming the types of relationship measures, the six measures were combined to assess the type of dyadic relationship. If transactional measures were greater than collaborative measures in a dyadic relationship, the dyadic relationship was assessed as a transactional dyad; otherwise, the dyad was assessed as a collaborative dyad. If all measures in a dyadic relationship were medium type, the relationship was identified as a transactional dyad as well because its relationship measures were not strong enough to facilitate collaboration. Finally, according to the confirmed types of embedded dyadic relationships, each triad was identified as one of the eight structures described in the propositions.

Table 3.12: Classification of relationship activities

Measures & Style	Activities
Information sharing	
Transactional	Order information
	Performance report
	Order delivery information
Medium	More customized information sharing
Collaborative	Sharing certain confidential information
	Sharing all business information
Goal congruence	
Transactional	Contract agreement
Medium	Sharing expectations
Collaborative	Sharing strategic goals
	Long term goal congruence
	Setting up common goals
Joint effort	
Transactional	Joint problem solving
Medium	Visiting each other
	Joint decision-making for order deliveries
Collaborative	Joint design for whole process
	Joint efforts for cost reduction
	Joint logistics process design
	Joint design for all relevant supply chain issues
Incentive alignment	
Transactional	None
Medium	None
Collaborative	Sharing risks
	Sharing inventory costs
	Sharing cost reductions
	Sharing markets
	Sharing rewards
Resource sharing	
Transactional	None
Medium	None
Collaborative	Cross team management
	Sharing warehouse resources
	Sharing financial resources
	Sharing infrastructure
	IT system integration
Communication	
Transactional	Little senior manager communication
	Order confirmations
Medium	Some senior manager communication
	Frequent senior manager communication
Collaborative	Senior managers always have conversations
	Full communication between senior managers and boards
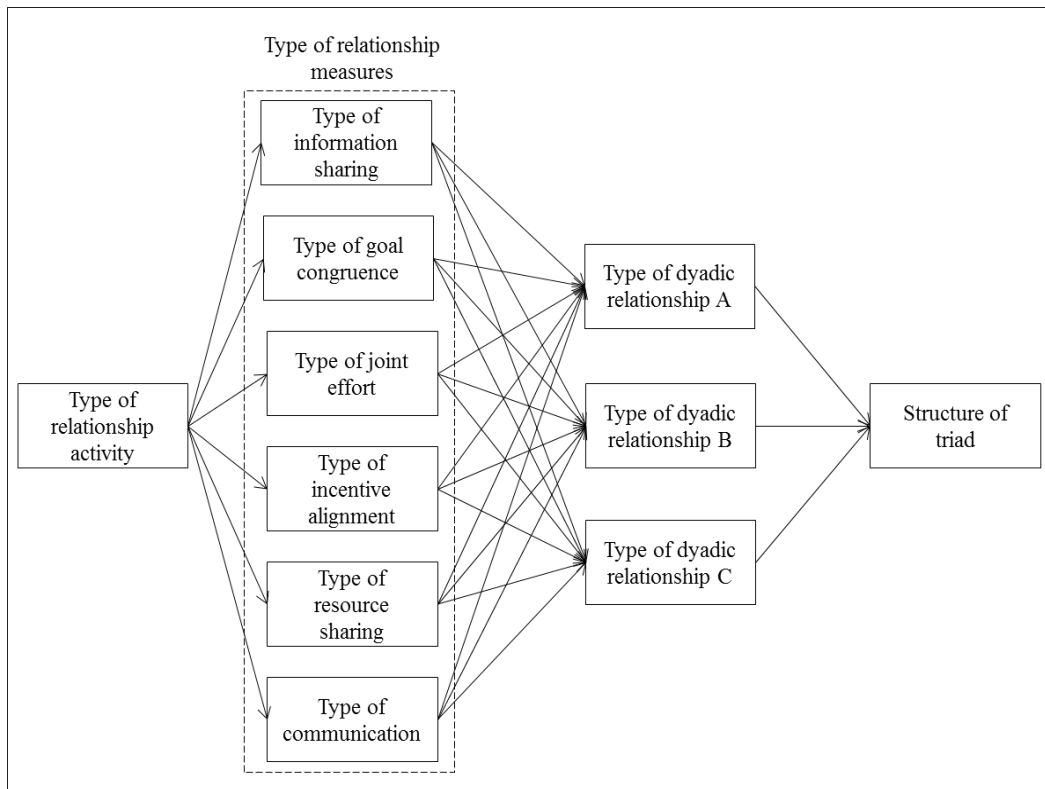
Figure 3.6: Assessing triadic relationship structure in logistics triads

As this research used interviews to collect multiple case studies, at a particular time, it is not longitudinal research. Details about when these triads started and the duration of their relationships were provided by participants. Table 3.13 shows a sample case of how to identify the types of dyadic relationships and triadic structure by assessing the relationship activities and measures in a case. In the table, Links A, B, and C represent the dyadic relationships in a triad. The six relationship measures were applied to assess the type for each dyadic relationship. In the column at the left side, the term 'Initial' indicates the time when the triadic relationship was first formed by related supplier, LSP, and customer. The term 'Current' reflects the time of data collection in this research. As a result, the 'Initial relationship activities' and the 'Current relationship activities' reflect the activities of each dyadic relationship at different times. Below these two lines, the 'Initial relationship status' and the 'Current relationship status' describes the relationship type of each dyad at different times.

The 'Relationship evolution' was used to show whether or not the dyadic relationship exhibited any dynamics at different times. The last element, 'Evolution of triadic structure', was designed to indicate whether the whole triadic

structure exhibits dynamics. In the sample case, all three of the dyadic relationships were transactional relationships in the initial stage because they only contained transactional activities at that time. In sum, the triadic structure was a transactional triad according to the conceptual framework and propositions.

A few relationship measures are labelled 'None' indicating a lack of sufficient data to identify its influences in related dyadic relationships. In the current stage, two relationships (Links A and C) retained a transactional type without change because they exhibited no change of related relationship activities at all. In contrast, the supplier-client dyad (Link B) exhibited obvious change of the relationship type. It changed from a transactional to collaborative relationship because it contained collaborative activities in all relationship factors in the current stage. In this research, to determine whether or not a dyad is dynamic in a triad case, its relationship type is compared between the initial and current stages. The result of comparison identifies the dyad as a dynamic relationship in three situations: change from transactional to collaborative type, change from collaborative to transactional type, or a dissolved relationship.

The dynamics of a logistics triad is totally determined by all related dyads. A triad is only identified as static when all of its three dyads are not dynamic relationships. Otherwise, the triad is a dynamic triad. In the sample case, according to the types of the three dyadic relationships, the triadic structure transited from a transactional triad to a partnership triad. This approach for analysing the sample case was adopted to evaluate all cases collected (the tables and analysis for all cases are attached in Appendix F).

Table 3.13: Sample case: Assessing dyadic link relationship type and triadic structure

Sample case	Relationship measures					
Link A (Supplier--LSP)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial relationship activities	Transactional style activities	Transactional style activities	Transactional style activities	None	None	Transactional style activities
Initial relationship status	Transactional relationship					
Current relationship activities	Transactional style activities	Transactional style activities	Transactional style activities	None	None	Transactional style activities
Current relationship status	Transactional relationship					
Relationship evolution	No change at all					
Link B (Supplier-Client)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial relationship activities	Transactional style activities	Transactional style activities	Transactional style activities	None	None	Transactional style activities
Initial relationship status	Transactional relationship					
Current relationship activities	Collaborative style activities	Collaborative style activities	Collaborative style activities	Collaborative style activities	Collaborative style activities	Collaborative style activities
Current relationship status	Collaborative relationship					
Relationship evolution	Evolved from Transactional relationship to Collaborative relationship					
Link C (LSP-Client)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial relationship activities	Transactional style activities	Transactional style activities	Transactional style activities	None	None	Transactional style activities
Initial relationship status	Transactional relationship					
Current relationship activities	Transactional style activities	Transactional style activities	Transactional style activities	None	None	Transactional style activities
Current relationship status	Transactional relationship					
Relationship evolution	No change at all					
Evolution of triadic structure	**Evolved from Transactional Triad to Partnership Triad**					

The conceptual framework directly reflects the direction of structural transition of the sample case in Figure 3.7.
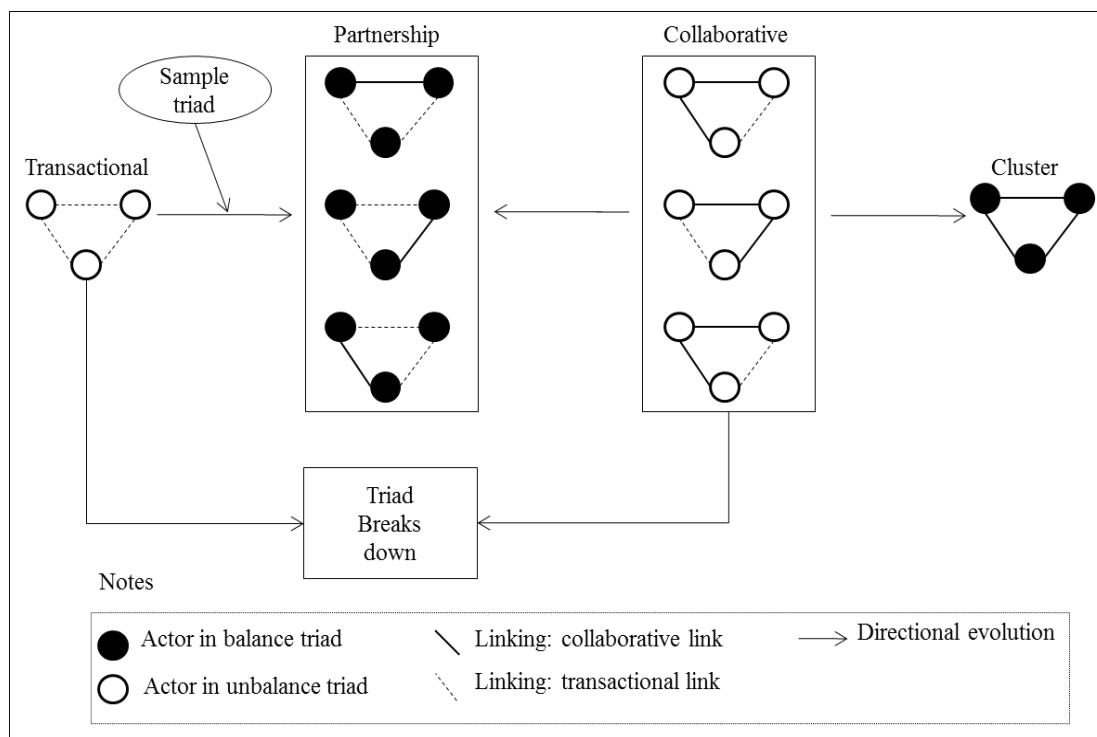
Figure 3.7: Positioning sample case in conceptual framework

Having analysed the triadic structures in all cases, the next step was to classify them into groups according to their similarities and differences, then to examine these groups of triads using the research propositions and the conceptual framework. The results determined whether balance theory was effective in explaining dynamics in logistics triads and assessed the implications of this in terms of the first research question. In order to answer the second research question, it was necessary to conduct in-depth data analysis to identify the influential factors in the dynamics in logistics triads.

3.7.2.5 Step 5: Analysing influential factors for dynamics in logistics triads

The processes in steps 2 and 3 were repeated to identify the factors impacting on triadic relationship dynamics. As explained in Chapter Two, each case was examined to identify the reasons which lead to, or impeded, the dynamics in the triadic relationship structure. The reasons identified from all triads were cross-referenced and were compared with the influential factors reviewed in Chapter

Two. If one conceptual group shared a similar meaning with an influential factor, the conceptual group was named according to that factor. All influential factors identified showed some influence on the dynamics or stability of logistics triads.

3.7.2.6 Step 6: Overall research findings of collected cases

The outcomes of the two research stages were compared in order to identify whether the two stages resulted in similar findings relating to the dynamics within logistics triads. A discussion has compared this research and extant studies of SCRs to reveal the research contributions and limitations in this study.

3.8 Conclusion

This chapter has outlined the methodology by explaining why a qualitative research approach was used to collect and analyse data in this study. The process of research design, data collection and data analysis was explained. All participating organizations in both stages were described. In addition, this chapter outlined how the research propositions and conceptual framework were investigated within the data analysis process by explaining how a sample logistics triad was analysed. The following two chapters will provide detail concerning data analysis in the first research stage. Chapter Four will provide detail of classifying logistics triads and testing research propositions and framework by using balance theory; while Chapter Five will focus on analysing and identifying the factors significantly influencing the stability and dynamics of logistics triads.

Chapter Four: Stage 1 - Investigation using balance theory

4.1 Preview

Chapter Two presented two research questions for achieving the research goal. The present chapter emphasizes the first research question which concerns the transition of relationship structure in logistics triads (see Figure 4.1).
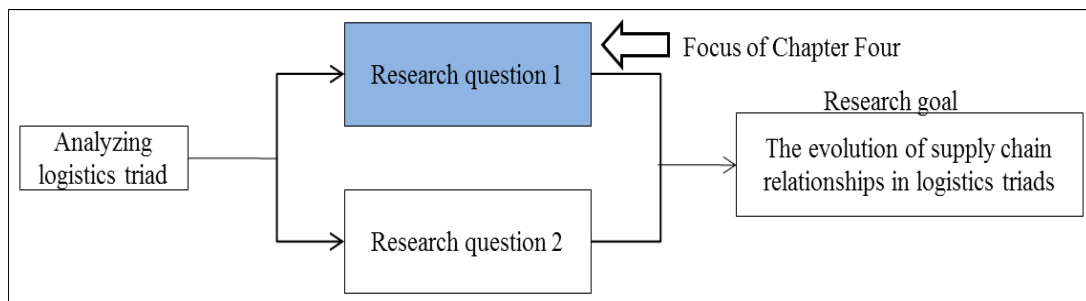
Figure 4.1: Focus of Chapter Four

This chapter will test research propositions and the conceptual framework, presented in Chapter Two. Both the propositions and framework have been developed according to balance theory. Consequently, the result of the testing will indicate whether or not balance theory is suitable to explain the dynamics and stability of relationship structures in logistics triads.

By testing balance theory, the findings of this chapter become the first step, leading to the next chapter which concerns the factors influencing relationship dynamics in logistics triads in Stage 1. In addition, as all the triadic case data was collected solely from LSPs in Stage 1, a final conclusion for balance theory cannot be reached in the present chapter. As a consequence, to triangulate and validate the data and findings, in Stage 2 empirical data from suppliers and customers was collected and analysed.

4.2 Classification of triads

The dynamics and stability of all triadic cases were assessed according to the process of data analysis explained in Chapter Three. Table 4.1 presents the dynamics and stability of all embedded dyads in each logistics triad. A majority of triads had not shown dynamics as their embedded dyads had been retained without change. In contrast, because of the change in embedded dyads, around one third of the triads had transited from their original structure to other structures or dissolved.

Table 4.1: Stage 1: Stability and dynamics of dyads in logistics triads

Triad case	LSP – Supplier dyad	LSP – Customer dyad	Supplier – Customer dyad	Dyads showing dynamics
J1	T	T	T	
J2	T	T	T	
J3	T	T	T	
K1	T→D	T	T→D	a, c
K2	T→D	T→D	T	a, b
K3	T	T	T	
K4	T	T	T	
L1	T	T	T	
L2	T	T	T	
L3	T	T	T	
L4	T	T→C	T	b
L5	T	T	T	
M1	T	T	T	
N1	T	T	T	
N2	T	T	T	
N3	C→D	T→D	T→C	a, b, c
O1	T	T→C	T	b
O2	T	T	T	
O3	T→C	T→C	T	a, b

P1	T	T	T	
P2	T	T	T	
P3	T	T	T	
Q1	T	C	T	
Q2	T	T	T	
R1	T	T	T	
R2	T	T	T	
S1	T	T	T	
S2	T→C	T	T	a
T1	T→D	T	T→D	a, c
T2	T	T	T	
U1	T→C	T	T	a
U2	T	T→C	T	b
U3	T	T	T	
V1	T→C	T	T	a
V2	T→C	T	T	a

Notes: T: stable transactional dyad; C: stable collaborative dyad; T→D: transactional dyad dissolved; C→D: collaborative dyad dissolved; T→C: changed from transactional to collaborative dyad

Based on the transitions exhibited, the triads were classified into five groups as shown in Table 4.2. Groups 1 and 2 include all static triads which did not display dynamics in their triadic structures. Group 1 includes 22 static triads that maintained a transactional structure. Only one triad in Group 2 retained a partnership structure. The other three groups showed dynamics in their triads. In Group 3, seven triads had transitioned from a transactional to a partnership structure. Four triads in Group 4 had dissolved. Before dissolving, three triads had retained a transactional structure, while one had retained a partnership structure. The triad in Group 5 had transitioned from a transactional to a collaborative structure. Along with the classifications of triadic structures, each group of triads was tested against the conceptual framework and research propositions developed in Chapter Two.

Table 4.2: Stage 1: Classification of logistics triads

Triad Set	Triad Groups	Triad ID
Set I: Static Triads	Group 1: static transactional triads	J1, J2, J3, K3, K4, L1, L2, L3, L5, M1, N1, N2, O2, P1, P2, P3, Q2, R1, R2, S1, T1, U3
	Group 2: static partnership triads	Q1
Set II: Dynamic Triads	Group 3: dynamic transactional triads	L4, O1, S2, U1, O1, V1, V2
	Group 4: dissolved triads	K1, K2, N3, T2
	Group 5: active transactional triads	O3

For the sake of brevity, each group of triads is described below through one sample triad selected which represents typical relationship characteristics of all triads in the group. Details of other triads are given in the Appendix F. The next section starts from Group 1—static transactional triads.

4.3 Group 1: Static transactional triads

The 22 triads in Group 1 failed to exhibit dynamics because, over time, they retained a transactional structure by keeping all embedded dyadic SCRs as transactional type (see Figure 4.2). Triad K3 was selected as the sample to be described here as the case is representative to explain the relationship characteristics of all triads in this group.
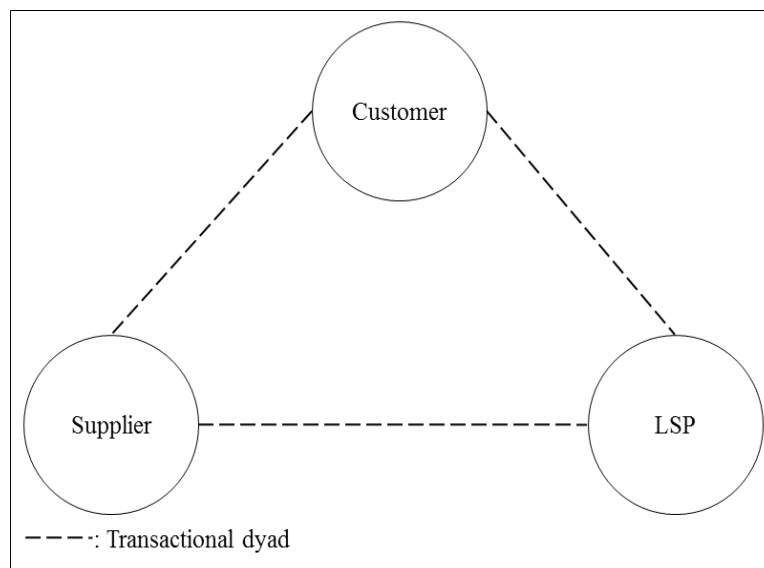
Figure 4.2: Stage 1: Static transactional triads

Triad K3 was formed by a delivery company (the LSP), a global logistics service supplier (the supplier), and a global cosmetic company's branch in NZ (the customer). This triad was built up and maintained over six years. The supplier worked as an information centre to manage the order information and related logistics process between the three actors. After receiving orders from the customer, the supplier signed a delivery contract with the LSP. The LSP focused on supplying delivery services to the customer. The customer placed only small orders with the supplier because they were not strategic partners. Both the supplier and the customer believed that a transactional dyad between them was sufficient for business. In the dyad between the supplier and the LSP, collaboration did not occur either because both sides were only concerned with minimizing their own costs. With the aim of keeping the process simple in the triad, the customer kept a basic transactional dyad with the LSP as well.

> …I do not think collaboration is really helpful here, they order from
> the supplier, and we help them deliver products, simple and easy…
> (Triad K3)

Table 4.3 illustrates the details of the three dyads in triad K3. The relationship activities and types of three dyadic relationships did not exhibit any differences over time; it did not change. The supplier conducted four basic transactional relationship activities with the LSP and the customer simultaneously: sharing order information, focusing on the basic contract agreement, making joint decisions for problem solving, and confirming basic orders through communication. The dyad between the customer and the LSP was even simpler. They conducted three activities: sharing information, joint problem solving around deliveries, and order confirmation. The triadic structure of triad K3 did not exhibit any dynamics in six years. The other 21 triads in Group 1 were similar to triad K3 because their triadic structures failed to show any dynamics either.

Table 4.3: Triad K3: Details of dyadic and triadic SCRs

Triad K3	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal order information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	None	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal order information	None	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal order information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional triad**					

4.3.1 Testing static transactional triads

No triads in Group 1 supported the related propositions 4a and 4b that an unbalanced transactional structure should quickly (in the short term) dissolve or transit to a partnership structure. As shown in Table 4.4, all triads in Group 1 retained their unbalanced transactional structures in the long term (more than three years). Although the dyads became stronger or weaker than previously in a number of triads, these changes neither broke any dyads nor developed collaborative dyads between partners in these triads. Therefore, all triads were stable without change.

Balance theory is inadequate in predicting the stability of the static transactional triads in Group 1 because of the difference between interpersonal relationships and inter-organizational relationships. According to three actors' attitudes (like or dislike) toward each other, balance theory suggests two opposite types of dyads (positive and negative) (Heider, 1958; Nooteboom, 2006). Positive and negative dyads between three actors can lead to power games resulting in different relationship dynamics in a triad (Cartwright & Harary, 1958). If three actors have negative dyadic links between each other, the triad has a transactional structure. This structure should dissolve or transit to the partnership structure quickly (Newcomb, 1961).

Table 4.4: Stage 1: Duration of static transactional triads and embedded dyads

Triad ID	Triad duration (years)	LSP – supplier dyad	LSP – customer dyad	Supplier – customer dyad	No dynamics
J1	4				√
J2	6				√
J3	3				√
K3	6				√
K4	10				√
L1	17		Stronger		
L2	12		Stronger		
L3	12	Stronger	Stronger		
L5	15	Weaker	Stronger	Weaker	
M1	12				√
N1	12		Stronger		
N2	4		Stronger		
O2	6		Stronger		
P1	4				√
P2	5		Stronger		
P3	5				√
Q2	4		Stronger		
R1	7				√
R2	20				√
S1	17	Stronger	Stronger	Stronger	
T1	4		Stronger		
U3	12				√

In contrast, as explained in Chapter Two, the positive and negative links in the logistics triads were represented by collaborative and transactional SCRs respectively in this thesis. Chapter Three explains that the assessments of transactional and collaborative dyads in the logistics triads are determined by relationship activities, such as information sharing and contract design. The development of relationship activities is strongly influenced by whether organizations can gain sufficient profits

from the relationships with partners. In this situation, unlike the dyadic links in interpersonal triads, organizations' attitudes do not show significant influence in determining the type of relationships between organizations. Consequently, in logistics triads, transactional dyads do not represent that organizations dislike each other. This indicates that whether or not attitudes determine the type of dyad is the difference between developing interpersonal and inter-organizational dyads in triadic relationships.

As shown in Figure 4.3, balance theory proposes the dynamics of the transactional triadic structure because embedded actors' attitudes influence embedded dyads (Heider, 1958). When embedded dyads are not determined by actors' attitudes, the theory is inadequate to explain the stability of the transactional structure in a triad. Therefore, balance theory cannot explain why triads in Group 1 can retain the transactional structure over time.
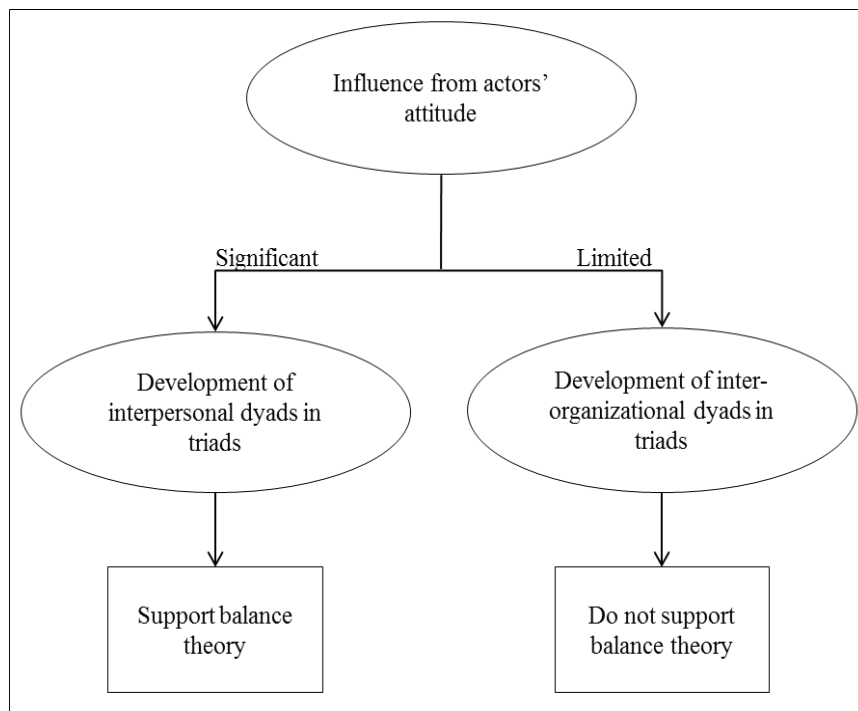
Figure 4.3: Limitation of balance theory in static transactional triads

In addition to the static transactional triads, the static partnership triad has displayed long term stability in this thesis. The next section presents this structure in detail.

4.4 Group 2: Static partnership triads

This group has only one triad—Q1. In the long term, this triad retained a partnership structure without change by keeping two transactional dyads and one collaborative dyad (see Figure 4.4). Triad Q1 was formed by a global freight forwarding company (the LSP), a NZ-based exporting company (the customer), and a global shipping line (the supplier). This triad had started four years previously. The exporting company outsourced global logistics services to the LSP. They were strategic partners in the NZ market. They previously developed collaboration in other businesses. The participating manager stated:

> …we know them [the final customer] very well because we have a
> good relationship history with them… even though this triad is a new
> project to us; we trusted each other from day one… (Triad Q1)

As a result, they continued their collaboration in this triad and maintained their ongoing collaboration.
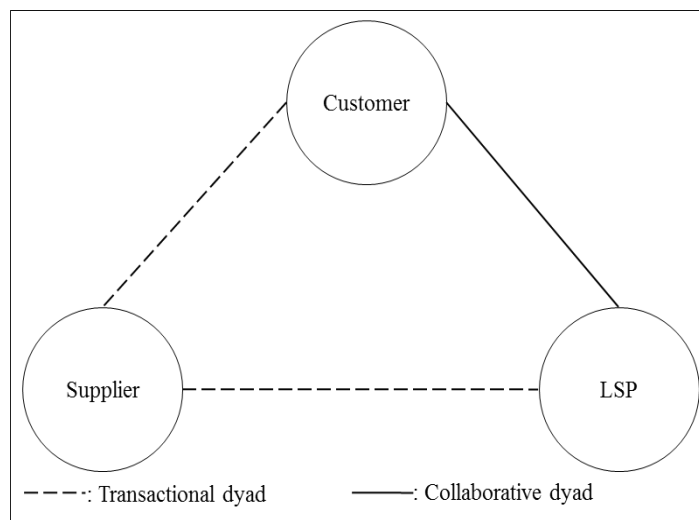
Figure 4.4: Stage 1: Static partnership triad

In the other two dyads within this triad, both the LSP and the customer kept transactional relationships with the shipping line. From the customer's view, the whole logistics process was managed by the LSP, while the supplier only processed

basic shipping services. Additionally, both the shipping line and the freight forwarding company were global companies, focusing more on global markets (North America and Asia). They did not see any advantage in building collaboration in the small NZ market.

> …NZ is too small to expand their [supplier] business, the branch here is to tell their global customers they can reach global arenas. Actually, their business in NZ cannot bring good profits to them … (Triad Q1)

Therefore, it was unnecessary to develop collaboration between them in this triad. From the view of the LSP, keeping the transactional dyad with the shipping line made the whole process simple and easy to manage.

Table 4.5 shows details of dyads and triad in triad Q1. None of the dyads had changed from the beginning to the current time. Therefore, the triad had not made any structural transition either. In the dyad between the customer and the LSP, highly customized information was shared and common long term business goals were initiated. They made common decisions on all supply chain issues and shared the rewards of cost reductions. Their senior managers held close conversations to make the relationship fluid. These relationships had remained unchanged for the last four years. The activities in the other two dyads were different. Both the LSP and the freight forwarding company developed and kept simple relationship activities with the shipping line. These activities included sharing normal order information, developing transactional contract agreements, ensuring joint effort at operational level, and communicating over order confirmations. Because of the stability of the three dyads, triad Q1 had retained its partnership structure since it was built.

Table 4.5: Triad Q1: Details of dyadic and triadic SCRs

Triad Q1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	Joint decision for order delivery	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal order information	Contract agreement	Joint decision for order delivery	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Highly customized information	Share common long term goal	Joint decision for order delivery, Joint design supply chain, joint cost reduction	Sharing cost reduction	None	Senior managers always have conversation
Initial type	Collaborative link					
Current activities	Highly customized information	Share common long term goal	Joint decision for order delivery, Joint design supply chain, joint cost reduction	Sharing cost reduction	None	Senior managers always have conversation
Current type	Collaborative link					
Change in dyad	No change at all					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	Joint decision for order delivery	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal order information	Contract agreement	Joint decision for order delivery	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all					
Dynamics in triad	**Static partnership triad**					

4.4.1 Testing static partnership triads

Balance theory could not effectively explain the stability of the partnership triad in Group 2 although related proposition 2 also suggests the long term stability in a partnership structure. According to balance theory, when two actors share the same negative attitudes toward the third actor, they can develop a solid collaborative dyad against the third actor. In this situation, a partnership structure can be retained over time (Dubois, 2009; Nooteboom, 2006). However, as in the triad Q1 shown above, the three organizations did not show obvious negative attitudes between one another. The LSP and the customer had developed collaboration from the first day of the triad and they had retained the collaborative dyad without change because of their positive relationship history. In contrast, the LSP and the customer had started from transactional dyads with the supplier because the supplier lacked a business history with them. The transactional dyads were not caused by a negative attitude between these organizations. As a result, similarly to the explanation in Group 1, Triad Q1 indicates that interpersonal relationships are different from inter-organizational relationships in triads. In this situation, balance theory is limited in predicting the development of a collaborative dyad or the long term stability of the static partnership structure in Triad Q1.

As Triad Q1 is the only static partnership triad in Stage 1, it is difficult to conclude that balance theory is insufficient to explain the stability of the partnership structure in logistics triads. The effectiveness of balance theory needs more testing in other structures of logistics triads. Therefore, after discussing all static triads in Stage 1, the following sections will introduce the three groups of dynamic logistics triads.

4.5 Group 3: Dynamic transactional triads

All seven triads in this group exhibited structural transitions from a transactional to partnership as one embedded dyad had transited from the transactional to the collaborative type in each triad. Triad O1 provided a representative example to explain the relationship characteristics and dynamics of triads in Group 3.

Triad O1 was formed by a global supply chain service provider (the LSP), a global sports company (the customer), and the sports company's supplier (the supplier). The triad had been in existence for five years. This triad contained three basic transactional links at the beginning (see Figure 4.5). The customer sent orders to the supplier and asked the LSP to organize the logistics process. The supplier and the LSP did not have to develop a close dyad because they both communicated directly with the customer. The customer selected the supplier because sourcing from this supplier was cheaper than sourcing from others. Because of the cost focus, the customer did not have extra resources or an interest in developing collaboration with the supplier. In the dyad with the LSP, the customer kept a transactional link as well because they lacked mutual understanding at the beginning.
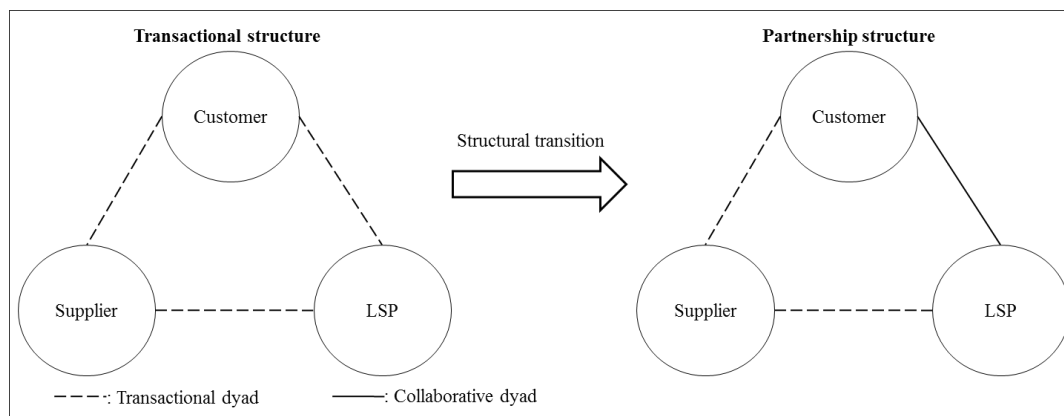
Figure 4.5: Triad O1: Dynamic transactional triad

With the development of a continuous trading business, the LSP gradually demonstrated it could offer better global logistics services than competitors. To save costs, the customer made the decision to outsource more supply chain and logistics services to the LSP. In this situation, the LSP helped the customer to serve global markets more effectively and efficiently:

> …the sports company has a very large market in the global arena, we have strong logistics service globally, we can satisfy their requirements better than others, and that's why the sports company works closely with us at the moment… (Triad O1)

The LSP enjoyed collaboration because of the continuous large orders coming from the customer:

> …we are happy to collaborate with them; they are our key customer because they order much more than other customers… (Triad O1)

The type of dyad between them had changed from a transactional to a collaborative in four years. The other two dyads did not change because the customer wanted to keep sourcing costs from the supplier down while the LSP was reluctant to change the existing relationship and tried to make the process as simple as possible in the triad.

Table 4.6 analyses the details of the relationships in triad O1. At the beginning, the customer had the same transactional dyads with both the supplier and the LSP. They shared stable order information, focused on basic contract agreement, developed joint efforts for problem solving, and communicated on order confirmations. The dyad between the customer and the supplier did not change over five years. The dyad between the LSP and the supplier did not change either. They only communicated and shared information for basic orders. On the other hand, the LSP and the customer developed a few collaborative activities in their dyad. They shared customized and confidential information; they cooperated on decision making in terms of many supply chain issues and shared possible risks and cost savings. Senior managers from both sides often conversed to facilitate the collaboration, ensuring the dyad evolved from transactional to collaborative. Overall, triad O1 had started to transit from an unbalanced transactional structure to a balanced partnership structure one year previously.

Table 4.6: Triad O1: Details of dyadic and triadic SCRs

Triad O1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal order information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	More customized information sharing, Sharing confidential information	Contract agreement	Joint design for all supply chain issues	Sharing risk and cost saving	None	Senior managers always have conversation
Current type	Collaborative link					
Change in dyad	Evolved from Transactional link to Collaborative link					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal order information	Contract agreement	joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Dynamic triad transited from a transactional structure to a partnership structure**					

4.5.1 Testing dynamic transactional triads

The situation in Group 3 is complex as some triads support related propositions while some triads do not. From the perspective of the long term stable transactional structure in these triads, no triad in Group 3 supports proposition 4b that logistics triads with a transactional structure should transition to a partnership structure in the short term. As shown in Table 4.7, not all triads exhibit relationship dynamics in the short term (less than three years) before transitioning to a partnership structure (see Appendix F for details of these triads). Similarly to Group 1, because of the difference between interpersonal relationships and inter-organizational relationships, not all organizations in triads of Group 3 showed negative attitudes toward each other although they retained transactional dyads before transitioning. The close similarity between Groups 1 and 3 shows that balance theory has limitations in explaining the long term stability of the transactional structure in logistics triads.

Table 4.7: Stage 1: Duration of dynamic transactional triads and embedded dyads

Triad ID	LSP – Supplier dyad	LSP – Customer dyad	Supplier – Customer dyad	Duration of transactional structure	Duration of partnership structure
L4	No difference	Change to collaborative link	No difference	3	2
O1	No difference	Change to collaborative link	No difference	4	1
S2	Change to collaborative link	No difference	No difference	11	3
U1	Change to collaborative link	No difference	No difference	4	4
U2	No difference	Change to collaborative link	No difference	3	4
V1	Change to collaborative link	No difference	No difference	4	2
V2	Change to collaborative link	No difference	No difference	3	2

The structural transition of several triads in Group 3 offers another perspective to test propositions. According to balance theory, proposition 4b suggests that two organizations in a triad form a collaboration against the third one in the short term. In

four triads (S2, U1, V1, and V2), with the enhancement of purchasing volumes, customers in these triads tried to use buyer power to gain advantage from suppliers and LSPs. To protect their own profits, as shown in Figure 4.6, LSPs and suppliers collaborated against the buyer power from the customers in these four triads.
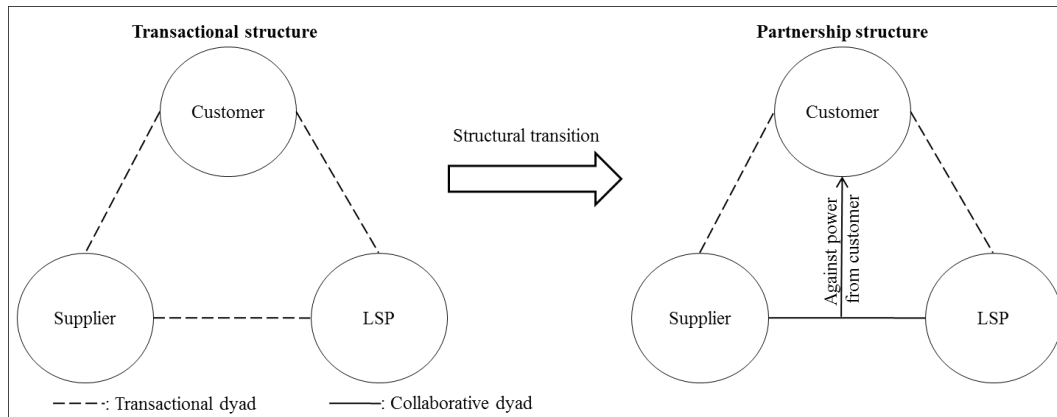
Figure 4.6: Structural transition in triads S2, U1, V1, and V2

A representative opinion comes from Triad V1:

> …we can collaborate with them [supplier] to save unnecessary costs and gain a balance of power between us and our common enemy [the customer]…

The power game shows that suppliers and LSPs share common negative attitudes towards customers. This phenomenon indicates that balance theory can be used to predict transition of a transactional triad if two organizations share a negative attitude toward the third one in a logistics triad. Similarly, previous balance theory studies also identify that organizations' attitudes affect the dynamics of supply chain triads (Phillips et al., 1998; Eggert et al., 2012). This finding indicates that when two weak organizations share a common enemy in a triad, they can collaborate against the third party to protect their own profits.

Another finding is the time for transition. As the development of an inter-organizational collaboration in logistics outsourcing is a gradual process (Lieb &

Butner, 2007; Selviaridis et al., 2008), it took a long time for suppliers and LSPs to foster collaborative dyads against customers in these four logistics triads (S2, U1, V1, and V2). Therefore, the structural transition in these four triads did not take place in the short term. However, these four triads retained the partnership structure because suppliers and LSPs continued to share common negative relations with their customers. This phenomenon supports proposition 2 that a partnership triadic structure is balanced and can be retained without dynamics in the long term. Overall, except that the change of structure did not happen in the short term, the findings from the four triads indicate that balance theory can explain relationship dynamics and stability of partnership structure in the logistics triads.

In contrast, the other three triads (L4, O1, and U2) in Group 3 are a mismatch with propositions 4b and 2. In these three triads, customers and LSPs developed and maintained collaborations because of the increase in purchasing volumes. They did not develop collaborations with suppliers because more collaboration did not ensure more profits for them. Previous studies also indicated that partners find it unnecessary to develop collaboration if the collaboration cannot ensure benefits for them (Cetindamar et al., 2005; Soosay et al., 2008). Suppliers did not have negative relationships with customers and LSPs in these triads although the dyads were transactional. In this situation, the structural transition of these triads and the stability of the partnership structure after transition are not determined by organizations' attitudes. Consequently, balance theory is limited in explaining the dynamics and stability in these three triads.

From the empirical view, the size of purchasing volumes can help organizations to determine whether or not they need to collaborate with partners because purchasing volumes directly affect the profits for all the organizations in a triad. This finding indicates that the changes in dyadic relationships in a triad depend on the influential factors identified. Although the duration of a relationship varies and might impact on the changes in supply chain relationships (Ellram, 1991; Spekman et al., 1998; Zineldin, 2002; Sawhney & Zabin, 2002), this thesis demonstrates that the influential

factors are more important than the duration of relationship to determine the stability and dynamic of SCRs.

In conclusion, by combining different findings in Group 3, this thesis indicates a selection criteria of using balance theory to study transition between transactional and partnership structure in logistics triads (see Figure 4.7). When organizations' attitudes toward each other significantly influence their relationships and result in power games in logistics triads, balance theory is effective to explain the relationship dynamics. Otherwise, balance theory is limited in describing the dynamics and stability in logistics triads. In addition, because the development of inter-organizational dyads usually takes a long time, the triadic relationships between organizations also take a long time to change. Therefore, although balance theory can explain how structures transition in the logistics triads when embedded dyads are determined by organizations' attitudes, this theory is still limited in predicting the time for relationship dynamics.
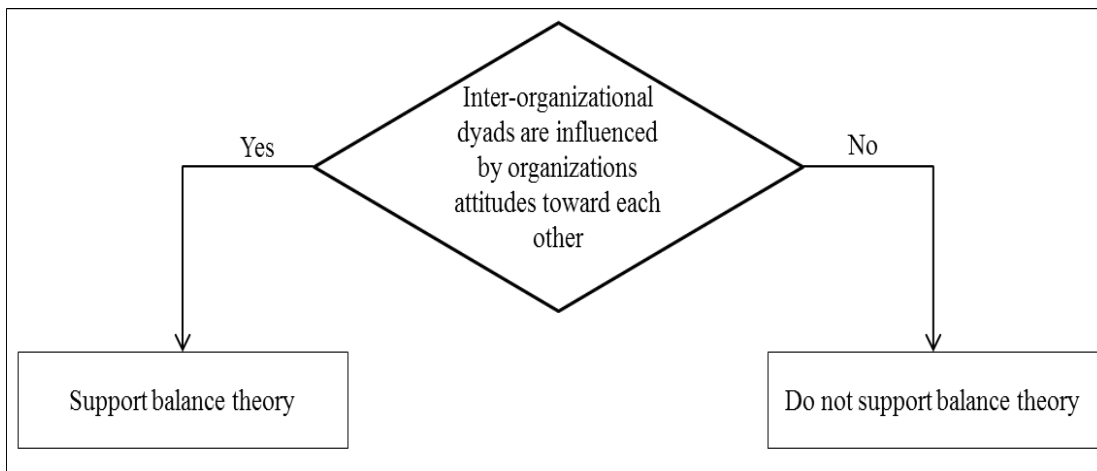
Figure 4.7: Balance theory: Limitation regarding differences between interpersonal and inter-organizational dyads

In addition to transitions between the transactional and the partnership structures, the triads with these two structures can both dissolve in certain situations which will be described in the next section.

4.6 Group 4: Dissolved triads

All triads in Group 4 finally dissolved. Three dissolved transactional triads (Triads T2, K1, & K2) had retained a transactional structure over time before dissolution; while another triad (N3) is a dissolved partnership triad as the triad had maintained a partnership structure in the long term before dissolution.

Triad T2 is a representative case that can illustrate the relationship characteristics in the three dissolved transactional triads. It had started five years previously and was formed by a NZ freight forwarding company (the LSP), a NZ exporting company (the customer), and an Australia-based custom service supplier (the supplier). In the beginning, the LSP helped the customer export goods to Australia. The supplier provided a service to receive and deliver goods for the customer in Australia. Because the purchasing volumes were small, it was unnecessary to build any collaboration between these organizations in the triad. Four years later, because of the changing requirements in NZ and global markets, the NZ LSP expanded its business to the Australian market and supplied the customer with the same services as the Australian supplier. In this situation, the customer replaced the Australian supplier by another company that could offer different services.

> …we expanded our business to Australia because of market requirements, to serve more global customers, we also provide more customized services, and we can serve our customer as the supplier did before, so, they [customer] feel they do not need to find a new partner that can offer something different, we know each other more and we are both based in NZ, they [customer] replaced the supplier by a new one and keep their business with us… (Triad T2)

The old triad then dissolved and only one dyad remained. At the same time, the LSP and the customer built a new triad with the new supplier (see Figure 4.8).
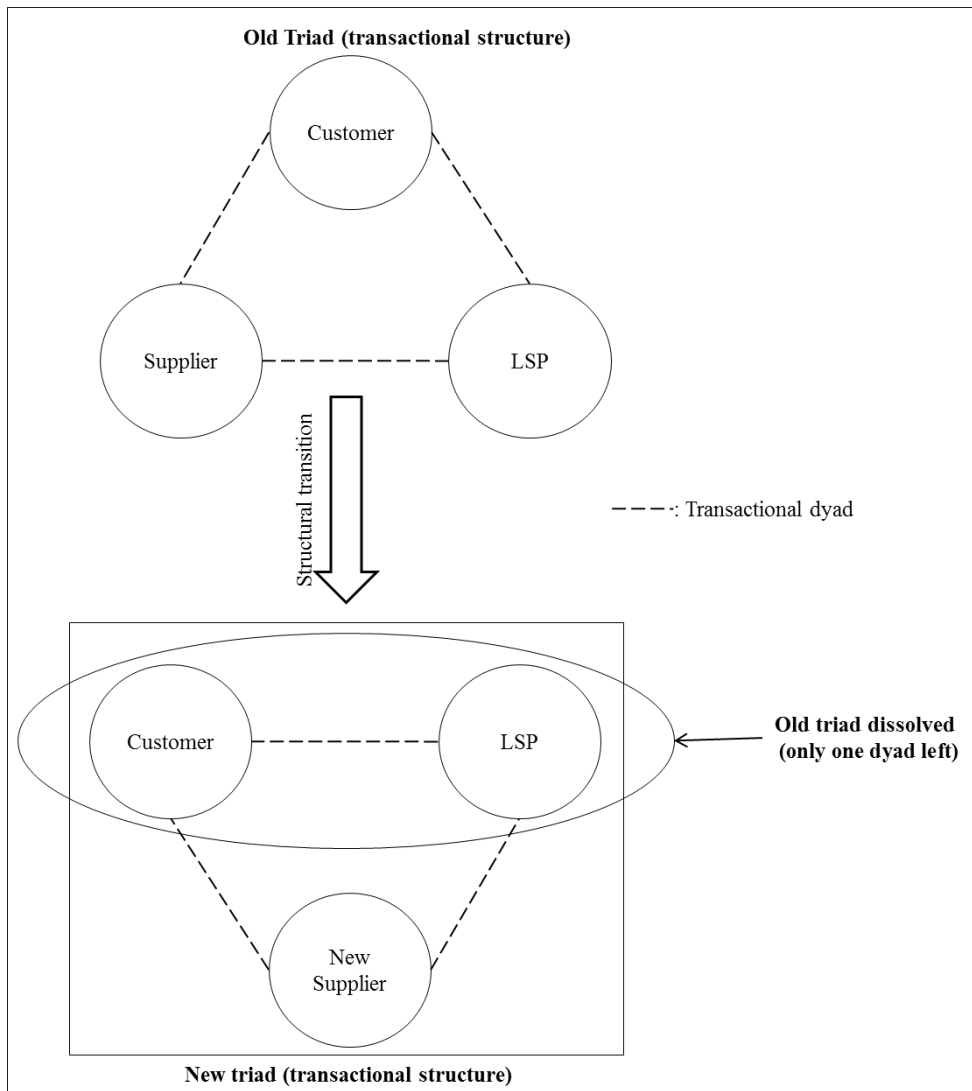
Figure 4.8: Dissolved triad T2

Table 4.8 shows the details of dyads in triad T2. All three dyads were exactly the same at the beginning. With the two parties sharing normal information and focusing on order confirmations, a basic contract agreement was used to connect them in each dyad. However, after the customer stopped outsourcing services to the Australian supplier, the supplier's two links ceased. On the other hand, with only one dyad left, the customer and the NZ LSP developed a closer relationship although it was not collaboration.

Table 4.8: Triad T2: Details of dyadic and triadic SCRs

Triad T2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	None
Current type	No link anymore					
Change in dyad	The link disappeared.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	More customized information sharing	Contract agreement	joint problem solving	None	None	Frequent senior managers' communication
Current type	Strong transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	None
Current type	No link anymore					
Change in dyad	The link disappeared.					
Dynamics in triad	**Dissolved triad**					

Unlike Triads T2, K1, and K2, Triad N3 dissolved from a partnership structure directly (see Figure 4.9). The triad had begun three years previously. It was formed by a NZ-based supply chain and logistics service provider (the LSP), a NZ-based warehouse service supplier (the supplier), and a wholesaler of construction materials (the customer). The customer had selected the LSP and the supplier according to cost considerations. At the beginning, although operating with large purchasing volumes, the customer built transactional dyads with the supplier and the LSP because both their offerings were commoditized and the customer was not familiar with them. In contrast, the supplier and the LSP had developed a collaborative relationship because of their strategic partnership and positive relationship history.

> …we [LSP] collaborate with them [supplier] because we have known each other for a while and we have already had long term cooperation plan, our [common] customer is well known in NZ, but they did not work with us before… (Triad N3)

With the growth of importing and exporting business between NZ and global markets, both the NZ-based supplier and LSP needed to enhance their resources to expand business in global markets. Consequently, they had prepared to merge for the long term. Because the supplier was larger than the LSP and had more financial resources, they had purchased the LSP two years previously. They worked as one to serve the customer more effectively because they worked together to enhance their total resources and offer services with more value added. It was difficult to find other organizations that had as substantial resources as the supplier in NZ. From that moment, the customer and the supplier relied on each other and developed collaboration.

> …after combining our resources, we can provide more unique services according to their [customer] requirements, our NZ competitors are hard put to offer them [customer] like us, so they [customer] preferred to develop a coalition with us in NZ... (Triad N3)

In sum, as shown in Figure 4.9, because of the merger between supplier and LSP, the triad dissolved and the customer developed and retained a collaborative dyad with the supplier.
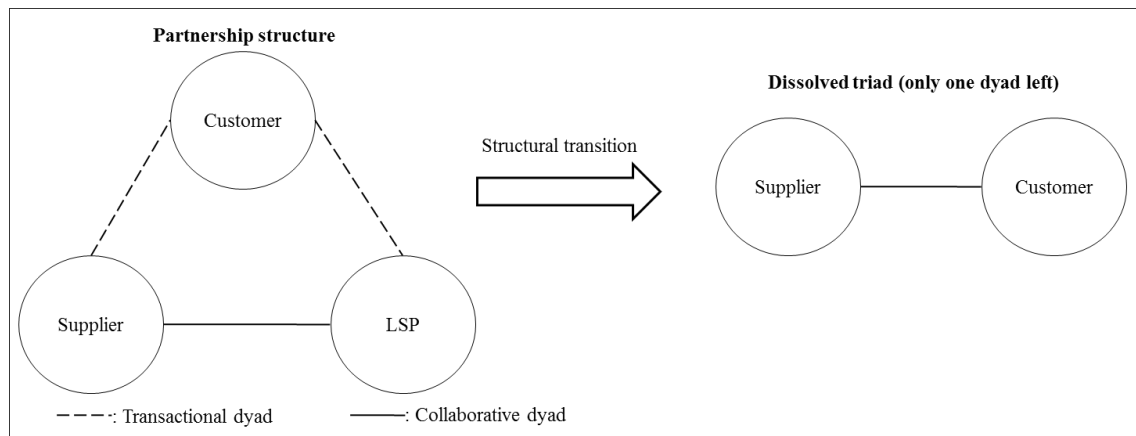
Figure 4.9: Dissolved triad N3

Table 4.9 outlines relationship details of triad N3. At the beginning, the customer had two transactional dyads with the LSP and the supplier. At that time, the supplier and LSP collaborated because of their strategic partnership. After the supplier had purchased the LSP, the two dyads linked with the LSP did not exist anymore. In this situation, the customer carried out collaborative activities with the supplier including sharing important business information, sharing strategic expectations, making joint decisions, and having frequent communications between senior managers. Two years ago, the triad dissolved and only one collaborative dyad was left.

Table 4.9: Triad N3: Details of dyadic and triadic SCRs

Triad N3	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Sharing all business information	Setting up common goal	Joint design for all supply chain issues	Sharing risk and cost saving	cross management team	Full communication between senior managers and board people
Initial type	Collaborative link					
Current activities	None	None	None	None	None	None
Current type	No link anymore					
Change in dyad	The link disappeared.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	None
Current type	No link anymore					
Change in dyad	The link disappeared.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Sharing confidential information, More customized information sharing	sharing expectation	Joint design for whole process	None	None	Senior managers always have conversation
Current type	Collaborative link					
Change in dyad	Evolved from Transactional link to Collaborative link					
Dynamics in triad	**Dissolved triad**					

4.6.1 Testing dissolved triads

The dissolved triads in Group 4 tested balance theory and related propositions from two triadic relationship structures: transactional and partnership. Three transactional triads (K1, K2, and T2) did not support proposition 4a, although these triads finally dissolved. The proposition suggests that an unbalanced transactional triad should dissolve quickly if no organization wants to develop collaboration in the triad. According to balance theory, the prerequisite of the proposition 4a is that all organizations show negative attitudes towards each other in a transactional triad (Choi & Wu, 2009c; Mena et al., 2013; Nooteboom, 2006). However, similarly to triads in Group 1, no organization exhibited a negative attitude toward others in the three dissolved triads although these organizations retained only transactional dyads before dissolving. In addition, these three triads showed changes of resources or key people in certain organizations before dissolving (see Table 4.10). Because of these changes, two organizations in each triad replaced the third organization by a new one. The reason is that the new one provided different services or added more value than the organization that had been replaced.

Table 4.10: Stage 1: Duration of transactional structure in dissolved triads and reason for dissolution

Triad ID	LSP – Supplier dyad	LSP – Customer dyad	Supplier – Customer dyad	Duration of triad (years)	Organizational Changes
T2	Discontinued	Retained	Discontinued	4	Change of resource capability in LSP
K1	Discontinued	Retained	Discontinued	6	Change of key people in supplier
K2	Discontinued	Discontinued	Retained	11	Change of key people in customer

It can be said that new organizations from wider networks helped dissolve old triads and build new triads. This kind of uncertainty is difficult to explain using balance theory because the theory only emphasizes dynamics in a triad (Heider, 1958). It does not investigate the influence from the uncertainty in the wider network (Bastl et al., 2013; Dubois, 2009). Further, similarly to Group 1, because of the difference between interpersonal and inter-organizational relationships, embedded dyads were not

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determined by organizations' attitudes in these dissolved triads. Therefore, balance theory is also limited in explaining why the three triads had retained long term transactional structure before dissolving.

Triad N3 is different from the other three dissolved transactional triads in Group 4 as triad N3 had retained a partnership structure before dissolving. Proposition 2 suggests that a partnership structure should be stable without change over time when two organizations collaborate against the third one in a triad. However, triad N3 dissolved in the short term because the collaborative LSP and supplier had merged to serve the customer. As balance theory has not investigated any dynamics where a partnership structure dissolves in the short term, the theory is not able to explain the dissolving partnership triad.

The reason for dissolving in triad N3 was also the uncertainty in the wider network. In order to serve changing customer requirements in global markets, the supplier had purchased the LSP to enhance resources. As they worked as one organization, the triad no longer existed. By combining findings from all dissolved triads, Figure 4.10 shows that balance theory is limited in explaining why logistics triads dissolve when the triads are influenced by uncertainty coming from the wider network. In dyadic SCRs, organizations can also disconnect their collaborations under the influence from uncertainty and risks that come from other organizations or the markets (Cai & Yang，2008; Kull et al., 2014). Therefore, this thesis sheds a light on the similarity between dyadic and triadic SCRs. Both dyads and triads can be dissolved under the influence from uncertainty in the wider supply chain network.
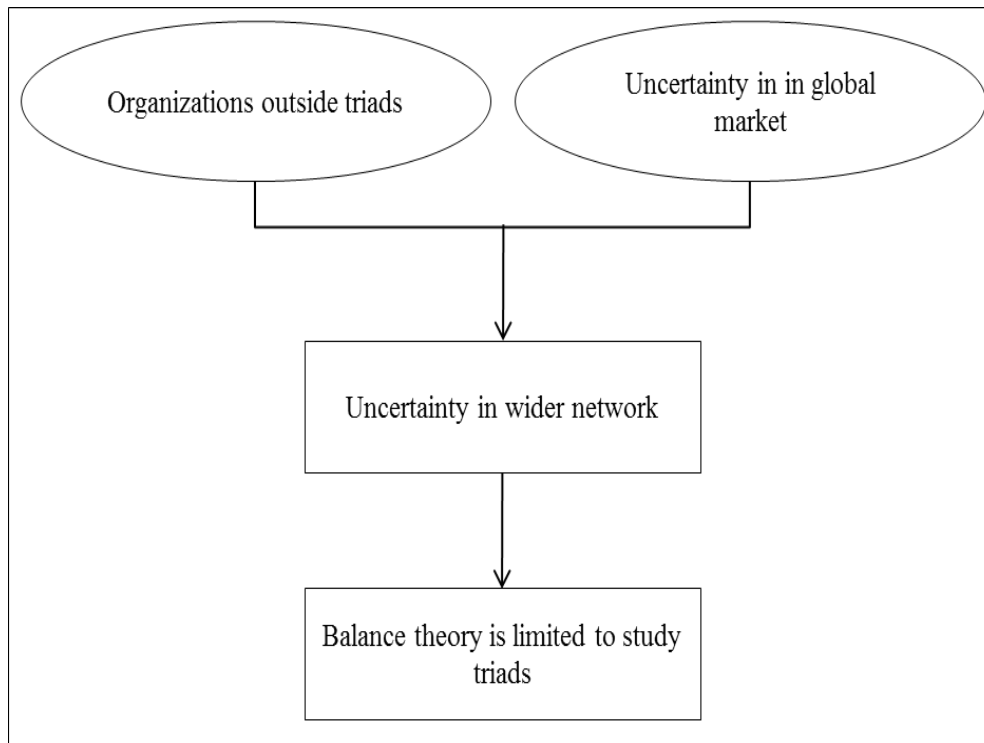
Figure 4.10: Balance theory: Limitation regarding uncertainty in wider network

The conceptual framework developed in Chapter Two has not predicted the relationship dynamics of a dissolved partnership triad (Triad N3). Therefore, the framework needs to be adjusted as shown in Figure 4.11. Compared to the conceptual framework, the modified framework added a link to show directional evolution from the Partnership structure to the Triad breaking down.
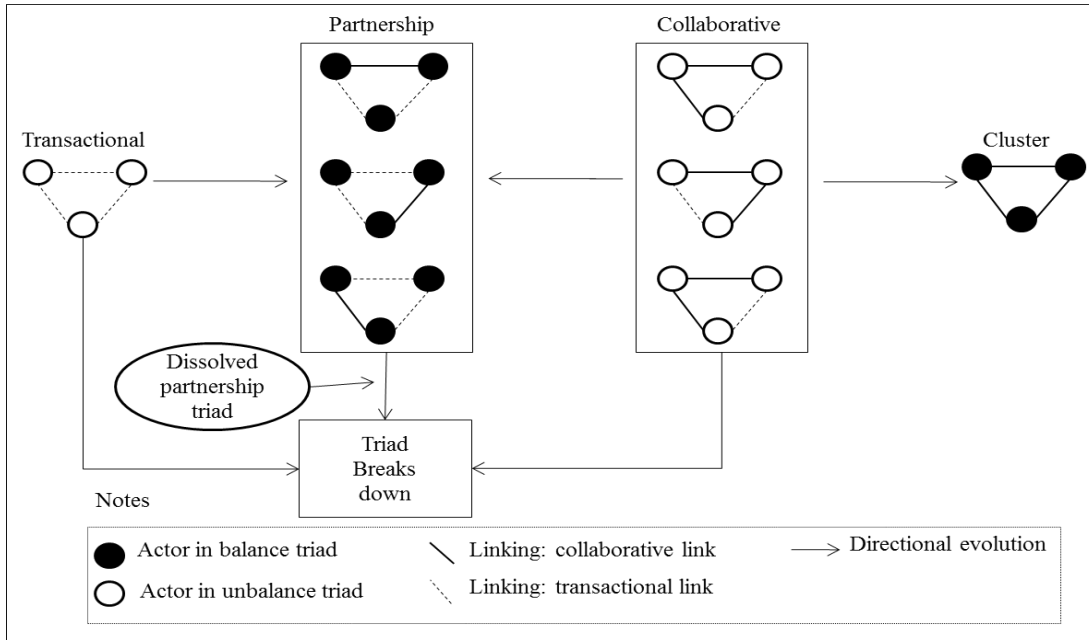
Figure 4.11: Modification of conceptual framework: Inserting dissolved partnership triad

In sum, because of influences from the uncertainty in the wider network, this research identifies the limitations of using balance theory to explain how both transactional triads and partnership triads can dissolve. The conceptual framework has also been modified accordingly. Furthermore, similarly to the dynamic transactional triad, the dissolved triads also demonstrate that the underlying influential factor (market uncertainty) is more significant than the effects of relationship duration in influencing the stability and dynamics of triadic relationships.

In addition to dissolving or transiting to a partnership structure, the next section introduces how a transactional logistics triad evolved to a collaborative structure. The triad showing this transition is called an active transactional triad in order to distinguish its dynamics from other dynamic triads in this research.

4.7 Group 5: Active transactional triad

O3 was the only triad in Stage 1 to transition directly from an unbalanced transactional structure to an unbalanced collaborative structure (see Figure 4.12). Triad O3 included a global supply chain service provider (the LSP), a NZ trading company which imports and exports consumer products, and an Australian trading company which imports and exports consumer products. This triad had started with three basic transactional dyads eight years previously.
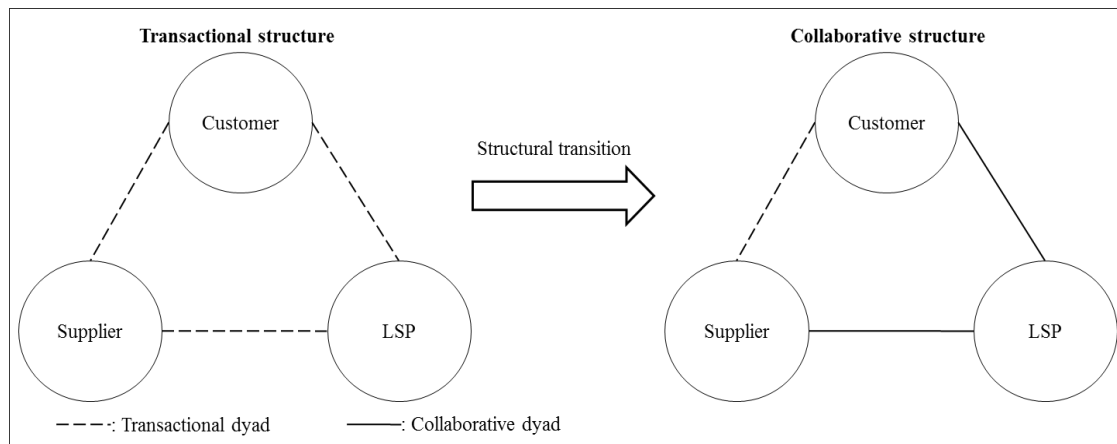
Figure 4.12: Stage 1: Active transactional triad

The NZ trading company and the Australian trading company were suppliers and customers to each other. The LSP organized logistics processes between them. Because the market share of the supplier and the customer overlapped, they were potential competitors although they purchased from each other. They preferred to keep their transactional link as long as possible to protect their business privacy. As neither was familiar with the LSP at the beginning, they preferred to offer small purchasing volumes in the triad and developed transactional dyads with the LSP. By keeping small purchasing volumes, each party retained transactional dyads with the other two parties in the first six years. In the last couple of years, both the supplier and customer gradually expanded their businesses to global markets.

> …their [customer and supplier] business expansion in Australia and NZ
> areas was exacerbated by the overlap of their target markets. This
> enhanced the possibility of their potential competition, so, although they

increased their demand, they still keep distance between each other…
(Triad O3)

Supplier and customer purchasing volumes both grew steadily. Because they were potential competitors, their transactional dyad remained although the purchasing volumes had increased. However, in order to make the globalized logistics process fluid and save total costs, both companies developed collaboration with the LSP. Therefore, the triad transitioned from a transactional structure to a collaborative structure.

…collaborating with us can help them make a quick response to the markets. However, to protect their own secrets, they strictly control the collaboration with us, any one of them does not want us speak too much to their competitor, so we need to keep close links with them both very carefully. We need to be collaborative with them and keep one step back at the same time… (Triad O3)

As shown in Table 4.11, in the beginning of triad O3, three basic relationship activities were identified from three transactional dyads. The dyad between the supplier and the customer had one more relationship activity—joint problem solving. This dyad did not exhibit any change in the duration of the triad. The other two dyads linked with the LSP had changed to the collaborative type by sharing more customized and confidential information. Both sides worked jointly with the LSP to design and manage supply chain issues. They also instituted long term common relationship goals with the LSP, and shared certain supply chain risks and cost savings with the LSP. Finally, frequent communications between senior managers secured confluence in these two dyads.

Table 4.11: Triad O3: Details of dyadic and triadic SCR

Triad O3	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Sharing confidential information, More customized information sharing	Long term common development goal	Joint design for all supply chain issues	Sharing risk and cost saving	None	Senior managers always have conversation
Current type	Collaborative link					
Change in dyad	Evolved from Transactional link to Collaborative link					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Sharing confidential information, More customized information sharing	Long term common development goal	Joint design for all supply chain issues	Sharing risk and cost saving	None	Senior managers always have conversation
Current type	Collaborative link					
Change in dyad	Evolved from Transactional link to Collaborative link					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal order information	Contract agreement	joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Dynamic triad from a transactional structure to a collaborative structure**					

4.7.1 Testing an active transactional triad

The transition displayed by triads in Group 5 has not been previously proposed by balance theory. In the triad, supplier and customer show a clear negative attitude toward each other. This has led to a long term transactional dyad between them. As the supplier and the customer were supplying and purchasing from each other, both outsourced logistics services directly to the LSP. They showed neither positive nor negative attitudes towards the LSP. With the increase of purchasing volumes, large purchasing volumes became a significant influence to all organizations' profits. In order to maximize profits and save logistics cost for commoditized products in the triad, both the supplier and the customer developed collaboration with the LSP.

Whether the triad was operating with small (before transition) or large (after transition) purchasing volumes, the buyer power of the supplier and customer was greater than the LSP's supply power because the LSP could only offer commoditized services to the supplier and customer. Therefore, the supplier and customer showed buyer dominance to control their dyads with the LSP, regardless of whether the dyads were a transactional or collaborative type. In the dyad between the customer and the supplier, it was difficult to develop collaboration as they were potential competitors to each other. Also, because of weak supply power, it was difficult for LSP to gain advantage from the supplier and the customer by manipulating any relationship in the triad although it had collaborations with both at the same time. As a result, the triad did not show further change after transitioning to the collaborative structure.

In contrast, proposition 4b suggests that an unbalanced transactional structure should transition to a balanced partnership structure in the short term. In addition, propositions 3a and 3b suggest that the collaborative structure should transition to a partnership or a cluster structure in the short term. However, in Triad O3, both its structural transition and the long term stability of collaborative structure did not support propositions 3a, 3b, and 4b.

The mismatch between Triad O3 and research propositions indicates the difference between interpersonal and inter-organizational relationships. Based on balance theory, one individual can use their attitudes toward the other two to influence those individuals' attitudes toward each other (Newcomb, 1961; Nooteboom, 2006). For example, if A and B like each other and A dislikes C, A will encourage B to dislike C (Cartwright & Harary, 1956; Heider, 1958). However, the triadic relationship between three organizations is different. As shown Triad O3, although the supplier and the customer competed against each other and controlled links with the LSP simultaneously, stopping any collaboration did not help improve profits. Therefore, neither the supplier nor the customer pushed the LSP to stop collaboration with their competitor in the triad.

It appears that balance theory is inadequate to explain the phenomenon in Group 5. The findings indicate a new dynamic of the collaborative structure in a triad. When a weak organization is controlled by the other two, and the two strong organizations have equal power to compete between each other (showing negative attitudes toward each other), the two competitors can develop and maintain collaborations with the weak organization to protect their own profits. In this situation, the power game between the two strong organizations helps retain a stable triadic collaborative structure over time.

As the conceptual framework has not presented the transition from the transactional to the collaborative structure, Figure 4.13 shows a modified framework by adding a link to show directional evolution between the two structures.
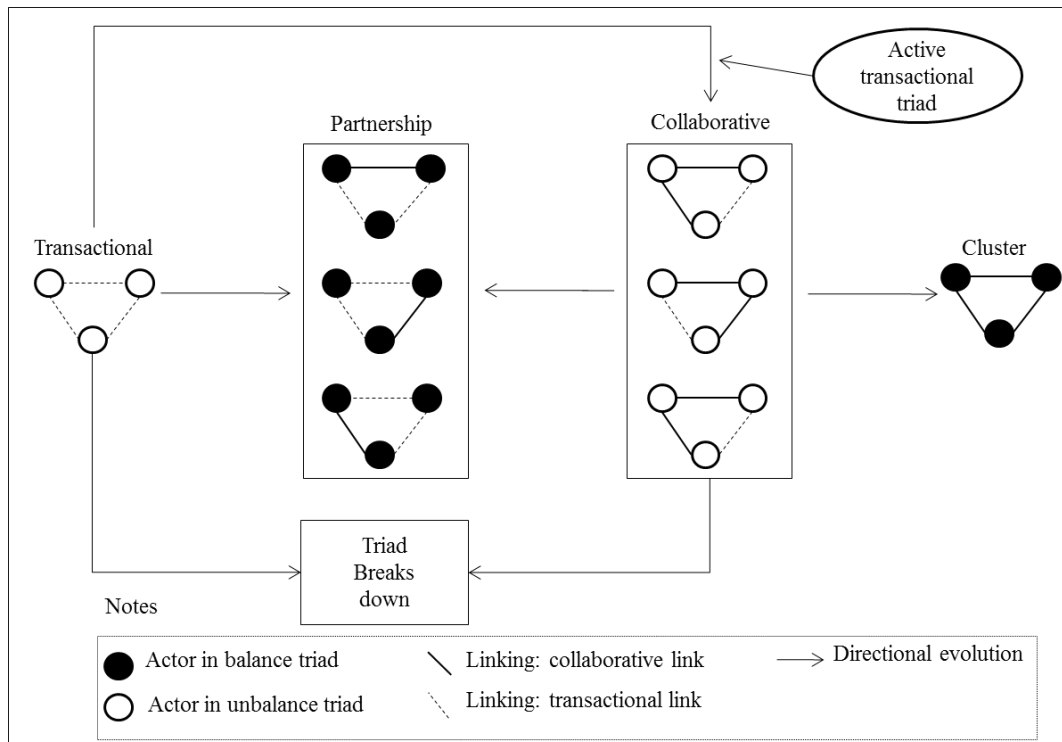
Figure 4.13: Modification of conceptual framework: Inserting active transactional triad

Overall, as Group 5 has only one triad, the findings of stability and dynamics relating to the transactional and the collaborative structure in a triad need to be validated by collecting further data regarding the logistics triads.

After presenting and explaining findings from each group of triads, the following sections provide an overview of all research findings about the usage of balance theory in studying logistics triads and present how triadic structures transit over time.

4.8 Validation of research propositions and balance theory

Table 4.12 shows that the evidence from Stage 1 only supports balance theory and related propositions in four dynamic transactional triads. In other situations, the theory and propositions are limited in explaining how logistics triads remain stable over time or transition between different structures. The two limitations of balance theory are presented in the Figure 4.14.

Table 4.12: Stage 1: Validation of research propositions

Group	Situation of triads	Related propositions	Acceptance of proposition
1	Static transactional triads	4a & 4b	Not supported
2	Static partnership triads	2	Not supported
3	Dynamics transactional triads: S2, U1, V1, & V2	2 & 4b	Supported
	Dynamic transactional triads: L4, O1, & U2	2 & 4b	Not supported
4	Dissolved transactional triads	4a	Not supported
	Dissolved partnership triads	2	Not supported
5	Active transactional triads	3a, 3b, & 4b	Not supported
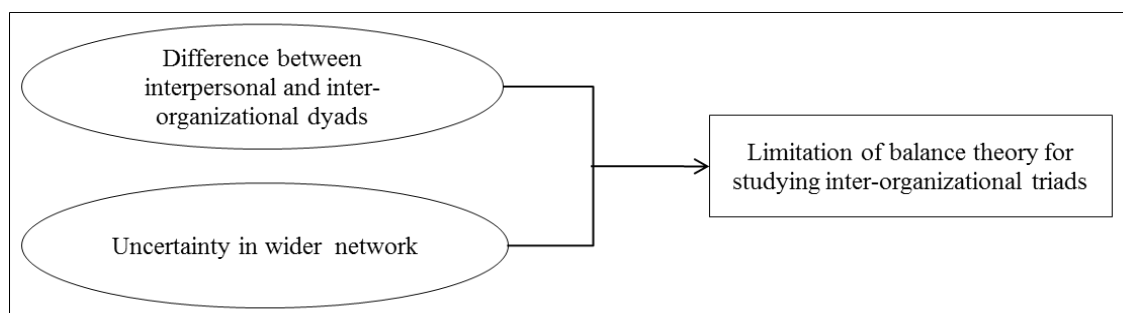
Figure 4.14: Limitations of balance theory

The difference between interpersonal and inter-organizational relationships and the uncertainty in the wider network can help explain why balance theory and related research propositions are not supported in Stage 1. These limitations will be explained in detail in the following sub-sections.

4.8.1 Difference between interpersonal and inter-organizational relationships

This difference is illustrated by two aspects: the influence from organizations' attitudes, and the length of time for developing an inter-organizational relationship.

4.8.1.1 Influence from organization's attitude

Balance theory suggests that three individuals' attitudes toward each other lead to the development of relationships between them and result in power games to form various triadic structures (Cartwright & Harary,1956; Heider, 1958; Newcomb, 1961). Therefore, the attitudes between individuals are important to assess whether or not balance theory can be used to study a triad. However, this thesis has identified that the development of dyads between organizations is often not influenced by organizations' attitudes. In this situation, it is a challenge to use balance theory to explain stability and dynamics of logistics triads.

In contrast, the only four dynamic transactional triads (S2, U1, V1, & V2) that support balance theory show consistency with previous supply chain studies because two organizations share common negative attitudes toward the third one in each triad (Choi & Wu, 2009a; Eggert et al., 2012). In this situation, two organizations develop and retain a collaborative dyad against the third. Comparing these four triads with others in Stage 1, it can be shown that balance theory is insufficient to study inter-organizational triads when embedded dyads are not significantly influenced by organizations' attitudes toward each other.

In addition to influence from attitudes, the time needed for developing relationships also indicates a limitation of balance theory in this research.

4.8.1.2 Time for developing inter-organizational relationships

In an interpersonal triad, three individuals' attitudes to each other can quickly determine the development of their interpersonal links (Nooteboom, 2006). Therefore, balance theory indicates that transactional and collaborative structures are unbalanced and should dissolve or transit to adjacent balanced structures

(partnership or cluster structure) quickly (Heider, 1958; Choi & Wu, 2009b). However, an inter-organizational relationship cannot be developed quickly; it is a gradual process (Bode et al., 2011; Mehrjerdi, 2009). In general, business partners need a couple of years to become familiar with each other (Gligor & Autry, 2012; Soosay et al., 2008).

Once an inter-organizational relationship has been built, it is difficult to change in the short term (Vieira et al., 2009; Fearon et al., 2010). Before their relationship can be changed, organisations need to assess the feasibility and compare pros and cons between different types of relationships (Daugherty, 2011; Spence & Bourlakis, 2009). After making a decision to change, both partners need to become familiar with each other because of the new relationship goal (Cheung & Rowlinson, 2011; House & Stank, 2001). Overall, both developing and changing an inter-organizational relationship are difficult to accomplish in the short term (Lorentz, 2008; Mehrjerdi, 2009). In this situation, all embedded dyads are difficult to change in the logistics triads. Accordingly, triadic structures are also difficult to transition in the short term. As a result, according to the difference in time for developing interpersonal and inter-organizational dyads, all triadic structures can be stable over time. Consequently, it is difficult to use balanced and unbalanced structures to distinguish triadic structures according to balance theory.

A combination of these explanations can be used to derive the first observation regarding the limitations of balance theory.

> **Observation 1:** Balance theory is limited for studying inter-organizational triads because of the difference between interpersonal and inter-organizational relationships.

Influence from wider networks is another limitation of balance theory.

4.8.2 Uncertainty in the wider network

Balance theory emphasizes the stability and dynamics between three actors in a triad (Cartwright & Harary, 1956; Nooteboom, 2006). It lacks consideration of other influences coming from the outside of the triad. However, in a supply chain, three actors and their triad cannot represent the whole network (van der Valk & van Iwaarden, 2011). Any uncertainty in a network can influence the dynamics of any SCR in the network (Barnes & Liao, 2012; Bernardes, 2010). All dissolved triads in Stage 1 show how uncertainty from wider network helps dissolve original triads. Little balance theory research has investigated this kind of phenomenon.

> **Observation 2**: Balance theory is limited in explaining dynamics of a triad if the triad is influenced by uncertainty coming from outside of the triad.

Both observations indicate that the inter-organizational triads differ from interpersonal triads in their support of balance theory. As the conceptual framework was developed according to balance theory, the limitations identified indicate that the framework also needs to be modified according to research findings in Stage 1.

4.9 Modification of the conceptual framework

The conceptual framework developed in Chapter Two can present dynamics of a majority of triads (Groups 1, 2, 3, and three dissolved transactional triads in Group 4) in Stage 1 except two triads. Therefore, Figure 4.15 offers a modified conceptual framework by adding the dynamics identified from the dissolved partnership triad (Group 4—N3) and the active transactional triad (Group 5—O3). In addition, as the classifications of balanced and unbalanced structures are not useful to indicate the stability and dynamics of identified triads, the modified framework has deleted the setting of these structures.
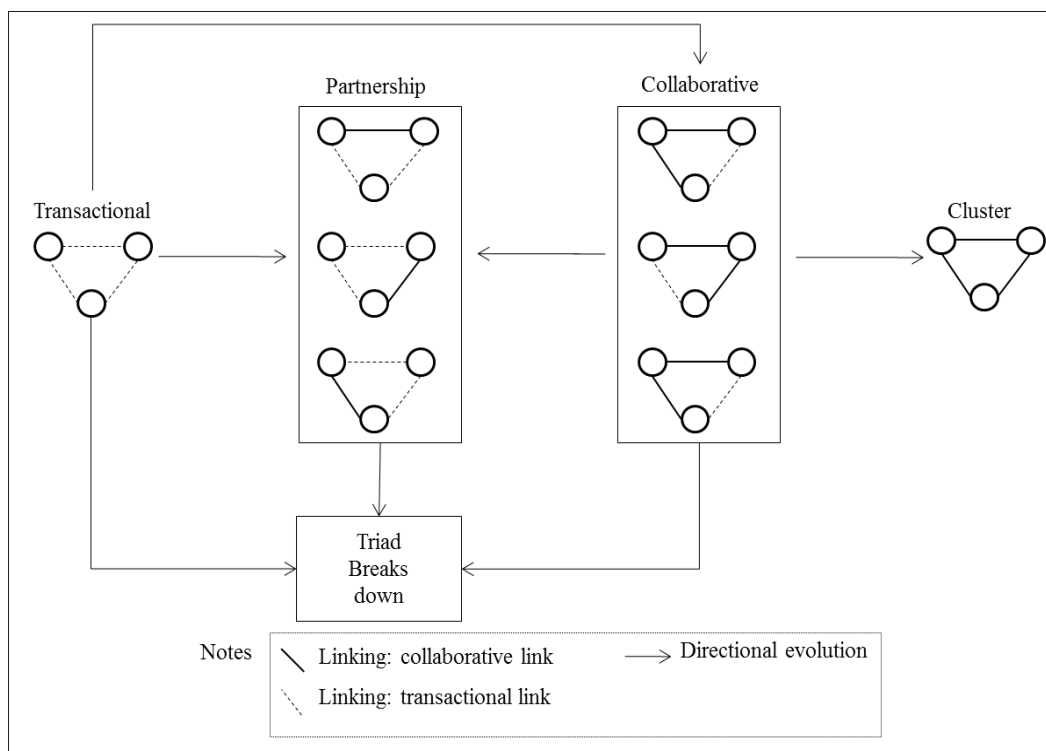
Figure 4.15: Modified conceptual framework

Compared to the original conceptual framework, the modified version pinpoints a new phenomenon relating to dynamics in logistics triads. Transition between different triadic structures is not a step-by-step progress. Instead, one triadic structure can transition directly to any other triadic structure or dissolve directly according to changes in embedded dyads. In contrast, the original conceptual framework only proposed a gradual transition from one structure to its adjacent structure. Based on the findings, Figure 4.16 restructures the modified conceptual framework to present an evolution model. This model can address the first research question concerning how the relationship structure in logistics triads transits over time. A triadic structure can transition to any other triadic structure or dissolve directly. Additionally, before and after transition, any triadic structure can be stable without change in the long term.
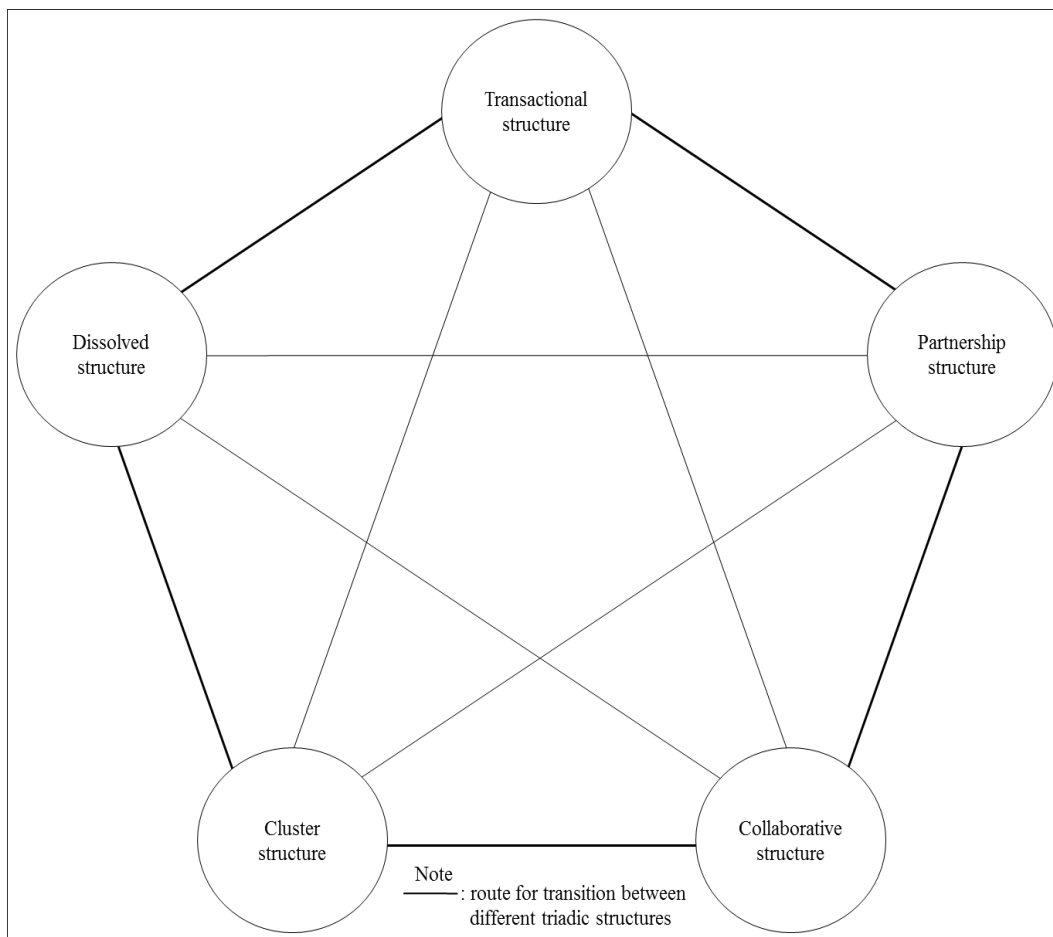
Figure 4.16: Evolution model

The findings in the first stage indicate the difference between balanced triadic relationship structure and the functionality of logistics triads. Balance theory suggests that only a balanced structure can ensure long term stability of a triadic relationship among three individuals (Choi & Wu, 2009a; Heider 1958). However, this theory does not explain the connection between the relationship stability of a triad and the functionality of the triad. In contrast, the findings from the first stage demonstrate that unbalanced logistics triads (e.g. all static transactional triads) can also present stable triadic relationship and functionality in the long term. Therefore, the balance of a triadic structure does not influence the functionality of a triad. Concerning these findings, the model presented in Figure 4.16 has one limitation: it does not explain the reasons for stability and dynamics in these triadic structures. The findings identified in the present chapter have already identified influences from certain influential factors (such as purchasing volumes and resource capability) in the logistics triads. Therefore, the next chapter will

address this limitation by studying factors that determine stability and dynamics in the logistics triads.

4.10 Conclusion

This research has found that balance theory has limitations in explaining the stability and dynamics of logistic triads. As balance theory has been developed for investigating dynamics among three individuals in a triad, the difference between interpersonal and inter-organizational relationships is one root cause explaining why this theory is insufficient to understand an inter-organizational triad. In regard to this difference, this chapter has identified that organizations' attitudes toward each other do not significantly influence the development of dyadic relationships in triads. In addition, this chapter has shown that the classification of balanced and unbalanced structures, which is a cornerstone of balance theory, is not helpful in predicting stability and dynamics of inter-organizational triads. The other reason for the limitation of balance theory is that the theory cannot take account of influences of any uncertainty coming from outside of a triad.

Theoretically, the findings of limitations contribute to theory development by testing balance theory and indicating its insufficiency in studying supply chain triads. The two observations identified from Stage 1 are valuable to add a new layer for the development of this theory from the perspective of studying inter-organizational triads. Further, the structural evolution model (Figure 4.16) is a first attempt to explain how triadic relationship structures transit over time in logistics outsourcing.

As this chapter has focused on testing balance theory and addressing the first research question, it has not discussed the root causes leading to stability and dynamics of logistics triads in Stage 1. In order to address the second research question, the next chapter will analyse identified influential factors in detail.

Chapter Five: Stage 1 - Factors influencing stability and dynamics of logistic triads

5.1 Preview

This chapter analyses logistics triads in Stage 1 to address the second research question regarding the factors that influence the stability and dynamics of supply chain relationships in logistics triads (see Figure 5.1).
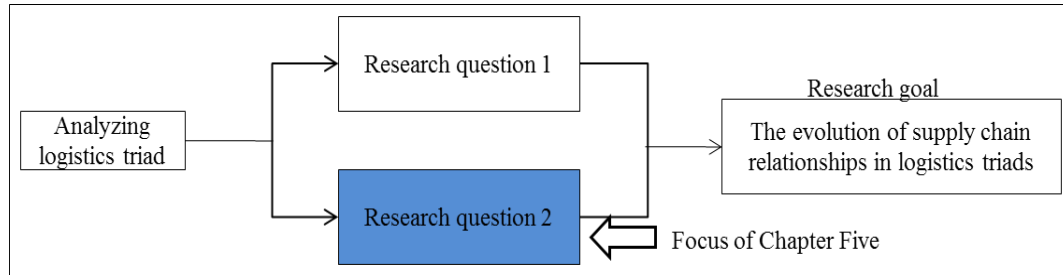
Figure 5.1: Focus of Chapter Five

In the method for data analysis explained in Chapter Three, all influential factors identified in Stage 1 have been classified into several categories. Through cross-case comparisons, these influential factors will be analysed from two perspectives. One studies how these factors help logistics triads to retain a stable triadic structure over time: the other explains how these influential factors cause the change of triadic relationship structure. The results will indicate the most important factors that influence stability and dynamics of logistics triads.

The findings of influential factors in this chapter and the limitations of balance theory that have been identified in Chapter Four respectively answer the two research questions. Therefore, the outcomes from these two chapters will be combined to address the research goal in the final section of the present chapter.

5.2 Classification of influential factors

Using the data analysis method introduced in Chapter Three, each logistics triad was examined to identify the reasons for dynamics and stability. The reasons identified from all triads were cross-referenced and classified into different conceptual groups according to their similarities and differences. Each conceptual group was compared with the influential factors reviewed in Chapter Two. If one

conceptual group shared a similar meaning with an influential factor, the conceptual group was named according to that factor. In total, eleven influential factors were identified in Stage 1.

Table 5.1 classifies these factors into five categories: supply network, business context, business continuity, relationship behaviour, and personal. The factors related to the supply network were derived from the supply network model. The factors in the other four categories shared similar meanings with four groups of influential factors discussed in Chapter Two (see sections 2.3.3.3 to 2.3.3.6). Because this thesis emphasizes the network perspective, two supply network factors are explained first.

Table 5.1: Classifications of influential factors

Category of influence	Influencing factors	Description
Supply network	Characteristics of process	The characteristics of process in a supply network can affect the dynamics of network structures.
	Focal firm influences	The focal firm in a triad can affect all dyads
Business context	Purchasing volume	The size of purchasing volume can affect the duration and type of SCRs.
	Resource capability	The influences from resource capabilities and uniqueness in SCRs.
	Market uncertainty	Influence from the uncertainty in domestic and global markets.
Business continuity	Relationship length & history	The duration and history of a SCR can affect its type.
	Business frequency	The frequency of customer demand can determine the type of SCR
Relationship behaviour	Organizational culture	How the living and business cultures affect the SCRs
	Organizational behaviour	How the organizational behaviour affects the SCRs
Personal factors	Personal relationship	Informal personal relationships between managers can affect the development of formal business relationships between partners
	Personal preference	Manager's personal preference can affect the development of SCR between partners

The supply network model introduced by Harland et al. (2001) proposes four types of supply networks by assessing two elements: the characteristics of process in supply networks, and the degree of focal firm's influence in supply networks.

The next section will start by analysing how the characteristics of process in logistics outsourcing affect the stability and dynamics of logistics triads.

5.3 Characteristics of process in logistics triads

Harland et al. (2001) proposes two different processes in a supply network: dynamic and routine processes. These processes show different characteristics based on four conditions (see Table 5.2). In a supply network, dynamic process encourages changes of embedded SCRs; while routine process ensures stability of relationships between all organizations (Kim et al., 2011).

Table 5.2: Conditions for assessing characteristics of process in supply networks

Conditions	Dynamic process in a supply network	Routine process in a supply network
Product volumes	Low volumes of products in network	High volumes of products in network
Innovation frequency	High frequency of launching new products and services into market	Low frequency of launching new products and services into market
Number of competitors	A large number of competitors in the market (easy to switch)	A small number of competitors in the market (difficult to switch)
Competition focus	Competing on innovation	Competing on cost

Source: (Adapted from Harland et al. (2001))

The four conditions introduced in Table 5.2 were used to identify the processes for logistics triads in Stage 1. Chapter One indentified that a majority of NZ based organizations are SMEs which operate with limited resources and offer commoditized products and services. Products and services offered by large organizations are also commoditized. In this situation, most organizations compete primarily on cost and these organizations usually show a low frequency in launching innovative products and services into the market (Harland et al., 2004; Kaipia et al., 2006). Logistics triads in Stage 1 showed a similar phenomenon. As two interviewees commented:

> …the logistics services and processes are similar in different companies, it is hard to develop very specific logistics services in NZ, so, the key in this process, is to keep existing simple process with good low costs, and a very close relationship is not necessary for this process… (Triad R2)

> …most NZ organizations compete on products with low profits, our customers and us struggle to compete on cost to survive, we do not have other choices because it is difficult to develop new products by adding value… (Triad L3)

These opinions could be found in all logistics triads within Stage 1. Therefore, the conditions of innovation frequency and competition focus indicated that the process were routine in logistics triads in Stage 1. A routine process results in a low level of dynamics in the network structure because commoditized products and services do not significantly affect the type of embedded relationships (Harland et al., 2001; Lamming et al., 2000; Kim et al., 2011). Therefore, logistics triads in Stage 1 could be stable over time.

From the perspective of the number of competitors, a triad is the smallest network that has only three organizations (Wu et al., 2010). The customer, supplier, and LSP are not competitors in a logistics triad because they fulfil different roles in the triad. The supplier and the LSP do not compete with each other because they provide complementary services to the customer (Naim et al., 2010). Therefore, no organization has direct competitors in a logistics triad. This finding also indicates that logistics triads had routine process in Stage 1.

In contrast, from the perspective of a wider network, there were a great number of suppliers and LSPs in NZ market. Theoretically, it was feasible for a customer to leave a logistics triad and find other partners from the market. However, most NZ suppliers and LSPs offered only similar commoditized products and services. Changing to a new supplier or LSP did not show a significant difference for a customer. In this situation, the customer preferred to retain the triad with the existing supplier and LSP in Stage 1. An interviewee provides a representative opinion concerning this phenomenon:

> …everyone in the market is the same; a new partner does not make big difference on their [customer] and our [LSP] revenues, that is why we have business with them very long term… (Triad K4)

Therefore, although there were a large number of competitors in the wider network, they did not threaten the position of organizations in a logistics triad. This finding indicates that the influences from the innovation frequency and competition focus in a network are more significant than the number of competitors in a network to determine the characteristics of process.

The influence from the volumes of product was tricky in logistics triads. As shown in Table 5.3, all static transactional triads operated with low product volumes without change. All dynamic triads also had low volumes of product before transition.

Table 5.3: Stage 1: Product volumes in logistics triads

Characteristics of product volumes		Static transactional triads	Static partnership triad	Dynamic transactional triads	Dissolved triads	Active transactional triad
Product volumes	Low	All		All (before transition)	All (before dissolving)	O3 (before transition)
	High		Q1	All (after transition)	N3 (after dissolving)	O3 (after transition)

Triad J1 was a triad with a typical interviewee opinion on this phenomenon:

…the domestic market [NZ] is too small, even we are good in our industry [logistics outsourcing], most of our customers can only offer small orders because they are SMEs, they can't get large orders from their customers either…

Most customers had difficulty in ordering high volumes of products because they were SMEs in the small NZ market. In this situation, according to the suggestion of supply network model, these triads should have dynamic processes and encourage changes in triadic structures and embedded SCRs (Valkokari & Helander, 2007). However, although three groups of dynamic triads eventually showed structural transitions or dissolution in Stage 1, these triads kept their original relationship structures in the long term before showing dynamics. This phenomenon shows that a logistics triad can have a routine process by operating with small volumes of products.

The findings regarding the routine process in logistics triads indicate that the conditions of innovation frequency and competition focus are more significant than the other two conditions to determine the characteristics of process in networks (see Figure 5.2). This is a new idea because limited studies have highlighted the various significances of the four conditions in research on supply network model.
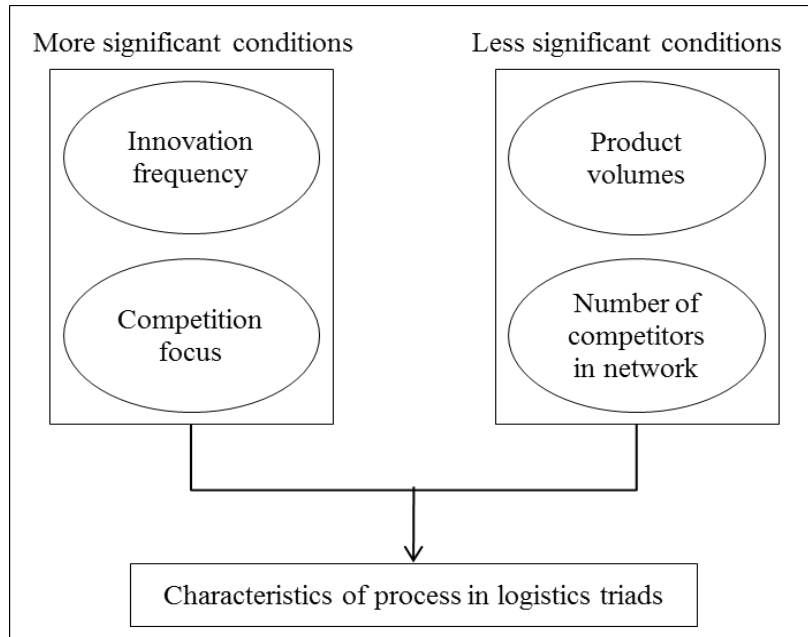
Figure 5.2: Influences from four conditions in determining characteristics of process

Additionally, because the influences from innovation frequency and competition focus were determined by the characteristics of NZ market (market uncertainty) and resources capability from suppliers and LSPs in Stage 1, business context factors and supply network factors exhibited a connection: organizations' limited resource capability and a small market can lead to routine process in logistics triads (see Figure 5.3).
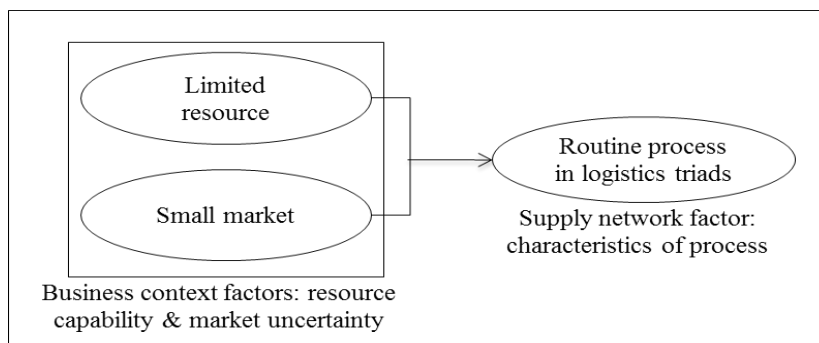
Figure 5.3: Factors leading to routine process in logistics triads

In conclusion, when the frequency of innovation is low and competition is primarily on cost, logistics triads show routine processes and are less likely to change the existing triadic relationship structure in the short term because routine process can help ensure stability in embedded dyads.

The other supply network factor was the focal firm's influence. A focal firm shows a high degree of influence in a supply network when it has sufficient power to influence other organizations and relationships in a network (Harland et al., 2004; Skjoett-Larsen et al., 2003). As shown in Chapter Two, a number of influential factors produce different kinds of power for organizations in SCRs. In order to understand the focal firm's influence on a logistics triad, it is necessary to study how the focal firm obtains power to control organizations and relationships in the triad from various influential factors. Therefore, the next section will analyse the combined effects of focal firm and influential factors.

5.4 Combined effects of the focal firm and other influential factors

The power of an organization is significantly affected by its buyer power or supply power in a dyadic SCR which is formed by one buyer and one supplier (Cox, 2001b). The buyer power and supply power are significantly determined by the buyer's purchasing volumes and the supplier's resources (Watson, 2001). In a logistics triad, three organizations are connected and exhibit power games in three embedded dyads. These dyads and organizations can influence each other in the triad. Therefore, the outcomes of power games among organizations in a triad are more complex than in a single dyad.

In this thesis, the power games in a triad are used to identify the focal firm, which has strongest power in the triad. Except for the active transactional triad (Triad O3), all other logistics triads in Stage 1 showed that the most powerful organization in a triad dominated the stability and dynamics of the triad by affecting the development of all embedded dyads. The interviewee of triad L4 expressed a typical opinion:

> …the shipping line [supplier] is stronger than us [LSP]; however, our
> common customer is more powerful than them because the customer
> offered business to the supplier, as a result, our customer can influence
> everyone else… (Triad L4)

Any organization could work as the focal firm in a logistics triad if it is more powerful than the other two. The following sub-sections will analyse how different organizations acted as the focal firm to influence stability and dynamics of logistics triads. Bastl et al. suggested, it is "…the buyer who is assumed to have more power and leads the relationship…" (2013, p. 22). Customers play a significant role in dominating SCRs in previous research (Barney, 2012; Jayaraman et al., 2014). Therefore, the next sub-section starts by explaining how the customer dominated a logistics triad and affected its stability and dynamics.

5.4.1 Customer as focal firm

The customer acted as the focal firm in a majority of triads. Based on different situations of power games among organizations, customers showed two control approaches to dictate logistics triads. By using the first control approach, the customer controlled the supplier to dominate a triad.

5.4.1.1 First control approach

In this situation, the customer's buyer power was greater than the supplier's supply power. The customer controlled this dyad directly and asked the supplier to select the LSP and gave autonomy to the supplier to manage the LSP. In the dyad between the supplier and the LSP, the supplier was the direct buyer for the LSP. This dyad also showed buyer dominance because the LSP's supply power was weak. As the supplier selected and managed the LSP, the customer and the LSP were not familiar with each other. Consequently, the customer and the LSP were independent in their dyad and had only basic communication for order delivery. They both had more interaction with the supplier. One interviewee noted this phenomenon:

> …they [supplier] are our direct customer, but they need to listen to
> their customer before sending orders to us, because of them [supplier],

we only need keep simple process with the customer, the relationship between us and them [supplier] is determined by the customer, if the customer is not happy with our delivery services, the supplier will punish us, or even replace us by other companies… (Triad P1)

The Figure 5.4 shows that the customer was the focal firm because it could dominate the supplier and the supplier could dominate the LSP. In this situation, besides two direct dyads linking with the supplier and the LSP, the customer could mediate the supplier-LSP dyad by dominating the supplier.
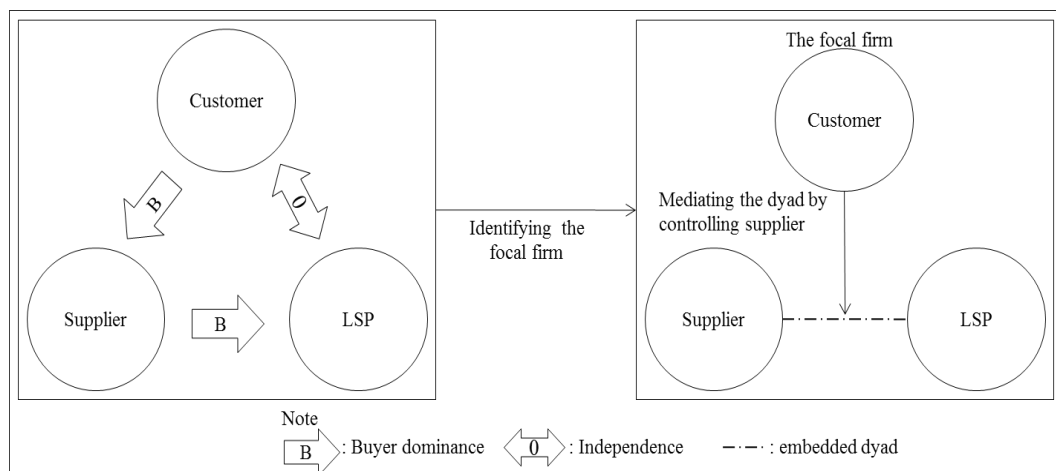
Figure 5.4: Stage 1: Customer as focal firm controlling supplier

When the customer only offered small purchasing volumes to the supplier in a triad, the supplier also offered small purchasing volumes to the LSP. As explained in section 5.3, all triads competed on cost and exhibited low frequency of innovation. In this situation, small purchasing volumes were not significant in influencing the profits for the customer. Further, the profits from small purchasing volumes could not compensate for the cost regarding the development of collaborative dyad between any organizations in a triad. Therefore, as a focal firm, the customer preferred to retain a transactional dyad with the supplier. A representative opinion was offered by triad N2:

…NZ is too small, our customer orders are also small in many businesses, they can't guarantee our profit, you know everything costs, collaborations are the same, and so, if we can't see good returns, we do not want to waste money on seeking collaboration… (Triad N2)

Also, the customer did not have any interest to invest more for its dyad with the LSP because of small purchasing volumes. As a result, controlling the supplier to manage the LSP and mediate the supplier-LSP dyad was an efficient approach for the customer to dictate the triad.

In the customer-supplier dyad, although the customer's buyer power was not strong because of small purchasing volumes, the supplier's supply power was even weaker because of its limited resources. Consequently, the dyad exhibited buyer dominance. It is why the customer could act as the focal firm. If the purchasing volumes had not been enhanced, the focal firm could ensure a stable logistics triad over time by inhibiting changes in all embedded dyads.

In Stage 1, except for several dissolved transactional triads, organizations had difficulty in replacing partners in all other logistics triads. From the perspective of the supplier and the LSP, they did not change to a new customer for one root cause. Because of the small domestic market in NZ, a majority of customers are SMEs and could only offer small purchasing volumes. It was difficult for most SMEs to increase from small to large purchasing volumes. Although some triads had large customers, they needed time to become familiar with the suppliers and LSPs. As explained in Chapter Four, developing and changing inter-organizational relationships usually takes a long time. Therefore, it was difficult for these large customers to increase purchasing volumes in the short term. In this situation, suppliers and LSPs preferred to keep their business with existing customers.

From the perspective of the customer, because the frequency of innovation was low and most suppliers and LSPs were SMEs, it was difficult for these SMEs to offer innovative products and services. Large suppliers and LSPs also offered similar commoditized products and services. In this situation, by operating with small purchasing volumes, large suppliers and LSPs had difficulty in showing big advantages in comparison with SMEs. Therefore, in the NZ market, it was difficult to find better suppliers and LSPs that showed a significant difference from others. Consequently, it was unnecessary for customers to replace the

suppliers and LSPs in triads. Overall, as shown in Figure 5.5, by combining the influences from small purchasing volumes and limited resource capabilities, it was difficult to change an existing triad in the short term. In this situation, the customer could act as the focal firm to ensure long term stability of the logistics triad.
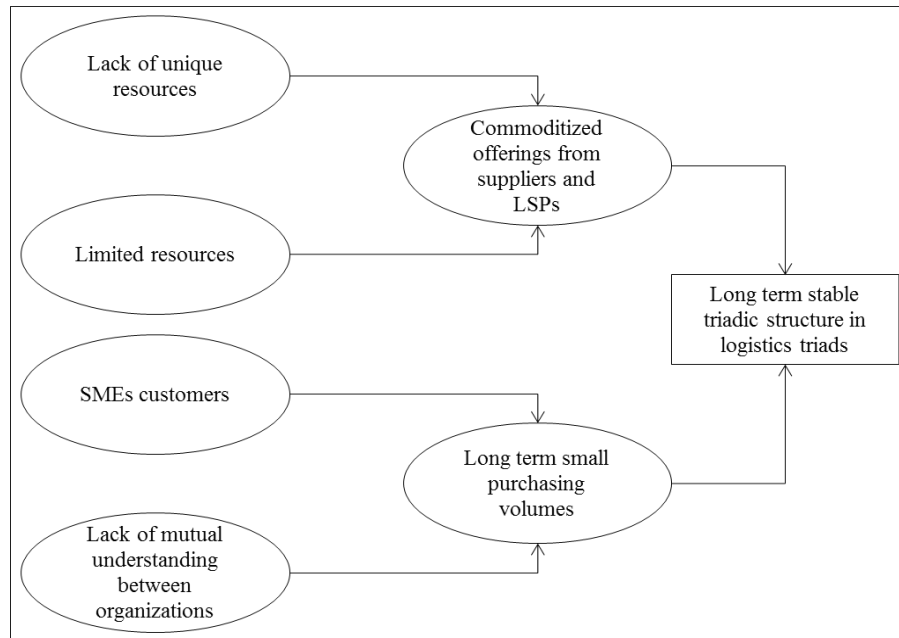
Figure 5.5: Reasons leading to long term stable structure in logistics triads

In Stage 1, based on reasons explained above, nearly one third of the logistics triads showed that customers dictated logistics triads and ensured stable triadic structures by controlling suppliers (see Table 5.4). All triads in the table showed a stable transactional structure in the long term although two triads eventually transitioned to the partnership structure.

Table 5.4: Stage 1: Customer as focal firm controlling supplier

	Triadic structures	Supportive triads
Customers ensure stable triads by controlling suppliers	Static transactional triads	J1, J3, L1, L2, L3, M1, N2, P1, P2, U3
	Dynamic transactional triads (before transition)	L4, U1

In sum, through the evidence in the Table 5.4, Figure 5.6 presents an overview to explain how a customer dominates a triad by controlling the supplier to ensure stable logistics triads. When a triad operates with stable and small purchasing volumes, the customer can dominate the supplier to control the LSP and ensure the stability of the triadic structure by impeding dynamics in embedded dyads.

This approach can help the customer minimize cost for relationship management in the triad.
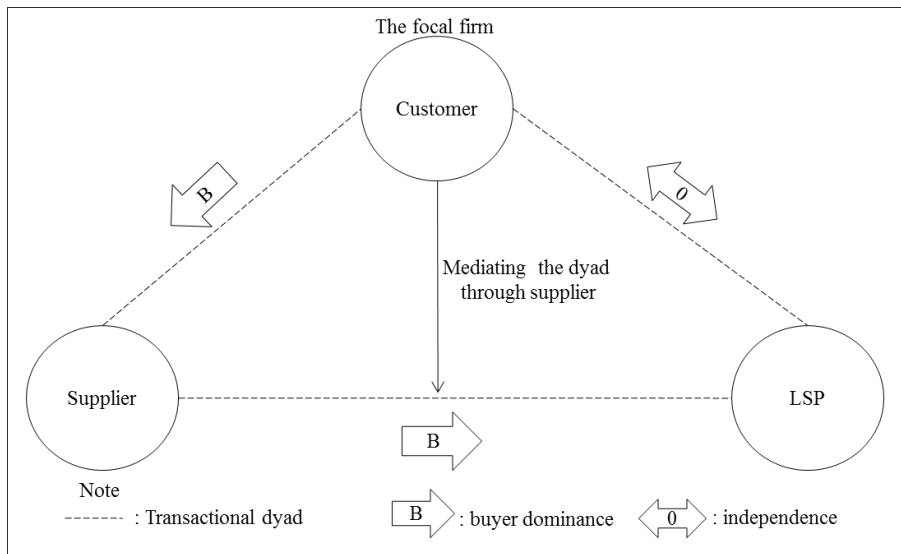
Figure 5.6: Power games: Customer as focal firm controlling supplier

In addition to only dominating the supplier to control a triad, a customer could also control both the supplier and the LSP to dictate a logistics triad. This is the second control approach identified in Stage 1.

5.4.1.2 Second control approach

Figure 5.7 illustrates the situation where the customer acted as the focal firm to mediate the supplier-LSP dyad and dictate the triad by dominating supplier and LSP at the same time.
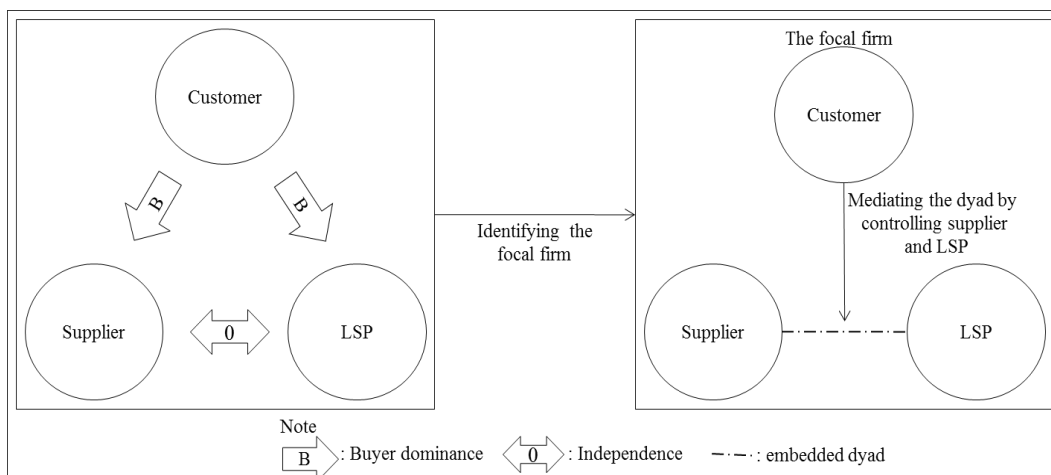
Figure 5.7: Customer as focal firm controlling supplier & LSP

Unlike using the first approach, the customer using the second approach did not give autonomy to the supplier to manage the LSP. The customer did this job themselves. Consequently, the customer and the LSP were not independent from each other. The customer's buyer power was greater than the supply power from the supplier and the LSP. In the dyad between the supplier and the LSP, the supplier did not purchase from the LSP in the triad because both the supplier and the LSP were selected and managed by the customer. As a result, the supplier and the LSP were independent and had less interaction. Both had more interactions with the customer. A representative phenomenon was mentioned by triad K3:

> …the customer sends their orders and requirements to us and the supplier directly, so we do not need have too much communication with the supplier, we only need do pick up and deliver products from the supplier to them [customer] as they required… (Triad K3)

The customer could mediate the supplier-LSP dyad by controlling both the supplier and the LSP through buyer power. Therefore, the customer could control all embedded dyads. For a similar reason to that in section 5.4.1.1, if the triad operated with stable and small purchasing volumes, the customer did not want to change the existing structure. As a result, the customer could ensure a stable transactional structure in logistics triads over time by dominating both the supplier and the LSP to inhibit changes in dyads.

Around two thirds of logistics triads showed that customers used the second approach to control the supplier, control the LSP, and govern the whole triad (see Table 5.5). In the table, apart from static triads, all dynamic triads also showed stable transactional structures in the long term before showing dynamics.

Table 5.5: Stage 1: Customer as focal firm controlling supplier and LSP

	Triadic structures	Supportive triads
Customers ensure stable triads by controlling suppliers and LSPs	Static transactional triads	K3, K4, L5, N1, O2, P3, Q2, R1, R2, S1, T1
	Dynamic transactional triads (before transition)	O1, S2, U2, V1, V2
	Dynamic transactional triads (after transition)	L4, O1, S2, U1, U2, V1, V2
	Dissolved triads (before dissolving)	K1, K2, T2

In dynamic transactional triads, after transition, all triads operated with large purchasing volumes and maintained a long term stable partnership structure. Customers gained strong buyer power from large purchasing volumes. In contrast, because of lack of uniqueness on products and services, the strong resources from large suppliers and LSPs did not help them gain sufficient supply power to compete against customers. Therefore, by operating with large purchasing volumes, the customer could retain its focal firm position to ensure the stability of partnership structure in logistics triads after transition.

Further, after transition, customers worked in two ways to keep stable partnership structures in the seven dynamic transactional triads. One has been explained in Chapter Four (section 4.4.1.1) with details. In triads S2, U2, V1, and V2, after increasing purchasing volumes to a large size, customers tried to use buyer power to take more advantage from both suppliers and LSPs. LSPs and suppliers could only collaborate with each other against the buyer power from the customers. Therefore, under pressure from the customer, suppliers and LSPs showed interdependence in their dyads. According to balance theory, this was a typical phenomenon of partnership triadic structure and this structure can be stable over time (Cartwright & Harary, 1956; Heider, 1958). The findings demonstrate that both the supply network model and balance theory can explain stable partnership triadic structure when two organizations need to work together against power from the third organization in a triad.

Three triads (L4, O1, and U2) showed another way to explain how customers ensure stable partnership structure. By operating with large purchasing volumes in

these three triads, compared to collaboration with suppliers, collaboration with LSPs could have more significant influence on customers' profits by saving running costs and logistics costs. Therefore, customers preferred retaining transactional dyads with suppliers. Additionally, if suppliers and LSPs had collaboration, their opportunistic behaviour could bring profit loss to customers. Consequently, customers controlled suppliers and LSPs simultaneously to inhibit their collaboration. The evidence was noted by an interviewee:

> …the final customer talks to us openly, they need a closer relationship with us to save their logistics costs, but they do not like to see a close relationship between us and the supplier; they think we may take more from them … (Triad O1)

In this situation, under the control of the focal firm, it was difficult to have further dynamics in any dyad if the purchasing volumes did not change. As a result, customers could make the partnership structure stable over time.

By combining the stability of logistics triads before and after transition, this thesis indicates that customers can act as the focal firm to dictate logistics triads by operating with both small and large purchasing volumes. When a triad operates with small and stable purchasing volumes, a customer can dominate both the supplier and LSP to ensure stable transactional structure in logistics triads (see Figure 5.8).
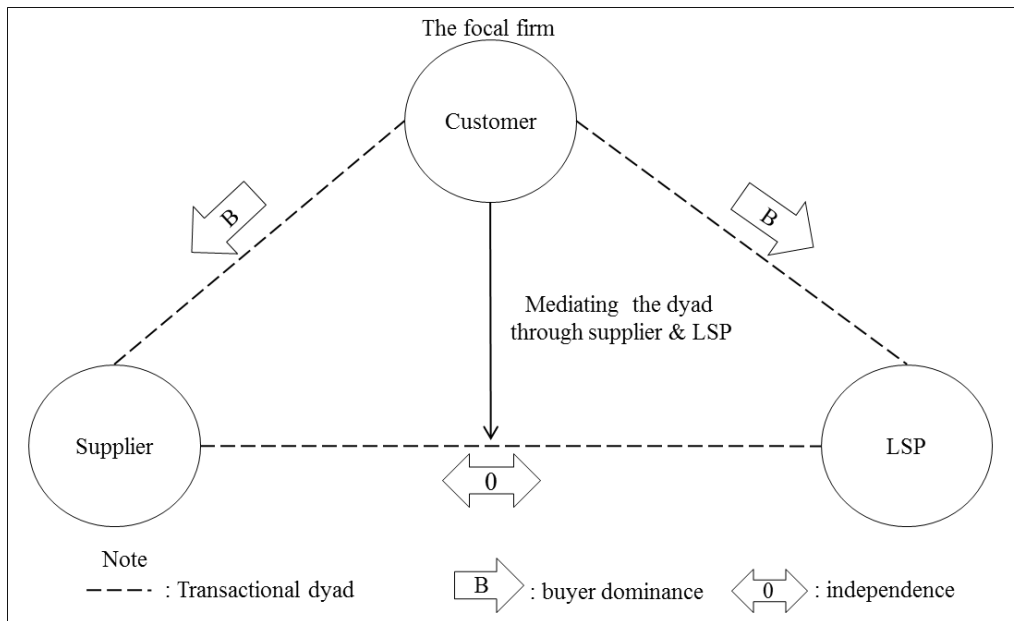
Figure 5.8: Power games: Customer as focal firm controlling supplier & LSP in transactional structure

Figure 5.9 shows when a triad operates with large purchasing volumes, the customer can have two ways to control supplier, LSP, and all three dyads to ensure long term stability of a partnership triad. The customer can chose to collaborate with one of the two non-focal firms. In this situation, under control of the customer, the supplier and the LSP keep independence. In contrast, the supplier and the LSP show interdependence if they need to collaborate with each other against the pressure from the customer.
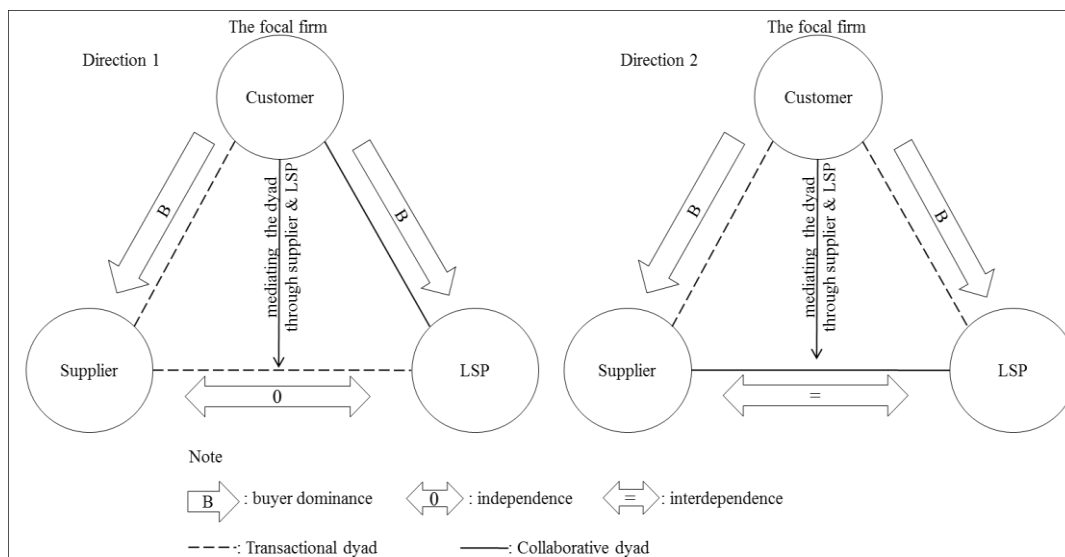
Figure 5.9: Power games: Customer as focal firm controlling supplier & LSP in partnership structure

Overall, by using purchasing power in a logistics triad, the customer can act as the focal firm to ensure a long term stable transactional structure and a stable partnership structure in a logistics triad by controlling the supplier and/or the LSP. Besides ensuring stability of triadic structures, customers also worked through a number of influential factors to determine the dynamics of logistics triads in Stage 1.

5.4.1.3 Customer controlling dynamics of logistics triads

The enhancement of purchasing volumes caused the change of triadic relationship structure in all seven dynamic transactional triads. The business frequency (a business continuity factor) was the root cause leading to the increase in purchasing volumes in these triads.

Business frequency

This factor reflected the influence from continuous and discrete customer demand. Triads J1 and L3 provided representative opinions about how continuous and discrete customer demands affected relationships in logistics triads:

> …even though every single order is small, the continuous business of on-going orders makes the environment for them and us easy to see, and know what we need, so it is good for us to have a long term business…. (Triad J1)

> …some customers are project based, that means it is hard to work with them; their orders are not stable, and despite some orders being very big, we can't rely on their unstable offers… (Triad L3)

All seven dynamic transactional triads indicated that the connection between continuous customer demand and the increase of purchasing volumes fostered the development of collaborative dyads in logistics triads. Triad L4 offered a representative comment in support of the influences from these two factors and their connection.

> …we didn't know each other before this business, so we both needed time to learn about and understand each other. Trust built up between

> us from continuous business. Although they didn't offer us large
> orders at the beginning, this changed with commitment… (Triad L4)

Long term continuous customer demand helped build mutual trust and commitment resulting in the enhancement of purchasing volumes (Hartmann & Caerteling, 2010). With the gradual enhancement, once the size of purchasing volumes was significant to influence organizations profits in triads, organizations intended to collaborate with partners. Consequently, the collaboration was built up as purchasing volumes grew. Two exceptions were the dissolved partnership triad (N3) and the static partnership triad (Q1). Each of these two triads had one collaborative dyad from the first day of the triad. This was because of the positive relationship history between organizations in triads. This reason will be discussed in a later section which focuses on the influences from the relationship history.

Although the increase in purchasing volumes could foster development of collaborative dyads, it was insufficient to determine which dyad should develop collaboration because the place for developing collaborative dyads was decided by the focal firms in these triads. This finding led to the connection between purchasing volumes, business frequency and the focal firm's influences in logistics triads.

Customers only controlled suppliers to dictate logistics triads before transition in L4 and U1. The customers and LSPs in these two triads showed independence at the time. However, with the increase of purchasing volumes, customers began to use buyer power to control both suppliers and LSPs because large purchasing volumes were significant in influencing all organizations' profits. Losing control of relationships with partners could cause profit loss for the customers. Further, the customers might lose control of triads. As one interviewee noted:

> …when they [customer] began to offer large orders, they did not rely
> on the supplier to organize the process with us anymore, to ensure their
> [customer] profits, they started to have more communication with us
> and give orders to us directly, so, we do not get orders from the
> supplier now. However, the customer kept asking us to reduce our

charge rate, to protect our profits, we must collaborate with the supplier… (Triad U1)

Therefore, the customer-LSP dyad changed from independence to buyer dominance in these two triads. In order to keep power to control dynamics in a triad, the customer changed from using the first approach (only controlled supplier) before transition to using the second approach (controlled both supplier and LSP) after transition. This finding indicates that the focal firm can change between the two control approaches to dominate a dynamic triad.

Overall, with the increase of purchasing volumes, customers could reinforce their buyer dominance in relationships with suppliers and LSPs and stabilize their leading position in all dynamic transactional triads. The customer could determine the development of collaboration between any two organizations in a triad. For the reasons explained in section 5.4.1.2, customers' power led to two ways to foster collaborative dyads in dynamic transactional triads (see Figure 5.10).
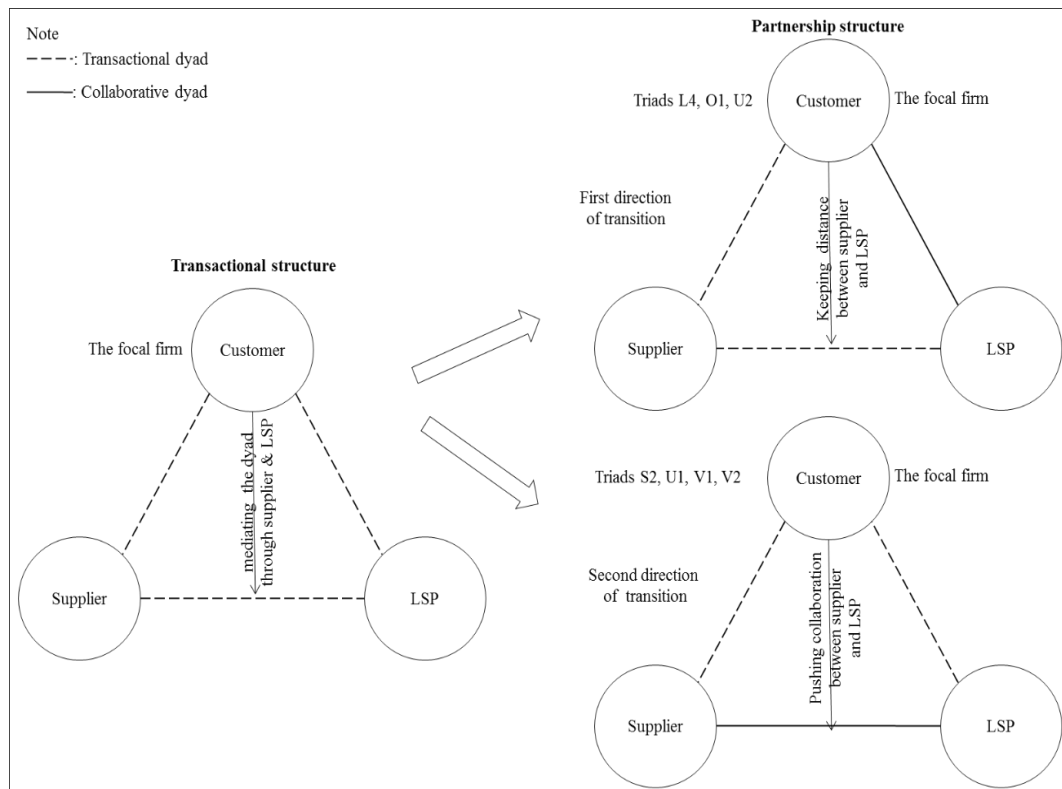
Figure 5.10: Change of power games: Customers as focal firm controlling dynamics in triad

Accompanying the change of embedded dyads and triadic structures, the power games among organizations were also changed. Table 5.6 introduces the dynamics

of power games within all dynamic transactional triads. In the four triads where suppliers and LSPs developed collaborations, the power games between them all changed to interdependence as they needed to work together against customers. In this situation, they had equal power, with no power asymmetry in their dyadic relationships.

Table 5.6: Stage 1: Change of power games in dynamic transactional triads

Triads	Change of power games in embedded dyads		
	Supplier-LSP dyad	Customer-LSP dyad	Supplier-customer dyad
L4	B→0	0→B	B
O1	0	B	B
U2	0	B	B
S2	0→=	B	B
U1	B→=	0→B	B
V1	0→=	B	B
V2	0→=	B	B
Note	B: buyer dominance; 0: independence; =: interdependence; →: change of power games between organizations		

In the other three dynamics transactional triads (L4, O1, and U2), customers developed collaborations with LSPs. To ensure their focal firm position in these triads, customers kept LSPs and suppliers distant by using buyer power to control their communication. Consequently, in these three triads, suppliers and LSPs were independent from each other.

In conclusion, under the influence from continuous customer demand, the increase of purchasing volumes can help the customer control how the logistics triad transitioned from the transactional to the partnership structure (see Figure 5.11). This finding reveals a connection among purchasing volumes, business frequency, focal firm, change of power games, and triadic relationship dynamics.
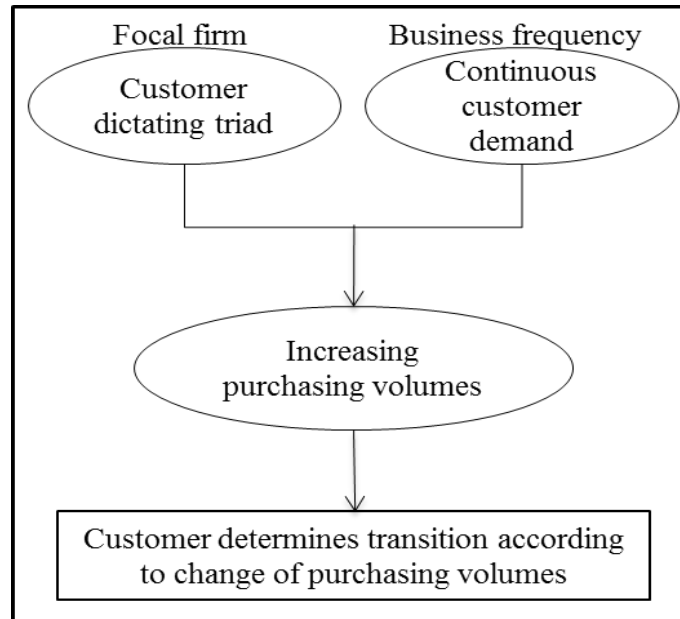
Figure 5.11: Influences from business frequency in dynamic transactional triads

Business frequency could also help ensure stability of logistics triads (see Table 5.7). Continuous customer demand did not trigger the enhancement of purchasing volumes in these triads for two reasons. One is that SMEs only could offer small purchasing volumes. The other is that suppliers and LSPs did not have strong resources or that their offerings were commoditized. In this situation, as focal firms, customers did not have an interest in increasing purchasing volumes. Consequently, they ensured long term stable structures in triads.

Table 5.7: Stage 1: Influence from business frequency

Triadic structures	Supportive triads	Influence from business frequency
Static transactional triads	J1, J3, K3, K4, L1, L2, L3, L5, O2, Q2, S1, U3	Continuous small purchasing volumes ensuring stable transactional dyads between organizations.
Dissolved triads (before transition)	K1, K2	Continuous small purchasing volumes ensuring stable transactional dyads between organizations

Overall, business frequency could help customers increase purchasing volumes in logistics triads. However, without the control from the customer, the influences from business frequency could not affect changes in the whole triadic structure. Therefore, the influences from purchasing volumes and focal firm's influences are more significant than business frequency to determine the dynamics of the logistics triad. In general, customers can manipulate power through changing purchasing volumes to control suppliers and LSPs in logistics triads. Besides the influence from continuous customer demand, the market uncertainty also helped

the customer to affect dynamics in logistics triads. These influences were reflected in two dissolved triads: T2 and N3.

Market uncertainty

In triad T2, because of the changing requirements in NZ market and global markets, the NZ-based LSP expanded its business into the Australian market and supplied the customer with the same services as the Australian supplier. In this situation, the customer replaced the Australian supplier by another company that could offer different services. The old triad then dissolved and only one dyad remained.

Figure 5.12 presents the change of power games between organizations in triad T2. Before dissolving, similarly to other triads, the customer dictated the triad by controlling both the supplier and the LSP. The supplier and the LSP were independent of each other. The supplier and the LSP became as direct competitors in the triad after the LSP expanded business and enhanced their resources.
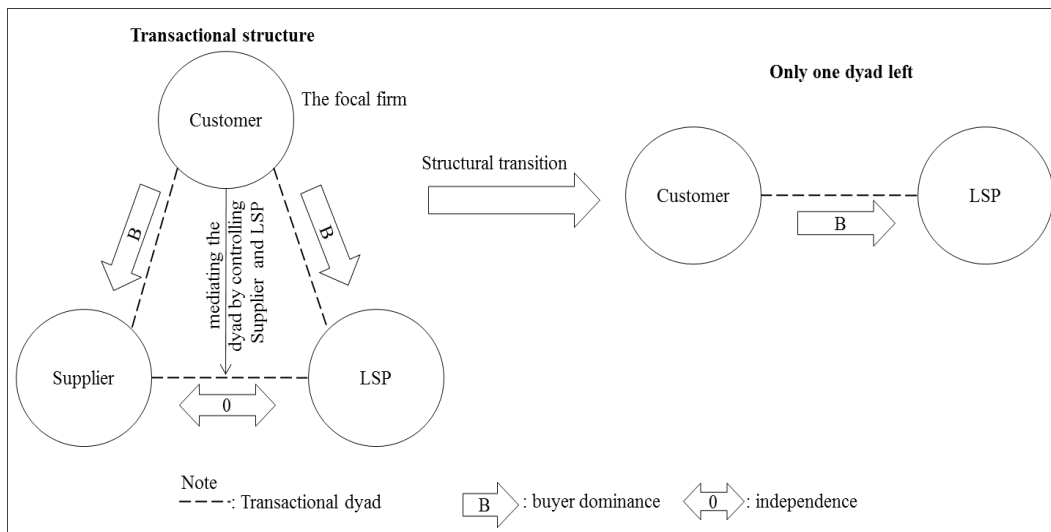
Figure 5.12: Change of power games: Dissolved transactional triad T2

As all services the customer wanted were commoditized and its market share was small, the customer had difficulty in increasing purchasing volumes. In order to avoid repeat investment, the customer stopped the connection with the supplier.

> …after expanding business, we are strong enough to serve them [customer] in Australia like the supplier, because they and we are both

> NZ organizations, they preferred to keep business with us and replace the supplier, this can help them save cost in the Australian market. In this situation, we also stopped our connection with the supplier… (Triad T2)

After the LSP enhanced resources, the customer's buyer power was not as strong as before in the dyad between them. However, as the LSP's offerings were still commoditised, the customer retained buyer dominance in the dyad although the purchasing volumes were small. Under the dominance from the customer, the LSP also stopped connection with the supplier. There was no focal firm in a dyad.

Compared to triad T2, market uncertainty showed a different influence in triad N3. As explained in Chapter Four (section 4.4.2), because the NZ-based supplier and LSP needed to enhance their resources to expand their business in global markets, the supplier had purchased the LSP. The old triad no longer existed. The supplier and the LSP became as one to serve the customer in the remaining dyad. Figure 5.13 outlines the change of power games in the triad before and after dissolving. The new supplier's substantial resources were difficult for others in NZ to copy. This helped enhance the supplier's supply power and lead to the interdependence between the supplier and the customer. The customer fostered collaboration with the supplier from that moment.

> ……after we [supplier and LSP] worked as one group, no company could compete with us in the NZ market, it is hard for them [customer] to find other better choice. It is also difficult to find other customers that can offer such big orders, so we relied on each other and grew with each other in the market… (Triad N3)
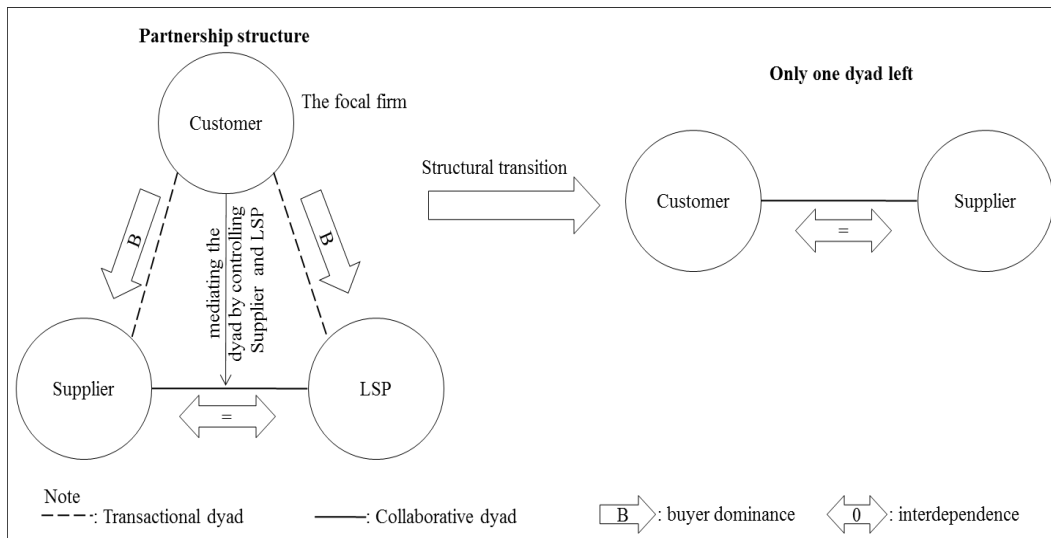
Figure 5.13: Change of power games: Dissolved partnership triad N3

The findings from triads T2 and N3 indicated that the dynamics of logistics triads can be affected by market uncertainty. Figure 5.14 presents a connection between market uncertainty, resource capability, and focal firm's influence in dynamic triads. Although market uncertainty was able to help suppliers and LSPs enhance resources, if suppliers and LSPs could not increase their supply power by enhancing the uniqueness of their offerings, customers could still dominate suppliers and LSPs to determine the dynamics of triads. In contrast, with the enhancement of resource capability, if the supplier or the LSP's supply power can be equal to the customer's buyer power, the customer needs to work together with partners to determine the dynamics of a logistics triad.
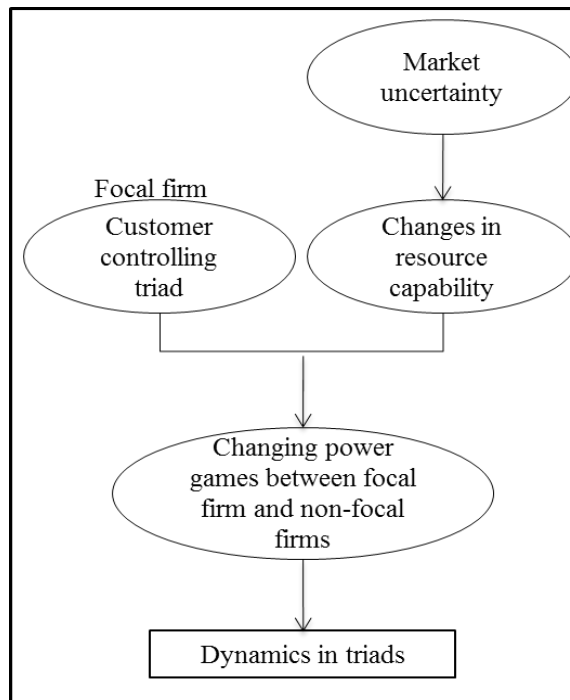
Figure 5.14: Influences from market uncertainty in dynamics triads

In contrast to dissolved triads, more triads in Stage 1 showed that market uncertainty could help organizations to keep stable dyads in logistics triads. As shown in Table 5.8, a number of triads showed that the global financial crisis inhibited the development of collaboration in dyads between organizations in logistics triads.

Table 5.8: Stage 1: Influence from market uncertainty

Triadic structure	Supportive triads	Influence from market uncertainty
Static transactional triads	L1, L2, L3, L5, M1, O2, Q2, T1	Partners lacked financial resources to develop collaboration in global financial crisis.

One interviewee said:

> …in the economy recession, all companies run out of money, no people want to waste money at the moment for simple connections in logistics process… (Triad M1)

As each organization had a different strategy to deal with the global financial crisis in dyadic SCRs, the influence from this market uncertainty was insufficient to explain how three organizations influence each other in a triadic relationship structure.

Overall, the influences from market uncertainty exhibit connection with resource capability and focal firm's influence in both static and dynamic logistics triads. However, because customers maintained strong buyer power from purchasing volumes to control triads, findings in Stage 1 indicate that the influences from market uncertainty and resource capability are less important than influences from the customer's purchasing volumes and the focal firm's influence in determining the stability and dynamics of logistics triads. In addition to market uncertainty and business frequency, personal preference was factor that showed influence on the dynamics of logistics triads.

Personal preference

Triads K1 and K2 demonstrated that the focal firm could dissolve the triad by the influences from personal preference. In both triads, the customer worked as the focal firm to dominate dyads with the supplier and the LSP. In triad K1, the ownership and supply manager had changed in the supplier organization. Because the new owner and manager had a habit of cutting budgets in their business, they were unable to provide the high standards of service to serve the customer.

> …the new owner has just bought out the supplier, and they do not have extra funds in the budget at the moment, so they tried to make a return on their investment as quickly as possible, which means they need to control costs carefully... (Triad K1)

Further, the supplier's services were not unique to the customer. Therefore, the customer replaced the supplier with another organization. The LSP also disconnected the relationship with the old supplier because of the customer's control. Therefore, the original triad dissolved.

In triad K2, the key manager in the customer organization had been replaced by the owner. Because the new manager selected a new LSP from his personal favourite business partners, the customer organization replaced the existing LSP in the triad and the triad K2 dissolved.

> …the new guy prefers to work with our competitor because he is more familiar with them… (Triad K2)

The supplier focused on connection with the customer and was independent of the old LSP. Therefore, the supplier did not care whether or not the customer changed the LSP.

After dissolving, the customer still showed buyer dominance on the only remaining dyad in both two dissolved triads K1 and K2. Overall, when any organization in a logistics triad has changed management personnel, the focal firm can determine the existence of a logistics triad under the influence from different management people's personal preference.

Besides the two dissolved triads, a number of static triads also exhibited influence from the management people's personal preference (see Table 5.9). In these triads, as small purchasing volumes could not provide large profits for partners, managers preferred to keep simple transactional dyadic SCRs between organizations. As noted in triad S1:

> …their manager and I are not interested in collaborating for small orders; I believe a basic link is enough for us…

Table 5.9: Stage 1: Influence from personal preference

Triadic structure	Supportive triads	Influence from personal preference
Static transactional triads	K3, K4, M1, N1, N2, S1	Managers' personal preference directly impacts the duration and closeness of business relationships.

These triads indicated, under influence from purchasing volumes, manager's personal preference could help to determine the development of embedded dyads between organizations in logistics triads (see Figure 5.15). Previous studies also support that the returns of profits can influence management personnel's personal preference in developing SCRs (Anbanandam et al., 2011; Sandberg & Abrahamsson, 2010).
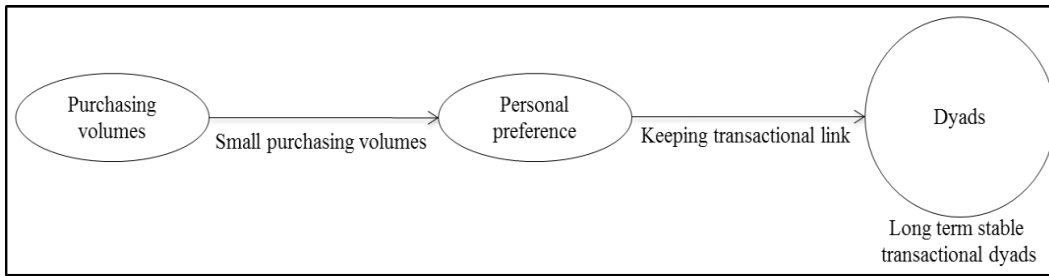
Figure 5.15: Purchasing volumes and personal preferences in dyads

In conclusion, as customers were focal firms in the dissolved and static transactional triads, the findings reinforce that purchasing volumes and the focal firm's influence are significant in determining the stability and dynamics of logistics triads. In contrast, personal preference alone could only impact dyadic relationships rather than influencing triadic relationship structures.

5.4.1.4 Overview

In Stage 1, focal firm, purchasing volumes, and resource capability were three most significant influential factors to determine the stability and dynamics of logistics triads when customers acted as focal firms. In logistics triads in which suppliers and LSPs only offered commoditized products and services, small purchasing volumes can also help customers gain more power to dictate logistics triads by dominating suppliers, LSPs, and all embedded dyads. In this situation, by operating with stable purchasing volumes, customers can ensure long term stability in logistics triads by controlling partners to keep embedded dyads stable. In contrast, changes of purchasing volumes are significant to assist customers to dictate the dynamics in logistics triads by changing or disconnecting embedded dyads. The findings in stage one indicate that relationship time does not impact on stability and dynamics of logistics triads because the change of relationship in these triads are significantly determined by the change of identified influential factors.

As shown in Figure 5.16, although business frequency, market uncertainty, and personal preferences also showed influences in logistics triads, these influences worked on certain embedded dyads not the whole triadic relationship structure. These influences assisted influences from purchasing volumes and resource capability to determine power games among organizations. In Stage 1, most triads

were governed by the customer because of their greater buyer power. Therefore, customers show significant focal firm influence to control stability and dynamics in triads.
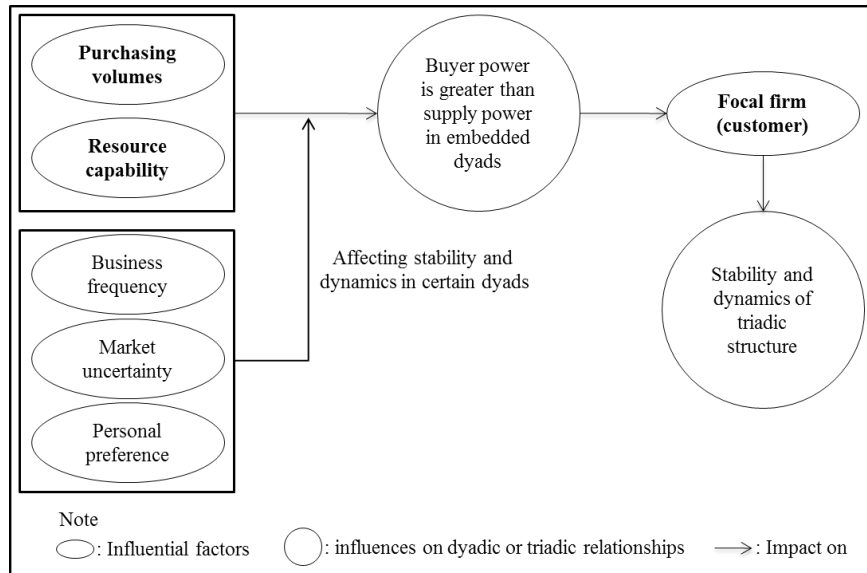
Figure 5.16: Influential factors in logistics triads controlled by customers

Further, customers dictated logistics triads by controlling partners through two approaches. The first approach was to control the supplier and then ask the supplier to control the LSP. In the second approach, the customer directly controlled both the supplier and the LSP. Customers selected the second approach more often than the first to dictate logistics triads in Stage 1. Further, customers showed direct control over both suppliers and LSPs in all dynamic triads to determine the time and direction of transition. This phenomenon demonstrated that the customer could determine the stability and dynamics of a logistics triad more efficiently and effectively by controlling both two partners than controlling only one. Additionally, in order to keep control in a dynamic triad, the focal firm could change from the first to the second approach to manage the dynamics of power games among organizations.

In sum, through power from purchasing volumes, customers showed significant focal firm influence to dictate logistics triads that operated with routine process. The next two sections introduce triads dictated by suppliers and LSPs.

5.4.2 Supplier as focal firm

J2 was the only triad where the supplier acted as the focal firm in Stage 1. The customer was an overseas car seller operating with small purchasing volumes in the triad. In the NZ market, the customer's market share was small. In contrast, the supplier was a large and well known organization in NZ. They had strong resources to help the customer running the business in NZ. Therefore, from the perspective of the NZ market, the customer was dependent on the supplier. The supplier also helped the customer select and manage the NZ LSP in the triad. Consequently, the supplier showed buyer dominance in the dyad with the LSP. As the customer was not familiar with the LSP and relied on the supplier, the LSP and the customer were independent in their dyad. Figure 5.17 shows the power games in the triad and signifies that the supplier acted as the focal firm in the triad.
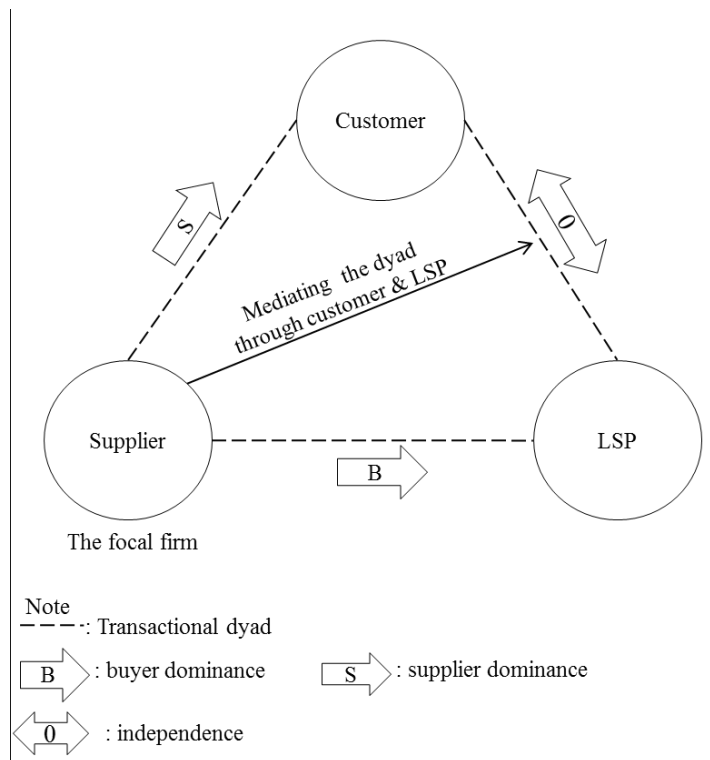
Figure 5.17: Supplier as focal firm controlling customer & LSP

By operating with small purchasing volumes, for the same reasons explained in section 5.4.1, the supplier wanted only transactional dyads with the other two. In the customer-LSP dyad, if customer had more interactions with the LSP, they could ask the LSP to find another supplier in NZ. In order to retain long term business with the customer, the supplier mediated the customer-LSP dyad by strictly controlling the communication and information sharing between the

customer and the LSP. Consequently, the customer-LSP dyad was kept at transactional type by the influences from the supplier. This relationship can be identified from interviewee's opinion:

…our connection with customer is controlled by them [supplier] because they do not want us introducing new suppliers to the customer, because the customer is from overseas, it is hard for them to take control in NZ market, so we can only rely on the supplier… (Triad J2)

In sum, as the size of purchasing volumes had not been changed at all, the supplier inhibited collaboration in all dyads and this resulted in a long term stable transactional structure.

5.4.3 LSP as focal firm

In the static partnership triad (Q1), the LSP worked as the focal firm to determine the long term stability of the triad. The customer and the LSP were strategic partners. They had a long term positive relationship history. The customer could trust the LSP and offered large purchasing volumes from the start of the triad. Therefore, they started from a collaborative dyad. As the customer relied more on the LSP's resources to help them forward products to global markets, the LSP's supply power was greater than the customer's buyer power although the customer offered large purchasing volumes.

…we are important partners to each other for a long time, we trust each other in this business, they [customer] need us to help their exporting business, in NZ market, it is hard to find a company like us that is trustworthy and can offer them what they want. However, the supplier is new and small to both of us, we do not understand them, this is why we do not collaborate with them… (Triad Q1)

In contrast, the supplier was a small organization and was a new partner to both the customer and LSP in the triad. The customer dominated the dyad with the supplier. Because the supplier's offering was not significant to the customer, the

customer did not have an interest in collaborating with the supplier. In the dyad between the supplier and the LSP, they were not directly dependent on each other in the triad as they both served the customer. Therefore, they showed independence in their transactional dyad. Because the supplier knew different LSPs and could introduce other LSPs to the customer, the LSP needed to control the connection between the supplier and customer, such as monitoring their communication and arranging meetings between the three organizations. Given the independence in the supplier-LSP dyad, dominating the customer was an effective approach to mediate the dyad between the customer and the supplier. Overall, the LSP acted as the focal firm to maintain a partnership triadic structure over time by dominating the customer and controlling the three embedded dyads (see Figure 5.18).
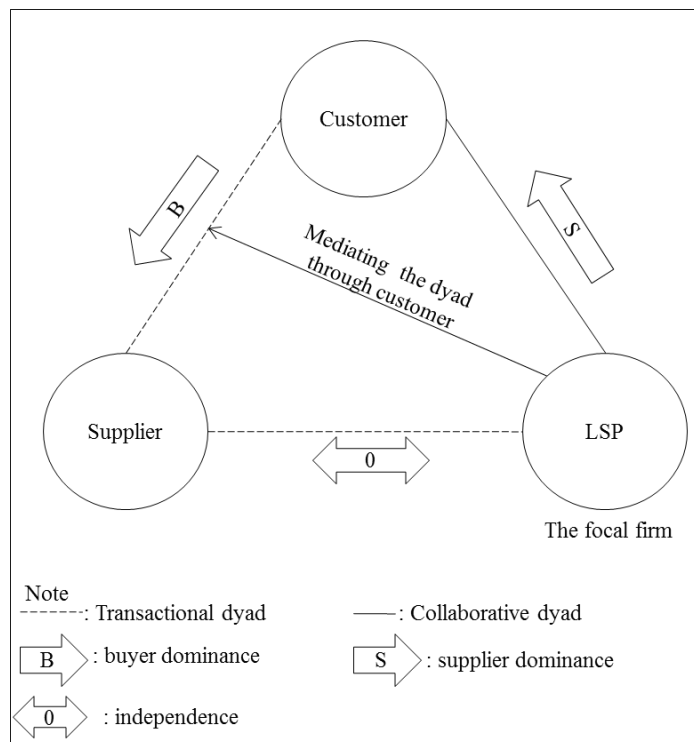
Figure 5.18: LSP as focal firm controlling customer

As explained in triads which were controlled by customers, static purchasing volumes were more significant than other influential factors to ensure relationship stability in logistics triads when triads operated with commoditized products and services. Although supplier and LSP could work as focal firms in triads J2 and Q1, they only offered commoditized products and services. Therefore, under the influence from stable purchasing volumes, focal firms in triads J2 and Q1 also

preferred to maintain stable triadic structures by dominating partners to impede dynamics in embedded dyads. This finding again highlights the significance of purchasing volumes in logistics triads.

5.4.4 Overview of combined effects of the focal firm and other influential factors

Findings in Stage 1 indicate that the combined effects of focal firm's influence, purchasing volumes, and resource capability work together to influence the logistics triads (see Figure 5.19). Purchasing volumes and resource capability produce buyer power and supply power in triads, under the influence from power games among all organizations, the most powerful organization acts as the focal firm to control the stability and dynamics of logistics triads.
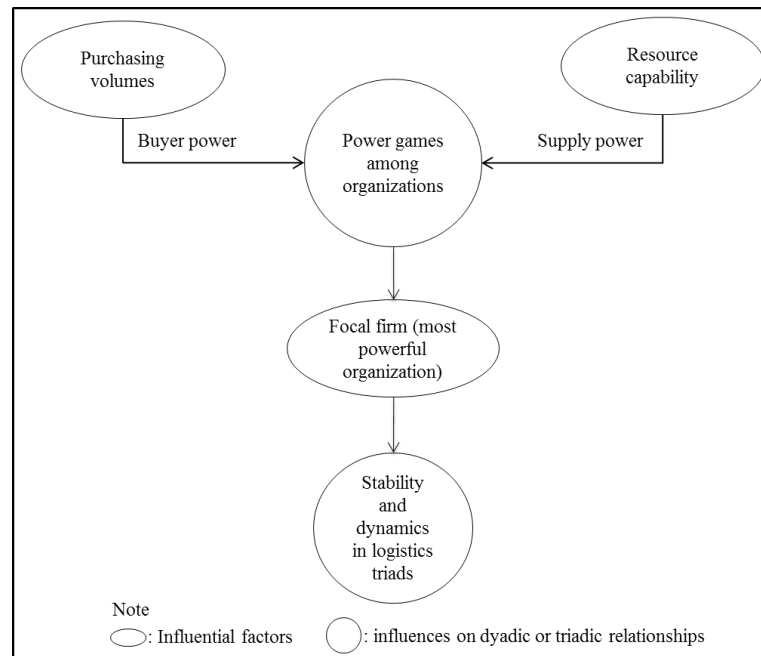
Figure 5.19: Power games: Focal firm controls triads

Compared to triads in which the customer acted as the focal firm, the number of triads in which the supplier or LSP acted as the focal firm was less in Stage 1. This phenomenon highlights the significant influence from purchasing volumes in logistics triads. Most suppliers and LSPs focused on cost competition and had difficulty offering innovative products and services in Stage 1. Further, all logistics triads showed that a great number of suppliers and LSPs in these triads were SMEs with limited resources. In this situation, suppliers and LSPs had difficulty in gaining strong supply power to control relationships with customers.

Therefore, purchasing volumes showed more power to help customers become focal firms and thereby controlling logistics triads.

Further, stability and dynamics of purchasing volumes can lead to changes in embedded dyads. By dominating changes in all dyads, the focal firm can determine how logistics triads remain stable, how logistics triads transition between different structures, or how logistics triads dissolve.

Compared to the triads having focal firms, in Stage 1, triad O3 showed that multiple powerful organizations could work together to influence evolution of a logistics triad and it was difficult to identify a focal firm for the triad in this situation.

5.5 Lack of focal firm in logistics triads

Triad O3 was the only case that did not have a focal firm in Stage 1. The details of the triad have already been explained in Chapter Four (see section 4.4.3.1). As shown in Figure 5.20, because the supplier and the customer supplied and purchased from each other, their powers were equal. Neither could dominate the other. Further, because they were potential competitors, their link was identified as a co-opetition dyad. The two organizations competed and worked as partners at the same time. Game theory suggests that a co-opetition dyad can occur when two competing suppliers serve one common customer (Wu et al., 2010). In this situation, the two suppliers do not purchase from each other and both them are dominated by the customer. However, in triad O3, the supplier and the customer purchased from each other and controlled the dyads with the LSP. Neither one could influence the other's dyad with the LSP. In contrast, previous studies suggest that the focal firm having a high degree of influence should be able to influence all embedded dyads in a network (Harland et al., 2001; Lamming et al., 2000).Therefore, triad O3 did not have a focal firm.
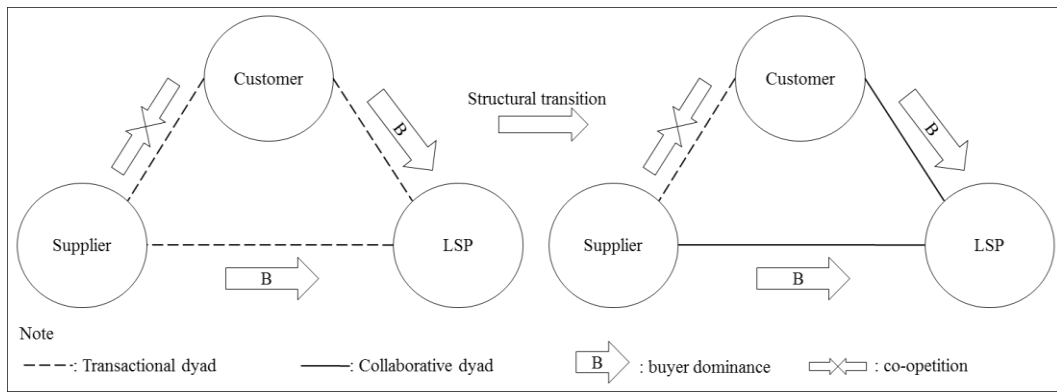
Figure 5.20: Power games: Active transactional triad O3

The LSP could only offer commoditized services to the supplier and customer. Even where the triad operated with small purchasing volumes, the buyer power from the supplier and the customer was stronger than the LSP's supply power. Therefore, the supplier and the customer kept buyer dominance in dyads with the LSP.

The reason for the supplier and the customer increasing their purchasing volumes to a large size was the uncertainty in the market. Because both of them expanded their global markets, small purchasing volumes were not sufficient to serve diversified global customers' requirements. In order to make the globalized logistics process fluid and minimize transactional costs, both organizations made the decision to develop collaboration with the LSP. Therefore, the triad transitioned from a transactional structure to a collaborative structure.

Findings from triad O3 indicate that, if a triad does not have a focal firm, the dynamics of a logistics triad can be influenced by multiple powerful organizations at the same time, based on the change of purchasing volumes (see Figure 5.21).
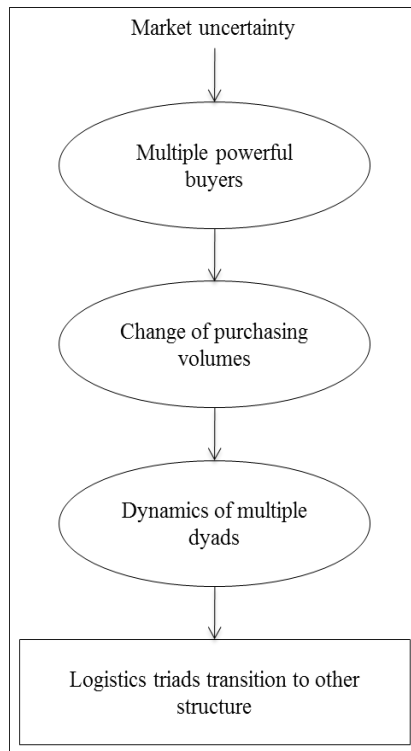
Figure 5.21: Dynamic in triad without influence from focal firm

In sum, both the transactional and collaborative triadic structures can be stable in the long term in a logistics triad despite the triad lacking a focal firm. Further, the influence from market uncertainty can help multiple powerful organizations to control dynamics of logistics triads. However, the background of the triad was too specific to find in other triads in Stage 1. Therefore, it is difficult to conclude how multiple powerful organizations work together to determine the stability and dynamics of logistics triads.

Sections 5.3, 5.4, and 5.5 identified influential factors and their combined effects in determining the stability and dynamics of triadic relationship structures. Besides these factors, a number of influential factors influenced only dyadic relationships in logistics triads.

5.6 Factors focusing on dyadic relationships

These factors showed two major effects in embedded dyads. One was to determine the time for developing collaborative dyads between organizations; the other concerns the stability of dyadic relationships.

5.6.1 Factors influencing time for development of collaborative dyad

In all logistics triads, only the static partnership triad (O1) and the dissolved partnership triad (N3) had collaborative dyads from the beginning. The reason was that the collaborative partners in these two triads had positive relationship histories in other business before building these triads. No other organizations showed a positive relationship history in logistic triads.

However, if the triad operated with small purchasing volumes that were not significant to organizations' profits, it was unnecessary to waste financial resources to develop a collaborative dyad although organizations had a positive relationship history. Therefore, the existence of a positive relationship history and the size of purchasing volumes worked together to determine the type of embedded dyad in a logistics triad (see Figure 5.22). Only when partners have a positive relationship history and operate with large purchasing volumes in a triad, the collaboration between organizations can start from the beginning of the triad.

Figure 5.22: Stage 1: Factors determining types of dyadic relationships at beginning of triads

5.6.2 Factors influencing stability of dyads

Besides business frequency, market uncertainty, and personal preference explained in sections 5.4.2, triads in Stage 1 indicated that the stability of embedded dyads could also be ensured by all relationship behaviour factors and personal relationships.

5.6.2.1 Relationship behaviour factors

Table 5.10 shows two factors identified regarding relationship behaviour in Stage 1. Except for the active transactional triad (O3), a majority of triads in the other four groups showed influence from the behaviour of "resistance to change". The behaviour of "minimizing own cost" was identified from a number of static transactional triads, all dynamic transactional triads, and all dissolved transactional triads.

Table 5.10: Stage 1: Influence from relationship behaviour

Triadic structures	Resistance to change	Minimizing own costs
Static transactional triads	J1, J2, J3, K3, K4, L1, L2, L3, L5, M1, N1, N2, O2, P1, P2, P3, Q2, S1, T1, U3	J1, J2, J3, K3, K4, L1, L2, L3, M1, N2, O2, P1, P2, P3, Q2, R1, R2, S1, T1, U3
Single static partnership triad	Q1	
Dynamic transactional triads	L4, O1, S2, U1, U2, V1, V2	L4, O1, S2, U1, U2, V1, V2
Dissolved triads	T2, K1, K2	T2, K1, K2

Resistance to change

The influence from this factor was that organizations were reluctant to change existing dyadic relationships with partners in order to avoid the complexity of relationship dynamics, to help them save resources, and to reduce problems relating to change management. This finding is consistent to other studies regarding change management in SCRs (Cheung & Rowlinson, 2011; House & Stank, 2001). Triad O2 gave a representative opinion to explain this behaviour:

> …we think the simple link is easy for control on both sides, especially in terms of the link with unimportant customers. If the current link is okay, I do not think we need to waste our resources and time to change it...

A majority of triads in Stage 1 supported this comment. This behaviour secured long term stable dyads between organizations. However, it impeded the development of collaboration and it was difficult to switch partners because all organizations were reluctant to change existing transactional dyads.

As suppliers or LSPs had limited resources to serve the customers in triads, customers resisted changing dyadic links with them. Therefore, resource capability was important to influence whether or not organizations were reluctant to change. As noted by one interviewee:

> …although the customer demand is large, they do not want to change their [transactional] relationship with the supplier because the supplier fails to provide special and customized shipping services... (Triad Q1)

Minimizing one's own cost

This behaviour showed that organizations preferred cost minimization in managing dyadic relationships within logistics triads. As one interviewee said:

> …cost is the only thing that matters in the logistics industry, our business advantage is good and we try to keep control of costs, we try to cut all unnecessary cost, so, if the investment in a relationship doesn't bring us quick returns, we do not enter into it… (Triad K4)

The behaviour of cost minimization inhibits partners from developing collaborative dyads (Fawcett et al., 2011; Mello & Stank, 2005). It was also common in logistics triads for two reasons: small purchasing volumes and limited resource capabilities. SMEs did not have sufficient resources to invest in collaborations and the profits from small purchasing volumes did not compensate the costs for developing collaborations. Therefore, most organizations preferred to minimize their own costs in dyadic relationships with all partners. Consequently, it was challenge to exhibit dynamics in these dyads.

In addition to two relationship behaviour factors, personal relationships also affected dyadic SCRs in logistics triads.

5.6.2.2 Personal relationships

Previous studies have already suggested that personal relationships can influence business relationships between organizations (Bode et al., 2011; Gligor & Autry, 2012). In Stage 1, logistics triads reflected two contradictory ideas concerning the connection between personal relationships and business relationships (see Table 5.11).

Table 5.11: Stage 1: Influence from personal relationships

Triadic structures	Interpersonal relationships positively link with business relationships	Interpersonal relationships negatively link with business relationships
Static transactional triads	J1, J2, J3, K3, K4, N1, N2, Q2, R1, R2, T1	L1, L2, L3, L5, M1, O2, P1, P2, P3, U3
Single static partnership triad	Q1	
Dynamic transactional triads	O1, S2, U1, U2, V1, V2	L4
Dissolved triads	T2	K1, K2

A number of triads argued that close personal relationships helped develop long term stable business relationships and foster business collaborations because people were the social glue for interactions between all partners in logistics triads. R1 was typical of triads which supported this idea:

> ...people are the key to all business; good personal links stick like glue,
> and can cement two companies together…

Paradoxically, if products and services in logistics triads showed low profit margins and small purchasing volumes, partners retained long term transactional SCRs only and lacked motivation to foster collaboration, despite managers having close personal relationships in these triads. Therefore, small purchasing volumes exerted more significant influence than personal relationships to determine the type of dyadic SCRs.

On the other hand, as shown in Table 5.11, a number of participants indicated that close personal relationships impeded the development of business relationships because of potential information leakage. As Triad P1 indicated:

> …personal links are more like business gossip, it is not good to keep
> secret information open to both sides…

In order to prevent information leakage, a number of organizations preferred to restrict and control the personal relationships by keeping distant transactional SCRs in logistics triads.

In sum, although these two findings revealed contradictory ideas, they confirmed that personal relationships could affect the type of dyadic SCRs in logistics triads. In addition, because small purchasing volumes weaken the influences from closer personal relationships, purchasing volumes showed more significant influence than personal relationships in affecting SCRs in logistics triads.

5.6.3 Overview of factors influencing dyads

Figure 5.23 illustrates that all factors in this section show their influences on determining the stability and type of dyadic relationships in logistics triads. Under control by the focal firm in logistics triads, the influences from these factors can assist in predicting the structure and stability of logistics triads. Overall, by comparing all influential factors identified in Stage 1, purchasing volumes, resource capability, and focal firm reflect the most significant influences in determining the stability and dynamics in logistics triads and all embedded dyads.
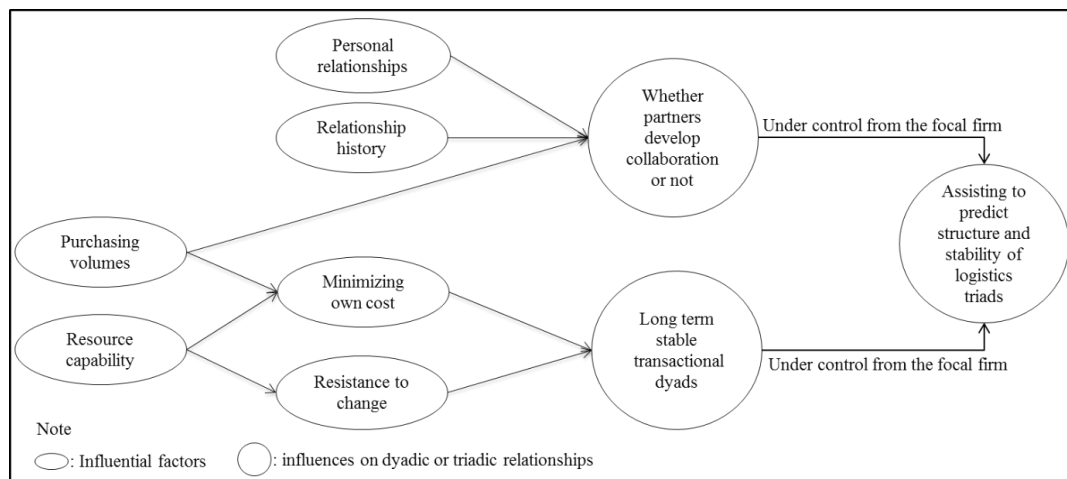
Figure 5.23: Stage 1: Factors influencing dyads in logistics triads

5.7 Stage 1: Key findings for influential factors

Although five categories of influential factors were identified in Stage 1, business context factors and supply network factors show more significant influence than the other three categories. The factors in these two categories show tight connections to determining the stability and dynamics of logistics triads (see Figure 5.24).
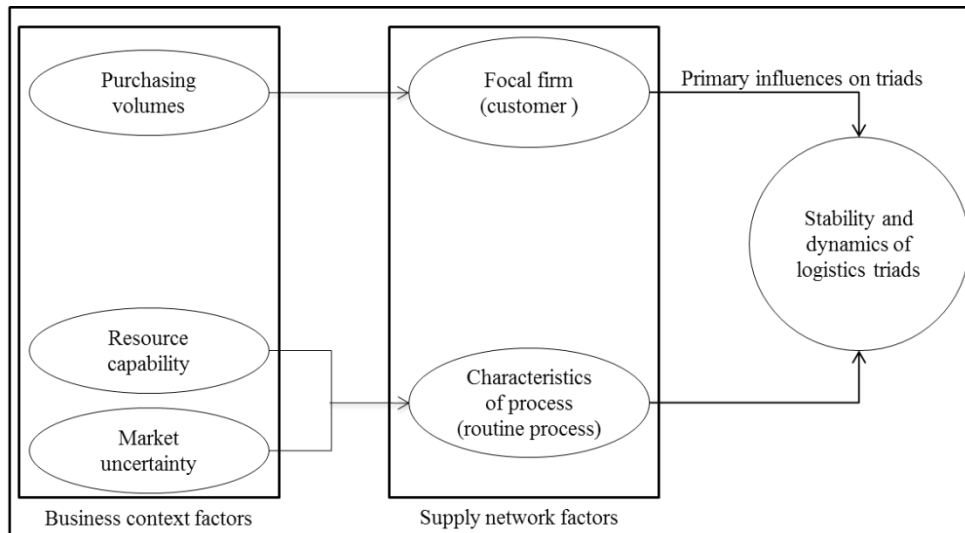
Figure 5.24: Stage 1: Significant factors influencing logistics triads

Purchasing volumes and the focal firm in a logistics triad show the primary influences which affect evolution of the triad in Stage 1. The limited resource capability from suppliers and LSPs in the NZ market indicate that most triads have a low frequency of innovation and compete on cost. Consequently, routine process is common in these logistics triads. In this situation, purchasing volumes can help customers gain stronger buyer power and show a high degree of focal firm influence in controlling logistics triads.

In a routine process, focal firms prefer to keep stable embedded dyads in a network (Harland et al., 2004; Skjoett-Larsen et al., 2003). Similarly, when logistics triads operate with stable purchasing volumes, customers can ensure long term stability in triads by inhibiting changes in all embedded dyads. If purchasing volumes are changed, in order to protect profits, customers dominate dynamics in logistics triads by controlling partners to change or disconnect dyads. Therefore,

as a focal firm, the customer can determine the direction of transition in dynamic triads.

Besides business context factors and supply network factors, all other factors show effects on certain dyadic relationships. They do not show significant influences to impact on the whole structure of a logistics triad.

Overall, from the findings of influential factors in Stage 1, a number of new observations (both Chapter 4 and 5 concern data analysis of triads in Stage 1, the number of the observations in Chapter 5 follows the number of observations introduced in Chapter 4) can be derived to predict the stability and dynamics of logistics triads.

Observation 3: based on stable purchasing volumes, the customer can use strong buyer power to ensure long term stability of the triadic structure by controlling partners and embedded dyads.

Observation 4: according to the change of purchasing volumes, customers can show significant influence in determining how a logistics triad evolves by dominating changes in all embedded dyads.

As all logistics triads in Stage 1 showed routine process, the data analysis also helped derive an observation concerning how to assess the characteristics of a process in logistics triads.

Observation 5: because of resource capability and market uncertainty in NZ, the influences from innovation frequency and competition focus are more significant than the influences from the number of competitors and volumes of products in determining the characteristics of process in logistics triads.

In addition to influential factors, two control approaches used by the focal firm are also important to study relationship dynamics in logistics triads.

5.8 Stage 1: Two Control approaches

Figure 5.25 illustrates that the focal firms can dictate a logistics triad through two control approaches. These approaches highlight the difference between dyadic and triadic relationships. In a dyad, two organizations only influence each other directly to determine the development and change of the dyad (Choi & Wu, 2009c; Mena et al., 2013). In a triad, besides the focal firm's two direct dyads connecting with non-focal firms, the focal firm can use power to mediate the dyad between the other two by dominating one or both of them in the triad (Nooteboom, 2006). Similarly, in logistics triads, the focal firm can determine the stability and dynamics of the triad by controlling all direct and indirect relationships.
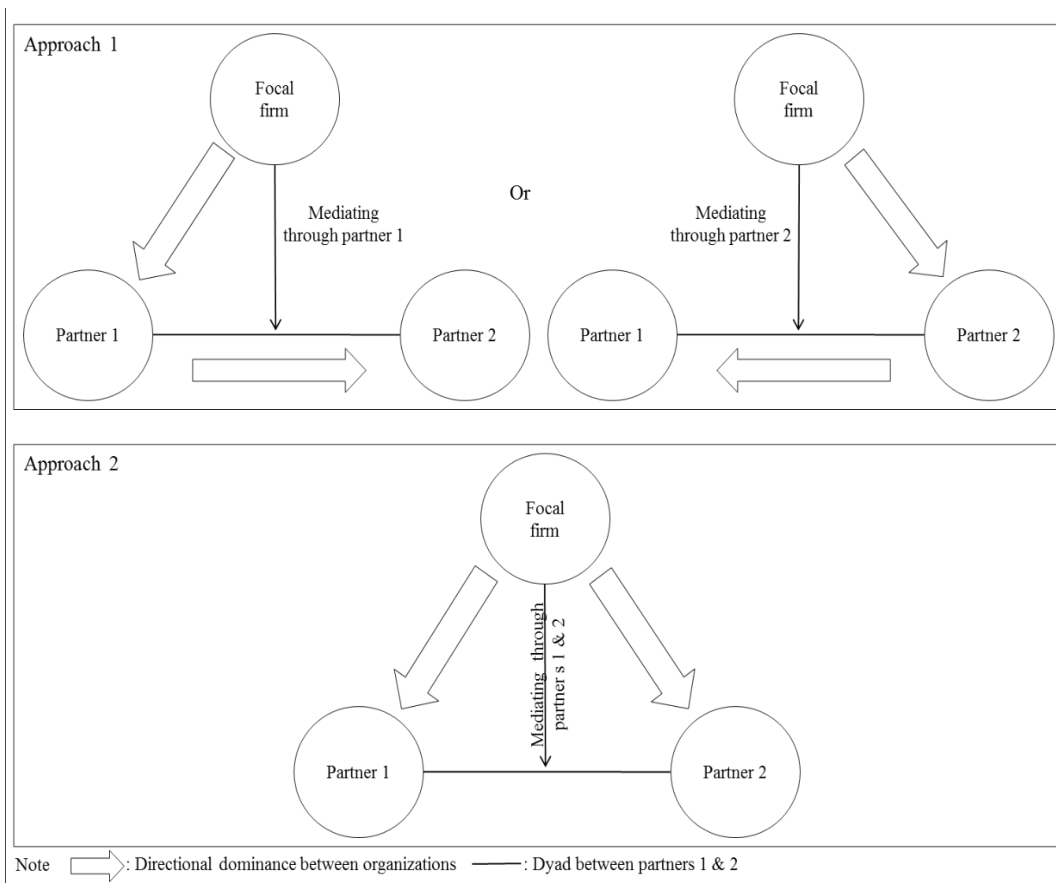
Figure 5.25: Stage 1: Control approaches

This finding helps introduce an observation concerning how the focal firm dictates a logistics triad.

Observation 6: the focal firm can control either one or both non-focal firms to achieve dominance in a triad.

Further, in a dynamic triad, power games among organizations can be changed based on the dynamics of influential factors (such as change in purchasing volumes or resource capability). In order to keep controlling the dynamics in a triad, the focal firm can change from the first approach to the second approach to manage the dynamics of power games and control relationships between organizations in the triad.

> **Observation 7**: in order to control the dynamics of a triad, the focal firm can change between two approaches to manage the dynamics of power games in the triad.

The significant influences from focal firms indicate that the supply network model can be an effective tool to investigate logistics triads although this model is not specifically developed for studying triadic relationship structures. In contrast, two limitations of balance theory identified in Chapter Four indicate that balance theory is insufficient to study logistics triads. Therefore, Stage 1 findings indicate that the supply network model is more appropriate than balance theory to study the stability and dynamics of logistics triads. Because of the significant influences from the focal firm, the next section will modify the evolution model developed in Chapter Four to address the second research question.

5.9 Stage 1: Modified evolution model

Chapter Four has developed an evolution model to show dynamics in logistics triads. However, the model does not reveal what factors can determine the transitions in logistics triads. By combining the model with significant influential factors identified in the present chapter, Figure 5.26 outlines a modified evolution model to present that, when logistics triads operate with routine process, the customer shows the primary influences to dictate all evolutions of triadic structures in logistics triads by gaining buyer power from purchasing volumes. As LSP and supplier only acted as focal firms in one triad each, it is difficult to verify the validity of these two triads. Therefore, the model does not include suppliers and LSPs.
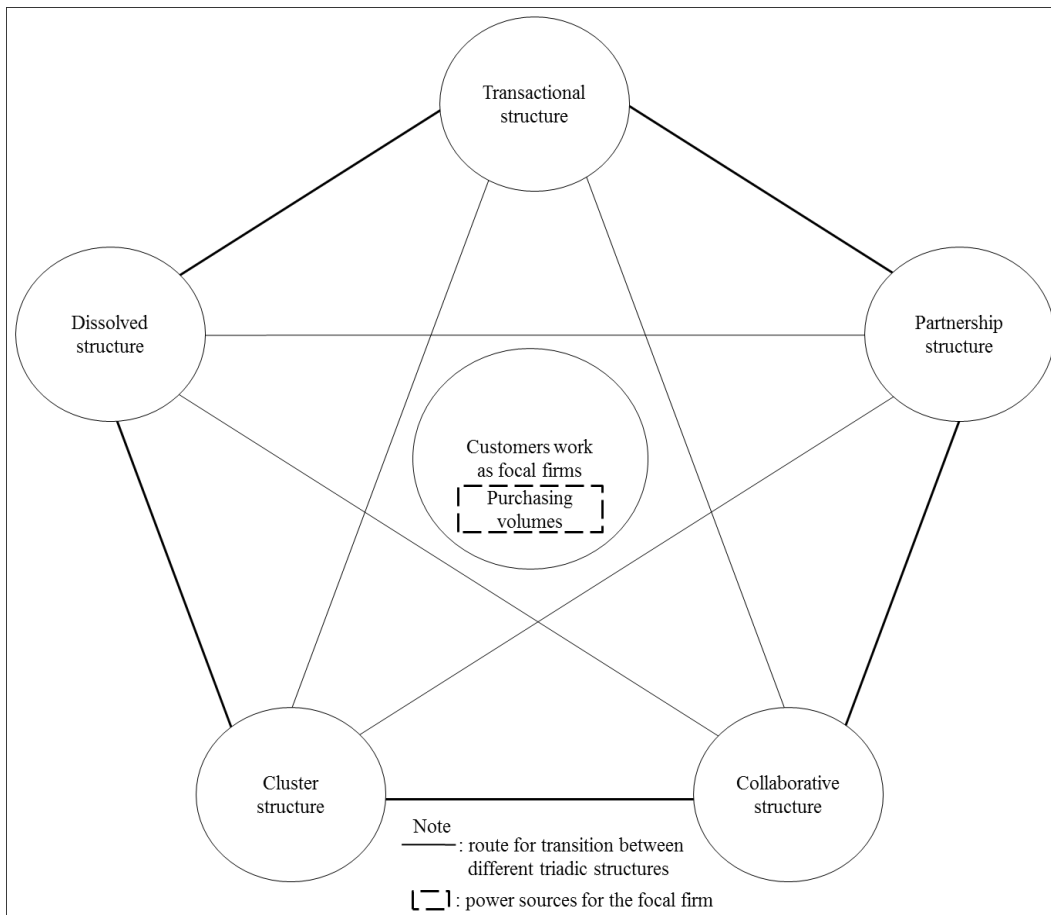
Figure 5.26: Modified evolution model

This modified evolution model can provide an initial idea to address the research goal by indicating the route of transition and revealing significant influential factors in logistics triads. This model indicates that the customer can control direct transition between any triadic structures in logistics triads by controlling partners. Therefore, the focal firm and purchasing volumes are significant influential factors in determining how triadic structures transit over time in the logistics triads. In general, compared to the balance of a triadic relationship structure, the influential factors identified show more significant influences to affect the stability of relationship structure and functionality in logistics triads. Empirically, the customer can use purchasing power to control the stability and dynamics of logistics triad by controlling the supplier and LSP in the triad. As Stage 1 only studied triads collected from LSPs, the findings need to be triangulated and verified by collecting data from suppliers and customers in Stage 2.

5.10 Conclusion

This chapter analysed influential factors and identified primary influential factors in explaining relationship dynamics within logistics triads. According to NZ market characteristics and most suppliers' and LSPs' limited resource capability, purchasing volumes show more significant influence on logistics triads that operate with routine processes. In this situation, customers are important in logistics triads because they can use buyer power from purchasing volumes to determine the stability and dynamics of logistics triads by controlling suppliers and LSPs.

This study contributes to theory development by testing the supply network model and indicating the effectiveness of the model in logistics triads. The five observations identified in this chapter add new findings for the development of the supply network model from the perspective of investigating stability and dynamics in logistics triads. Further, the comparison between the supply network model and balance theory indicates that the model is more appropriate to study inter-organizational triads when the embedded dyads are highly influenced by power games among organizations. In addition, by highlighting the focal firm's influences, the modified evolution model (Figure 5.26) provides several new ideas to identify what factors are significant in influencing the stability and dynamics in logistics triads.

By combining the findings from Chapters Four and Five, an initial perception can be developed to address the research goal regarding the evolution of relationships in logistics triads. The next chapter will present an analysis of the data collected from suppliers and customers in Stage 2, then compare the findings identified in the two stages to arrive at final research outcomes for this thesis.

Chapter Six: Verification of the research findings

6.1 Preview

In the previous two chapters a number of findings have identified explanations for the stability and dynamics of logistics triads in Stage 1. In this chapter, an analysis is made of the empirical data collected from suppliers and customers in Stage 2. This chapter will verify the research findings by comparing the outcomes between the two research stages. The comparison will triangulate and validate the research findings of how logistics triads transit over time (research question 1) and what factors can significantly influence the relationship dynamics in logistics triads (research question 2).

The researcher has identified two limitations of balance theory and has developed a modified evolution model in Chapter Five. The present chapter will test the two limitations and the model against triads collected in Stage 2. Additionally, in Chapter Five, the researcher has highlighted the significance of business context factors and supply network factors in determining stability and dynamics of logistics triads. The present chapter will also verify these findings. The comparison between the two stages leads to a consensus of findings. Therefore, saturation has been reached in the current research and there is no further need to collect data because the close similarity between the two research stages and triangulation of empirical data demonstrates the validity and reliability of research findings.

6.2 Stage 2: Classification of triads

Similarly to the data analysis in Chapter Four, the dynamics and stability of all triadic cases were assessed according to the process explained in the methodology chapter (Appendix G has attached the Table G.82 to present the dynamics and stability of all embedded dyads in each logistics triad within Stage 2). In this process, all triads were classified into six groups (see Table 6.1). In order to avoid confusion between the two research stages, the six groups of triads in Stage 2 were assigned the numbers 6 - 11. Groups 6, 7, and 8 include all static triads

without transition of triadic relationships in Stage 2. Group 6 was formed by all static transactional triads. All static partnership triads were allocated in Group 7. The two triads in Group 8 retained their collaborative structures over time. Transitions were found in the other three groups. All triads in Group 9 had transitioned from a transactional to a partnership structure. Group 10 included three triads which had moved from a transactional to a collaborative structure. Finally, the triad in Group 11 had transitioned from a partnership to a transactional structure.

Table 6.1: Stage 2: Classification of triads

		Triadic structure	Triad ID
Static Triad	Group 6:	static transactional	BA1, BD1, BE1, BE3, BF1, BG2, BH2, BI1, BJ2, BL1, BL2, BM1, BM2, BO2, BP1, BP2, BQ1, BR1, BR2, BS1, BT1, BT2, BT3, BV1, BW1, BW2, BX1, BY1, BY2, BZ1, CA1, CC1, CC2
	Group 7:	static partnership	BC1, BC2, BE2, CA2, CA3
	Group 8:	static collaborative	BK1, BU1
Dynamic Triad	Group 9:	dynamic transactional	BB1, BG1, BJ1, BO1, BQ2, BS2, CB1
	Group 10:	active transactional	BH1, BN1, BV2
	Group 11:	dynamic partnership	BK2

The next section will compare all triads between the two stages to verify the limitations of balance theory identified in Stage 1.

6.3 Verification of the limitations of balance theory

Although Stage 2 identified two new groups of triads that were not found in Stage 1, the other four groups of triads revealed highly similar patterns in both stages. Table 6.2 illustrates that the evidence only supported balance theory and related propositions in seven out of eighty six logistics triads in two stages. All of these seven triads showed transition from the transactional to the partnership structure. In other situations, balance theory and propositions were limited in explaining how logistics triads remained stable over time or transitioned between different structures.

Table 6.2: Stages 1 & 2: Validation of research propositions

Group	Triadic structure	Stage	Triad	Related propositions	Acceptance of proposition
1 & 6	Static transactional triads	1	All	4a & 4b	Not supported
		2	All		
2 & 7	Static partnership triads	1	All	2	Not supported
		2	All		
3 & 9	Dynamic transactional triads	1	S2, U1, V1, & V2	2 & 4b	Supported
		2	BO1, BQ2, CB1		
		1	L4, O1, & U2	2 & 4b	Not supported
		2	BB1, BG1, BJ1, BS2		
5 & 10	Active transactional triads	1	All	3a, 3b, & 4b	Not supported
		2	All		

Two limitations of balance theory have been identified in Stage 1. One concerns the difference between interpersonal and inter-organizational relationships; the other relates to the uncertainty of the wider network. The four groups of triads identified in both stages showed consistent findings of these limitations (see Table 6.3).

Table 6.3: Stages 1 & 2: Limitation of balance theory

Triadic structures	Stages	Reasons regarding the limitation of balance theory	Supportive triads
Static transactional triads	1 & 2	difference between interpersonal and inter-organizational relationships	all
Static partnership triads	1 & 2	difference between interpersonal and inter-organizational relationships	all
Dynamic transactional triads	1	difference between interpersonal and inter-organizational relationships	L4, O1, & U2
	2	difference between interpersonal and inter-organizational relationships	BB1, BG1, BJ1, BS2
Active transactional triads	1 & 2	difference between interpersonal and inter-organizational relationships & uncertainty of wider network	all
Dissolved triads	1	uncertainty of wider network	all

Table 6.3 indicates that the difference between interpersonal and inter-organizational relationships identified the insufficiency of balance theory in all triads except dissolved triads. Active transactional triads in both stages and dissolved triads in Stage 1 showed that the uncertainty of the wider network made it difficult to use balance theory in studying logistics triads. In addition to all triads in Table 6.3, the two groups of triads that were only identified from Stage 2 also showed the same limitations to explain the insufficiency of balance theory.

The next two sub-sections will introduce more details of these two groups (the details of relationship activities in these triads have been attached in Appendix F).

6.3.1 Group 8: Static collaborative triads

The two triads (BK1; BU1) in this group retained a collaborative structure without change over time. In these triads, suppliers developed and retained collaborations with customers while customers and LSPs maintained transactional links (see Figure 6.1). Triad BU1 is a representative example that explains the characteristics of these static triads. This five-year-duration triad was formed by a medical equipment importer and wholesaler (the supplier), a logistics company (the LSP), and the customer. Because of regulatory constraints covering importing medical equipment into the NZ market, the supplier was the only legal importer and wholesaler specialized in sales.
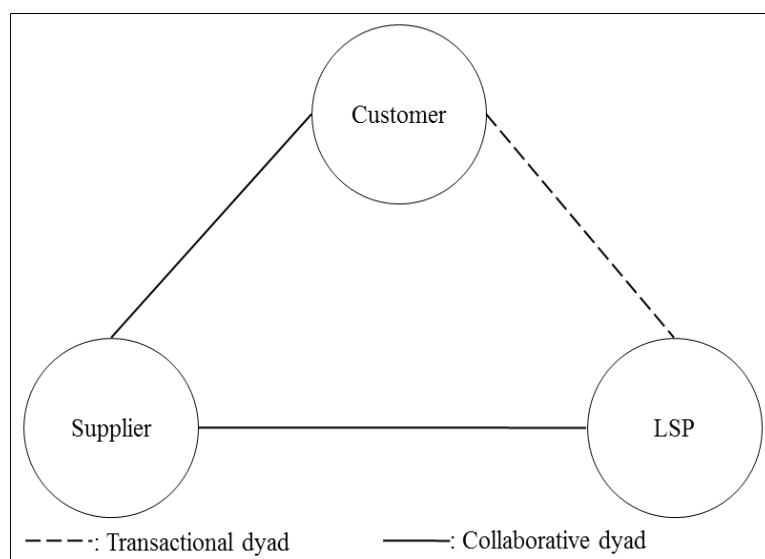
Figure 6.1: Stage 2: Static collaborative triads

> …the government regulation policy is a big issue, the products and equipment are unique and relate to different safety and health issues in our industry. In order to ensure quality of importing these products and equipment, every three years, NZ government runs a competition between all suppliers like us, only one final winner can gain permission from the government to import these products and equipment. At the same time, we can only deal with the only one

government selected domestic wholesaler, we are not allowed to sell our products or equipment to any other organizations in NZ…

…in the process of dealing with the wholesaler, they will frequently report our performance to the government for a reference to check in the next competition, so, we need try our best to serve them for winning the competition between us and other suppliers in the future, otherwise, we will lose this business at least in three years… (Triad BU1)

At the same time, the customer was the only legal entity dealing with the importer. As a consequence, the supplier and the client were strategically important to each other and started their collaboration from the beginning of the triad. In order to focus on core business, the supplier outsourced its entire logistics requirement to the LSP who had a good reputation in NZ.

…because of uniqueness of our products and equipment, it needs special equipment to deliver and store them, they [LSP] are professional in this and it is difficult to find other logistics companies that can have the special equipment in NZ. They also like to have a close link with us because our large and stable orders can provide them more profits than other customers…

…after negotiation with the wholesaler, we work with them [LSP] to organize the whole logistics process, in this process, the wholesaler does not really need too much communication with the logistics company because we have already done all things, they just need to wait for delivery… (Triad BU1)

The LSP selected also wanted to maintain business relations with their direct customer (the supplier) who could continuously offer large purchasing volumes. In this situation, the interdependency between the supplier and the LSP helped them foster collaboration in the triad. Also, because the supplier had managed all

logistics activities from the beginning, the customer needed only basic communication with the LSP, such as, order delivery and order receiving. Therefore, triad BU1 started with and retained two collaborative dyads and one transactional dyad without further dynamics over five years.

6.3.1.1 Testing static collaborative triads

Balance theory does not propose the long term stability in the collaborative triadic structure (Heider, 1958). Therefore, propositions 3a and 3b suggest that a collaborative triad should transit to the partnership structure, or transit to the cluster structure, or dissolved quickly. However, as shown in Table 6.4, both two triads in Group 8 retained a collaborative structure without change in the long term (at least 5 years). As a result, Group 8 did not support balance theory.

Table 6.4: Stage 2: Duration of static collaborative triads and embedded dyads

Triad ID	LSP – Supplier dyad	LSP – Customer dyad	Supplier – Customer dyad	Duration of triad (years)
BK1	Static collaborative dyad	Static transactional dyad	Static collaborative dyad	10
BU1	Static transactional dyad	Static collaborative dyad	Static collaborative dyad	5

The difference between interpersonal and inter-organizational relationships caused a limitation of balance theory in these triads. Based on balance theory, all of the dynamics in triadic structures and embedded links are based on actors' attitudes toward each other (Choi & Wu, 2009b).

However, in triads BK1 and BU1, customers and LSPs retained transactional dyads and had no interest in collaborating with each other. Because both customers and LSPs had collaborations with suppliers, the logistics processes in these two triads were fluent enough. Developing collaboration between customers and LSPs did not help any organization gain more profit or further decrease cost. Therefore, customers and LSPs did not see any necessity to change their dyads. Consequently, relationships between customers and LSPs were not determined by their attitudes to each other. Neither customers nor LSPs asked suppliers to

change existing collaboration to a transactional dyad because any such change only made the logistics process difficult to control and enhanced total costs for all organizations. Therefore, the collaborative structure could be retained over time in these triads.

Overall, although static collaborative triads were not identified in Stage 1, the findings from this kind of triad can verify that the difference between interpersonal and inter-organizational relationships makes it difficult to use balance theory for studying logistics triads. Further, as described in triad BU1, the influence from government regulation policy came from the outside the triad. This finding can also verify the limitation that balance theory is insufficient to study influences relating to uncertainty from the wider network. In sum, the static collaborative triads showed consistent findings to verify the two limitations of balance theory identified in Stage 1. Another new group of triads identified in Stage 2 dynamic partnership triad also supported the limitations of balance theory.

6.3.2 Group 11: Dynamic partnership triad

This group includes the only triad (BK2) that transited from a partnership to a transactional structure. The triad BK2 was formed by a fish wholesaler and exporter (the supplier), a global freight forwarding company (the LSP), and an overseas agent who operated a business with fish products globally (the customer). This triad was built up over 15 years. In the beginning, the LSP built two transactional dyads with the supplier and the customer respectively; while the supplier and the customer had a collaborative dyad. As a key supplier of fresh fish in NZ, the supplier had already built mutually beneficial relationships with overseas customers who could offer large purchasing volumes in other markets. They believed that collaboration was necessary to help gain real time communication and to make joint decisions encompassing supply chain practices in the triad. On the other hand, the LSP was a newly selected party, meaning the triad started from a partnership structure. However, the situation had changed five years previously when both the supplier and customer were trying to expand their markets into Northern China.

> …with the enhancement of business communication between us (NZ)
> and China, more Chinese customers know us, especially the customers
> from the north of China. They find it difficult to get NZ fish. To save
> purchasing cost, these customers prefer to buy from us directly. This
> can also enhance our profits. However, the agent company has also
> planned to expand their business to the north of China, so we argue
> about serving Chinese customers… (Triad BK2)

The supplier wanted new markets to enhance profit because several final
customers preferred to buy fish directly from the supplier. The agent company
also wanted to extract more profit from Northern China, leading to the supplier
and the customer becoming potential competitors, with their goals conflicting in
the same market. However, except for the Chinese market, the supplier and the
agent still needed to work together to serve customers in other markets.

> …although we have arguments on this [expanding market to the north
> of China], both of us need time to explore the market, further, we still
> need each other in American markets and European markets, so, even
> if we do not work close as we did before, we still keep connections
> with each other and the logistics company in this case… (Triad BK2)

Accordingly, the original collaborative dyad changed to a transactional type. The
supplier and the agent company concluded that the cost of logistics was the
critical factor in selecting a suitable LSP. This explains why the LSP retained two
basic transactional dyads without changes in the triad (see Figure 6.2).
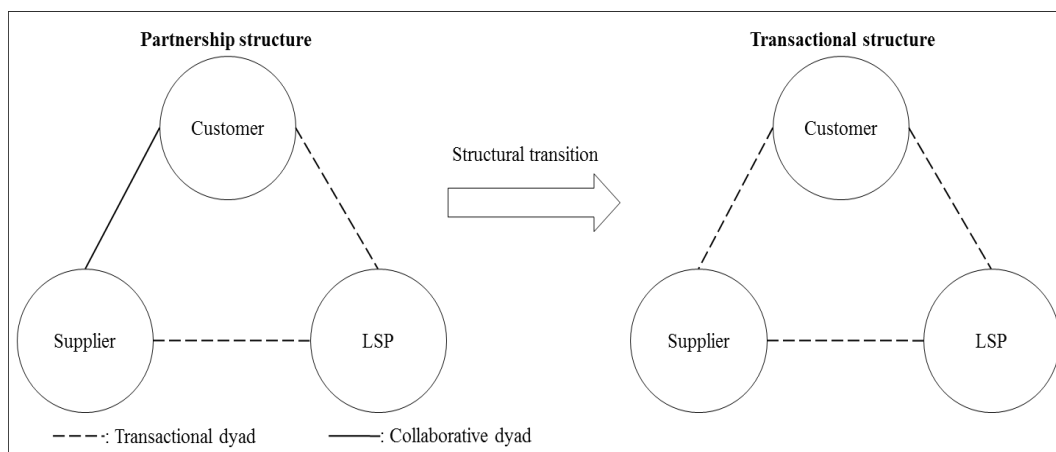
Figure 6.2: Stage 2: Dynamic partnership triad

6.3.2.1 Testing dynamic partnership triad

The triad in group 11 did not support related proposition 2 because the triad finally transitioned from a partnership structure to a transactional structure. The reason for the dynamics in this triad was the uncertainty in the wider network. Because the final customer coming from the outside of the triad preferred to have more direct connection with the supplier, the agent (the customer) and the supplier were potential competitors in the near future. In order to protect confidential business information, they changed their collaboration to a transactional dyad. However, balance theory is insufficient to study how uncertainty outside of a triad impacts relationship dynamics among organizations in the triad (Heider, 1958; Newcomb, 1961). Therefore, although Stage 1 did not have a dynamic partnership triad, the consensus of findings between two stages verified the second limitation of balance theory.

6.3.3 Verified limitations of balance theory

By combining all triads identified in both stages, Figure 6.3 indicates that the two stages shared the same two limitations of balance theory. The difference between interpersonal and inter-organizational relationships leads to its limitation in studying static transactional, static partnership, and dynamic transactional triads. The influence from the uncertainty in the wider network determines that balance theory is limited for studying dissolved triads and dynamic partnership triads. Both limitations work in static collaborative and active transactional triads.
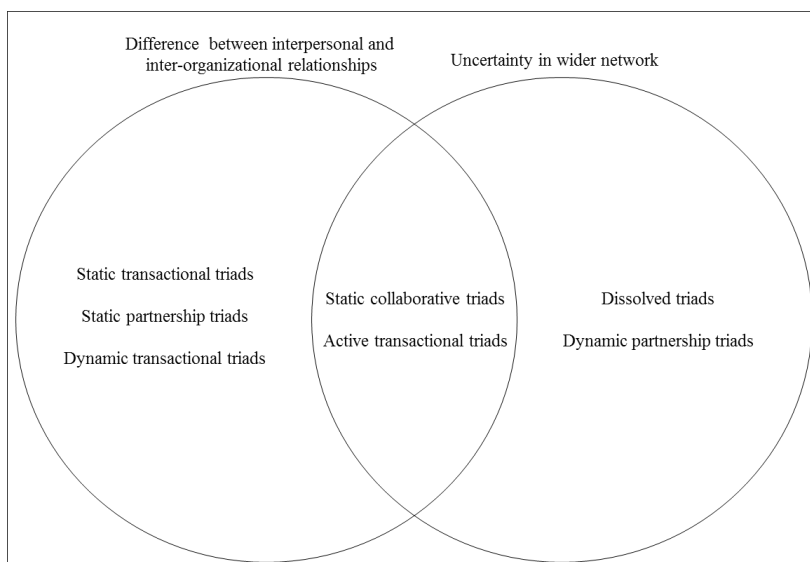
Figure 6.3: Stages 1 & 2: Limitations of balance theory in different triads

Because of the validation of the two limitations in Stage 2, this thesis can provide two research findings regarding the insufficiency of balance theory.

Finding 1: Balance theory is limited for studying inter-organizational triads because of the difference between interpersonal and inter-organizational relationships.

Finding 2: Balance theory is limited in explaining the dynamics of a triad if the triad is influenced by uncertainty coming from the outside of the triad.

Given a modified evolution model has been developed to explain how all triads within Stage 1 transit over time (Chapter Five, section 5.9), the next section verifies the validity of this model.

6.4 Verification of the evolution model

Although the analysis of empirical data revealed certain different triads between the two stages, as shown in Figure 6.4, all triads identified in the two stages can be presented in the modified evolution model that has been developed in Stage 1. Specifically, the dissolved triads show two situations because both transactional triads and partnership triads can dissolve directly. Further, the transactional

structure and the partnership structure can transition between each other because dynamic transactional triads display transition from the transactional to the partnership structure; while the dynamic partnership triads display evolution from the partnership to transactional structure. Overall, the findings in Stage 2 can verify the validity of the modified evolution model because the model is valid to illustrate all types of transitions in logistics triads.
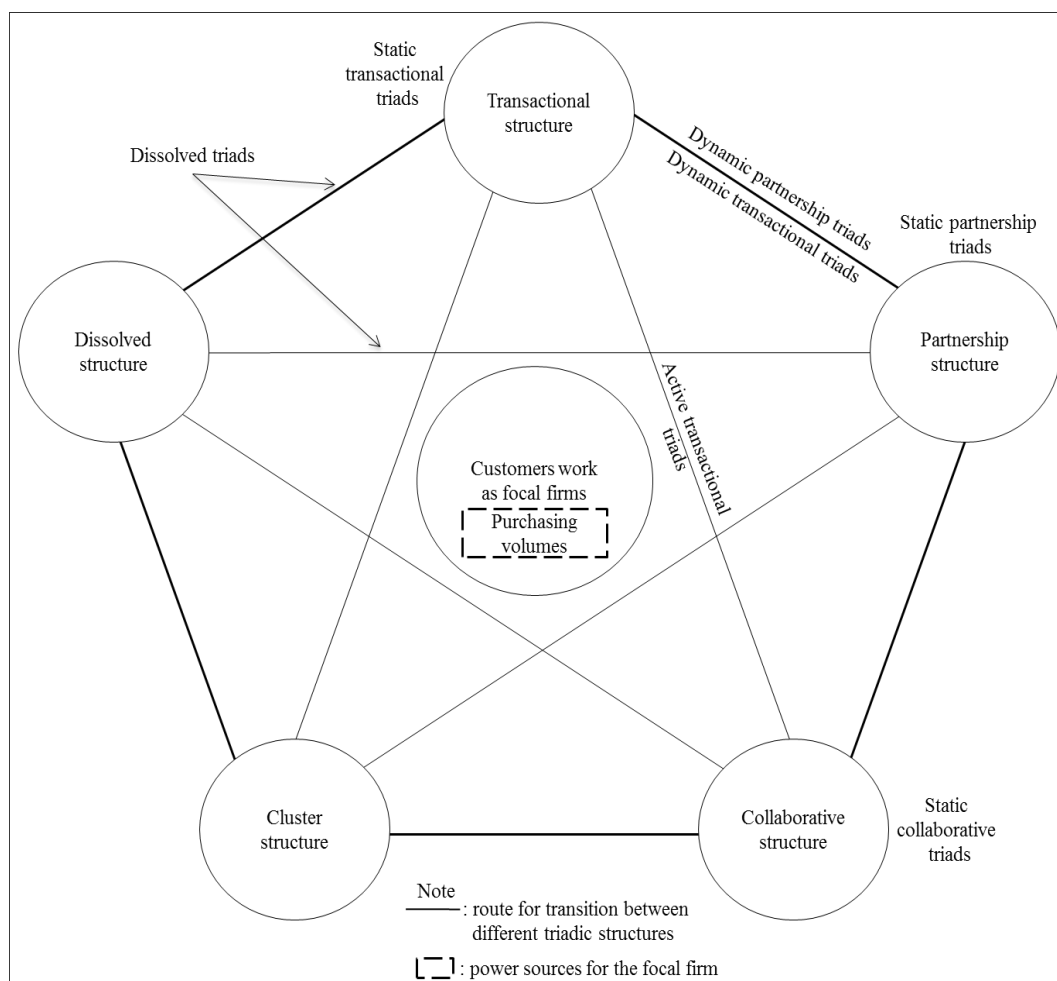
Figure 6.4: Stages 1 & 2: Matching the modified evolution model with triads

Additionally, in Stage 1, the core of the model highlights that customers could gain strong buyer power from purchasing volumes to dictate transitions in triads. However, these findings were only based on data collected from LSPs. In order to triangulate and validate the findings, it is necessary to compare the influential factors and their impact on logistics triads between the two stages. The next section will start by comparing how influences from the characteristics of process affected logistics triads in the two stages.

6.5 Characteristics of process in the two stages

For the same reasons regarding limited resource capability and market uncertainty that have been identified in Stage 1, all triads except BU1 in Stage 2 also exhibited low innovation frequency. Further, organizations in these triads also competed primarily on cost (see Table 6.5). These similarities indicate that logistics triads also had routine process in Stage 2.

Table 6.5: Stage 1 & 2: Innovation frequency and competition focus in logistics triads

Triad	Stage	Low innovation frequency	Competition on cost
Static transactional triads	1 & 2	All	All
Static partnership triads	1 & 2	All	All
Dynamic transactional triads	1 & 2	All	All
Active transactional triads	1 & 2	All	All
Dissolved triads	1	All	All
Static collaborative triads	2	All (except triad BU1)	All (except triad BU1)
Active partnership triad	2	All	All

In Triad BU1, although the supplier's offering showed high innovation frequency and they competed primarily on speciality, the government specified the only supplier and customer for triad BU1 in a fixed long term because of the regulation policy. In this situation, it was difficult for the triad to show dynamics in the long term.

Stage 1 has already highlighted that resources capability and market uncertainty determined the characteristics of process in logistics triads. The government regulation in Triad BU1 was also a market uncertainty. Therefore, both stages shared the same findings related to the characteristics of process: because of influences from limited resource capability and market uncertainty, logistic triads usually show routine process in NZ.

In addition to the similarity regarding the routine process in logistics triads, two stages also showed similar findings about the combined effects of focal firm, purchasing volumes, and resource capability. In Stage 1, based on the combined

effects, customers showed two approaches to control logistics triads by gaining buyer power from purchasing volumes. Through the two approaches, the customer controls either one partner or both partners to dictate a triad. These two control approaches were also identified in a number of triads in Stage 2. The next section will start from comparing how the first control approach was used by the focal firm to determine stability of logistic triads in both two stages.

6.6 Comparison of stable triadic structures: first control approach

Suppliers did not use the first approach to control triads in both two stages. Further, only one triad in Stage 1 showed that the LSP was the focal firm. No LSP acted as the focal firm in Stage 2. Therefore, in order to compare the findings regarding the first control approach between the two stages, the comparison of triads governed by customers was the only choice. Table 6.6 presents that a number of static and dynamic transactional triads showed the first approach in both two stages. In these triads, although the customer and the LSP were independent from each other, the customer could use buyer power to control the supplier and asked the supplier to control the LSP.

Table 6.6: Stages 1 & 2: Customer as focal firm controlling supplier

Triadic structures	Stages	Purchasing volume	Supportive triads
Static transactional triads	1	Stable	J1, J3, L1, L2, L3, M1, N2, P1, P2, U3
	2	Stable	BF1, BG2, BH2, BM1, BO2, BR1, BR2, BV1, BX1, BY2, BZ1, CA1
Dynamic transactional triads (before transition)	1	Stable	L4, U1
	2	Stable	BB1, BG1, BO1, BQ2, CB1

As shown in Table 6.6, in all static triads, because of stable purchasing volumes, customers did not see a necessity to change any dyad. As a result, customers ensured long term stability of triadic structures. The situation in dynamic triads before transition was the same. Additionally, in dynamic triads, purchasing volumes did not show further change after transition. In this situation, customers could also use buyer power to maintain the new triadic structure over time.

In conclusion, the close similarity between two stages indicates that the customer can use stable purchasing volume to ensure long term stability for a logistics triad by controlling the supplier and impeding changes in embedded dyads.

6.7 Comparison of stable triadic structures: second control approach

Compared to triads in Stage 1, a number of triads were controlled by suppliers in Stage 2. Therefore, this section will compare how customers and suppliers used the second approach to ensure stable logistics triads.

6.7.1 Customer as focal firm

The customer controlling supplier and LSP to dictate a logistics triad was common in both stages (see Table 6.7). In general, customers gained strong buyer power from stable purchasing volumes to control both suppliers and LSPs and ensure long term stability of a transactional structure although some triads finally transitioned to other structures or dissolved.

Table 6.7: Stages 1 & 2: Customer as focal firm controlling supplier and LSP

Triadic structures	Stages	Supportive triads
Static transactional triads	1	K3, K4, L5, N1, O2, P3, Q2, R1, R2, S1, T1
	2	BD1, BE1, BE3, BI1, BJ2, BM2, BP1, BP2, BS1, BT1, BT2, BT3, BY1
Dynamic transactional triads (before transition)	1	O1, S2, U2, V1, V2
	2	BJ1, BS2
Dynamic transactional triads (after transition)	1	L4, O1, S2, U1, U2, V1, V2
	2	BB1, BJ1, BQ2, BS2
Active transactional triads (before transition)	2	BV2
Dissolved triads (before dissolving)	1	K1, K2, T2

In addition to the similarity, it was difficult to compare dissolved triads between two stages because only Stage 1 had dissolved triads. However, in those triads showing difficulty in comparison, customers also ensured long term stable transactional structure before dynamics by controlling suppliers and LSPs.

In sum, although the two stages showed certain different triadic structures, both the similarities and differences between the two stages indicate one common finding: with strong buyer power from stable purchasing volumes, the customer can ensure long term stability of a triadic structure before and after dynamics in a triad by controlling the supplier and LSP to impede changes in embedded dyads.

6.7.2 Suppliers as focal firm

Table 6.8 presents all triads that were governed by suppliers in the two stages. In all of these triads, suppliers used strong supply power to dominate customers and applied buyer power to control LSPs.

Table 6.8: Stages 1 & 2: Supplier as focal firm controlling customer and LSP

Classification of triad	Stage	Supportive triad	Purchasing volume & resource capability
Static transactional triads	1	J2	Stable
	2	BA1, BL1, BL2, BQ1, BW1, BW2, CC1, CC2	Stable
Active transactional triads (before transition)	2	BH1, BN1	Stable
Dynamic partnership triad	2	BK2	Stable (before transition)

Although suppliers governed more logistics triads in Stage 2, the power games among organizations in these triads were same in both stages. In dyads between suppliers and customers, suppliers gained strong supply power from strong resource capability to control customers for two reasons (see Figure 6.5).
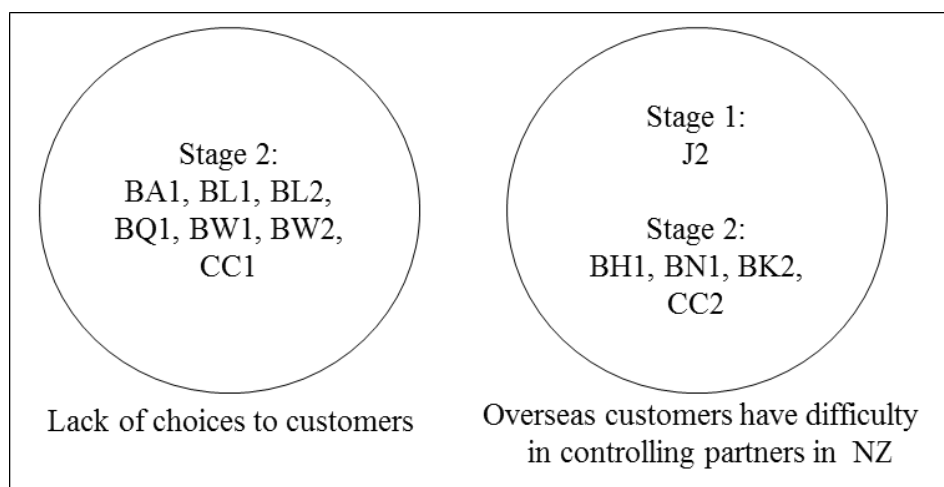
Figure 6.5: Explanations for suppliers dominating customers

One reason was that customers had difficulty in finding other suppliers that had similar strong resource to satisfy customer requirements. The representative opinion was provided by a couple of interviewees:

…we are the largest supplier in NZ market, other companies are hard put to serve their [customer] requirements with such low cost …(Triad BA1)

…we are more professional than others to provide this kind of fish in NZ, customers rely more on us…(Triad BL1)

The other reason was that customers came from overseas. They found it difficult to influence NZ-based suppliers, LSPs, and connections between suppliers and LSPs. Therefore, suppliers dominated customers in these triads. One interviewee said:

…the overseas customer needs us to select the logistics company for them in NZ market, they also need us to organize the whole process to deliver products and service for them… (Triad BK2)

In dyads with LSPs, as LSPs' direct customers in these triads, suppliers showed stronger buyer power to dominate LSPs. Customers and LSPs were independent of each other because suppliers organized the whole process and mediated connections between customers and LSPs.

As shown in Table 6.8, in all triads within the two stages, organizations kept stable purchasing volume and resource capability. Even in the dynamic triads, in the periods before transition, organizations' purchasing volume and resource capability were also stable. The similarity between the two stages indicated, when purchasing volumes and resource capability did not change, suppliers could retain dominance over customers and LSPs to ensure stable transactional and partnership structures over time.

In contrast, after transition, the power games among organizations were changed in certain triads. This finding revealed a new control approach to explain how a focal firm dominates logistics triads when the focal firm shows interdependence with one non-focal firm in a triad. Both the two control approaches identified in Stage 1 indicate that the focal firm is the most powerful organization in a triad. However, in the new control approach, the focal firm does not have to be the most powerful in the triad.

6.8 Stable triadic structures: New control approach

All static partnership triads and active transactional triads in Stage 2 showed that the focal firm could dominate a logistic triad when the focal firm had interdependence with one partner in the triad (see Table 6.9). The new control approach was reflected in two situations. The next section will introduce the first situation: customers governing triads and showing interdependency with suppliers in triads.

Table 6.9: Interdependence between focal firm and one non-focal firm

Focal firm	Interdependent partner	Triadic structures	Supportive triads
Customer	Supplier	Static partnership triads	All in Stage 2
		Active transactional triads (after transition)	BV2
Supplier	Customer	Active transactional triads (after transition)	BH1, BN1

6.8.1 Customer dictating triads through interdependence with supplier

This situation has two kinds of logistics triads. In all static partnership triads within Stage 2, customers and suppliers showed equal power and interdependence in their collaborative dyads from the first day because they had been the key business partner to each other in NZ market from a long time previously. Both sides found mutually benefit in collaboration. The buyer power and supply power were equal between the two partners. This relationship did not exhibit any change in the duration of the triad. One of the interviewees noted:

> …we have known each other very well for a long time, working closer
> can help both sides to gain more profits. Because we rely on each other,
> we treat each other friendly, our large orders are significant to their
> business, their products are also critical to our business in NZ… (Triad
> BC1)

In contrast, as the LSP only supplied basic transportation services, the customer
gained strong buyer power from large purchasing volumes to dominate the LSP.
In addition to two direct links, the customer could also mediate the dyad between
the LSP and the supplier. In order to keep a simple process in the triad and
prevent the LSP's opportunistic behaviour, the customer encouraged a stable
transactional dyad between the supplier and the LSP. Triad BC2's explanation of
this phenomenon was representative:

> …if they [supplier and LSP] work too closely, we may have some
> troubles because the logistics company can introduce other customers
> to the supplier. If the supplier has collaborations with other customers,
> we need to face more strong competitors in the market, therefore, we
> organize the process and control their communications to avoid
> potential risks, the supplier also do not want to make us upset, so they
> [supplier] only keep basic communication with the logistics
> company… (Triad BC2)

Based on mutual benefits between the supplier and the customer, the supplier did
not see any necessity to interfere with the control from the customer in the triad.
Therefore, the supplier only kept a transactional dyad with the LSP under the
influence from the customer. Figure 6.6 illustrates this kind of power games
among organizations in static partnership triads within Stage 2.
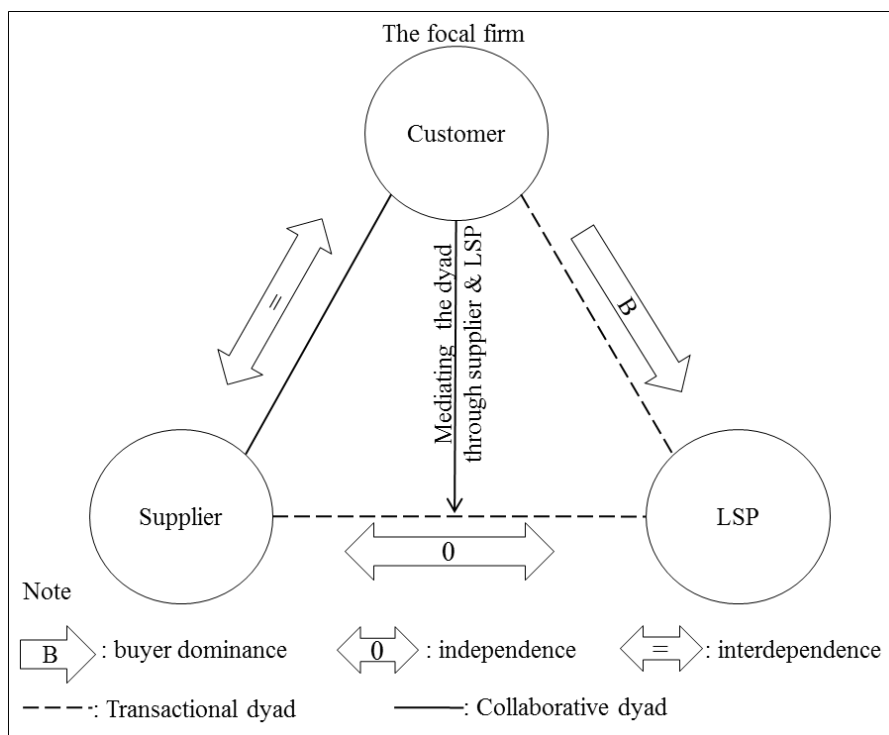
Figure 6.6: Stage 2: Power games in static partnership triads

Other literature suggests that a focal firm with high degree of influence in a network can affect embedded dyads between organizations (Harland, Zheng, Johnsen, & Lamming, 2004; Kaipia et al., 2006). Accordingly, although the customer and supplier had equal power in the figure, the customer still acted as the focal firm to dictate the triad because the customer showed more influence than the supplier on embedded dyads among all organizations. As neither the customer nor the supplier showed change in purchasing volumes and resource capability, they maintained interdependence. Therefore, the customer could ensure stability of the partnership structure by inhibiting changes in embedded dyads.

Compared to static partnership triads in Stage 2, one active transactional triad (BV2) showed a similar situation after transition. The only difference between these two kinds of triads is that the customer had collaborations with both the supplier and LSP in the triad BV2 after transition. In contrast, the customers only collaborated with suppliers in static partnerships triads.

Figure 6.7 presents the power games in triad BV2 after transition. Although the customer collaborated with both partners, it only showed equal power and

interdependence with the supplier. In the dyad with the LSP, the customer used stronger buyer power to control the LSP and their collaboration.
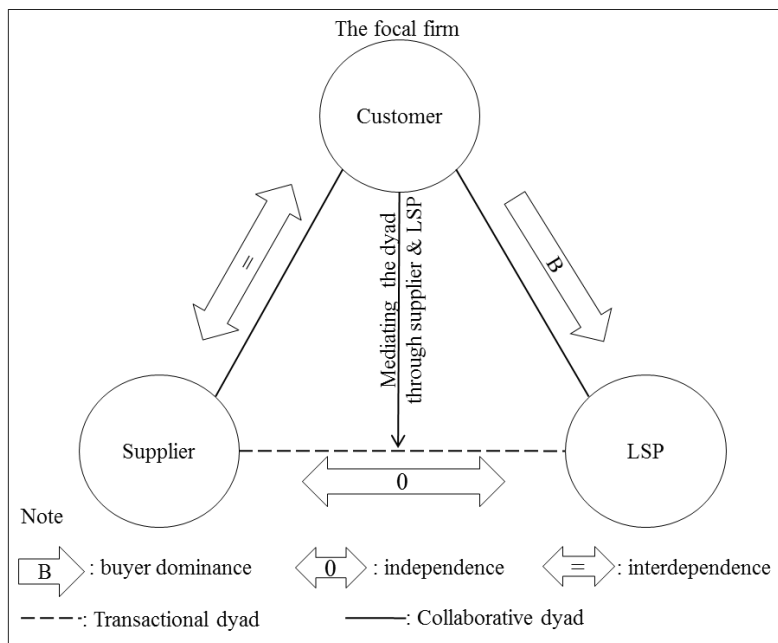
Figure 6.7: Triad BV2: Power games after transition

> …we also have collaborations with the logistics service provider and our supplier for different reasons. Collaborating with supplier can be because their investment on equipment can offer unique products we need. We depend on each other to enhance our business revenues, at the same time, collaborating with that company [LSP] can help us save logistics cost, we can ask them to reduce quotation price further for our large orders… (Triad BV2)

The customer also mediated the supplier–LSP dyad. Because of equal power between the supplier and the customer, if the supplier and the LSP collaborated, the customer needed to face the potential danger of losing control in the triad.

> …both of them are critical to us in this case now, we hope to keep leading the relationships, if supplier takes over our position, we may lose profits… (Triad BV2)

Therefore, the customer encouraged the supplier and the LSP to keep a transactional dyad by controlling logistic outsourcing process. In this situation, the

supplier and the LSP could only keep independence between each other in the triad. After transition, purchasing volumes and resource capability did not change further in the triad. As a result, organizations' power and the power games among them did not change either. Consequently, after transitioning to the partnership structure, the customer could also ensure the stability of this structure over time by controlling power games to keep two collaborative dyads and one transactional dyad simultaneously.

In conclusion, the new approach identified from static partnership triads and the active transactional triad indicate a new finding that has not been identified in Stage 1. When equal power between the customer and the supplier leads to an interdependent dyad between them, the customer can dictate to the triad by controlling the LSP.

All triads explained in this section reflect the first situation described in the Table 6.9, the next section will introduce the second situation where suppliers dictated to triads and showed interdependence with customers.

6.8.2 Supplier dictating to triads through interdependence with customer

This situation was identified from two active transactional triads (BH1; BN1) after they transitioned to the collaborative structure. The situations of power games in these two triads were the same (see Figure 6.8).
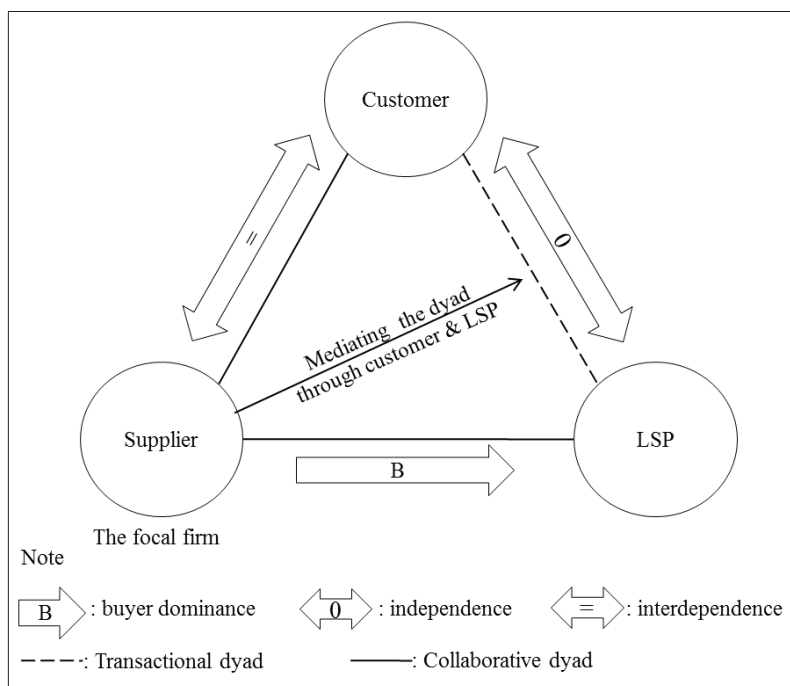
Figure 6.8: Power games after transition in Triads BH1 and BN1

Comparing Figure 6.8 with Figure 6.7, the power games among organizations within triads BH1 and BN1 shared close similarity with triad BV2. All three triads presented interdependency between suppliers and customers. Further, focal firms in these three triads dominated LSPs to control triads.

The only difference was that triads BH1 and BN1 were governed by suppliers not customers. However, the reason for suppliers keeping stable collaborative structure in these two triads was the same reason as for the customer ensuring a stable collaborative structure in triad BV2. When purchasing volume and resource capability did not change further after transition, the power games did not have further change either. Consequently, suppliers could ensure stability of collaborative structure in these triads by controlling power games to impede changes in embedded dyads.

6.8.3 Overview of interdependence between focal firm and non-focal firm

The two situations explained in the previous two sections provide a new finding for this research. When the equal power between two organizations leads to interdependence and collaboration between them in a triad, one of them can

dominate the third organization to dictate to the triad. This finding indicates that the focal firm does not have to be the most powerful party in a triad if this organization can dominate the weaker organization in the triad.

Further, by comparing the two stages, all triads showing collaborative dyads indicate that collaboration between two organizations can be developed by their interdependence or under one organization's dominance. Therefore, power games among organizations can determine changes in SCRs, thereby influencing dynamics of a triad. Previous studies argue that power games and coalition among organizations keep changing in a triad because every organization intends to control the other two organizations as much as possible, while business relationships should be long term stable connections between organizations (Bastl et al., 2013; Verwaal & Hesselmans, 2004; Zhao et al., 2008). In comparison with previous studies, this thesis indicates that a change power games can lead to the development of long term collaboration in a network although power games among organizations may keep changing.

In addition to triads where the focal firm showed interdependence with one non-focal firm, Stage 2 indicated that a focal firm could also dominate collaboration with one non-focal firm to encourage interdependence between the two non-focal firms in a triad.

6.8.4 Interdependence between non-focal firms

Both two research stages had triads showing interdependency between non-focal firms (see Table 6.10). However, the static collaborative triads were only identified in Stage 2.

Table 6.10: Interdependence between non-focal firms

Focal firm	Interdependent firms	Stage	Triadic structure	Supportive triad
Customer	Supplier & LSP	1	Dynamic transactional triads (after transition)	S2, U1, V1, V2
		2	Dynamic transactional triads (after transition)	BB1, BQ2, CB1
			Static collaborative triads	BK1, BU1

In Table 6.10, the dynamic transactional triads in both two stages shared a common finding that suppliers and LSPs showed interdependency and collaboration because of customers' pressure. In contrast, although the interdependency also helped suppliers and LSPs develop collaboration in the two static collaborative triads (BK1; BU1), suppliers and LSPs did not resist power from customers. Instead, they collaborated to satisfy customers because suppliers and customers also had collaboration. Triad BK1 expressed the opinion:

> …the overseas customer is critical to our business. Because their orders influence more around 60 per cent of our annual revenues, we need to try our best to satisfy them, we can't afford to lose them. They also need us because we are the largest and best NZ supplier that can supply this kind of fish. Other suppliers are not professional like us. Because time is critical to the delivery of live fish, we also need to collaborate with the logistics company to ensure the quick response in the delivery process. We need to help each other to fix all existing and potential problems for serving the customer. As we have already managed the whole process well, the customer only needs a basic business relationship with the logistics company…

As shown in Figure 6.9, customers dominated collaborations with suppliers and kept independence with LSPs in triads BK1 and BU1.
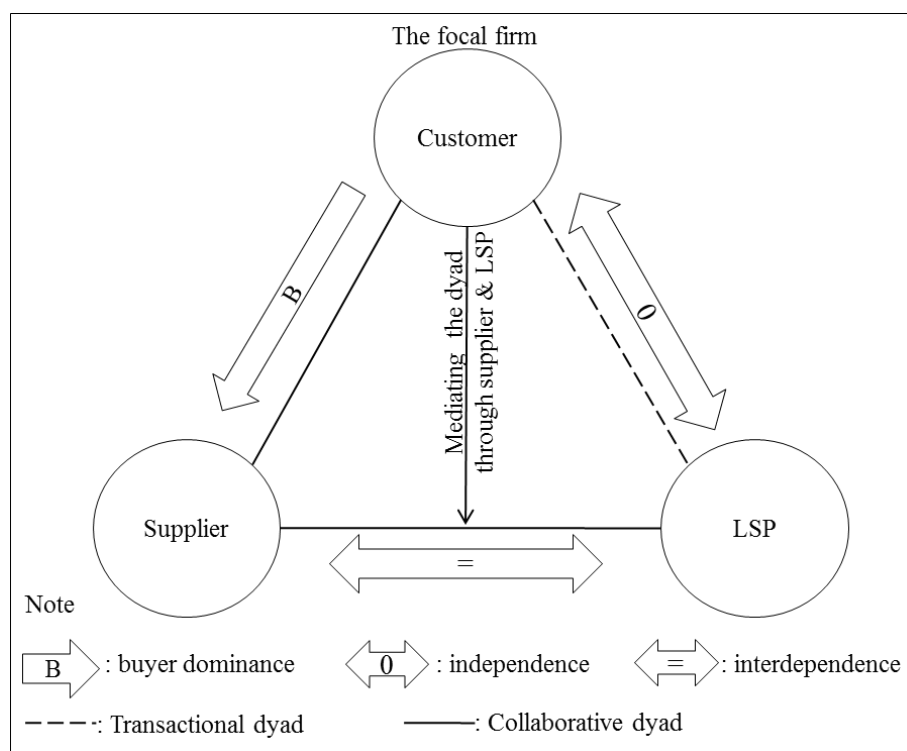
Figure 6.9: Stage 2: Power games in static collaborative triads

In these triads, although suppliers provided innovative products or held strong resources, their supply power still could not overwhelm customers' buyer power because customers' large purchasing volumes were significant in influencing suppliers' profits. Further, suppliers had difficulty in finding other customers that could offer such large purchasing volumes in the market. As a result, customers dominated collaborations with suppliers. Additionally, customers asked suppliers to select and manage LSPs. Therefore, customers and LSPs showed independence in their dyads and customers did not want to waste time and cost to manage dyads with LSPs. The approach was similar to the first control approach explained in section 6.6. The major difference is that the supplier dominated the LSP in the first approach; while it showed interdependence in this new approach.

In relationships between suppliers and LSPs, they relied on each other because suppliers offered large purchasing volumes to LSPs and LSPs' logistics services were important to help suppliers serving customers. In order to keep long term business with customers, suppliers and LSPs needed to collaborate to reduce the lead time and decrease total logistics cost to serve customers with the highest

performance. Therefore, by controlling large purchasing volumes to dominate suppliers, customers could mediate dyads between suppliers and LSPs.

In conclusion, by comparing triads where non-focal firms show interdependency between two research stages, this research reveals two ways to explain how a focal firm leads to the interdependency and collaboration between non-focal firms in a triad. When the focal firm does not collaborate with any non-focal firm in a triad, the two non-focal firms can collaborate against the focal firm's pressure. On the other hand, if the focal firm can show mutual benefit with one non-focal firm and two non-focal firms are significant to each other; non-focal firms will collaborate to satisfy the focal firm. This finding sheds a light on studies of power games in network structures. Previous studies usually focus on how two weaker organizations ally against the strongest one in a triad (Bastl et al., 2013; Pilbeam et al., 2012). Fewer studies investigate why and how two weak organizations collaborate to serve the strongest organization under influence from the combined effects of purchasing volume, resource capability, and focal firm influence.

6.9 Overview of stability in logistics triads

Findings in Stage 2 helped verify and adjust research findings regarding the focal firm's influence in determining the stability of triadic relationship structures. By combining the findings in the two stages, this research verifies that either the customer or the supplier can be the focal firm to control a triad if they can gain sufficient power from purchasing volumes or resource capability to dominate non-focal firms and embedded dyads.

Additionally, Stage 1 has identified two control approaches to show how the focal firm dictates a triad. These two approaches have also been identified and verified in Stage 2. In addition to verifying the two approaches, Stage 2 revealed a new control approach. This approach highlights the influence from the interdependence between focal firm and non-focal firms in a triad. When the focal firm shows interdependence with one non-focal firm, the focal firm can dominate the other non-focal firm to govern the whole triad even if the focal firm is not the most powerful organization in the triad. Further, the finding presents that the focal

firm can also control collaboration with one non-focal firm to mediate collaboration between two non-focal firms in a triad.

Finally, in all triads within both stages, if purchasing volume and resource capability are stable, the power games between the focal firm and non-focal firms do not change either. In this situation, the focal firm can use one of the three control approaches to ensure stable triadic structures by impeding dynamics in embedded dyads.

In sum, concerning stability in logistics triads, all findings identified in Stage 1 have been verified in Stage 2 because the two stages showed close similarity. The stability of logistics triads is significantly affected by the combined effects of purchasing volume, resource capability, and focal firm influence. Further, although only a few triads indicate a new control approach in Stage 2, it can be seen as a complement to the two approaches identified in Stage 1. Three control approaches work together to provide a full picture regarding how the focal firm controls non-focal firms and embedded dyads to ensure stability in logistics triads.

Having compared findings about the stability of triads, the next section will compare the findings about dynamics of logistics triads between Stage 1 and Stage 2.

6.10 Comparison of dynamics in logistics triads

Both stages indicated that the enhancement of purchasing volumes and focal firm's influence caused the change of triadic relationship structure in most dynamic triads. Further, these triads reflected that the business frequency could lead to the enhancement of purchasing volumes. In addition, market uncertainty and personal preference also showed similar influences in dynamic triads within the two stages.

6.10.1 Business frequency

Stage 1 indicated the connection between continuous customer demand and the enhancement of purchasing volumes. This connection helped foster collaborative dyads in logistics triads. As the focal firm, the customer could control the development of collaboration to dictate dynamics in triads. Stage 2 verified this finding from all dynamic transactional triads. Further, in Stage 2, a number of triads controlled by suppliers also showed dynamics because of the increase of purchasing volumes (see Table 6.11). In each dynamic transactional triad, the customer dictated the triad and encouraged one collaborative dyad in the triad because this could maximize the customer's profits. The main difference between the two stages was that the focal firm in three active transactional triads (BH1, BN1, BV2) because focal firms encouraged two collaborations not one in these triads.

Table 6.11: Stages 1 & 2: Influence from continuous demand in dynamic triads

Stage	Triadic structures	Supportive triads	Focal firm	Influence from focal firm
1	Dynamic transactional triads	All	Customer	dictating transition by encouraging one collaborative dyad in a triad
2	Dynamic transactional triads	BJ1, BO1, BQ2, BS2, CB1	Customer	
2	Active transactional triads	BV2	Customer	dictating transition by encouraging two collaborative dyads in a triad
2	Active transactional triads	BH1, BN1	Supplier	dictating transition by encouraging two collaborative dyads in a triad

Figure 6.10 shows the change of power games in triad BV2. Because of continuous customer demand, increased purchasing volumes helped the customer to foster collaboration with both the supplier and the LSP. Before transition, small purchasing volumes from the customer were not significant to the overseas supplier. Therefore, the supplier did not have an interest in interfering with the control by the customer. Consequently, the customer could dominate dyads with the supplier and the LSP.
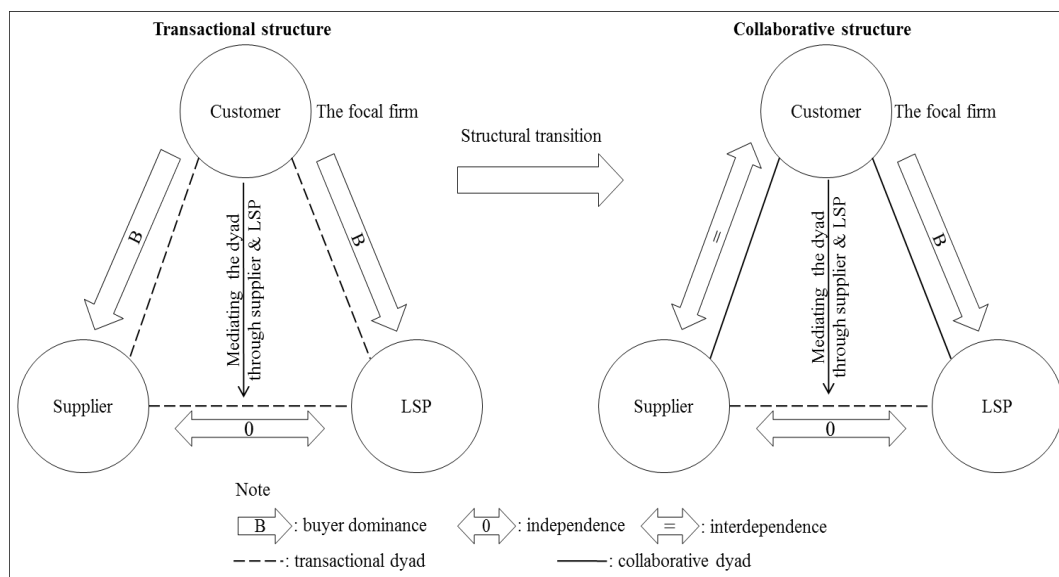
Figure 6.10: Change of power games: Active transactional triad BV2

As interviewee said:

> …before we decide to enhance orders from the supplier, we are not their key customers in their strategy. After we know more about the supplier, we believe they are reliable, so we improve our orders. More than that, we also began to order some specific products from them, new orders become important to the supplier's business, in order to keep business with us, they have invested in new equipment for offering and satisfying our requirements. From that moment, we come to rely on each other rather than keep distance between each other…
> (Triad BV2)

In contrast, with a change in purchasing volumes, large purchasing volumes significantly influenced profits for the supplier. The supplier invested to enhance resource capability and offer unique products and service to the customer. As a result, their supply power was increased significantly. The power game between the supplier and the customer changed from buyer dominance to interdependence. In the meantime, the LSP did not improve their resources. The customer could retain buyer dominance to control the LSP although they collaborated to save total logistics costs.

> …we only need normal logistics services from them [LSP], they do not
> need to change anything, in our collaboration, they just need follow
> our requirements to reduce logistics cost for us… (Triad BV2)

The customer was not the most powerful organization in the triad any more after the change because they were interdependent with the supplier. In this situation, to keep dominating the triad, the customer mediated the dyad between the supplier and the LSP by controlling the LSP. As a result, the customer could still dictate to the Triad BV2.

Compared to other triads in Table 6.11, BH1 and BN1 were the only two triads that were controlled by suppliers. This kind of dynamic triad was not found in Stage 1. Suppliers in BH1 and BN1 also developed collaborations with two partners because of the increased purchasing volumes.

Under the influence from continuous customer demand, customers' buyer power gradually became stronger with the increased purchasing volumes. In contrast, suppliers did not invest in resources to increase supply power. One interviewee noted:

> …we can supply best semi-finished products for them to produce
> final products. It is hard for them to find similar suppliers like us from
> NZ. Initially, they only ordered small quantity, as they are an overseas
> company, it was difficult for them to handle the supply and logistics
> process at the moment, they highly relied on us. However, after they
> began to order more and more from us, they became as our key
> customer, their order quantity is more than the sum of orders from our
> other overseas' customers. Growing with each other is the common
> goal for us now… (Triad BH1)

Therefore, once the size of volumes was large enough to significantly influence the supplier's profits, the power game between the supplier and the customer changed from supplier dominance to interdependence (see Figure 6.11). Previous

studies also suggest that two partners are interdependent and may develop collaborative SCRs when they are significant to each other (Cox et al., 2001; Watson, 2001).
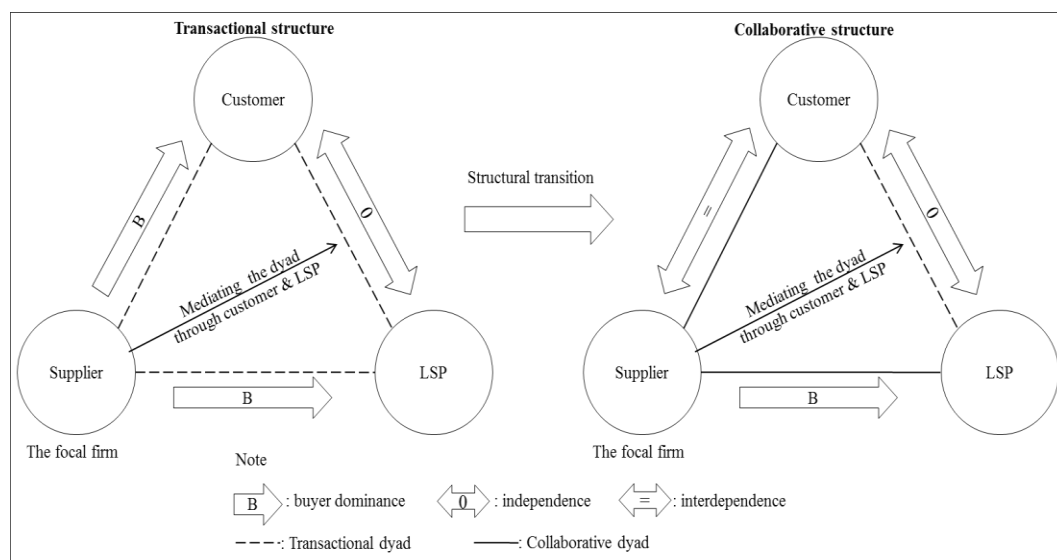
Figure 6.11: Change of power games: Active transactional triads BH1 and BN1

In addition to the change in relationships between suppliers and customers within triads BH1 and BN1, to retain their leading position in triads, suppliers dominated collaboration with LSPs and mediated dyads between LSPs and customers.

From the perspective of the three approaches that focal firms used to control triads, the focal firms in all active transactional triads changed from using the second approach to using the third approach because the focal firms showed interdependence with non-focal firms after transition. Therefore, both stages showed that the control approach used by the focal firm is dynamic. The focal firm needs to change approach in order to retain dominance in the dynamic triad.

Overall, although the situations in all active transactional triads were not identified in Stage 1, both stages shared the finding that the connection between business frequency and increased purchasing volume can help the focal firm to dictate a triadic relationship structure's transition from the transactional structure to other structures. Further, in order to retain dominance in triads, focal firms can change approaches to control partners and relationships in triads.

6.10.2 Market uncertainty

Market uncertainty led to two dissolved triads in Stage 1. In contrast, in Stage 2, market uncertainty only influenced a dynamic partnership triad (Triad BK2). Further, unlike the two dissolved triads, triad BK2 was dictated to by the supplier not the customer. As explained in the case description (see section 6.3.2), the agent (the customer) and the supplier would became potential competitors in the near future. In order to protect confidential business information, the supplier controlled supplying products to dominate the dynamics in the supplier-customer dyad by changing it from collaboration to a transactional type (see Figure 6.12). However, as the supplier needed time to build connection with the final customer outside the triad, the supplier preferred to retain the triad for a while. Further, in order to prevent the situation in which the LSP and the agent worked together to resist the supplier, by controlling communication and information sharing between the LSP and the agent, the supplier kept the LSP and the agent distant from each other in the triad.
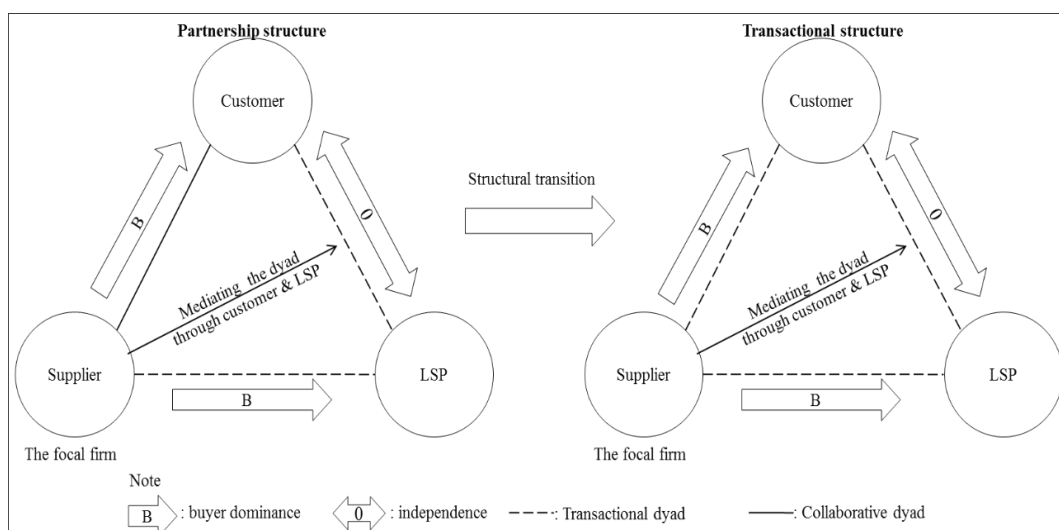
Figure 6.12: Change of power games: Dynamic partnership triad BK2

Overall, although the market uncertainty showed different influences in the dissolved triads and the dynamic partnership triad, the triads in the two stages shared one similar finding: the focal firm can use influence from market uncertainty to determine how a triadic relationship structure can be changed.

6.10.3 Personal preference

Concerning influence from personal preference, both stages indicated a common phenomenon: change of management personnel (see Table 6.12). According to the change, customers determined the dynamics of triads under the influence from personal preference.

Table 6.12: Stages 1 & 2: Influence from personal preference in dynamic triads

Stage	Triadic structure	Supportive triad	Influence from personal preference
1	Dissolved transactional triads	K1, K2	New manager's directly impacts the closeness of business relationships.
2	Dynamic transactional triads	BB1, BG1	

In Stage 1, because of the new personnel's preference, triads K1 and K2 dissolved under the control of the focal firm. However, in Stage 2, a new manager's preference helped transition triads BB1 and BG1 from the transactional to the partnership structure. One interviewee noted that:

> …the original manager preferred cutting costs from us, because we only supplied basic materials, he did not have any interest to collaborate with us. Our relationship changed because they sent a new manager a couple of years ago. The new manager has his own management experience, he believed that collaboration with us can help them minimize their management cost in the logistics process if we keep supplying large orders for them… (Triad BB1)

In these two triads, before the change of personnel, although the customers offered large purchasing volumes, they did not collaborate with any partners because suppliers and LSPs could only offer commoditized services and products. However, after changing personnel, the new managers of the customer organization believed that collaboration with the suppliers could decrease total costs by saving transactional costs for large purchasing volumes. Therefore, customers dominated suppliers to develop collaboration in these triads. The triadic structure was also changed because of the change in customer-supplier dyads.

In conclusion, both stages showed influence from personal preference in different kinds of logistics triads, they shared the idea that the personal preference can

connect with purchasing volumes to assist the focal firm in determining dynamics of logistics triads.

6.10.4 Overview of dynamics in logistics triads

The comparison between the two stages identified three of the same influential factors (business frequency, market uncertainty, and personal preference) that can lead to dynamics in logistics triads. However, both stages showed that the major influences from these factors were to initiate the change of purchasing volume and resource capability. In this situation, organizations' buyer power and supply power were also changed. Accordingly, power games between the focal firm and non-focal firms were dynamic. Through influence from the dynamics of power games, the focal firm could dictate transitions of logistics triads by controlling dynamics in embedded dyads.

The major difference between the two stages was that only the customer showed significant focal firm influence in Stage 1. In contrast, the second stage indicated that either suppliers or customers could dictate to logistics triads. This difference was caused by interviewees' positions in the two stages. In Stage 1, all interviewees came from LSPs. As LSPs were usually selected and dominated by customers or suppliers, it was difficult for LSPs to mediate supplier-customer dyads. Therefore, interviewees from LSPs did not know much detail of the power games and relationships between suppliers and customers in triads.

In Stage 2, all interviewees came from suppliers and customers. As most triads were dominated by customers or suppliers, these interviewees knew more about power games among all organizations in triads. They also understood how the process of logistics outsourcing was controlled. Therefore, they could offer more information regarding the focal firm's influence in logistics triads. This finding indicates that comparison between the two stages helped to triangulate and validate the validity and reliability of research outcomes.

In conclusion, although there were certain differences, the two stages shared close similarity regarding the influential factors. This thesis indicates that the influences

from the focal firm, dynamics of purchasing volume, and changes in resource capability are more significant than other factors to determine the dynamics of logistics triads.

In addition to findings regarding the stability and dynamics of triadic structures, both stages also identified similar factors that impacted stability and dynamics in dyadic relationships.

6.11 Comparison of factors focusing on dyadic relationships

Logistics triads in both two stages showed close similarity regarding factors that affected dyadic relationships. Although these factors did not directly impact the stability and dynamics of logistics triads, they could help to validate the significance of purchasing volumes and resource capability in logistics triads. The only new finding from Stage 2 was the cooperative behaviour between partners. As the influences from other factors were highly similar in both stages, for brevity, the supportive triads of these factors have been attached in Appendix G (see Tables G.83, G.84, and G.85). This section focuses on the influence from the cooperative behaviour.

6.11.1 Cooperative behaviour

This behaviour was detected in both static and dynamic logistics triads that had collaborative dyads. This relationship behaviour displayed a connection with large purchasing volumes. Interviewees said:

> ...their annual orders are really big and important to us, and as we are their top suppliers in terms of other businesses, collaboration is good for both sides. We need, and are happy, to make adjustments to match their demands, and likewise… (Triad CA2)

> …with the enhancement of customer orders, all of us can realise higher profits than before, and if we have to change something for

them to make them happy in order to increase orders from them, then
we do that… (Triad BG1)

Table 6.13 shows all triads that supported cooperative behaviour in Stage 2. This
behaviour not only ensured stable collaboration in static triads; it could also help
partners evolve a dyad from the transactional to the collaborative type. The reason
for developing this behaviour was that profits from large purchasing volumes were
significant to partners in triads.

Table 6.13: Stage 2: Cooperative behaviour in triads

Triadic structure	Supportive triad	Influence from cooperative behaviour
Static partnership triads	BC1, BC2, BE2, CA1, CA2	
Dynamic transactional triads	All	Partners change relationship behaviour and process to cooperate with each other
Active transactional triads	All	

This behaviour was not emphasized by LSPs in Stage 1 because of the three
parties' different positions in a logistics triad. Most suppliers and customers only
outsourced basic logistics services to LSPs. In this situation, the cooperative
behaviour between LSPs and partners was not crucial to them although they might
have collaboration. However, in collaboration between suppliers and customers,
customer requirements could vary and be highly specific in different situations.
Here, as suggested in previous studies, cooperative behaviour in collaboration is
critical to help suppliers serve customers effectively (Fawcett et al., 2011; Mello
& Stank, 2005). Therefore, this behaviour was highlighted by suppliers and
customers in Stage 2.

Further, as each organization in a supply chain has perceived relationship
management differently (Hofstede et al., 2010; Liu et al., 2010), the cooperative
behaviour was difficult to be applied by all organizations in a triad. Therefore, this
behaviour did not directly impact on the stability and dynamics of a triadic
relationship structure.

Overall, in Stage 2, purchasing volume was the root cause for developing
cooperative behaviour between partners in particular dyads. In Stage 1, although

the behaviour was only identified in Stage 2, the finding that purchasing volumes were more significant than other factors that only influenced particular dyads in logistics triads could still be verified.

Having compared all findings between two stages, the next section will highlight the major research outcomes for this thesis.

6.12 Key findings

The two stages shared more similarities than differences. Because of close similarities, most findings identified in Stage 1 have been verified in Stage 2. Additionally, the difference between the two stages and new findings in Stage 2 also helped adjust and validate Stage 1's findings.

6.12.1 Stage 1 & 2: Significant influential factors

Both stages verified that business context factors and supply network factors show more significant influence than the other three categories of factors. By combining findings in the two stages, this research highlights that the combined effect of purchasing volume, resource capability, and focal firm is the primary influence to determine the stability and dynamics of logistics triads (see Figure 6.13). Previous studies suggest that relationship duration can impact on the change of SCRs (Zineldin, 2002; Sawhney & Zabin, 2002). However, the present research indicates that the time for relationship change is controlled by the change of influential factors. When the factors do not change, the relationship structure of a logistics triad will be stable over time.
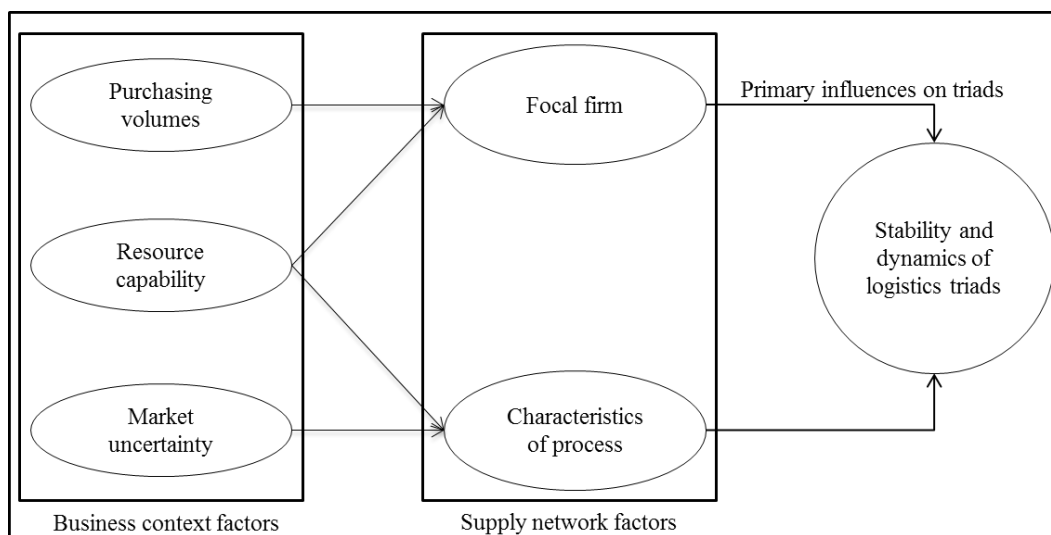
Figure 6.13: Stages 1 & 2: Significant factors influencing logistics triads

Compared to Stage 1 in which only purchasing volumes and the focal firm showed primary influence, Stage 2 proved that resource capability could also produce a primary influence because suppliers also showed significant focal firm influences to control triads.

Regarding the characteristics of process in triads, both stages highlight that the limited resource capability and market uncertainty in NZ lead to routine process in logistics triads. In this situation, focal firms prefer to keep stable purchasing volumes and do not change resource capability. As a result, the focal firms can ensure long term stability in a triad. If purchasing volumes or resource capability is changed in logistics triads, in order to protect profits and keep dominance in triads, focal firms manage dynamics in logistics triads by controlling partners to change embedded dyads.

Overall, in order to predict the evolution of logistics triads, the comparison between Stage 1 and Stage 2 helps identify three verified research findings by inserting influences from resource capability to adjust three observations (observations 3, 4, and 5, section 5.7) identified in Chapter Five (see Figure 6.14). As customers gained power from purchasing volume in most triads in Stage 1, observations 3 and 4 only highlighted the significance of these two factors. However, Stage 2 indicated that suppliers could gain power from resource

capability to dictate logistics triads. Therefore, both purchasing volumes and resource capability are important. Only observation 5 does not need adjustment because the findings of routine process were the same in both stages.
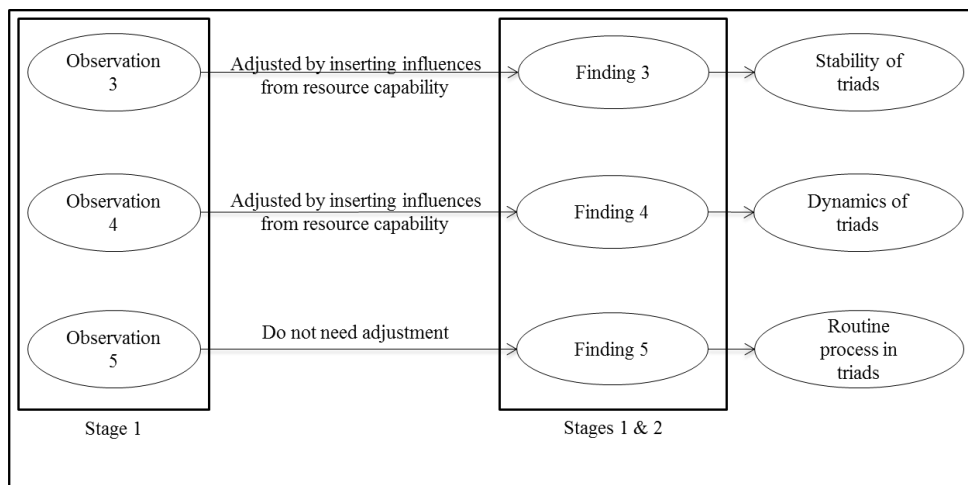
Figure 6.14: Validation of findings: Combined effects of business context and supply network factors

Finding 3: By operating stable purchasing volumes and resource capability, the focal firm can dominate a long term stable triad by controlling partners and impeding changes in embedded dyads.

Finding 4: According to a change in purchasing volume and resource capability, the focal firm shows significant influence in determining how a logistics triad evolves by dominating dynamics in embedded dyads.

Finding 5: Because of resource capability and market uncertainty in NZ, the influences from innovation frequency and competition focus are more significant than the number of competitors and volume of products to determine the characteristics of process in logistics triads.

In addition to influential factors, three control approaches used by the focal firm are important findings in this thesis.

6.12.2 Stage 1 & 2: Control approaches

The comparison between the two stages highlights three control approaches that a focal firm can use to dictate to a triad. All of these approaches highlight the major difference between dyadic and triadic relationship structures. As shown in Figure 6.15, by using the first control approach, the focal firm can control one non-focal firm to dictate to a triad. The focal firm can control two non-focal firms by using the second and the third approaches. Further, by using the third approach, the focal firm can dictate to a triad that has two collaborative dyads. However, when the focal firm uses the first or the second approach, they can only control the triad that has one collaborative dyad or does not have collaboration. Finally, with the change of dyadic relationships in a triad, the focal firm needs to change between these approaches to control the dynamics of triads. Otherwise, the focal firm's leading position can be replaced by non-focal firms.
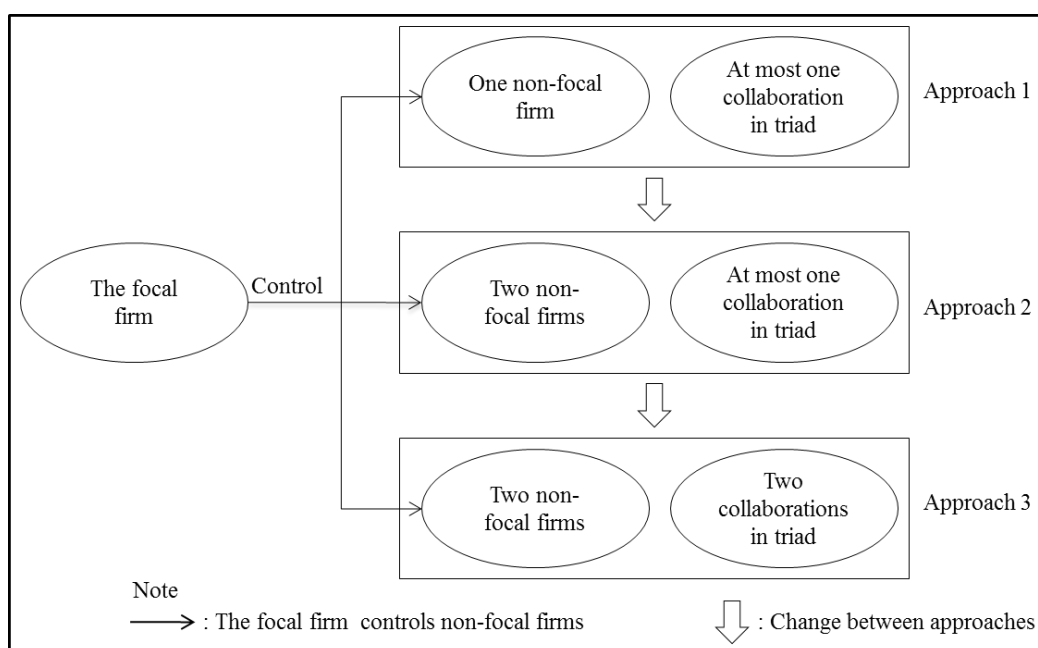
Figure 6.15: Validation of findings: Three control approaches

The third approach identified in Stage 2 helps adjust the two observations (observations 6 and 7, Chapter Five, section 5.8) regarding control approaches in Stage 1. The adjustment leads to two research findings for this thesis.

Finding 6: The focal firm can either control one partner or control both partners to dominate the stability and dynamics of a triad through three different approaches even if the focal firm is not the most powerful organization in the triad.

Finding 7: In order to control the transition of a triad, the focal firm can change between three approaches to manage the dynamics of power games among organizations in the triad.

The findings of control approaches verified the significance of the focal firm in a network structure. Consequently, both stages shared a common finding that supply network model is more appropriate than balance theory to study the logistics triads.

The next section will use the findings to validate the modified evolution model to explain dynamics in the logistics triads.

6.12.3 Validated evolution model

Chapter Five has proposed a modified evolution model to show dynamics in logistics triads. By combining the findings regarding business context factors and supply network factors in the two previous sections, this thesis indicates that the modified evolution model developed in Stage 1 only needs a little adjustment. Stage 1 highlighted the significance of customers as they acted as focal firms in almost all triads. Therefore, the core of the modified evolution model only includes customers and their power source (purchasing volume). In contrast, as shown in comparisons between the two stages, suppliers also dictated stability and dynamics in a number of triads within Stage 2. Therefore, in the validated evolution model, the core includes both power sources (purchasing volume and resource capability) and highlights that logistics triads are not only controlled by customers because suppliers can also be focal firms in triads (see Figure 6.16).
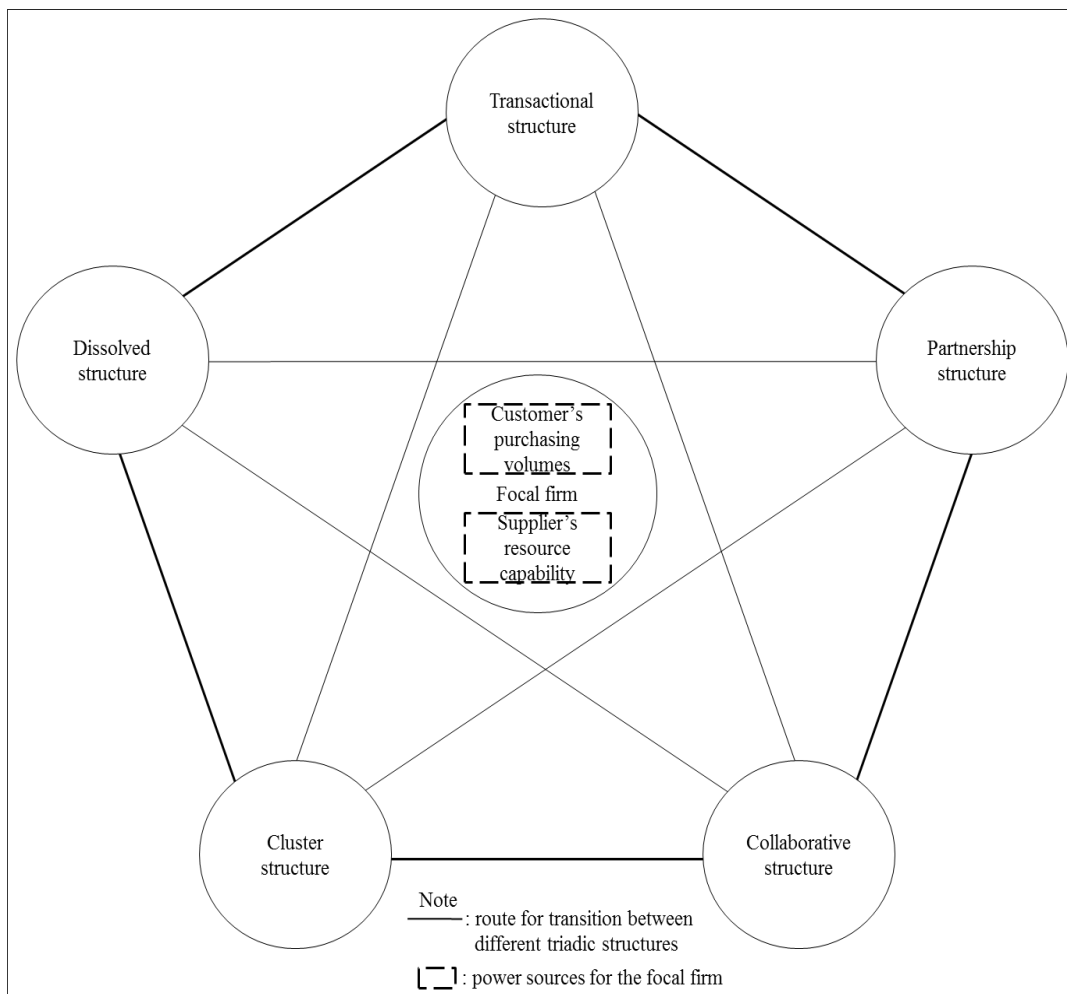
Figure 6.16: Validated evolution model: Dynamics in logistics triads

The validated evolution model does not include LSP for the consideration of research validity and reliability. In both the stages, only one triad was controlled by an LSP in Stage 1. In this situation, it is difficult to ensure the validity and reliability of this finding because it lacks triangulation and validation of research data.

Overall, concerning the two research questions, the validated evolution model indicates that no factor can work alone to influence logistics triads. The combined effects of focal firm, purchasing volume, and resource capability show primary influence in logistics triads. In this situation, the stability of relationship structure and functionality of a logistics triad are not determined by whether or not the triad has a balanced relationship structures. Under the combined effects of different influential factors, the focal firm can not only ensure long term stability of relationship structure and functionality in logistics triads, it can also dictate

transitions between triadic structures in logistics triads. From an empirical view, the power games between the customer, supplier, and LSP in a triad can determine which the focal firm in the triad is. The focal firm can use its power to dominate a logistics triad by controlling all partners and related relationships.

6.13 Conclusion

In summary, after examining balance theory, testing the research propositions against empirical data, and comparing the findings identified in both stages, this chapter has triangulated and verified a number of research findings which can explain the dynamics and stability of logistics triads. Theoretically, this research has argued that the supply network model is a more suitable theoretical lens than balance theory to study logistics triads; given balance theory has two limitations in studying logistics triads. Both stages lent support to a validated evolution model which proved more effective than the original conceptual framework to explain how triadic relationship structures transition over time in logistics outsourcing context. Empirically, from the view of identified influential factors, they work in an integrative way to determine the stability and structural transition in logistics triads. The combined effects of focal firm, purchasing volumes, and resource capability show as the most significant influences to affect logistics triads. The next chapter will discuss these major findings by comparing them with extant supply chain studies to highlight the contributions of this thesis.

Chapter Seven: Discussion

7.1 Preview

This chapter discusses the findings of the present study by comparing them with extant supply chain research. The discussion addresses the two research questions and the research goal. First, this chapter will present how research findings are connected with the two research questions. Second, as the research design was developed according to balance theory, two limitations of balance theory identified in the present study are compared with extant research to elucidate the insufficiency in applying this theory within supply chain studies. Then, the findings relating to significant influential factors are discussed to distinguish how the combined effects of three most significant influential factors influence evolution of relationships in logistics triads. Finally, in order to show a full picture of stability and dynamics of logistics triads, an integrative model is developed by combining all findings in this thesis.

7.2 Matching research questions with research findings

The current research has identified and verified seven findings which can address the two research questions. As shown in Figure 7.1, findings 1 and 2 are the identified limitations of balance theory. These findings indicate that balance theory is insufficient to answer the first research question: How do the relationship structures within a logistics triad transit over time? In contrast, in order to answer the second research question, five findings validate that the combined effects of three significant influential factors (purchasing volumes, resource capability, and focal firm) show primary influence in determining the stability and dynamics of logistics triads. Additionally, these five findings can also address the first research question. Consequently, the combined effects of influential factors are significant in achieving the research goal.
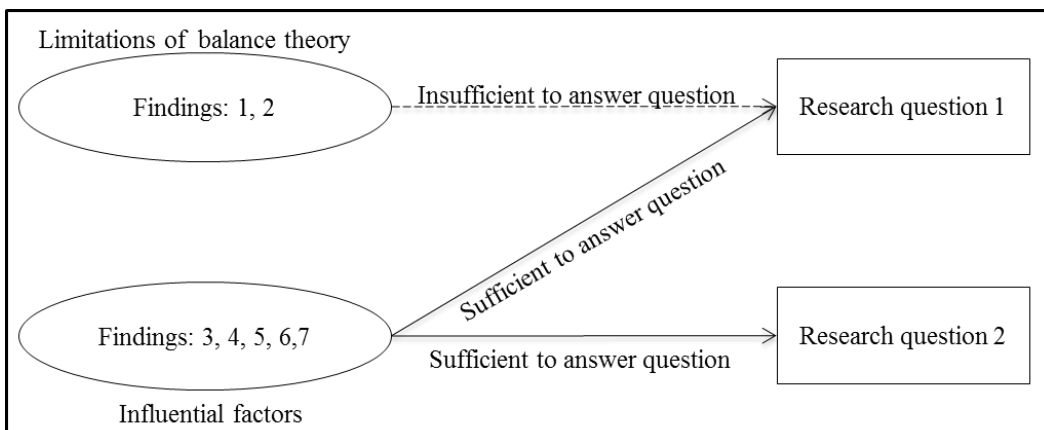
Figure 7.1: Matching research findings with research questions

As the initial research design was based on balance theory, the next section starts from discussing findings relating to this theory.

7.3 Discussion: balance theory

7.3.1 Limitation 1

This limitation concerns the situation when the type of inter-organizational dyad is determined by relationship activities not the organization's attitude in a triad. Based on balance theory, three individuals' personal attitudes (like or dislike) toward each other can determine development of inter-personal links in a triad thereby influencing the stability and dynamics of the triad (Heider, 1958; Newcomb, 1961).

In order to apply balance theory, previous research adopted organization's attitude to indicate whether or not two organizations have positive or negative relationships in an inter-organizational triad. Phillips et al. (1998) use satisfactory and unsatisfactory to indicate positive and negative inter-organizational relationships between organizations in a triad. Further, Eggert et al. (2012) apply loyalty to assess positive and negative dyadic SCRs between organizations in a triad. Although these studies investigate inter-organizational triads, the development and dynamics of embedded dyads between organizations are similar to interpersonal relationships (Mavondo & Rodrigo, 2001). As explained in other research, the influence from attitude in interpersonal dyads and inter-organizational dyads does not show significant difference because the

socialization behaviours in interpersonal and inter-organizational relationships share close similarities (Bendapudi & Berry, 1997; Kelly, 2004).

In contrast, Choi and Wu (2009a) test balance theory by using two types (adversarial and cooperative) of business relationships, not organizations' attitudes, to represent positive and negative links between organizations in a triad. However, the researchers have not collected empirical data to test their research propositions.

In comparison with previous research, similar to Choi and Wu's research (2009a), this thesis has applied two relationship types (transactional and collaborative) to distinguish positive and negative dyads in a triad. Further, relationship activities (such as information sharing, resource sharing, joint efforts, and communication frequency) have been used to assess whether the embedded dyads are transactional or collaborative links in a logistics triad. Consequently, in a triad, the identification of positive and negative dyads is determined by relationship activities not organizations' attitudes. As a result, the change of three embedded dyadic relationships in a logistics triad is not significantly affected by organizations' attitudes either. In this situation, it is difficult to use balance theory in explaining the stability and dynamics of logistics triads.

The result of comparison indicates that the difference between interpersonal and inter-organizational relationships makes it difficult to study an inter-organizational triad through balance theory when inter-organizational dyads are not influenced by organizations' attitudes.

7.3.2 Limitation 2

Previous balance theory research focused on how a triad evolves under influences from inter-personal or inter-organizational relationships in a triad (Carter, 2011; Choi & Wu, 2009a). Little research has investigated how uncertainty of wider network affects dynamics of a triad.

However, the present study indicates that organizations coming from the wider network also influence the stability and dynamics of logistics triads because any organization in a triad can be replaced by organizations outside the triad. In this situation, the original triad no longer exists (triad dissolution). Further, in order to deal with influences from market uncertainty, organizations in a triad can also change an existing triadic relationship structure by changing one or more embedded dyads. As balance theory does not explain influences outside a triad (Heider, 1958), the theory is also insufficient to study evolution of a triadic structure when organizations and dyads in a triad are impacted by the uncertainty of a wider network.

Although balance theory is insufficient to study the stability and dynamics of logistics triads in the present study because of two limitations, this theory still shows certain effectiveness.

7.3.3 Effectiveness of balance theory

In this thesis, balance theory can explain why a logistics triad transitions from a transactional to a partnership structure when two organizations dislike the third organization in a triad. In this situation, the development and change of dyadic relationships between organizations are significantly influenced by organizations' attitudes. In other studies, balance theory is also effective in explaining the stability and dynamics of inter-organizational triads if the dynamic of dyadic SCRs are determined by organizations' attitudes (Eggert et al., 2012; Mena et al., 2013; Phillips et al., 1998). The similarity between previous studies and the current research indicates that this theory is appropriate for studying inter-organizational triads when organizations' attitudes show primary influences to determine development of relationships.

7.3.4 Overview

By combining the two limitations and the only effectiveness of balance theory, Figure 7.2 outlines a condition to decide whether balance theory is suitable to study an inter-organizational triad. When a triad is not influenced by uncertainty outside the triad and embedded dyads are determined by organizations' attitudes,

balance theory can be effective to predict stability and dynamics of inter-organizational triads. Otherwise, the theory is insufficient.
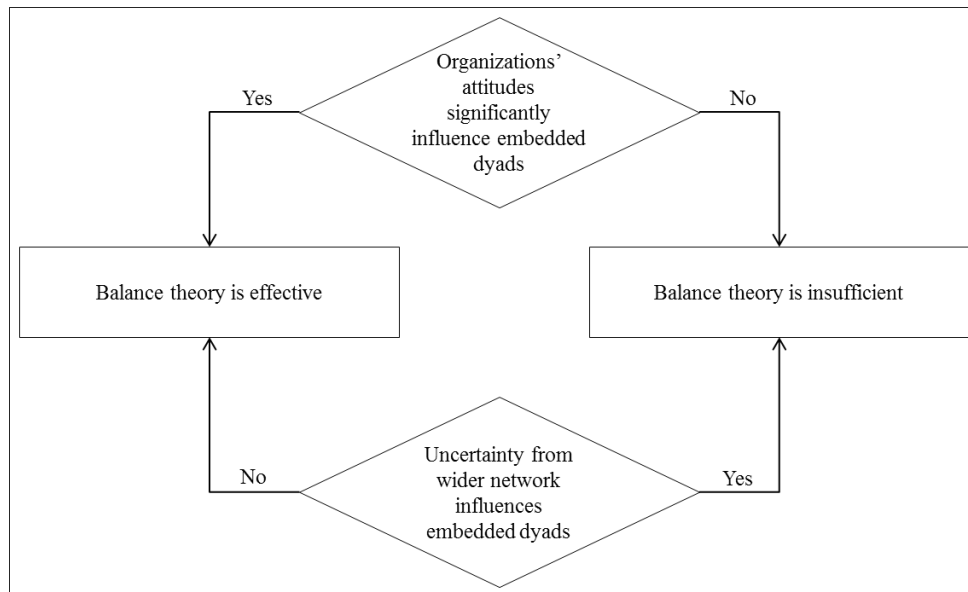
Figure 7.2: Conditions to select balance theory in studying inter-organizational triads

In comparison with balance theory, three significant influential factors are more effective in studying logistics triads. The next section will discuss findings regarding these influential factors and their combined effects.

7.4 Discussion: significant influential factors

The combined effects of purchasing volumes, resource capability, and focal firm override influences from all other factors to determine the stability and dynamics of logistics triads. According to the combined effects, this thesis has identified five findings to explain how the focal firm can gain power from purchasing volume or resource capability to control non-focal firms and how the focal firm uses three control approaches to determine stability and dynamics of a triad in different situations. These five findings not only share similarities with other research, they also add new layer of ideas to study the dynamics of SCRs from a network perspective. These similarities and differences are reflected from three directions, discussed in following sub-sections.

7.4.1 Integration of different variables in a triad

Based on combined effects, the present study investigates the evolution of relationships in a triad through connections among a number of variables: power sources (purchasing volume and resource capability), focal firm influence, power games, and development of relationships. Purchasing volumes or resource capability help organizations obtain buyer power or supply power in a triad. According to power games among three organizations, the strongest can act as the focal firm to determine the stability and dynamics of a triad by managing embedded dyads.

This thesis identifies four triadic structures (transactional, partnership, collaborative, and cluster) and one dissolved structure. According to finding 3, if a triad operates with stable purchasing volumes and resource capability, the focal firm can use either buyer power or supply power to inhibit dynamics in embedded dyads. In this situation, the focal firm can help the triad maintain any triadic structure in the long term without change. In contrast, finding 4 indicates the dynamics of triad. According to the change in purchasing volumes or resource capability, the focal firm can use either buyer power or supply power to manage dynamics in embedded dyads thereby controlling the transition of the triad among the four triadic structures and dissolved structure. Both findings 3 and 4 indicate that influences from purchasing volumes, resource capability, focal firm, power games, and development of relationships can be integrated to study dynamics of network structures.

Previous network studies lack integration of these influences. A number of studies use power games among organizations to identify the focal firm in a network and to study the dynamics of the network (Crook & Combs, 2007; Griffith, Harvey & Lusch, 2006; Wu et al., 2010). For example, under pressure from the focal firm, weak organizations can form a coalition against the focal firm (Pilbeam et al., 2012; Zhao et al., 2008). However, these studies lack a consideration of matching the change of power games with the development of inter-organizational relationships in network structures because they suggest that dynamics of power

games cannot represent long term business relationships in networks (Bastl et al., 2013; Verwaal & Hesselmans, 2004).

Other network studies focus on connecting the development of inter-organizational relationships with purchasing volume and resource capability (Huuskonen, 2014; Li, Shi, Gregory, & Tan, 2014; Lorentz, Kittipanya-ngam, & Srai, 2013; Xu, Koh, & Parker, 2009). The enhancement of purchasing volumes and development of unique resources can cause dynamics within networks by encouraging collaboration among organizations (Choi, Dooley, & Rungtusanatham, 2001; Huuskonen, 2014; Moser et al., 2011; Palsule-Desai et al., 2013). Nevertheless, these studies lack a view on how to connect the dynamics of power games with the change of purchasing volumes and the change of resource capability. As a result, it is difficult to understand how the focal firm controls a change of power games to influence the development of inter-organizational relationships and manage dynamics of whole network structure.

Although a few supply chain studies indicate the connection between power sources, power games, and development of relationships, these studies focus on dyadic relationships (Cox, 2001b; Watson, 2001). They do not consider how the focal firm controls power games between more than two organizations to influence the dynamics of a network structure.

Overall, previous network studies and dyadic SCR studies show their limitations regarding the connections among power sources, focal firm, power games, and development of SCRs. In contrast, through the identification of the connections, the present study bridges the dynamics of dyadic SCRs with the dynamics of network structures because the focal firm can control power games to influence embedded SCRs, thereby determining the dynamics of a network. Additionally, concerning the difference between dyadic relationship structure and network structure in supply chain context, this thesis specifies the influences of the focal firm's mediating effect in a triad.

7.4.2 Focal firm's mediating effect in a triad

Compared to dyadic SCR, previous studies indicate that the significant difference of network structure is organization's mediating effect (Mena et al., 2013; Nooteboom, 2006). This thesis shows that, through power games, the focal firm can mediate the dyad between the two non-focal firms by controlling at least one non-focal firm in a triad. However, except in triadic relationship studies (Choi & Wu, 2009a; van der Valk & van Iwaarden, 2011; Wu et al., 2010), most literature relating to other network structures has not explained how one organization mediates its indirect supply chain relationships between other organizations in a wider network.

Additionally, although other triadic relationship studies have investigated the mediating effect, they focus more on how an organization gains power from information asymmetry or unique resources to mediate its indirect relationship in a triad (Dubois, 2009; Li & Choi, 2009; Mena et al., 2013). The present study indicates that purchasing volumes can also be a power source to help the focal firm mediate indirect relationships in a triad.

Overall, based on the mediating effect and connections among different variables, this thesis demonstrates that the combined effects of the two power sources (purchasing volumes and resource capability) and focal firm can help to explain the stability and dynamics of a triad in more detail. Further, concerning stability of a triad, the present study highlights that the routine process can also assist in ensuring a stable triad over time.

7.4.3 Routine process in stable logistics triads

The connection among resource capability, market uncertainty, and characteristics of the network process shows an influence on determining stability of logistics triads. Because of limited resource capability and the small NZ market, suppliers and LSPs primarily compete on cost and exhibit low frequency of innovation in their offerings. In this situation, logistics triads usually operate with a routine process in NZ. As suggested by other studies, a routine process helps ensure long

term stability of a network structure by keeping embedded dyads stable (Kim et al., 2011; Skjoett-Larsen et al., 2003; Valkokari & Helander, 2007).

Concerning the characteristics of a process in a supply network, the major difference between the present study and previous studies is how to identify a routine process. Other studies suggest that a routine process should satisfy four conditions: low frequency of innovation, primary competition on cost, a small number of competitors, and a large quantity of product volumes (Harland et al., 2001 Harland et al., 2004; Kaipia et al., 2006). However, little research has compared the various significances among the four conditions.

In contrast, in the present study, although logistics triads operate with small volumes of products and there are a large number of competitive suppliers and LSPs in small markets, routine process is still a common phenomenon. Therefore, finding 5 indicates that, under the influence from organizations' resource capability and influences from market uncertainty, the impacts from innovation frequency and competition focus are more significant than the impacts from the volume of products and number of competitors in determining the characteristics of a process in a supply network.

In sum, because of influences regarding limited resource capability and a small market, a logistics triad operates with a routine process and shows a tendency to be stable in the long term.

7.4.4 Overview

Overall, this thesis has highlighted three findings (3, 4 and 5) relating to the combined effects of the three significant influential factors in investigating logistics triads. In addition to showing certain similarities with previous research, the present study has identified the connections among purchasing volumes, resource capability, focal firm, power game, and development of relationships in a network. These connections provide new ideas about how organizations determine stability and dynamics of triadic relationships. Additionally, based on the combined effects, this thesis has identified three control approaches to explain in

more detail how the focal firm controls the power game to manage evolution of relationships in a triad. These approaches will be discussed in the next section.

7.5 Discussion: control approaches in triads

The three approaches describe how a focal firm controls a logistics triad by governing two direct links and mediating the indirect link in a triad. Further, the focal firm can change approaches to ensure stability and manage the dynamics of a triad in various situations.

7.5.1 First control approach

By using the first approach, the focal firm directly controls one non-focal firm to manage a triad. This approach is only used when the customer controls a triad that operates with small purchasing volumes and shows a routine process. In order to save total transaction cost for small purchasing volumes, the customer maintains independence from the LSP and mediates the supplier-LSP dyad by controlling the supplier.

Compared to other network studies, the first control approach supports the idea that a customer can give autonomy to the supplier to manage other organizations in a network structure (Choi et al., 2001; Pathak, Day, Nair, Sawaya, & Kristal, 2007). However, previous studies suggest that the customer should only give autonomy to the supplier when the supplier can offer innovative products or services (Johnsen, 2011; Pilbeam et al., 2012). They lack consideration of influences from purchasing volumes. In contrast, in the present study, although the offerings from suppliers are not commoditized, the customer still gives autonomy to the supplier to manage the LSP in a triad because the profits from small purchasing volumes cannot compensate costs for the customer controlling both supplier and LSP.

Additionally, after giving autonomy to a supplier, a few studies indicate that the customer should use an intervention strategy to mediate the supplier's connections with other organizations in a network (Britton, Stewart, & O'Halloran, 2013; Johnsen & Ford, 2005). This thesis shares a similar idea because the customer

also mediates the supplier-LSP dyad by controlling the supplier. However, as shown in Figure 7.3, previous studies support the customer delegating management decisions to the supplier when the customer does not have direct connections with other organizations (Choi & Linton, 2011; Cox, 1999; Harland et al., 2004). In contrast, the present study identifies that the customer can also give autonomy to the supplier to manage the LSP even if the customer has direct connection with the LSP.
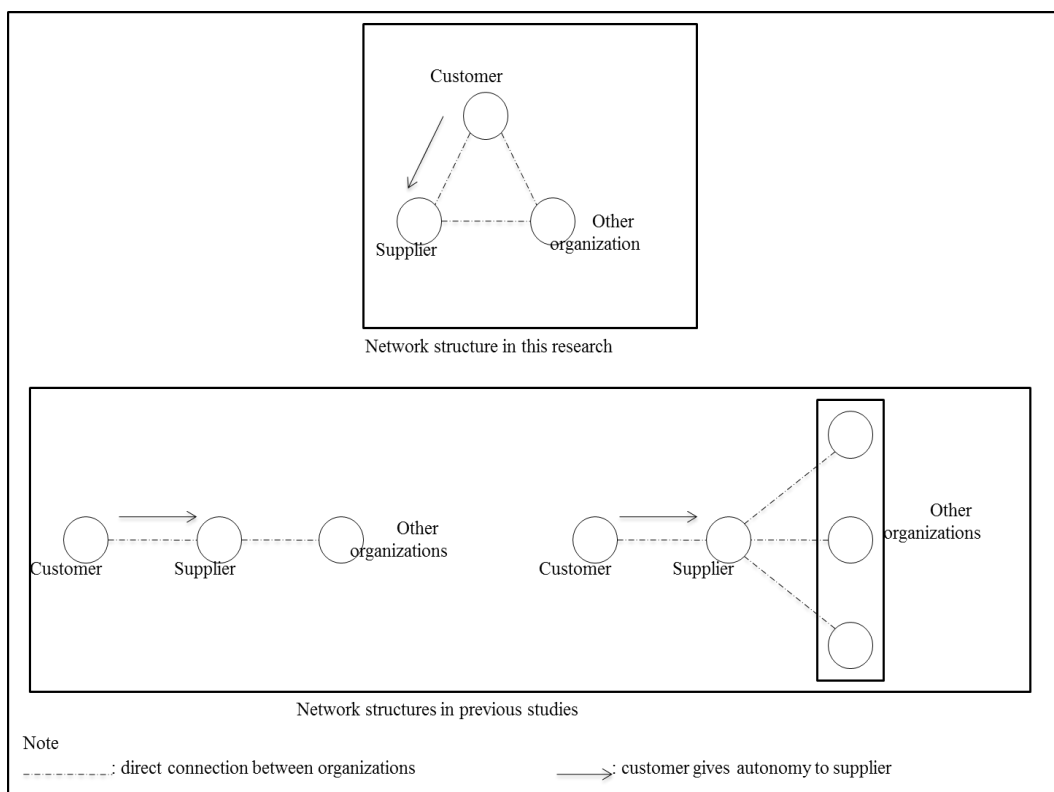
Figure 7.3: Comparisons: How customer gives autonomy to supplier to manage other organizations

The difference between previous studies and this thesis indicates that, except for supplier's resources, the influence from customer's purchasing volumes can also help the focal firm decide whether to give autonomy to one selected non-focal firm or not. Further, in order to keep controlling the triad, the focal firm needs to control the selected non-focal firm to mediate the focal firm's indirect relationship.

In addition, concerning small purchasing volumes, the low profits cannot compensate the customer's costs for developing collaboration with the supplier or

the LSP in a triad. Further, as the supplier relies on the customer's offering, they also do not have an interest in collaborating with the LSP if the customer only offers small purchasing volumes. In this situation, the customer indirectly impedes collaboration between the supplier and the LSP. If the small purchasing volumes are stable, without change, the customer can ensure long term stability of the triad by impeding dynamics in all embedded dyads. Previous studies also support that the powerful company does not need to encourage collaboration with partners in a network when profits are low (Bastl et al., 2013; Cox, 2001a; Danese & Romano, 2013).

In other triadic relationship research, each organization in a triad tries to use power to control the other two as much as possible (Dubois & Fredriksson, 2008; Nooteboom, 2006; van der Valk & van Iwaarden, 2011). As a result, when organization A's power is greater than organization B's power, and B's power is greater than organization C's power, the weakest organization (C) shows a tendency to have a coalition with B (Bastl et al., 2013; Choi & Linton, 2011). Based on the coalition, the collective power from B and C can change the power games in the triad, and can help B and C against power from A (Jin & Wu, 2006; Wu & Choi, 2005).

However, in the present study, organizations do not show coalition in a triad when the customer offers small purchasing volumes and uses the first approach to dictate to a triad. The root cause is profit. A coalition between any two organizations does not help them enhance their profits from small purchasing volumes. Consequently, the supplier and the LSP have no incentive to develop a coalition even if they are weaker than the customer. This finding indicates that organizations need to consider profits (from purchasing volumes) to determine whether or not they need to change the situation of power game in a triad.

In conclusion, the finding of the first approach indicates that the focal firm in a network needs to consider purchasing volumes to manage relationships in a network and control power games among embedded organizations. However, the first approach only works in the situation that triads operate with stable and small

purchasing volumes. This approach has difficulty in handling the change of purchasing volumes in a network. The second control approach identified from the present study can address this limitation.

7.5.2 Second control approach

Compared to the first approach, the focal firm using the second approach can directly control both non-focal firms to manage a triad. This approach is widely used by either customers or suppliers to manage logistics triads in the present study. By using the second approach, the focal firm can mediate the indirect dyad by controlling two non-focal firms simultaneously. Therefore, compared to the first approach, the focal firm using the second approach can control the whole triadic structure more effectively because the focal firm using the first approach only controls one non-focal firm in a triad. Three situations show how the focal firm uses the second approach.

In the first situation, the focal firm intends to use strong power taking advantage from two non-focal firms when the focal firm tries to maximize its own profits from large purchasing volumes in a triad. Under the focal firm's pressure, the two non-focal firms show interdependency and make a coalition with each other to develop collaboration against the focal firm because neither non-focal firm can resist the focal firm alone. As a result, this thesis indicates that influences from purchasing volumes can influence the focal firm's control of power games in a triad. Thus, the dynamics of the triad are also influenced.

Previous studies also suggest that two weak organizations will have a coalition against the strongest one in a triad if the collective power from the two weak organizations is equal to or weaker than the strongest organization's power (Ahuja, 2000; Baum, Calabrese, & Silverman, 2000). However, these studies suppose that the development of coalition is only based on power asymmetry because each organization in a triad should try to control other organizations as much as possible (Bastl et al., 2013; Miles, Preece, & Baetz, 1999). Little research has matched the coalition of power between two non-focal firms with the development of collaboration because a number of studies believe that power

games in a network can be changed continuously; while business relationships among organizations in a network should be stable over time (Bastl et al., 2013; Bristor & Ryan, 1987; Stevenson et al. 1985). Compared to previous studies, this thesis indicates that the influences from purchasing volumes and power games can be integrated to affect the evolution of relationships in a network.

In the second situation, the focal firm maximizes profits through coalition and collaboration with one non-focal firm. The focal firm will impede further coalition and collaboration in the triad for two reasons. Firstly, having coalition with and collaborating with both two non-focal firms does not ensure more profits for the focal firm. Secondly, the focal firm may lose control and profits if the two non-focal firms have coalition with each other. Therefore, after the focal firm has coalition and collaboration with one non-focal firm in a triad, if further coalition and collaboration in the triad does not ensure more profits and can threaten the focal firm's leading position in the triad, the focal firm will control both non-focal firms to prevent further coalition and collaboration.

Previous studies also suggest that a triad can have one coalition between one weak organization and the strongest organization when three organizations have different powers (Baum et al., 2000; Ramsay & Wagner, 2009). However, they do not mention how and why organizations impede further coalition in a triad. Specifically, they do not provide detail to explain how an organization impedes coalition and collaboration between the other two in a triad. Further, given these studies propose that coalition of power is a short term activity between organizations (Bristor & Ryan, 1987; Gamson, 1961; Stevenson et al., 1985), few studies investigate how the coalition helps organizations develop long term collaboration in a network. In contrast, the present study has identified that the integration of influences from power games and purchasing volumes can help the focal firm control the coalition of power and lead to the development of collaboration in a triad. Thus, the focal firm can manage the dynamics of the triad. The last situation for using second control approach concerns the independence between the two non-focal firms in a triad. When two non-focal firms have more direct interaction with the focal firm and they are controlled by the focal firm, if

the triad operates with small purchasing volumes, no firm has interest in having a coalition or developing collaboration even if there is power asymmetry in the triad. The reason is that coalition and collaboration between the two non-focal firms are not helpful for enhancing their profits.

In previous studies, when there is power asymmetry in a triad, two weak organizations usually have a coalition because they want to make a balance of power in a triad (Autry et al., 2014; Bastl et al., 2013; Wu & Choi, 2005). However, this thesis indicates that profit is also important in a triad. If a triad operates with small purchasing volumes, profits are limited for all organizations. As a result, the change of power games among organizations cannot significantly enhance profits for non-focal firms. It is unnecessary for them to develop coalition and collaboration in this situation. Therefore, the focal firm can keep controlling the triad by dominating two non-focal firms over time.

In sum, for the focal firm, using the second approach can achieve more effective control than using the first approach in a triad. All findings relating to the first and the second approaches indicate that the focal firm can combine the influence from purchasing volumes with influences from power games to determine the stability and dynamics of a triad by controlling the development of coalition and collaboration among organizations.

7.5.3 Third control approach

By using the third approach, the focal firm at least has collaboration with one non-focal firm in a triad. The present study identifies two situations regarding how the focal firm uses this approach: the focal firm shows interdependency with one non-focal firm; and two non-focal firms show interdependency.

In the first situation, if organizations show strong resource capability in a triad and the triad operates with large purchasing volumes, the buyer power and the supply power can be equal between the focal firm and one non-focal firm. Neither can dominate the other. They can have coalition of power and develop collaboration for maximizing their profits in the triad. In order to keep controlling the triad, the

focal firm needs to collaborate with the other non-focal firm (the weak non-focal firm in the triad) to enhance mutual profits. Further, the focal firm needs to keep two non-focal firms apart by dominating collaboration with the weaker non-focal firm. If the focal firm does not collaborate with the weaker non-focal firm, the weaker non-focal firm may collaborate with the strong non-focal firm to enhance profits. This will be dangerous to the focal firm because it will no longer control the triad and the strong non-focal firm will dominate the triad in this situation.

In the other situation, the focal firm is the strongest organization in a triad that operates with large purchasing volumes. The focal firm dominates collaboration with one non-focal firm to maximize profits. Further, the collective power from the two non-focal firms is still weaker than the focal firm. The two non-focal firms need to have a coalition with each other and collaborate to serve the focal firm because neither can work alone to satisfy the focal firm. The focal firm's overwhelming power ensures it can control the triad.

Few previous studies have studied the two situations described above. It is rare to see organizations encourage two collaborations in one triad under the influence from the power games (Choi & Linton, 2011; Finne, Turunen, & Eloranta, 2015). Further, little research has identified a situation where two strong organizations collaborate with each other in a triad. Previous studies rarely combine influences from power games and influences from purchasing volumes to investigate the coalition of power and development of collaboration in a network. Therefore, similarly to the first and second control approaches, the third approach also indicates that the focal firm needs to consider both the influence from purchasing volumes and the influences from power games to control the dynamics of a triad.

In conclusion, compared to previous studies regarding network structures and triadic relationships, three control approaches show how the focal firm dictates to a triad in different situations by controlling development of relationships between organizations, based on the combination of influence from power games and influence from purchasing volumes. In addition to using one of the three control

approaches, the focal firm also needs to change between these approaches in a dynamic triad.

7.5.4 Changes between three control approaches

Similarly to other network studies, the power game is dynamic in a triadic structure in the present study (Bastl et al., 2013; Cox, 2001a; Maloni & Benton, 2000). In this situation, the focal firm needs to change approaches to keep controlling a triad (Bakker & Kamman, 2007; Crespin-Mazet & Dontenwill, 2012). Two kinds of changes have been identified in this thesis.

In triads in which the focal firm applies the first approach, if purchasing volumes have been increased to show significant influence on embedded organizations' profits, to ensure and maximize profits, the focal firm will change from controlling one non-focal firm to controlling both non-focal firms in a triad. Therefore, the focal firm changes to the second approach. Other studies also suggest that the strongest organization cannot give more autonomy to one partner when the strongest organization can enhance their performance or profits by controlling all organizations in a network (Choi & Linton, 2011; Cox, 1999).

If the focal firm has already used the second approach and the increase of purchasing volumes has not changed power games between the focal firm and non-focal firms in a triad, the focal firm does not need to change the control approach. It only needs to dictate the transition of triadic relationship structure by determining the development of collaborations in the triad.

In contrast, if one non-focal firm keeps increasing purchasing volumes or resource capability and finally shows equal power to the focal firm in a triad, the power asymmetry between the focal firm and non-focal firms is changed from focal firm dominance to interdependency in the triad. The focal firm will change from the second to the third control approach. To prevent coalition between two non-focal firms, the focal firm needs to develop coalition and collaboration with the stronger interdependent non-focal firm. At same time, the focal firm needs to control collaboration with the other non-focal firm (the weaker non-focal firm). Otherwise,

the focal firm can no longer control the triad. Therefore, based on the change of the control approach, the focal firm can control the dynamics of a triad by dominating the development of collaborations.

Compared this thesis, little research has investigated how the change of power games in a triad are influenced by the dynamics of an organization's purchasing volume or change in an organization's resource capability. Therefore, the changes of control approaches provide a new view for understanding how the focal firm controls the change of power games and development of collaboration to dictate the dynamics in the triad.

7.5.5 Overview

Figure 7.4 presents two aspects to distinguish three control approaches: the number of collaborations in a triad, and the number of non-focal firms controlled by the focal firm in a triad. By using the first approach, the focal firm only controls one non-focal firm. In contrast, the focal firm controls two non-focal firms by using the other two approaches. From the perspective of the collaborative dyad, the first and the second approach can be used to manage a triad that has one collaborative dyad or has no collaborative dyad. The third approach can help the focal firm to control a triad that has two collaborative dyads.
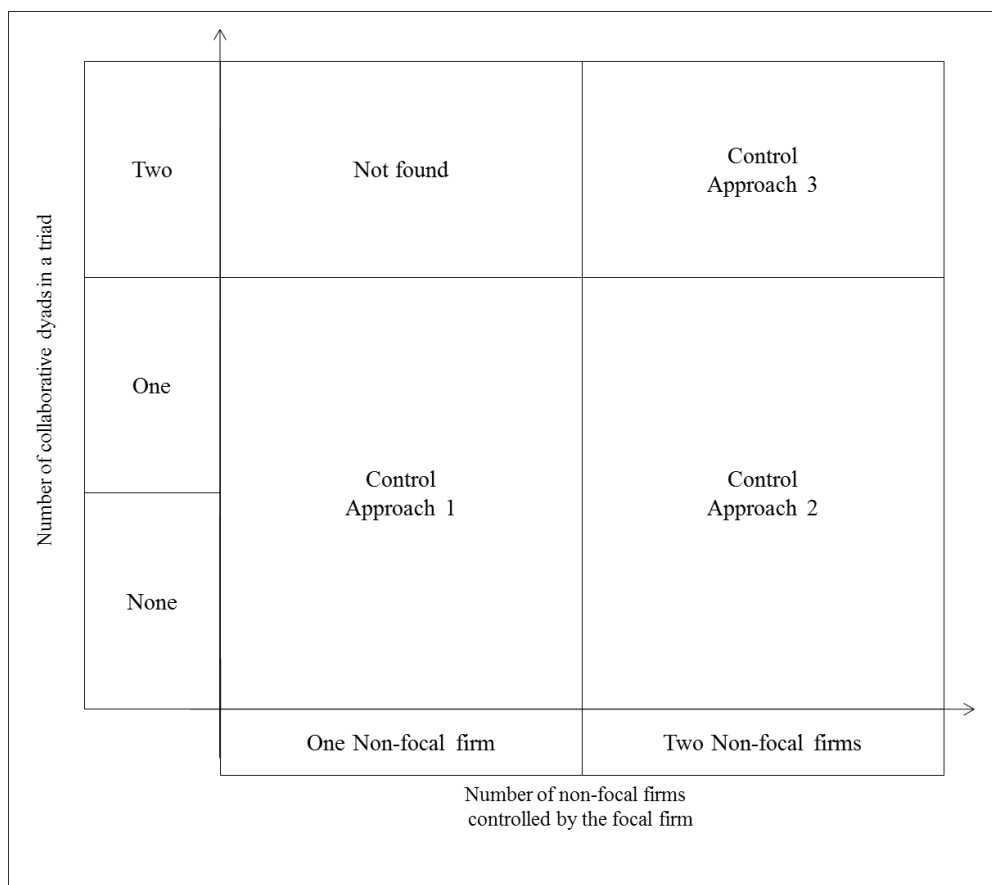
Figure 7.4: Three control approaches

Under the influence of the change of organizations' purchasing volumes or the change of organizations' resource capability, power games among organizations and organizations' profits will be dynamic in a triad. The focal firm will change control approaches in this situation. As the change of control approach can result in the change of collaborative dyads in a triad, the triad will also be dynamic because the change of a triadic relationship structure is determined by whether or not embedded dyads are changed.

Overall, the focal firm can either keep one control approach or change among three control approaches to determine the stability and dynamics of logistics triads by controlling the development of the embedded dyads.

Having discussed the findings of this thesis, the next section will develop a model to integrate them to present a full view of dynamics in logistics triads.

7.6 Integrative model

The goal of the current research is to study the evolution of relationships in logistics triads. Two research questions have been developed to attain to this goal. The first research question concerns how the relationships within logistics triads transit over time. The second question relates to the significant factors that can influence the stability and dynamics of logistics triads. The validated evolution model developed in Chapter Six (see section 6.12.3) has shown its effectiveness to answer the two questions. This model presents five structures of logistics triads and indicates that a logistics triad can transit directly between any two structures. Further, this model indicates that the core to determining the stability and dynamics of a logistics triad is the combined effects of the focal firm, purchasing volumes, and resource capability. Consequently, these three influential factors are the most significant factors in managing the stability and dynamics of logistics triads.

Although the validated evolution model can answer both research questions, it has its own limitation. As discussed in sections 7.5 and 7.6, the focal firm can use any of three different approaches to control the dynamics and stability in logistics triads. The researcher cannot predict these findings, especially the focal firm's influences, before collecting data. Therefore, the researcher did not develop a research question regarding how the focal firm uses the three approaches identified to control dynamics and stability in logistics triads. In order to address this limitation, an integrative model has been developed (see Figure 7.5).
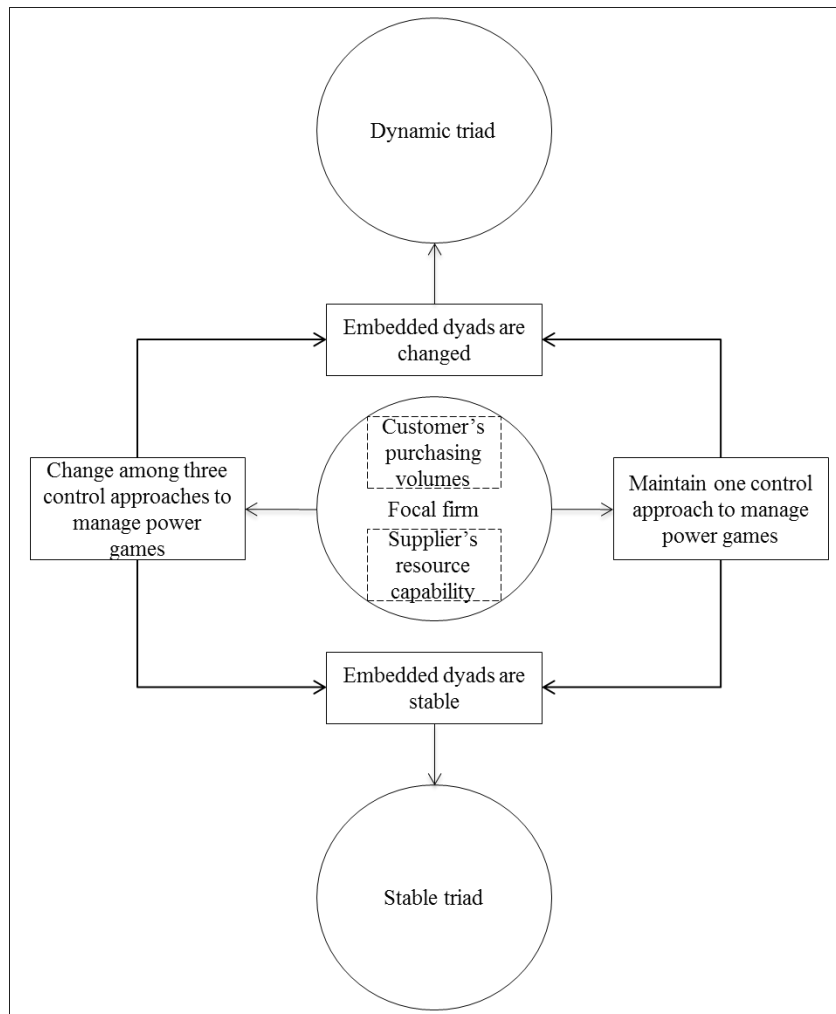
Figure 7.5: Integrative model: Evolution of relationships in logistics triads

Similarly to the validated evolution model, the core of the integrative model is also the focal firm that is determined by power games between the supplier and the customer in a triad. The customer obtains buyer power from purchasing volumes while the supplier obtains supply power from resource capability. Through the changes of power games, the focal firm can either maintain one control approach or change between three approaches to control a triad by influencing all embedded dyads. If the focal firm impedes change in all embedded dyads, the relationship structure of a triad can be stable over time. In contrast, if the focal firm prefers to change one or more embedded dyads, the triad has a dynamic structure that can transition among the five relationship structures which have been identified in this thesis.

The integrative model not only indicates that a logistics triad can be stable over time or can transition to different structures; it also combines control approaches and significant influential factors to explain how the focal firm determines the stability and dynamics of logistics triads.

7.7 Conclusion

The present study indicates that the combined effects of purchasing volumes, resource capability, and focal firm are more effective than balance theory to explain the stability and dynamics of logistics triads. The balance theory is insufficient because of two limitations: the relationship dynamics in a triad are not significantly influenced by organizations' attitudes; or the triads are influenced by outside uncertainty (e.g. market uncertainty and organizations outside triad). In contrast, the combined effects identified indicate that power games between organizations determine the focal firm in a triad. The focal firm can control direct dyads and mediate indirect dyads by managing power games in the triad. Further, concerning change of organizations' profits and dynamics of power games in a triad, the focal firm can maintain one control approach or change between three control approaches to dominate a triad in different situations. Finally, the integrative model has integrated all findings to explain how the combined effects of factors show a primary influence in determining the stability and dynamics of logistics triads. Theoretically, the integrative model and all major findings discussed in the present chapter have provided a number of new ideas to explore the knowledge about how to manage SCRs from a network perspective. The next chapter will conclude this thesis by presenting summary of findings, contributions, limitations, and future research directions.

Chapter Eight: Conclusion

8. 1 Preview

This chapter summarizes research findings to address the research goal. Based on these findings, theoretical contributions and empirical implications are presented. This chapter also introduces research strengths and limitations. The final section provides future research directions based on the findings, contributions, and limitations of this thesis.

8.2 Summary of research findings

8.2.1 Combined effects of purchasing volumes, resource capability, and focal firm

The combined effects can determine the stability and dynamics of logistics triads. In a logistics triad, three organizations can obtain either buyer power or supply power from their purchasing volumes or resource capability. One powerful organization can control the other two in the triad because of power asymmetry between three organizations. In this situation, that organization is the focal firm in the triad and can control the evolution of relationships in the triad.

When purchasing volumes and resource capability are stable without change, all organizations' power is stable. Consequently, power games among organizations do not change in a triad. In this situation, the focal firm can ensure long term stability of the logistics triad by impeding dynamics in embedded dyads. In contrast, with the change of purchasing volume or resource capability, the power games between the three organizations becomes dynamic. The change of power games can affect relationships between organizations in a triad. The focal firm needs to control the dynamics of power games and manage the change of relationships to maintain domination of the triad. In this situation, the focal firm can determine the transition of a triadic structure. Otherwise, if the focal firm does not control the change of power games and change of relationships in a triad, either non-focal firm can replace the focal firm to control the triad.

To control the stability and dynamics of logistics triads in different situations, the

focal firm can use three different control approaches.

8.2.2 Control approaches in logistics triads

The three control approaches have unique characteristics. No single control approach can help the focal firm to manage a logistics triad in all different situations. When a logistics triad has routine processes and operates with small purchasing volumes, the profits are not significant to the focal firm. In this situation, the focal firm can use two approaches to control the triad in two situations. If the focal firm is familiar with one non-focal firm in the triad, the focal firm will focus on controlling this non-focal firm and give them autonomy to manage the other non-focal firm in the triad. This is the first approach. In contrast, in the second approach, the focal firm will directly control the two non-focal firms in the triad because the focal firm is not familiar with neither of them. The focal firm is the most powerful organization in a triad if it uses the first or the second control approach.

When one non-focal firm's power keeps growing with the increase of purchasing volumes or enhancement of resource capability, the non-focal firm's power can become equal to the focal firm's power. Consequently, the focal firm and the non-focal firm are interdependent and the focal firm is no longer the most powerful organization in the triad. In this situation, the focal firm using either of the first two approaches will change to using the third approach to control the triad. They will collaborate with both two non-focal firms. Because the focal firm cannot control the interdependent non-focal firm, in order to maintain controlling position in the triad, the focal firm will have coalition with the interdependent non-focal firm. Further, the focal firm will dominate the other non-focal firm to prevent collaboration between two non-focal firms.

The findings of control approaches and combined effects of three significant influential factors demonstrate the effectiveness of the supply network model because the model indicates that the focal firm can determine the relationship dynamics in a network. In contrast, the findings of balance theory reveal the limitations of the theory in this thesis.

8.2.3 Limitations of balance theory

This thesis has identified two limitations of balance theory in studying inter-organizational triads. Because of the difference between interpersonal and inter-organizational relationships, when the development of dyadic relationships in a triad is not significantly influenced by organizations' attitudes, balance theory is limited in explaining the evolution of relationships in a triadic structure. To be fair, previous studies have demonstrated that balance theory is effective when the classifications of positive and negative dyadic relationships are based on social links in a triad (Eggert et al., 2012; Phillips et al., 1998). Inter-organizational attitude is also a kind of social link in a supply chain context (Bendapudi & Berry, 1997; Kelly, 2004). However, besides inter-organizational attitude, most influential factors identified are non-social factors in this research. When these factors show more significant influence than the social factor, attitude, balance theory is limited in explaining the dynamics of a logistics triad. As a result, because of the difference between social and non-social factors, the findings of this research should be taken and used with caution.

Another limitation concerns the influence from uncertainty outside a triad. When the development of relationships in a logistics triad is impacted by organizations outside the triad or is impacted by market uncertainty, it is a challenge to use balance theory to study the stability and dynamics of the triad.

Based on research findings, this thesis reflects several theoretical contributions.

8.3 Theoretical contributions

8.3.1 Integrative model

The integrative model developed in the discussion chapter is an early attempt to study the dynamics of triadic supply chain relationships by integrating influences from the focal firm, purchasing volumes, resource capability, and dynamic of power games among organizations (see section 7.6 in Chapter Seven). Previous studies have investigated the significance of the focal firm and the characteristics of process in a supply network (Harland et al., 2001; Kim et al., 2011). However,

little research has provided detail to explain how the focal firm influences all organizations and relationships in a network by controlling power games. Further, although a number of studies investigate the influences from power games and business context factors (purchasing volumes and resource capability) in supply chain triads (Choi et al., 2001; Wu et al., 2010), they lack an integration of these influences. The integrative model developed in this thesis demonstrates that the combined effects of the focal firm, purchasing volumes, and resource capability can provide a more comprehensive view to explain how the focal firm influences the evolution of relationships in a triad by controlling power games between organizations and managing dynamics of embedded dyads.

8.3.2 Control approaches

Previous studies present the change of power games among organizations in a triad (Maloni & Benton, 2000; Wu & Choi, 2005). They also suggest that weaker organizations in a triad can develop a coalition against the strongest organization to achieve power balance in a triad (Bastl et al., 2013; Li & Choi, 2009). However, these studies lack consideration of how the strongest organization deals with the coalition between weak organizations in a triad. This thesis has identified that the strongest organization can act as the focal firm to maintain control of two non-focal firms in a triad through three control approaches. When power games change in a triad, the focal firm can change approaches to keep controlling the triad even when two non-focal firms have a coalition. Additionally, with the changing of control approaches, the focal firm can determine the transition of the triadic relationship structure. The change between the three control approaches provides a new idea for supply chain studies to investigate how the strongest organization manages the dynamics of triadic relationship structure by controlling dynamics of power games.

8.3.3 Comparison: balance theory and supply network model

Little research has investigated triadic relationships by using balance theory and the supply network model at same time. After studying inter-organizational triads in a logistics outsourcing context, this thesis has identified the limitations of balance theory and has demonstrated the effectiveness of the supply network

model in one research project. The comparison between the two theoretical lenses indicates a selection standard for investigating supply chain triads. When organizations' attitudes significantly influence the development of relationships in a triad, balance theory is effective to investigate the dynamics of the triad. Otherwise, the supply network model is more appropriate to study the stability and dynamics of the triad.

8.3.4 Mediating effects in triads

The mediating effect is a significant difference between dyadic and triadic relationships (Choi & Wu, 2009b). A number of studies have investigated how an organization mediates the indirect dyadic relationship in a triad from the view of game theory and structural hole theory (Borgatti & Li, 2009; Mena et al., 2013; Wu et al., 2010). Further, these studies have suggested that the mediating effect is dynamic because the power games between organizations in a triad are also dynamic (Autry & Griffis, 2008; Li & Choi, 2009). Studies regarding game theory focus on a customer-supplier-supplier triad and investigate influences from resources (Cachon & Netessine, 2006; Esmaeili et al., 2009); while studies of structural hole theory focus on information asymmetry in an open triad where two organizations do not have direct connection at the beginning of the triad (Carter, 2011). In contrast, this thesis explains mediating effects in a triad by studying connections between purchasing volumes, resource capability, focal firm's influence, and power games between organizations in a triad. The findings of the present study provide ideas complementary to previous triadic relationship studies.

Along with offering theoretical contributions, this thesis also offers a number of insights for supply chain practitioners as explained below.

8.4 Managerial implications

This thesis has identified four implications for the management of logistics outsourcing. Firstly, it has presented a comprehensive analysis of influential factors that impact on the stability and dynamics of SCRs in a triadic structure. These factors can help practitioners develop a benchmark to assess the

significance of different influential factors in managing their supply chains. For example, the business context factors are especially important as they reflect the most significant influence in supply chain triads. As a consequence, practitioners can put more effort into controlling purchasing volumes or resource capability in order to manage their relationships with multiple partners in any supply chain network. This thesis can help practitioners expand their perspectives, opening up to factors they might have ignored before.

The second managerial implication concerns the connections between influential factors. These connections can provide practitioners with new ideas about problem solving. If it is difficult to modify and resolve existing problems, practitioners may revert to the connecting factors discovered in this thesis to work out problems. For example, if business partners are reluctant to change existing relationships, it is difficult to foster a collaborative culture in the short term. In this situation, the practitioners can change the size of purchasing volumes to achieve change in the relationship which encourages a collaborative organizational culture and related relationship behaviours in supply chain triads. As a result, the practitioners can adjust a factor that is easy for them to manage and change through interconnections between all influential factors. In general, under the influence of power games between three organizations in a triad, the focal firm can control purchasing volumes or resources to control a triad by dominating relationships in the triad.

Finally, this thesis has helped expand practitioners' views to the broader supply chain networks. Previous studies suggest that supply chain practitioners should expand their relationship management view from a dyadic relationship to broad supply chain networks (Harland et al., 2004; Mentzer, 2001). However, it is difficult to take care of a large number of actors at the same time in a supply chain network (Choi & Wu, 2009c; Mena et al., 2013). This thesis indicates that the first step for practitioners to expand their SCR view from dyad to network is to consider one more directly connected actor from a triadic relationship perspective. In detail, through controlling purchasing volumes and resource capability, organizations can practice how to manage power games between three

organizations in a triad. This practice can help organizations to learn how to develop and manage relationships with partners in broad supply chain network in the future.

In addition to the theoretical contributions and empirical implications outlined above, this thesis has its specific research strengths and limitations, discussed below.

8.5 Research strengths

As an early attempt to propose an approach to understand the evolution of relationships in triads within a supply chain context, there are three strengths in this thesis. Two concern theoretical developments and supply chain practices. The last relates to the research reliability and validity.

The first strength of this thesis is reflected in the test of balance theory in the supply chain context and the analysis of empirical data relating to logistics triadic cases. There are two main weaknesses in extant supply chain studies where balance theory is used to study supply chain triads. One is the lack of support provided by empirical data to demonstrate and verify the research propositions (Choi & Wu, 2009a). The other is the lack of detailed measures to assess the triadic relationships (Phillips et al., 1998; Eggert et al., 2012). These two weaknesses have been addressed in this research which has collected substantial empirical data to study logistics triads, and identified a number of influential factors impacting on triadic relationships in supply chains.

The second strength is that the research outcomes are feasible for supply chain practitioners to apply. As described in the chapters of data analysis (Chapters Five and Six) and subsequent discussions of research findings (Chapter Seven), the influential factors identified and their inter-connections can provide feasible ideas for practitioners rather than just making vague suggestions from an abstract perspective.

The last strength concerns how the research design and research process help

ensure and enhance reliability and validity for this thesis. The propositions and framework developed in the design stage have been tested and modified after collecting data in the first stage. All findings identified in the first stage have been triangulated and verified by collecting data in the second stage. The logistics triads collected in two continuous research stages have been triangulated and have ensured the reliability and validity of research data. Further, the cross-comparisons of findings between two stages help enhance the validity and reliability for research outcomes.

In addition to research strength, this thesis has limitations as discussed below.

8.6 Research limitations

This thesis has four limitations arising from a variety of reasons. The first limitation concerns research targets. As explained in the literature review (Chapter Two) and research methodology (Chapter Three), the logistics triad was selected as a focus for this study. However, the logistics triad is only one kind of triadic relationship in the supply chain context. Other kinds of supply chain triads exhibit various and unique characteristics (Rossetti & Choi, 2008; van der Valk & van Iwaarden, 2011). As a result, it is difficult to conclude that the research findings can explain both the stability and dynamics in all kinds of supply chain triads.

The second limitation concerns the data collection in this research. In the first research stage, all participants were logistics service providers. In order to triangulate the research findings through the comparisons of comments between LSPs, suppliers, and customers in logistics triads, the research participants in the second stage should preferably be selected from suppliers and customers in the triads that were provided by the participating LSPs in Stage 1. However, because of business security requirements, a majority of LSPs hindered this research by disallowing contact with the suppliers and the customers in their triads. To show respect to the participating LSPs and comply with the rules of ethical consideration, the suppliers and the customers were selected from other companies in the second research stage. Because LSPs, suppliers, and customers came from different logistics triads, this limits the synthesis of research outcomes

by comparing all research findings from two research stages. However, the large sample size in both stages helps to provide a comprehensive view of relationships dynamics in logistics triads. Furthermore, the close similarity of research findings between two research stages can also ensure robust reliability and validity for this research.

The classification of dyadic SCRs in this research is the third limitation. As described in Chapter Two, dyadic SCRs can be classified into a number of types. However, according to balance theory, there are only two opposite types in each dyadic relationship within a triad (Cartwright & Harary, 1956; Newcomb, 1961). In order to match the rationale underpinning balance theory, this thesis simplified all types of dyadic SCRs into two basic relationship categories: collaborative and transactional. However, in the empirical data on logistics triads, it was difficult to divide all of the dyadic SCRs according to such a simplified approach. This simplification failed to explain situations where the dyadic relationship was neither transactional nor collaborative. As a result, balance theory has been proved limited in understanding the dynamics in supply chain triads.

The business context of NZ leads to the last limitation. As most NZ organizations are SMEs and operate with commoditized offerings, a majority of organizations and supply chains compete primarily on cost (Mollenkopf & Dapiran, 2005; Sankaran & Luxton, 2003). Therefore, this thesis identifies that most logistics triads show routine processes. In this situation, it is difficult to discover how innovative offerings from suppliers or LSPs can affect the power games and the identification of focal firms in logistics triads.

These four research limitations draw attention to the need for new supply chain studies concerning the stability and dynamics of triadic relationship structures in the future.

8.7 Future research directions

The first research direction is to use balance theory and supply network model in

quantitative studies. The results can provide complementary research findings to this qualitative research. In this thesis, all data were categorized and compared according to the researcher's knowledge and personal perceptions of SCRs. The lack of development and verification of quantified research instruments and statistical analysis can cause research bias. Future quantitative research can mitigate the limitations and research bias exhibited in this thesis.

The second research direction is to conduct similar research in other kinds of supply chain triads. There is more than one kind of triadic relationship structure in supply chain networks. This research only focuses on the logistics triad. According to extant studies of SCRs and networks, three kinds of supply chain triad can offer appropriate research options: supplier-supplier-customer; customer-customer-supplier; and manufacturer-dealer-customer (Choi & Kim, 2008; van der Valk & van Iwaarden, 2011; Wu & Choi, 2005). Using balance theory or the supply network model to study these triads can help expand the understanding of the dynamics and stability of supply chain triads.

The limitation of balance theory is another research direction. In order to demonstrate the two limitations identified in this thesis, it is necessary to conduct more research to verify them. For example, future research can collect data to test whether the application of balance theory is only suitable for studying the dynamics of supply chain triads when the dyads are assessed by organization attitudes.

It would be interesting also to investigate the application of research findings in this research. Both academics and practitioners can test whether the influential factors identified are helpful in understanding other supply chain triads. Specific to the integrative model, there are two more potential research directions. One is to verify the validity of the model in other supply chain triads by examining whether future studies can identify and insert any new influential factors or control approach into this model. Another research direction is to test the model in broad supply chain networks to examine whether or not the components within the model need adjustment because of the unique structures in various triadic

supply chain relationships.

Conducting similar qualitative research in other countries is also valuable. As each country has a unique business context, the influences from the five categories of influential factors can be different. By collecting data from countries and organizations that are strong at providing innovative products, the research outcome can help build a more comprehensive view regarding the stability and dynamics of inter-organizational triads in both routine and dynamic processes.

Finally, it is worthwhile to study SCRs and power games between more than three organizations, such as four, five, or six organizations. A supply network is complex while a triad is only the smallest and the simplest network in supply chain context. Studying relationships beyond the triadic structure would reveal how different triads interact and influence each other in a wider network.

In conclusion, as a relatively new topic in research on supply chain management, the dynamics of SCRs in triadic structures are worthy of further investigation from both theoretical and empirical views.

8.8 Final remarks

This research was motivated by the author's personal background and the paucity of the research on the dynamics and stability of triadic supply chain relationships. Similarly to extant supply chain studies, this research adopted a theoretical lens to conduct the research process. Results of data analysis demonstrated that balance theory was limited as a model to explain the dynamics of logistics triads. However, the research findings identified a number of influential factors and confirmed the effective application of another management theory - the supply network model. Through the influences of these factors and inter-connections between them, this thesis has offered an integrative model and related research findings to make contributions to the knowledge of dynamics in supply chain triads. These contributions provide ideas for conducting future research on the dynamics of triadic supply chain relationships in network structures.

References

Ahmadi J., A., & Hoseinpour, P. (2011). A game-theoretic analysis for coordinating cooperative advertising in a supply chain. *Journal of Optimization Theory and Applications, 149*(1), 138-150.

Ahuja, G. (2000). The duality of collaboration: Inducements and opportunities in the formation of inter-firm linkages. *Strategic Management Journal, 21*(3), 317-343.

Alvarez, G., Pilbeam, C., & Wilding, R. (2010). Nestlé Nespresso AAA sustainable quality program: An investigation into the governance dynamics in a multi-stakeholder supply chain network. *Supply Chain Management: an International Journal*, *15*(2), 165-182.

Anbanandam, R., Banwet, D. K., & Shankar, R. (2011). Evaluation of supply chain collaboration: A case of apparel retail industry in India. *International Journal of Productivity and Performance Management*, *60*(2), 82-98.

Angeles, R., & Nath, R. (2001). Partner congruence in electronic data interchange (EDI)-enabled relationships. *Journal of Business Logistics, 22*(2), 109-128.

Arroyo, P., Gaytan, J., & Luitzen de, B. (2006). A survey of third party logistics in Mexico and a comparison with reports on Europe and USA. *International Journal of Operations & Production Management, 26*(6), 639.

Autry, C. W., & Griffis, S. E. (2008). Supply chain capital: The impact of structural and relational linkages on firm execution and innovation. *Journal of Business Logistics, 29*(1), 157-173.

Autry, C. W., Skinne, L. R., & Lamb, C. W. (2008). Interorganizational citizenship behaviors: An empirical study. *Journal of Business Logistics*, *29*(2), 53-74.

Autry, C. W., Williams, B. D., & Golicic, S. (2014). Relational and process multiplexity in vertical supply chain triads: An exploration in the US restaurant industry. *Journal of Business Logistics*, *35*(1), 52-70.

Azadegan, A., Patel, P. C., Zangoueinezhad, A., & Linderman, K. (2013). The effect of environmental complexity and environmental dynamism on lean practices. *Journal of Operations Management*, *31*(4), 193-212.

Bachrach, D. G., & Bendoly, E. (2011). Rigor in behavioral experiments: A basic primer for supply chain management researchers. *Journal of Supply Chain Management*, *47*(3), 5-8.

Bajari, P., & Tadelis, S. (2001). Incentives versus transaction costs: A theory of procurement contracts. *The Rand Journal of Economics, 32*(3), 387-407.

Bakker, E. F., & Kamann, D. J. F. (2007). Perception and social factors as influencing supply management: A research agenda. *Journal of Purchasing and Supply Management*, *13*(4), 304-316.

Baldwin, J. S., Rose-Anderssen, C., Ridgway, K., Allen, P. M., Lopez, A., Strathern, M., & Varga, L. (2006). Management decision-making: Risk reduction through simulation. *Risk Management*, *8*(4), 310-328.

Ballou, R. H., Gilbert, S. M., & Mukherjee, A. (2000). New managerial challenges from supply chain opportunities. *Industrial Marketing Management*, *29*(1), 7-18.

Barnes, J., & Liao, Y. (2012). The effect of individual, network, and collaborative competencies on the supply chain management system. *International Journal of Production Economics*, *140*(2), 888-899.

Barney, J. B. (2012). Purchasing, supply chain management and sustained competitive advantage: The relevance of resource-based theory. *Journal of Supply Chain Management, 48*(2), 3-6.

Barratt, M. (2004). Understanding the meaning of collaboration in the supply chain. *Supply Chain Management: An International Journal*, *9*(1), 30-42.

Bartels, N. (2006). 21st century logistics. *Manufacturing Business Technology, 24*(3), 16-30.

Bask, A. H. (2001). Relationships among TPL providers and members of supply chains- A strategic perspective. *The Journal of Business & Industrial Marketing, 16*(6/7), 470.

Bastl, M., Johnson, M., & Choi, T. Y. (2013). Who's seeking whom? Coalition behavior of a weaker player in buyer-supplier relationships. *Journal of Supply Chain Management, 49*(1), 8-28.

Bates, H., & Slack, N. (1998). What happens when the supply chain manages you? A knowledge-based response. *European Journal of Purchasing & Supply Management*, *4*(1), 63-72.

Baum, J. A. C., Calabrese, T., & Silverman, B. S. (2000). Don't go it alone: Alliance network composition and startups' performance in Canadian biotechnology. *Strategic Management Journal, 21*(3), 267-294.

Beaumont, N., & Sohal, A. (2004). Outsourcing in Australia. *International Journal of Operations & Production Management, 24*(7), 688.

Bendapudi, N., & Berry, L. L. (1997). Customers' motivations for maintaining relationships with service providers. *Journal of Retailing, 73*(1), 15-37.

Bengtsson, M., & Kock, S. (2015). Tension in co-opetition. In *Creating and delivering value in marketing* (pp. 38-42). Springer International.

Benton, W. C., & Maloni, M. (2005). The influence of power driven buyer/seller relationships on supply chain satisfaction. *Journal of Operations Management*,*23*(1), 1-22.

Berglund, M., van Laarhoven, P., Sharman, G., & Wandel, S. (1999). Third-party logistics: Is there a future? *International Journal of Logistics Management, 10*(1), 59.

Bernardes, E. S. (2010). The effect of supply management on aspects of social capital and the impact on performance: A social network perspective: Supply management and social capital. *The Journal of Supply Chain Management*, *46*(1), 45-56.

Beverland, M. (2005). Creating value for channel partners: The Cervena case. *The Journal of Business & Industrial Marketing, 20*(2/3), 127-135.

Bhatnagar, R., & Viswanathan, S. (2000). Re-engineering global supply chains alliances between manufacturing firms and global logistics services providers. *International Journal of Physical Distribution & Logistics Management, 30*(1), 13.

Bhatnagar, R., & Teo, C. (2009). Role of logistics in enhancing competitive advantage: A value chain framework for global supply chains. *International Journal of Physical Distribution & Logistics Management*, *39*(3), 202-226.

Biermann, R. (2008). Towards a theory of inter-organizational networking. *The Review of International Organizations, 3*(2), 151-177. doi:http://dx.doi.org/10.1007/s11558-007-9027-9

Birchfield, D. (2002). Supply chains deliver competitive advantage. *New Zealand Management, 49*(2), 50-54.

Bititci, U. S., Martinez, V., Albores, P., & Parung, J. (2004). Creating and managing value in collaborative networks. *International Journal of Physical Distribution & Logistics Management*, *34*(3/4), 251-268.

Bode, C., Lindemann, E., & Wagner, S. M. (2011). Driving trucks and driving sales? The impact of delivery personnel on customer purchase behavior. *Journal of Business Logistics, 32*(1), 99–114.

Bode, C., Wagner, S. M., Petersen, K. J., & Ellram, L. M. (2011). Understanding responses to supply chain disruptions: Insights from information processing and resource dependence perspectives. *Academy of Management Journal*, *54*(4), 833-856.

Boeije, H. (2010). *Analysis in qualitative research*. Los Angeles, CA: Sage.

Bohehme, T., Ma, O., Childerhouse, P., Corner, J., Seuring, S., & Basnet, C. (2007). *The application of Quick Scan Audit Methodology in SME's*. Hamilton, New Zealand: University of Waikato, Dept. of Waikato Management School.

Bolumole, Y. A. (2003). Evaluating the supply chain role of logistics service providers. *International Journal of Logistics Management, 14*(2), 93-107.

Bolumole, Y. A., Frankel, R., & Naslund, D. (2007). Developing a theoretical framework for logistics outsourcing. *Transportation Journal, 46*(2), 35-54.

Bordonaba-Juste, V., & Cambra-Fierro, J. J. (2009). Managing supply chain in the context of SMEs: A collaborative and customized partnership with the suppliers as the key for success. *Supply Chain Management: An International Journal*, *14*(5), 393-402.

Borgatti, S. P., & Li, X. (2009). On social network analysis in a supply chain context. *The Journal of Supply Chain Management, 45*(2), 5-22.

Borgatti, S. P., Mehra, A., Brass, D. J., & Labianca, G. (2009). Network analysis in the social sciences. *Science*, *323*(5916), 892-895.

Bowersox, D. J., Closs, D. J., & Cooper, M. B. (2007). *Supply chain logistics management*. Boston, MA: McGraw-Hill/Irwin.

Boyatzis, R. E. (1998). *Transforming qualitative information: Thematic analysis and code development*. Thousand Oaks, CA: Sage.

Boyd, B. (1990). Corporate linkages and organizational environment: A test of the resource dependence model. *Strategic Management Journal, 11*(6), 419-430.

Boyle, B. A., & Dwyer, F. R. (1995). Power, bureaucracy, influence, and performance: Their relationships in industrial distribution channels. *Journal of Business Research*, *32*(3), 189-200.

Brannen, J. (1992). *Mixing methods: Qualitative and quantitative research*. Aldershot, Brookfield, Country: Avebury.

Braziotis, C., Bourlakis, M., Rogers, H., & Tannock, J. (2013). Supply chains and supply networks: Distinctions and overlaps. *Supply Chain Management: An International Journal*, *18*(6), 644-652.

Bristor, J. M., & Ryan, M. J. (1987). The buying center is dead, long live the buying center. Advances in *Consumer Research, 14*(1), 255-258.

Britton, T. C., Stewart, R. A., & O'Halloran, K. R. (2013). Smart metering: Enabler for rapid and effective post meter leakage identification and water loss management. *Journal of Cleaner Production, 54*(0), 166-176. doi:http://dx.doi.org/10.1016/j.jclepro.2013.05.018

Bruton, G. D., Ahlstrom, D., & Li, H.-L. (2010). Institutional theory and entrepreneurship: Where are we now and where do we need to move in the future? *Entrepreneurship Theory and Practice, 34*(3), 421-440.

Buchen, I. H. (1994). The Collaborative Customer: The Benefits Of" Coopetition". *Telemarketing*, *13*, 45-45.Buechel, B., & Buskens, V. (2013). The dynamics of closeness and betweenness. *The Journal of Mathematical Sociology, 37*(3), 159-193.

Buskens, V., & Yamaguchi, K. (1999). A new model for information diffusion in heterogeneous social networks. *Sociological Methodology, 29*, 281-325.

Cachon, G. P., & Netessine, S. (2006). Game theory in supply chain analysis. *Tutorials in Operations Research: Models, Methods, and Applications for Innovative Decision Making*, 200-233.

Cadden, T., Marshall, D., & Cao, G. (2013). Opposites attract: Organisational culture and supply chain performance. *Supply Chain Management: An International Journal*, *18*(1), 86-103.

Cadilhon, J. J., Fearne, A. P., Tam, P. G., Moustier, P., & Poole, N. D. (2005, July). Quality incentives and dependence in vegetable supply chains to Ho Chi Minh City. In *International Symposium on Improving the Performance of Supply Chains in the Transitional Economies 699* (pp. 111-118).

Cai, S., & Yang, Z. (2008). Development of cooperative norms in the buyer-supplier relationship: The Chinese experience. *The Journal of Supply Chain Management*, *44*(1), 55-70.

Campbell, J., & Sankaran, J. (2005). An inductive framework for enhancing supply chain integration. *International Journal of Production Research*, *43*(16), 3321-3351.

Caniels, M. C., & Gelderman, C. J. (2005). Purchasing strategies in the Kraljic matrix: A power and dependence perspective. *Journal of Purchasing and Supply Management*, *11*(2), 141-155.

Caniels, M. C., & Gelderman, C. J. (2007). Power and interdependence in buyer supplier relationships: A purchasing portfolio approach. *Industrial Marketing Management*, *36*(2), 219-229.

Cannon, J. P., Doney, P. M., Mullen, M. R., & Petersen, K. J. (2010). Building long-term orientation in buyer–supplier relationships: The moderating role of culture. *Journal of Operations Management*, *28*(6), 506-521.

Cao, M., & Zhang, Q. (2010). Supply chain collaborative advantage: A firm's perspective. *International Journal of Production Economics, 128*(1), 358-367.

Cao, M., Vonderembse, M. A., Zhang, Q., & Ragu-Nathan, T. S. (2010). Supply chain collaboration: Conceptualisation and instrument development. *International Journal of Production Research, 48*(22), 6613-6635.

Cao, Q., Thompson, M. A., & Triche, J. (2013). Investigating the role of business processes and knowledge management systems on performance: A multi-case study approach. *International Journal of Production Research*, *51*(18), 5565-5575.

Caplow, T. (1956). A theory of coalitions in the triad. *American Sociological Review, 21*(4), 489-493.

Caplow, T. (1959). Further development of a theory of coalitions in the triad. *American Journal of Sociology, 64*(5), 487-493.

Carey, S., Lawson, B., & Krause, D. R. (2011). Social capital configuration, legal bonds and performance in buyer–supplier relationships. *Journal of Operations Management*, *29*(4), 277-288.

Caridi, M., Crippa, L., Perego, A., Sianesi, A., & Tumino, A. (2010). Measuring visibility to improve supply chain performance: A quantitative approach. *Benchmarking: An International Journal*, *17*(4), 593-615.

Carr, A. S., Kaynak, H., Hartley, J. L., & Ross, A. (2008). Supplier dependence: Impact on supplier's participation and performance. *International Journal of Operations & Production Management*, *28*(9), 899-916.

Carter, C. R. (2011). A call for theory: The maturation of the supply chain management discipline. *The Journal of Supply Chain Management, 47*(2), 3-7.

Carter, C. R., & Rogers, D. S. (2008). A framework of sustainable supply chain management: Moving toward new theory. *International Journal of Physical Distribution & Logistics Management*, *38*(5), 360-387.

Cartwright, D., & Harary, F. (1956). Structural balance: A generalization of Heider's theory. *Psychological Review*, *63*(5), 277-292.

Celuch, K., Bantham, J. H., & Kasouf, C. J. (2012). Change as a moderator of inter-firm communication and conflict management in relationship continuity. *Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behavior*, *25*, 46-62.

Cetindamar, D., Çatay, B., & Basmaci, O. S. (2005). Competition through collaboration: Insights from an initiative in the Turkish textile supply chain. *Supply Chain Management: An International Journal*, *10*(3/4), 238-240.

Chandra, S., & Sharma, M. K. (2013). *Research methodology*. Oxford, England: Alpha Science International.

Chatterjee, S., & Wernerfelt, B. (1991). The link between resources and type of diversification: Theory and evidence. *Strategic Management Journal*, *12*(1), 33-48.

Chen, H., Tian, Y., Ellinger, A. E., & Daugherty, P. J. (2010). Managing logistics outsourcing relationships: An empirical investigation in China. *Journal of Business Logistics, 31*(2), 279-XIII.

Chen, I. J., & Paulraj, A. (2004). Towards a theory of supply chain management: The constructs and measurements. *Journal of Operations Management, 22*(2), 119-150.

Chen, Y. M., Goan, M.-J., & Huang, P.-N. (2011). Selection process in logistics outsourcing: A view from third party logistics provider. *Production Planning & Control, 22*(3), 308.

Chen, J. V., Yen, D. C., Rajkumar, T. M., & Tomochko, N. A. (2011). The antecedent factors on trust and commitment in supply chain relationships. *Computer Standards & Interfaces*, *33*(3), 262-270.

Cheng, S. K., & Kam, B. H. (2008). A conceptual framework for analysing risk in supply networks. *Journal of Enterprise Information Management*, *21*(4), 345-360.

Cheung, Y. K., & Rowlinson, S. (2011). Supply chain sustainability: A relationship management approach. *International Journal of Managing Projects in Business*, *4*(3), 480-497.

Childerhouse, P., Luo, W., Basnet, C., Ahn, H. J., Lee, H., & Vossen, G. (2013). Evolution of inter-firm relationships: A study of supplier-logistical services provider-customer triads. *International Journal of Industrial Engineering*, *20*(1/2), 126-140.

Choi, K. Y., Yan, T. Y. & Dooley, K. (2011). Structural investigation of supply networks: A social network analysis approach. *Journal of Operations Management, 29*(3), 194-211.

Choi, T. Y., & Dooley, K. J. (2009). Supply networks: Theories and models. *The Journal of Supply Chain Management, 45*(3), 25-26.

Choi, T. Y., & Kim, Y. (2008). Structural embeddedness and supplier management: A network perspective*. Journal of Supply Chain Management, *44*(4), 5-13.

Choi, T. Y., & Krause, D. R. (2006). The supply base and its complexity: Implications for transaction costs, risks, responsiveness, and innovation. *Journal of Operations Management*, *24*(5), 637-652.

Choi, T. Y., & Linton, T. (2011). Don't let your supply chain control your business. *Harvard Business Review, 89*(12), 112-117.

Choi, T. Y., & Wu, Z. (2009a). Triads in supply networks: Theorizing buyer-supplier-supplier relationships. *Journal of Supply Chain Management, 45*(1), 8-25.

Choi, T. Y., & Wu, Z. (2009b). Go ahead, leap: Triads and their practical and theoretical import: In response to "To leap or not to leap: Triads as arbitrary subsets of networks of connected dyads" by Anna Dubois. *Journal of Purchasing and Supply Management, 15*(4), 269-270.

Choi, T. Y., & Wu, Z. (2009c). Taking the leap from dyads to triads: Buyer–supplier relationships in supply networks. *Journal of Purchasing and Supply Management, 15*(4), 263-266.

Choi, T. Y., Dooley, K. J., & Rungtusanatham, M. (2001). Supply networks and complex adaptive systems: Control versus emergence. *Journal of Operations Management, 19*(3), 351-366.

Chopra, S., & Meindl, P. (2007). *Supply chain management: Strategy, planning & operation* (pp. 265-275). Gabler.

Chu, Z., & Wang, Q. (2012). Drivers of relationship quality in logistics outsourcing in China. *Journal of Supply Chain Management, 48*(3), 78-96.

Claycomb, C., & Frankwick, G. L. (2005). The dynamics of buyers' perceived costs during a relationship development process: An empirical assessment. *Journal of Business Research, 58*(12), 1662-1671.

Collis, J., & Hussey, R. (2003). *Business research: A practical guide for undergraduate and postgraduate students*. Houndmills, England: Palgrave Macmillan.

Collyer, M. (2000). Communication: The route to successful change management: Lessons from the Guinness Integrated Business Programme. *Supply Chain Management: An International Journal*, *5*(5), 222-227.

Corbett, C. J., Blackburn, J. D., & Van Wassenhove, L. N. (1999). Partnerships to improve supply chains. *Sloan Management Review, 40*(4), 71-82.

Coromina, L., Guia, J., Coenders, G., & Ferligoj, A. (2008). Degree centrality: Duocentered networks. *Social Networks, 30*(1), 49-59.

Corsten, D., & Felde, J. (2005). Exploring the performance effects of key-supplier collaboration: An empirical investigation into Swiss buyer-supplier relationships. *International Journal of Physical Distribution & Logistics Management*, *35*(6), 445-461.

Cox, A. (1999). Power, value and supply chain management. *Supply Chain Management, 4*(4), 167.

Cox, A. (2001a). Managing with power: Strategies for improving value appropriation from supply relationships. *Journal of Supply Chain Management, 37*(2), 42-47.

Cox, A. (2001b). The power perspective in procurement and supply management. *Journal of Supply Chain Management, 37*(2), 4-7.

Cox, A. (2001c). Understanding buyer and supplier power: A framework for procurement and supply competence. *Journal of Supply Chain Management, 37*(2), 8-15.

Cox, A. (2004). The art of the possible: Relationship management in power regimes and supply chains. *Supply Chain Management, 9*(5), 346-356.

Cox, A., Sanderson, J., & Watson, G. (2001). Supply chains and power regimes: Toward an analytic framework for managing extended networks of buyer and supplier relationships. *Journal of Supply Chain Management, 37*(2), 28-35.

Cox, A., Watson, G., Lonsdale, C., & Sanderson, J. (2004). Managing appropriately in power regimes: Relationship and performance management in 12 supply chain cases. *Supply Chain Management, 9*(5), 357-371.

Crespin-Mazet, F., & Dontenwill, E. (2012). Sustainable procurement: Building legitimacy in the supply network. *Journal of Purchasing and Supply Management, 18*(4), 207.

Creswell, J. W. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, CA: Sage.

Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed method approaches* (2nd ed.). Thousand Oaks, CA: Sage.

Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed method approaches* (3rd ed.). Thousand Oaks, CA: Sage.

Crook, T. R., & Combs, J. G. (2007). Sources and consequences of bargaining power in supply chains. *Journal of Operations Management, 25*(2), 546.

Crotty, M. (1998). *The foundations of social research: Meaning and perspective in the research process*. London, England: Sage.

Danese, P., & Romano, P. (2013). The moderating role of supply network structure on the customer integration-efficiency relationship. *International Journal of Operations & Production Management, 33*(4), 372-393. doi:http://dx.doi.org/10.1108/01443571311307226

Das, T. K., & Teng, B.S.(1998). Resource and risk management in the strategic alliance making process. *Journal of Management, 24*(1), 21-42.

Daugherty, P. J. (2011). Review of logistics and supply chain relationship literature and suggested research agenda. *International Journal of Physical Distribution & Logistics Management*, *41*(1), 16-31.

Denzin, N. K., & Lincoln, Y. S. (2000). *Handbook of qualitative research*. Thousand Oaks, CA: Sage.

Denzin, N. K., & Lincoln, Y. S. (2005). *The Sage handbook of qualitative research* (3rd ed.). Thousand Oaks, CA: Sage.

Denzin, N. K., & Lincoln, Y. S. (2013). *The landscape of qualitative research* (4th ed.). Thousand Oaks, CA: Sage.

Dev, N. K., Swami, S., & Caprihan, R. (2010). A discrete dynamic programming approach towards optimal outsourcing policy in supply chain management. *Journal of Advances in Management Research, 7*(1), 94-111. doi:http://dx.doi.org/10.1108/09727981011042874

DeWitt, T., Giunipero, L. C., & Melton, H. L. (2006). Clusters and supply chain management: The Amish experience. *International Journal of Physical Distribution & Logistics Management*, *36*(4), 289-308.

Doran, D., Thomas, P., & Caldwell, N. (2005). Examining buyer-supplier relationships within a service sector context. *Supply Chain Management: An International Journal*, *10*(4), 272-277.

Dubois, A. (2009). Comment on "Taking the leap from dyads to triads: Buyer–supplier relationships in supply networks" by Choi and Wu: To leap or not to leap: Triads as arbitrary subsets of networks of connected dyads. *Journal of Purchasing and Supply Management, 15*(4), 267-268.

Dubois, A., & Fredriksson, P. (2008). Cooperating and competing in supply networks: Making sense of a triadic sourcing strategy. *Journal of Purchasing and Supply Management, 14*(3), 170-179.

Dunnette, M. D., & Hough, L. M. (1990). *Handbook of industrial and organizational psychology: Volume 1*. Palo Alto, CA: Consulting Psychologists.

Dyer, J. H. (1997). Effective interfirm collaboration: How firms minimize transaction costs and maximize transaction value. *Strategic Management Journal (1986-1998), 18*(7), 535-556.

Dyer, W. G., Jr., Wilkins, A. L., & Eisenhardt, K. M. (1991). Better stories, not better constructs, to generate better theory: A rejoinder to Eisenhardt; Better stories and better constructs: The case for rigor and comparative logic. *The Academy of Management Review, 16*(3), 613-619.

Eckerd, S., & Hill, J. A. (2012). The buyer-supplier social contract: Information sharing as a deterrent to unethical behaviors. *International Journal of Operations & Production Management*, *32*(2), 238-255.

Eggert, A., Henseler, J., & Hollmann, S. (2012). Who owns the customer? Disentangling customer loyalty in indirect distribution channels. *The Journal of Supply Chain Management, 48*(2), 75-92.

Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *The Academy of Management Review*, *14*(1), 57-74.

Ellram, L. M. (1991). Life-cycle patterns in industrial buyer-seller partnerships. *International Journal of Physical Distribution & Logistics Management, 21*(9), 12.

Esmaeili, M., Aryanezhad, M.-B., & Zeephongsekul, P. (2009). A game theory approach in seller-buyer supply chain. *European Journal of Operational Research, 195*(2), 442.

Everett, M. G., Sinclair, P., & Dankelmann, P. (2004). Some centrality results new and old. *The Journal of Mathematical Sociology, 28*(4), 215-227.

Fabbe-Costes, N., Jahre, M., & Roussat, C. (2009). Supply chain integration: The role of logistics service providers. *International Journal of Productivity and Performance Management, 58*(1), 71-91.

Fawcett, S. E., & Clinton, S. R. (1997). Enhancing logistics to improve the competitiveness of manufacturing organizations: A triad perspective. *Transportation Journal, 37*(1), 18-28.

Fawcett, S. E., Magnan, G. M., & McCarter, M. W. (2008). Benefits, barriers, and bridges to effective supply chain management. *Supply Chain Management: An International Journal*, *13*(1), 35-48. Fawcett, S. E., Jones, S. L., & Fawcett, A. M. (2012). Supply chain trust: The catalyst for collaborative innovation. *Business Horizons*, *55*(2), 163-178.

Fawcett, S. E., Magnan, G. M., & Fawcett, A. M. (2010). Mitigating resisting forces to achieve the collaboration-enabled supply chain. *Benchmarking: An International Journal*, *17*(2), 269-293.

Fawcett, S. E., Wallin, C., Allred, C., Fawcett, A. M., & Fawcett, G. M. (2011). Information technology as an enabler of supply chain collaboration: A dynamic-capabilities perspective. *Journal of Supply Chain Management*, *47*(1), 38-59.

Fayezi, S., O'Loughlin, A., & Zutshi, A. (2012). Agency theory and supply chain management: A structured literature review. *Supply Chain Management: An International Journal*, *17*(5), 556-570.

Fearon, C., Ballantine, J., & Philip, G. (2010). Understanding the role of electronic trading and inter-organisational cooperation and coordination: A conceptual matrix framework. *Internet Research*, *20*(5), 545-562.

Ferrer, M., Santa, R., Hyland, P. W., & Bretherton, P. (2010). Relational factors that explain supply chain relationships. *Asia Pacific Journal of Marketing and Logistics*, *22*(3), 419-440.

Finne, M., Turunen, T., & Eloranta, V. (2015). Striving for network power: The perspective of solution integrators and suppliers. *Journal of Purchasing and Supply Management, 21*(1), 9.

Fleisher, C. S. (1991). Using an agency-based approach to analyze collaborative federated interorganizational relationships. *The Journal of Applied Behavioral Science*, *27*(1), 116-130.

Flynn, B. B., Zhao, X., Huo, B., & Yeung, J. H. Y. (2008). We've got the power! How customer power affects supply chain relationships. *Business Horizons*, *51*(3), 169-174.

Ford, D. (1980). The development of buyer-seller relationships in industrial markets. *European Journal of Marketing*, *14*(5/6), 339-353.

Forslund, H. (2009). Logistics service performance contracts: Design, contents and effects. *International Journal of Physical Distribution & Logistics Management*, *39*(2), 131-144.

Forslund, H., & Jonsson, P. (2009). Obstacles to supply chain integration of the performance management process in buyer-supplier dyads. *International Journal of Operations & Production Management, 29*(1), 77-95.

Frascatore, M. R., & Mahmoodi, F. (2008). Long-term and penalty contracts in a two-stage supply chain with stochastic demand. *European Journal of Operational Research, 184*(1), 147-156.

Freeman, S., & Browne, E. (2004). The influence of national culture on dissolution communication strategies in Western versus Asian business relationships: A theoretical model. *Supply Chain Management: An International Journal*, *9*(2), 169-182.

Gadde, L.-E., & Hulthén, K. (2009). Improving logistics outsourcing through increasing buyer-provider interaction. *Industrial Marketing Management, 38*(6), 633-640.

Gadde, L. E., Huemer, L., & Håkansson, H. (2003). Strategizing in industrial networks. *Industrial Marketing Management*, *32*(5), 357-364.

Galaskiewicz, J. (2011). Studying supply chains from a social network perspective. *The Journal of Supply Chain Management, 47(*1), 4-8.

Gammelgaard, B., & Larson, P. D. (2001). Logistics skills and competencies for supply chain management. *Journal of Business Logistics, 22*(2), 27-50.

Gamson, W. A. (1961). A theory of coalition formation. *American Sociological Review, 26*(3), 373-382.

Garfamy, R. M. (2012). Supply management: A transaction cost economics framework. *South East European Journal of Economics and Business*, 7(2), 139-147.

Gaski, J. F. (1986). Interrelations among a channel entity's power sources: Impact of the exercise of reward and coercion on expert, referent, and legitimate power sources. *Journal of Marketing Research*, 62-77.

Gassenheimer, J. B., Hunter, G. L., & Siguaw, J. A. (2007). An evolving theory of hybrid distribution: Taming a hostile supply network. *Industrial Marketing Management, 36*(5), 604-616.

Gelderman, C. J., & Van Weele, A. J. (2005). Purchasing portfolio models: A critique and update. *Journal of Supply Chain Management*, *41*(3), 19-28.

Gentry, J. J. (1996). Carrier involvement in buyer-supplier strategic partnerships. *International Journal of Physical Distribution & Logistics Management, 26*(3), 14-25.

Ghosh, A., & Fedorowicz, J. (2008). The role of trust in supply chain governance. *Business Process Management Journal*, *14*(4), 453-470.

Gibson, B. J., & Cook, R. L. (2001). Hiring practices in US third-party logistics firms. *International Journal of Physical Distribution & Logistics Management, 31*(9/10), 714.

Giannakis, M., & Croom, S. R. (2004). Toward the development of a supply chain management paradigm: A conceptual framework. *Journal of Supply Chain Management*, *40*(1), 27-37.

Gligor, D. M., & Autry, C. W. (2012). The role of personal relationships in facilitating supply chain communications: A qualitative study. *Journal of Supply Chain Management*, *48*(1), 24-43.

Gligor, D. M., & Holcomb, M. (2014). The road to supply chain agility: An RBV perspective on the role of logistics capabilities. *International Journal of Logistics Management, 25*(1), 160-179. doi:http://dx.doi.org/10.1108/IJLM-07-2012-0062

Goffin, K., Lemke, F., & Szwejczewski, M. (2006). An exploratory study of 'close' supplier-manufacturer relationships. *Journal of Operations Management, 24*(2), 189-209.

Gonzalez, R., Gasco, J., & Llopis, J. (2005). Information systems outsourcing reasons in the largest Spanish firms. *International Journal of Information Management, 25*(2), 117.

Gooley, T. B. (2000). Growth spurt. *Logistics Management and Distribution Report, 39*(11), 77-84.

Gopal, G., & Cline, S. (2007). Driving towards sustainable profitability: Transportation service providers and customer relationship management. *Supply Chain Management: An International Journal*, *12*(2), 85-87.

Gosain, S., & Palmer, J. W. (2004). Exploring strategic choices in marketplace positioning. *Electronic Markets, 14*(4), 308-321.

Gotzamani, K., Longinidis, P., & Vouzas, F. (2010). The logistics services outsourcing dilemma: Quality management and financial performance perspectives. *Supply Chain Management: An International Journal*, *15*(6), 438-453. doi:http://dx.doi.org/10.1108/13598541011080428

Grawe, S. J., Chen, H., & Daugherty, P. J. (2009). The relationship between strategic orientation, service innovation, and performance. *International Journal of Physical Distribution & Logistics Management*, *39*(4), 282-300.

Gray, D. E. (2004). *Doing research in the real world*. London, England: Sage.

Grbich, C. (2013). *Qualitative data analysis: An introduction*. Los Angeles, CA : Sage.

Griffith, D. A., Harvey, M. G., & Lusch, R. F. (2006). Social exchange in supply chain relationships: The resulting benefits of procedural and distributive justice. *Journal of Operations Management, 24*(2), 85-98.

Gummesson, E. (2000). *Qualitative methods in management research*. Thousand Oaks, CA: Sage.

Ha, B., Park, Y., & Cho, S. (2011). Suppliers' affective trust and trust in competency in buyers: Its effect on collaboration and logistics efficiency. *International Journal of Operations & Production Management*, *31*(1), 56-77.

Hall, D. C., & Saygin, C. (2012). Impact of information sharing on supply chain performance. *International Journal of Advanced Manufacturing Technology*, *58*(1-4), 397-409.

Halldorsson, A., & Skjott-Larsen, T. (2004). Developing logistics competencies through third party logistics relationships. *International Journal of Operations & Production Management, 24*(1/2), 192-206.

Halldorsson, A., Kotzab, H., Mikkola, J. H., & Skjøtt-Larsen, T. (2007). Complementary theories to supply chain management. *Supply Chain Management: An International Journal*, *12*(4), 284-296.

Hallebone, E., & Priest, J. (2009). *Business and management research: Paradigms & Practices*. Basingstoke, England: Palgrave Macmillan.

Handley, S. M., & Benton, W. C. (2012). The influence of exchange hazards and power on opportunism in outsourcing relationships. *Journal of Operations Management*, *30*(1/2), 55-68.

Hardy, M. A., & Bryman, A. (2004). *Handbook of data analysis*. London, England: Sage.

Harland, C. M., & Knight, L. A. (2001). Supply network strategy: Role and competence requirements. *International Journal of Operations & Production Management, 21*(4), 476-489.

Harland, C. M., Lamming, R. C., Zheng, J., & Johnsen, T. E. (2001). A taxonomy of supply networks. *The Journal of Supply Chain Management, 37*(4), 21-27.

Harland, C., Zheng, J., Johnsen, T., & Lamming, R. (2004). A conceptual model for researching the creation and operation of supply networks. *British Journal of Management, 15*(1), 1-21.

Hartmann, A., & Caerteling, J. (2010). Subcontractor procurement in construction: The interplay of price and trust. *Supply Chain Management: An International Journal*, *15*(5), 354-362.

Hartmann, E., & Grahl, A. D. (2012). Logistics outsourcing interfaces: The role of customer partnering behavior. *International Journal of Physical Distribution & Logistics Management*, *42*(6), 526-543.

Hayat, K., Abbas, Z., Siddique, M., & Cheema, K. (2012). A study of the different factors that are affecting the supply chain responsiveness. *Academic Research International*, *3*(3), 345-356.

Heider, F. (1958). *The psychology of interpersonal relations*. New York, NY: Wiley.

Helmick, J. S. (2000). 21st century logistics: Making supply chain integration a reality. *Transportation Journal, 40*(1), 48-49.

Hennink, M. M., Hutter, I., & Bailey, A. (2011). *Qualitative research methods*. London, England: Sage.

Hilletofth, P., & Hilmola, O.-P. (2010). Role of logistics outsourcing on supply chain strategy and management. *Strategic Outsourcing: An International Journal, 3*(1), 46-61. doi:http://dx.doi.org/10.1108/17538291011023070

Hinkka, V., Kary, F., & Tätilä, J. (2013). Supply chain tracking: Aligning buyer and supplier incentives. *Industrial Management + Data Systems, 113*(8), 1133-1148. doi:http://dx.doi.org/10.1108/IMDS-12-2012-0439

Hofer, A. R., Knemeyer, A. M., & Dresner, M. E. (2009). Antecedents and dimensions of customer partnering behavior in logistics outsourcing relationships. *Journal of Business Logistics, 30*(2), 141.

Hofmann, E. (2010). Linking corporate strategy and supply chain management. *International Journal of Physical Distribution & Logistics Management*, *40*(4), 256-276.

Hofstede, G. J., Fritz, M., Canavari, M., Oosterkamp, E., & Van Sprundel, G. (2010). Towards a cross-cultural typology of trust in B2B food trade. *British Food Journal*, *112*(7), 672-687.

Holcomb, T. R., & Hitt, M. A. (2007). Toward a model of strategic outsourcing. *Journal of Operations Management*, *25*(2), 464-481.

Holma, A.-M. (2012). Interpersonal interaction in business triads: Case studies in corporate travel purchasing. *Journal of Purchasing and Supply Management, 18*(2), 101-112.

Holmen, E., Aune, T. B., & Pedersen, A.-C. (2013). Network pictures for managing key supplier relationships. *Industrial Marketing Management, 42*(2), 139.

House, R. G., & Stank, T. P. (2001). Insights from a logistics partnership. *Supply Chain Management: An International Journal*, *6*(1), 16-20.

Howard, M., & Squire, B. (2007). Modularization and the impact on supply relationships. *International Journal of Operations & Production Management, 27*(11), 1192-1212.

Huang, X., Gattiker, T. F., & Schwarz, J. L. (2008). Interpersonal trust formation during the supplier selection process: The role of the communication channel. *Journal of Supply Chain Management, 44*(3), 53-75.

Hult, G. T. M., Ketchen, D. J., Jr., Cavusgil, S. T., & Calantone, R. J. (2006). Knowledge as a strategic resource in supply chains. *Journal of Operations Management, 24*(5), 458-475.

Hummon, N. P., & Doreian, P. (2003). Some dynamics of social balance processes: Bringing Heider back into balance theory. *Social Networks, 25*(1), 17-49.

Humphrey, C., & Lee, B. (2004). *The real life guide to accounting research: A behind-the-scenes view of using qualitative research methods*. Amsterdam, The Netherlands: Elsevier.

Humphries, A. S., Towriss, J., & Wilding, R. (2007). A taxonomy of highly interdependent supply chain relationships. *International Journal of Logistics Management, 18*(3), 385-401.

Hunt, S. D., & Davis, D. F. (2012). Grounding supply chain management in resource-advantage theory: In defense of a resource-based view of the firm. *Journal of Supply Chain Management, 48*(2), 14-20.

Huuskonen, A. (2014). Supply network design in the residential-FM sector. *Facilities, 32*(11/12), 723.

Janvier-James, A. M., & Didier, E. (2011). A benchmarking framework for supply chain collaboration: A data envelopment analysis (DEA) application. *International Journal of Business Administration*, *2*(3), 19-31.

Jap, S. D. (2001). Perspectives on joint competitive advantages in buyer-supplier relationships. *International Journal of Research in Marketing, 18*(1/2), 19-35.

Jayaraman, R., Taha, K., Park, K. S., & Lee, J. (2014). Impacts and role of group purchasing organization in healthcare supply chain. *IIE Annual Conference. Proceedings*, 3842-3851.

Jin, M., & Wu, S. D. (2006). Supplier coalitions in on-line reverse auctions: Validity requirements and profit distribution scheme. *International Journal of Production Economics, 100*(2), 183-194.

Johnsen, T. E. (2011). Supply network delegation and intervention strategies during supplier involvement in new product development. *International Journal of Operations & Production Management, 31*(6), 686-708. doi:http://dx.doi.org/10.1108/01443571111131999

Johnsen, T., & Ford, D. (2005). At the receiving end of supply network intervention: The view from an automotive first tier supplier. *Journal of Purchasing and Supply Management, 11*(4), 183-192. doi:http://dx.doi.org/10.1016/j.pursup.2005.10.010

Johnston, D. A., McCutcheon, D. M., Stuart, F. I., & Kerwood, H. (2004). Effects of supplier trust on performance of cooperative supplier relationships. *Journal of Operations Management, 22*(1), 23-38.

Jonker, J., & Pennink, B. (2009). *The essence of research methodology: A concise guide for master and PhD students in management science*. Berlin, Germany: Springer-Verlag.

Jonsson, P., & Zineldin, M. (2003). Achieving high satisfaction in supplier-dealer working relationships. *Supply Chain Management: An International Journal*, *8*(3/4), 224-240.

Juga, J., Juntunen, J., & Grant, D. B. (2010). Service quality and its relation to satisfaction and loyalty in logistics outsourcing relationships. *Managing Service Quality, 20*(6), 496-510. doi:http://dx.doi.org/10.1108/09604521011092857

Kahkonen, A.-K., & Virolainen, V. M. (2011). Sources of structural power in the context of value nets. *Journal of Purchasing and Supply Management, 17*(2), 109-120.

Kaipia, R., Korhonen, H., & Hartiala, H. (2006). Planning nervousness in a demand supply network: An empirical study. *The International Journal of Logistics Management*, *17*(1), 95-113.

Kamaruddin, N. K., & Udin, Z. M. (2009). Supply chain technology adoption in Malaysian automotive suppliers. *Journal of Manufacturing Technology Management*, *20*(3), 385-403.

Katok, E., & Pavlov, V. (2013). Fairness in supply chain contracts: A laboratory study. *Journal of Operations Management*, *31*(3), 129-137.

Kelly, S. J. (2004). Measuring attitudinal commitment in business-to-business channels. *Marketing Intelligence & Planning, 22*(6/7), 636-651.

Kim, Y., Choi, T. Y., Yan, T., & Dooley, K. (2011). Structural investigation of supply networks: A social network analysis approach. *Journal of Operations Management*, *29*(3), 194-211.

Knemeyer, A. M., & Murphy, P. R. (2005). Is the glass half full or half empty? An examination of user and provider perspectives towards third-party logistics relationships. *International Journal of Physical Distribution & Logistics Management,* 35(9/10), 708-727.

Knemeyer, A. M., Corsi, T. M., & Murphy, P. R. (2003). Logistics outsourcing relationships: Customer perspectives. *Journal of Business Logistics, 24*(1), 77-110.

Koh, S. C. L., & Tan, Z. (2005). Using e-commerce to gain a competitive advantage in 3PL enterprises in China. *International Journal of Logistics Systems and Management, 1*(2), 187-210

Koufteros, X., Vickery, S. K., & Dröge, C. (2012). The effects of strategic supplier selection on buyer competitive performance in matched domains: Does supplier integration mediate the relationships? *Journal of Supply Chain Management*, *48*(2), 93-115.

Krause, D. R., Handfield, R. B., & Tyler, B. B. (2007). The relationships between supplier development, commitment, social capital accumulation and performance improvement. *Journal of Operations Management*, *25*(2), 528-545.

Kull, T. J., Ellis, S. C., & Narasimhan, R. (2013). Reducing behavioral constraints to supplier integration: A socio-technical systems perspective. *Journal of Supply Chain Management*, *49*(1), 64-86.

Kull, T. J., Oke, A., & Dooley, K. J. (2014). Supplier selection behavior under uncertainty: Contextual and cognitive effects on risk perception and choice. *Decision Sciences*, *45*(3), 467-505.

Kvale, S., & Brinkmann, S. (2009). *InterViews: Learning the craft of qualitative research interviewing*. Los Angeles, CA: Sage.

Lai, F., Chu, Z., Wang, Q., & Fan, C. (2013). Managing dependence in logistics outsourcing relationships: Evidence from China. *International Journal of Production Research, 51*(10), 3037.

Lai, F., Tian, Y., & Huo, B. (2012). Relational governance and opportunism in logistics outsourcing relationships: Empirical evidence from China. *International Journal of Production Research, 50*(9), 2501.

Lambert, D. M., & Cooper, M. C. (2000). Issues in supply chain management. *Industrial Marketing Management*, *29*(1), 65-83.

Lamming, R., Johnsen, T., Zheng, J., & Harland, C. (2000). An initial classification of supply networks. *International Journal of Operations & Production Management*, *20*(6), 675-691.

Lamprinopoulou, C., & Tregear, A. (2011). Inter-firm relations in SME clusters and the link to marketing performance. *Journal of Business & Industrial Marketing*, *26*(6), 421-429.

Large, R. O. (2005). Communication capability and attitudes toward external communication of purchasing managers in Germany. *International Journal of Physical Distribution & Logistics Management*, *35*(6), 426-444.

Larson, P. D., Carr, P., & Dhariwal, K. S. (2005). SCM involving small versus large suppliers: Relational exchange and electronic communication Media. *The Journal of Supply Chain Management*, *41*(1), 18-29.

Lau, K. H., & Zhang, J. (2006). Drivers and obstacles of outsourcing practices in China. *International Journal of Physical Distribution & Logistics Management, 36*(10), 776.

Lawson, B., Tyler, B. B., & Cousins, P. D. (2008). Antecedents and consequences of social capital on buyer performance improvement. *Journal of Operations Management, 26*(3), 446.

Lee, H. L., & Whang, S. (2000). Information sharing in supply chain. *International Journal of Technology Management, 20*(3/4), 373-387.

Lee, H. L., Padmanabhan, V., & Whang, S. (1997). The bullwhip effect in supply chains. *Sloan Management Review, 38*(3), 93-102.

Lee, J., & Qualls, W. J. (2010). A dynamic process of buyer-seller technology adoption. *Journal of Business & Industrial Marketing*, *25*(3), 220-228.

Lejeune, M. A., & Yakova, N. (2005). On characterizing the 4 C's in supply chain management. *Journal of Operations Management, 23*(1), 81-100.

Lemke, F., Goffin, K., & Szwejczewski, M. (2003). Investigating the meaning of supplier-manufacturer partnerships: An exploratory study. *International Journal of Physical Distribution & Logistics Management*, *33*(1/2), 12-35.

Li, F., Li, L., Jin, C., Wang, R., Wang, H., & Yang, L. (2012). A 3PL supplier selection model based on fuzzy sets. *Computers & Operations Research, 39*(8), 1879.

Li, H., Zhang, H., & Fine, C. H. (2013). Dynamic business share allocation in a supply chain with competing suppliers. *Operations Research, 61*(2), 280-297.

Li, H.-H. J. K., Shi, Y. J., Gregory, M., & Tan, K. H. (2014). Rapid production ramp-up capability: A collaborative supply network perspective. *International Journal of Production Research, 52*(10), 2999.

Li, M., & Choi, T. Y. (2009). Triads in services outsourcing: Bridge, bridge decay and bridge transfer. *The Journal of Supply Chain Management, 45*(3), 27-39.

Li, G., Wang, S., Yan, H., & Yu, G. (2005). Information transformation in a supply chain: A simulation study. *Computers & Operations Research*, *32*(3), 707-725.

Liao, Y., Hong, P., & Rao, S. S. (2010). Supply management, supply flexibility and performance outcomes: An empirical investigation of manufacturing firms: Supply management, supply flexibility and performance outcomes. *The Journal of Supply Chain Management*, *46*(3), 6-12.

Lieb, R. C., & Randall, H. L. (1996). A comparison of the use of third-party logistics services by large American manufacturers, 1991, 1994, and 1995. *Journal of Business Logistics, 17*(1), 305-320.

Lieb, R. C., Millen, R. A., & Van Wassenhove, L. N. (1993). Third-party logistics: A comparison of experienced American and European manufacturers. *International Journal of Physical Distribution & Logistics Management, 23*(6), 35.

Lieb, R., & Bentz, B. A. (2005a). The North American third party logistics industry in 2004: The provider CEO perspective. *International Journal of Physical Distribution & Logistics Management, 35*(7/8), 595-611.

Lieb, R., & Bentz, B. A. (2005b). The use of third-party logistics services by large American manufacturers: The 2004 survey. *Transportation Journal, 44*(2), 5.

Lieb, R., & Butner, K. (2007). The North American third-party logistics industry in 2006: The provider CEO perspective. *Transportation Journal, 46*(3), 40-52.

Lincoln, Y. S., & Guba, E. G. (2013). *The constructivist credo*. Walnut Creek, CA: Left Coast.

Liu, Z., Xu, J., Li, Y., Wang, X., & Wu, J. (2012). Using system dynamics to study the logistics outsourcing cost of risk. *Kybernetes, 41*(9), 1200-1208. doi:http://dx.doi.org/10.1108/03684921211275216

Liu, H., Ke, W., Wei, K. K., Gu, J., & Chen, H. (2010). The role of institutional pressures and organizational culture in the firm's intention to adopt internet-enabled supply chain management systems. *Journal of Operations Management*, *28*(5), 372-384.

Lorentz, H. (2008). Collaboration in Finnish-Russian supply chains: Effects on performance and the role of experience. *Baltic Journal of Management*, *3*(3), 246-265.

Lorentz, H., Kittipanya-ngam, P., & Srai, J. S. (2013). Emerging market characteristics and supply network adjustments in internationalising food supply chains. *International Journal of Production Economics*, *145*(1), 220-232.

Lumsden, K., & Mirzabeiki, V. (2008). Determining the value of information for different partners in the supply chain. *International Journal of Physical Distribution & Logistics Management*, *38*(9), 659-673.

Luo, Y., Liu, Y., Zhang, L., & Huang, Y. (2011). A taxonomy of control mechanisms and effects on channel cooperation in China. *Journal of The Academy of Marketing Science*, *39*(2), 307-326.

Madhavan, R., Gnyawali, D. R., & He, J. (2004). Two's company, three's a crowd? Triads in cooperative-competitive networks. *Academy of Management Journal*, *47*(6), 918-927.

Madhok, A., & Tallman, S. B. (1998). Resources, transactions and rents: Managing value through inter-firm collaborative relationships. *Organization Science, 9*(3), 326-339.

Maloni, M., & Benton, W. C. (2000). Power influences in the supply chain. *Journal of Business Logistics, 21*(1), 49-74.

Manthou, V., Maro, V., & Folinas, D. (2004). Virtual e-chain (VeC) model for supply chain collaboration. *International Journal of Production Economics, 87*(3), 241-250.

Marasco, A. (2008). Third-party logistics: A literature review. *International Journal of Production Economics, 113*(1), 127.

Martinez-de-Albéniz, V., & Simchi-Levi, D. (2013). Supplier-buyer negotiation games: Equilibrium conditions and supply chain efficiency. *Production and Operations Management, 22*(2), 397.

Mavondo, F. T., & Rodrigo, E. (2001). The effect of relationship dimensions on interpersonal and inter-organizational commitment in organizations conducting business between Australia and China. *Journal of Business Research, 52*(2), 111-121.

McAdam, R., & McCormack, D. (2001). Integrating business processes for global alignment and supply chain management. *Business Process Management Journal, 7*(2), 113-130.

McAfee, R. B., Glassman, M., & Honeycutt, E. D., Jr. (2002). The effects of culture and human resource management policies on supply chain management strategy. *Journal of Business Logistics, 23*(1), 1-18.

McCarthy-Byrne, T. M., & Mentzer, J. T. (2011). Integrating supply chain infrastructure and process to create joint value. *International Journal of Physical Distribution & Logistics Management*, *41*(2), 135-161.

McDowell, W. C., Harris, M. L., & Zhang, L. (2009). Relational orientation and performance in micro-businesses and small and medium-sized enterprises: An examination of inter-organizational relationships. *Journal of Business and Entrepreneurship*, *21*(2), 1-19.

McIvor, R., & McHugh, M. (2000). Partnership sourcing: An organization change management perspective. *The Journal of Supply Chain Management, 36*(3), 12-20.

McKone-Sweet, K., & Lee, Y.-T. (2009). Development and analysis of a supply chain strategy taxonomy. *Journal of Supply Chain Management, 45*(3), 3-24.

McLachlin, R., & Larson, P. D. (2011). Building humanitarian supply chain relationships: Lessons from leading practitioners. *Journal of Humanitarian Logistics and Supply Chain Management*, *1*(1), 32-49.

Medcof, J. W. (2001). Resource-based strategy and managerial power in networks of internationally dispersed technology units. *Strategic Management Journal, 22*(11), 999-1012.

Meehan, J., & Wright, G. H. (2012). The origins of power in buyer–seller relationships. *Industrial Marketing Management*, *41*(4), 669-679.

Mehrjerdi, Y. Z. (2009). The collaborative supply chain. *Assembly Automation*, *29*(2), 127-136.

Mello, J. E., & Stank, T. P. (2005). Linking firm culture and orientation to supply chain success. *International Journal of Physical Distribution & Logistics Management*, *35*(7/8), 542-554.

Mena, C., Humphries, A., & Choi, T. Y. (2013). Toward a theory of multi-tier supply chain management. *Journal of Supply Chain Management*, *49*(2), 58-77.

Mena, C., Humphries, A., & Wilding, R. (2009). A comparison of inter- and intra-organizational relationships: Two case studies from UK food and drink industry. *International Journal of Physical Distribution & Logistics Management*, *39*(9), 762-784.

Mentzer, J. T. (2001). *Supply chain management*. Thousand Oaks, CA: Sage.

Miemczyk, J., Johnsen, T. E., & Macquet, M. (2012). Sustainable purchasing and supply management: A structured literature review of definitions and measures at the dyad, chain and network levels. *Supply Chain Management: An International Journal*, *17*(5), 478-496.

Miles, G., Preece, S. B., & Baetz, M. C. (1999). Dangers of dependence: The impact of strategic alliance use by small technology-based firms. *Journal of Small Business Management, 37*(2), 20-29.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis an expanded sourcebook*. Thousand Oaks, CA: Sage.

Mills, T. M. (1958). Some hypotheses on small groups from Simmel. *American Journal of Sociology, 63*(6), 642-650.

Min, J., & Mitsuhashi, H. (2012). Dynamics of unclosed triangles in alliance networks: Disappearance of brokerage positions and performance consequences. *The Journal of Management Studies, 49*(6), 1078-1108.

Min, S., Roath, A. S., Daugherty, P. J., Genchev, S. E., et al. (2005). Supply chain collaboration: What's happening? *International Journal of Logistics Management, 16*(2), 237-256.

Min, S., & Mentzer, J. T. (2000). The role of marketing in supply chain management. *International Journal of Physical Distribution & Logistics Management*, *30*(9), 765-787.

Ming Cheng Temple (2003). *Chan Zong Jing Dian*.

Miocevic, D., & Crnjak-Karanovic, B. (2012). The mediating role of key supplier relationship management practices on supply chain orientation: The organizational buying effectiveness link. *Industrial Marketing Management, 41*(1), 115.

Mohanty, R. P., & Deshmukh, S. G. (2009). *Supply chain management: Theories & practices*. New Delhi, India: Biztantra.

Mohr, J., & Nevin, J. R. (1990). Communication strategies in marketing channels: A theoretical perspective. *Journal of Marketing, 54*(4), 36-51.

Mollenkopf, D., & Dapiran, G. P. (2005). World-class logistics: Australia and New Zealand. *International Journal of Physical Distribution & Logistics Management, 35*(1), 63-74.

Morgan, R. M., & Hunt, S. D. (1994). The commitment-trust theory of relationship marketing. *Journal of Marketing, 5*8(3), 20.

Moser, R., Kern, D., Wohlfarth, S., & Hartmann, E. (2011). Supply network configuration benchmarking : Framework development and application in the Indian automotive industry.

Benchmarking: An International Journal, *18*(6), 783-801. doi:http://dx.doi.org/10.1108/14635771111180707

Mouton, J. (2001). *How to succeed in your master's and doctoral studies: A South African guide and resource book*. Pretoria, South Africa: Van Schaik.

Murphy, P. R., & Poist, R. F. (2000). Third-party logistics: Some user versus provider perspectives. *Journal of Business Logistics, 21*(1), 121-133.

Myers, T. (2003). Logistics: International crisis boosts supply chain integrity New Zealand's trading history gives advantages in the new world of tighter border controls. *NZ Business, 43*.

Myerson, R. B. (1977). Graphs and cooperation in games. *Mathematics of Operations Research*, *2*(3), 225-229.

Naim, M., Aryee, G., & Potter, A. (2010). Determining a logistics provider's flexibility capability. *International Journal of Production Economics, 127*(1), 39.

Neuman, W. L. (2000). *Workbook for social research methods: Qualitative and quantitative approaches*. Boston, MA: Allyn and Bacon.

Newcomb, T. M. (1961). *The acquaintance process*. New York, NY: Holt, Rinehart and Winston.

Nooteboom, B. (2006). Simmel's treatise on the triad (1908). *Journal of Institutional Economics, 2*(3), 365-383.

Oosterhuis, M., Van der Vaart, T., & Molleman, E. (2012). The value of upstream recognition of goals in supply chains. *Supply Chain Management: An International Journal*, *17*(6), 582-595.

Pagell, M., & Krause, D. R. (2004). Re-exploring the relationship between flexibility and the external environment. *Journal of Operations Management*, *21*(6), 629-649.

Pagell, M., & Wu, Z. (2009). Building a more complete theory of sustainable supply chain management using case studies of 10 exemplars. *The Journal of Supply Chain Management*, *45*(2), 37-56.

Palsule-Desai, O. D., Tirupati, D., & Chandra, P. (2013). Stability issues in supply chain networks: Implications for coordination mechanisms. *International Journal of Production Economics, 142*(1), 179.

Parker, D. W., & Russell, K. A. (2004). Outsourcing and inter/intra supply chain dynamics: Strategic management issues. *The Journal of Supply Chain Management, 40*(4), 56-68.

Parsons, A. L. (2002). What determines buyer-seller relationship quality? An investigation from the buyer's perspective. *The Journal of Supply Chain Management*, *38*(1), 4-12.

Pathak, S. D., Day, J. M., Nair, A., Sawaya, W. J., & Kristal, M. M. (2007). Complexity and adaptivity in supply networks: Building supply network theory using a complex adaptive systems perspective*. *Decision Sciences, 38*(4), 547-580.

Paulraj, A., & Chen, I. J. (2007). Environmental uncertainty and strategic supply management: A resource dependence perspective and performance implications. *The Journal of Supply Chain Management, 43*(3), 29-42.

Paulraj, A., Lado, A. A., & Chen, I. J. (2008). Inter-organizational communication as a relational competency: Antecedents and performance outcomes in collaborative buyer–supplier relationships. *Journal of Operations Management*, *26*(1), 45-64.

Payne, G., & Williams, M. (2005). Generalization in qualitative research. *Sociology: The Journal of the British Sociological Association, 39*(2), 295-314.

Pearcy, D. H., & Giunipero, L. C. (2008). Using e-procurement applications to achieve integration: What role does firm size play? *Supply Chain Management: An International Journal*, *13*(1), 26-34.

Peck, H. (2005). Drivers of supply chain vulnerability: An integrated framework. *International Journal of Physical Distribution & Logistics Management*, *35*(3/4), 210-232.

Petersen, K. J., Handfield, R. B., Lawson, B., & Cousins, P. D. (2008). Buyer dependency and relational capital formation: The mediating effects of socialization processes and supplier integration. *The Journal of Supply Chain Management, 44*(4), 53-65.

Phillips, J. M., Liu, B. S., & Costello, T. G. (1998). A balance theory perspective of triadic supply chain relationships. *Journal of Marketing Theory and Practice, 6*(4), 78-91.

Pilbeam, C., Alvarez, G., & Wilson, H. (2012). The governance of supply networks: A systematic literature review. *Supply Chain Management, 17*(4), 358-376. doi:10.1108/09600030610642913

Pope, C., Ziebland, S., & Mays, N. (2000). Qualitative research in health care: Analysing qualitative data. *BMJ: British Medical Journal*, *320*(7227), 114-116.

Poppo, L., & Zenger, T. (1998). Testing alternative theories of the firm: Transaction cost, knowledge-based, and measurement explanations for make-or-buy decisions in information services. *Strategic Management Journal (1986-1998), 19*(9), 853-877.

Power, D., Moosa, S., & Bhakoo, V. (2007). Adding value through outsourcing. *Management Research News, 30*(3), 228-235.

Prahinski, C., & Benton, W. C. (2004). Supplier evaluations: Communication strategies to improve supplier performance. *Journal of Operations Management, 22*(1), 39-62.

Prahinski, C., & Fan, Y. (2007). Supplier evaluations: The role of communication quality. *The Journal of Supply Chain Management*, *43*(3), 16-28.

Prasad, K. G. D., Subbaiah, K. V., & Rao, K. N. (2012). Aligning the competitive strategy with supply chain strategy through QFD. *Journal of Advances in Management Research*, *9*(2), 189-198.

Prater, E. (2005). A framework for understanding the interaction of uncertainty and information systems on supply chains. *International Journal of Physical Distribution & Logistics Management*, *35*(7/8), 524-539.

Prater, E., & Ghosh, S. (2006). A comparative model of firm size and the global operational dynamics of U.S. firms in Europe. *Journal of Operations Management*, *24*(5), 511-529.

Preis, M. W. (2003). The impact of interpersonal satisfaction on repurchase decisions. *The Journal of Supply Chain Management*, *39*(3), 30-38.

Preiss, K. J., & Murray, P. A. (2005). Fashions of learning: Improving supply-chain relationships. *Supply Chain Management: An International Journal*, *10*(1), 18-25.

Priluck, R. (2003). Relationship marketing can mitigate product and service failures. *The Journal of Services Marketing, 17*(1), 37.

Pryke, S. D. (2004). Analysing construction project coalitions: Exploring the application of social network analysis. *Construction Management and Economics*, *22*(8), 787-797.

Qiang, Q., Ke, K., Anderson, T., & Dong, J. (2013). The closed-loop supply chain network with competition, distribution channel investment, and uncertainties. *Omega*, *41*(2), 186-194.

Qureshi, M. N., Kumar, P., & Kumar, D. (2009). Selection of 3PL service providers: A combined approach of AHP and graph theory. *International Journal of Services Technology and Management, 12*(1), 35.

Rajagopal, P., Zailani, S., & Sulaiman, M. (2009). Assessing the effectiveness of supply chain partnering with scalable partnering as a moderator. *International Journal of Physical Distribution & Logistics Management*, *39*(8), 649-668.

Ramsay, J.(1995).Purchasing power. *European Journal of Purchasing & Supply Management*, *1*(3),125–138.

Ramsay, J. (1996). Power measurement. *European Journal of Purchasing & Supply Management*, *2*(2), 129-143. Ramsay, J., & Wagner, B. A. (2009). Organisational supplying behaviour: Understanding supplier needs, wants and preferences. *Journal of Purchasing and Supply Management, 15*(2), 127-138. doi:http://dx.doi.org/10.1016/j.pursup.2009.02.001

Ravindranath, M., Gnyawali, D. R., & He, J. (2004). Two's company, three's a crowd? Triads in cooperative-competitive networks. *Academy of Management Journal, 47*(6), 918-927.

Razzaque, M. A., & Sheng, C. C. (1998). Outsourcing of logistics functions: A literature survey. *International Journal of Physical Distribution & Logistics Management*, *28*(2), 89-107.

Ren, Z. J., Cohen, M. A., Ho, T. H., & Terwiesch, C. (2010). Information sharing in a long-term supply chain relationship: The role of customer review strategy. *Operations Research, 58*(1), 81-93,252-255.

Richey, J. R., & Autry, C. W. (2009). Assessing inter-firm collaboration/technology investment tradeoffs: The effects of technological readiness and organizational learning. *The International Journal of Logistics Management*, *20*(1), 30-56.

Ritchie, B., Brindley, C., & Armstrong, N. (2008). Risk assessment and relationship management: Practical approach to supply chain risk management. *International Journal of Agile Systems and Management*, *3*(3/4), 228-247.

Romanelli, E. (1991). The evolution of new organizational forms. *Annual Review of Sociology, 17*, 79-103.

Rose-Anderssen, C., Baldwin, J., & Ridgway, K. (2010). Communicative interaction as an instrument for integration and coordination in an aerospace supply chain. *Journal of Management Development*, *29*(3), 193-209.

Rossetti, C. L., & Choi, T. Y. (2008). Supply management under high goal incongruence: An empirical examination of disintermediation in the aerospace supply chain. *Decision Sciences*, *39*(3), 507-540.

Ryu, I., So, S., & Koo, C. (2009). The role of partnership in supply chain performance. *Industrial Management and Data Systems*, *109*(4), 496-514.

Ryu, S., Lee, E., & Lee, W. (2011). A cross-cultural study of interfirm power structure and commitment: The effect of collectivism. *Journal of Business & Industrial Marketing, 26*(2), 92-103.

Sahay, B. S., & Ramneesh, M. (2006). 3PL practices: An Indian perspective. *International Journal of Physical Distribution & Logistics Management, 36*(9), 666.

Salam, A. F. (2011). Semantic matchmaking and decision support system for dependable supplier selection in the extended enterprise supply chain. *International Journal of Dependable and Trustworthy Information Systems*, *2*(1), 50-80.

Saldana, J. (2011). *Fundamentals of qualitative research*. New York, NY: Oxford.

Salo, A., Tähtinen, J., & Ulkuniemi, P. (2009). Twists and turns of triadic business relationship recovery. *Industrial Marketing Management, 38*(6), 618-632.

Sambasivan, M., & Yen, C. N. (2010). Strategic alliances in a manufacturing supply chain: Influence of organizational culture from the manufacturer's perspective. *International Journal of Physical Distribution & Logistics Management*, *40*(6), 456-474.

Sandberg, E., & Abrahamsson, M. (2010). The role of top management in supply chain management practices. *International Journal of Retail & Distribution Management*, *38*(1), 57-69.

Sandberg, E., & Bildsten, L. (2011). Coordination and waste in industrialised housing. *Construction Innovation: Information, Process, Management*, *11*(1), 77-91.

Sanders, N. R., Autry, C. W., & Gligor, D. M. (2011). The impact of buyer firm information connectivity enablers on supplier firm performance: A relational view. *The International Journal of Logistics Management*, *22*(2), 179-201.

Sanders, N. R., & Premus, R. (2005). Modeling the relationship between firm IT capability, collaboration, and performance. *Journal of Business Logistics*, *26*(1), 1-23.

Sanderson, J. (2001). The impact of regulation on buyer and supplier power. *Journal of Supply Chain Management, 37*(2), 16-21.

Sanderson, J. (2004). Opportunity and constraint in business-to-business relationships: Insights from strategic choice and zones of manoeuvre. *Supply Chain Management: An International Journal*, *9*(5), 392-401.

Sankaran, J. K., & Luxton, P. (2003). Logistics in relation to strategy in dairying: The case of New Zealand dairy. *International Journal of Operations & Production Management, 23*(5/6), 522-545.

Sanzo, M. J., Santos, M. L., Álvarez, L. I., & Vázquez, R. (2007). The effect of a buyer's market orientation on attitudinal loyalty toward a supplier: Is dependence a moderator? *Supply Chain Management: An International Journal*, *12*(4), 267-283.

Saunders, M. N., Saunders, M., Lewis, P., & Thornhill, A. (2011). *Research methods for business students, 5/e*. Pearson Education India. Saura, I. G., Molina, M. E., & Francés, D. S. (2008). Logistic service quality and technology: A comparison between supplier–retailer and retailer–consumer relationships. *The International Review of Retail, Distribution and Consumer Research*, *18*(5), 495-510.

Sawhney, M., & Zabin, J. (2002). Managing and measuring relational equity in the network economy. *Journal of the Academy of Marketing Science*, *30*(4), 313-332.

Scandura, T. A., & Williams, E. A. (2000). Research methodology in management: Current practices, trends, and implications for future research. *Academy of Management Journal, 43*(6), 1248-1264.

Scheer, L. K., Miao, C. F., & Garrett, J. (2010). The effects of supplier capabilities on industrial customers' loyalty: The role of dependence. *Journal of The Academy of Marketing Science*, *38*(1), 90-104.

Seggern, M. V., & Young, N. J. (2003). The focus group method in libraries: Issues relating to process and data analysis. *Reference Services Review*, *31*(3), 272-284.

Seidman, I. (1998). *Interviewing as qualitative research: A guide for researchers in education and the social sciences*. New York, NY: Teachers College.

Sekaran, U. (2003). *Research methods for business: A skill-building approach* (4th ed.). New York, NY: John Wiley & Sons.

Selviaridis, K., & Spring, M. (2007). Third party logistics: A literature review and research agenda. *The International Journal of Logistics Management, 18*(1), 125-150.

Selviaridis, K., Spring, M., Profillidis, V., & Botzoris, G. (2008). Benefits, risks, selection criteria and success factors for third-party logistics services. *Maritime Economics & Logistics, 10*(4), 380.

Sheen, G.-J., & Tai, C.-T. (2006). A study on decision factors and third party selection criterion of logistics outsourcing: An exploratory study of direct selling industry. *Journal of American Academy of Business, Cambridge, 9*(2), 331.

Sheu, C., HsiuJu, R. Y., & Chae, B. (2006). Determinants of supplier-retailer collaboration: Evidence from an international study. *International Journal of Operations & Production Management, 26*(1/2), 24-49.

Shook, C. L., Adams, G. L., Ketchen Jr, D. J., & Craighead, C. W. (2009). Towards a "theoretical toolbox" for strategic sourcing. *Supply Chain Management: An International Journal*, *14*(1), 3-10.

Simatupang, T. M., Wright, A. C., & Sridharan, R. (2004). Applying the theory of constraints to supply chain collaboration. *Supply Chain Management: An International Journal*, *9*(1), 57-70.

Simatupang, T., & Sridharan, R. (2005). *The collaboration index: A measure for supply chain collaboration*. Northhampton, UK: Emerald Group .

Simmel, G. (1950). *The triad*. *The sociology of George Simmel*. (K.H.Wolff Trans. Ed.). Glencoe, IL: Free.

Sink, H. L., & Langley Jr., C. J. (1997). A managerial framework for the acquisition of third-party logistics services. *Journal of Business Logistics, 18*(2), 163-189.

Sink, H. L., Langley Jr, C. J., & Gibson, B. J. (1996). Buyer observations of the US third-party logistics market. *International Journal of Physical Distribution & Logistics Management, 26*(3), 38-46.

Skjoett-Larsen, T. (2000). Third party logistics: From an inter-organizational point of view. *International Journal of Physical Distribution & Logistics Management, 30*(2), 112.

Skjoett-Larsen, T., Thernoe, C., & Andresen, C. (2003). Supply chain collaboration: Theoretical perspectives and empirical evidence. *International Journal of Physical Distribution & Logistics Management, 33*(6), 531-549.

Sohail, M. S., Bhatnagar, R., & Sohal, A. S. (2006). A comparative study on the use of third party logistics services by Singaporean and Malaysian firms. *International Journal of Physical Distribution & Logistics Management, 36*(9), 690.

Sohal, A. S., & Perry, M. (2006). Major business-environment influences on the cereal products industry supply chain: An Australian study. *International Journal of Physical Distribution & Logistics Management, 36*(1), 36-50.

Solakivi, T., Töyli, J., Engblom, J., & Ojala, L. (2011). Logistics outsourcing and company performance of SMEs. *Strategic Outsourcing: An International Journal, 4*(2), 131-151. doi:http://dx.doi.org/10.1108/17538291111147982

Song, H., & Chatterjee, S. R. (2010). Achieving global supply-chain competitiveness. *Chinese Management Studies, 4*(2), 101-118.

Soosay, C. A., Hyland, P. W., & Ferrer, M. (2008). Supply chain collaboration: Capabilities for continuous innovation. *Supply Chain Management: An International Journal*, *13*(2), 160-169.

Spence, L., & Bourlakis, M. (2009). The evolution from corporate social responsibility to supply chain responsibility: The case of Waitrose. *Supply Chain Management: An International Journal*, *14*(4), 291-302.

Spekman, R. E., Kamauff, J. W., Jr., & Myhr, N. (1998). An empirical investigation into supply chain management: A perspective on partnerships. *International Journal of Physical Distribution & Logistics Management, 28*(8), 630-650.

Squire, B., Cousins, P. D., Lawson, B., & Brown, S. (2009). The effect of supplier manufacturing capabilities on buyer responsiveness: The role of collaboration. *International Journal of Operations & Production Management*, *29*(8), 766-788.

Srabotic, A., & Ruzzier, M. (2012). Logistics outsourcing: Lessons from case studies. *Managing Global Transitions, 10*(2), 205-225.

Stading, G., & Altay, N. (2007). Delineating the "ease of doing business" construct within the supplier- customer interface. *The Journal of Supply Chain Management*, *43*(2), 29-38.

Stank, T. P. (2001). Supply chain integration: Tales from the trenches. *Supply Chain Management Review*, *5*(3), 62-69.

Stank, T. P., & Daugherty, P. J. (1997). The impact of operating environment on the formation of cooperative logistics relationships. *Transportation Research Part E-logistics and Transportation Review*, *33*(1), 53-65.

Stannack, P. (1996). Purchasing power and supply chain management power: Two different paradigms? A response to Ramsay's 'Purchasing power'(1995).*European Journal of Purchasing & Supply Management*, *2*(1), 47-56.

Statistics New Zealand. (2008). Retrieved from http://www.stats.govt.nz/

Statistics New Zealand. (2009). Retrieved from http://www.stats.govt.nz/

Statistics New Zealand. (2010). Retrieved from http://www.stats.govt.nz/

Statistics New Zealand. (2011). Retrieved from http://www.stats.govt.nz/

Statistics New Zealand. (2012). Retrieved from http://www.stats.govt.nz/

Stefansson, G. (2006). Collaborative logistics management and the role of third-party service providers. *International Journal of Physical Distribution & Logistics Management, 36*(2), 76-92.

Stevenson, M., & Spring, M. (2009). Supply chain flexibility: An inter-firm empirical study. *International Journal of Operations & Production Management, 29*(9), 946-971.

Stevenson, W. B., Pearce, J. L., & Porter, L. W. (1985). The concept of "coalition" in organization theory and research. *The Academy of Management Review, 10*(2), 256.

Storer, M., & Hyland, P. (2011). Utilizing industry-led innovation capacity to enhance supply chain performance: An empirical study. *Modern Applied Science, 5*(6), 55-81. doi:410.1016/S0148-2963(1002)00313-00312.

Svahn, S., & Westerlund, M. (2007). The modes of supply net management: A capability view. *Supply Chain Management: An International Journal*, *12*(5), 369-376.

Talluri, S., Vickery, S. K., & Narayanan, S. (2008). Optimization models for buyer-supplier negotiations. *International Journal of Physical Distribution & Logistics Management*, *38*(7), 551-561.

Tang, C., & Tomlin, B. (2008). The power of flexibility for mitigating supply chain risks. *International Journal of Production Economics*, *116*(1), 12-27.

Tangpong, C., Michalisin, M. D., & Melcher, A. J. (2008). Toward a typology of buyer–supplier relationships: A study of the computer industry*. *Decision Sciences*, *39*(3), 571-593.

Tate, W. L., Ellram, L. M., Bals, L., Hartmann, E., & Valk, W. V. (2010). An agency theory perspective on the purchase of marketing services. *Industrial Marketing Management*, *39*(5), 806-819.

Terpend, R., Krause, D. R., & Dooley, K. J. (2011). Managing buyer–supplier relationships: Empirical patterns of strategy formulation in industrial purchasing. *Journal of Supply Chain Management*, *47*(1), 73-94.

Terpend, R., Tyler, B. B., Krause, D. R., & Handfield, R. B. (2008). Buyer–supplier relationships: Derived value over two decades. *The Journal of Supply Chain Management*, *44*(2), 28-55.

Thomas, R. M. (2003). *Blending qualitative & quantitative research methods in theses and dissertations*. Thousand Oaks, CA: Corwin.

Thorelli, H. B. (1986). Networks: Between Markets and. *Strategic management journal*, *7*(1), 37-51. Tokman, M., & Beitelspacher, L. S. (2011). Supply chain networks and service-dominant logic: Suggestions for future research. *International Journal of Physical Distribution & Logistics Management*, *41*(7), 717-726.

Touboulic, A., Chicksand, D., & Walker, H. (2014). Managing imbalanced supply chain relationships for sustainability: A power perspective. *Decision Sciences, 45*(4), 577.

Towers, N., & Burnes, B. (2008). A composite framework of supply chain management and enterprise planning for small and medium-sized manufacturing enterprises. *Supply Chain Management: An International Journal*, *13*(5), 349-355.

Tsai, M.-C., Lai, K.-H., Lloyd, A. E., & Lin, H.-J. (2012). The dark side of logistics outsourcing: Unraveling the potential risks leading to failed relationships. Transportation Research. Part E, *Logistics & Transportation Review, 48*(1), 178.

Tsai, M.-C., Liao, C.-H., & Han, C.-S. (2008). Risk perception on logistics outsourcing of retail chains: Model development and empirical verification in Taiwan. *Supply Chain Management, 13*(6), 415.

Tuckman, B. W. (1978). *Conducting educational research*. New York, NY: Harcourt Brace Jovanovich.

Tummala, V. M., Phillips, C. L., & Johnson, M. (2006). Assessing supply chain management success factors: A case study. *Supply Chain Management: An International Journal*, *11*(2), 179-192.

Uzzi, B. (1997). Social structure and competition in interfirm networks: The paradox of embeddedness. *Administrative Science Quarterly, 42*(1), 35-67.

Vaaland, T. I., & Heide, M. (2007). Can the SME survive the supply chain challenges? *Supply Chain Management: An International Journal*, *12*(1), 20-31.

Vaidyanathan, G. (2005). A framework for evaluating third-party logistics. *Association for Computing Machinery. Communications of the ACM, 48*(1). 89-94.

Valkokari, K., & Helander, N. (2007). Knowledge management in different types of strategic SME networks. *Management Research News, 30*(8), 597-608.

van der Valk, W., & van Iwaarden, J. (2011). Monitoring in service triads consisting of buyers, subcontractors

Van de Vijver, M., Vos, B., & Akkermans, H. (2011). A tale of two partnerships: Socialization in the development of buyer–supplier relationships. *Journal of Supply Chain Management, 47*(4), 23-41.

van Hoek, R., I. (2000). The role of third-party logistics providers in mass customization. *International Journal of Logistics Management, 11*(1), 37.

van Laarhoven, P., Berglund, M., & Peters, M. (2000). Third-party logistics in Europe: Five years later. *International Journal of Physical Distribution & Logistics Management, 30*(5), 425-442.

Verwaal, E., & Hesselmans, M. (2004). Drivers of supply network governance: An explorative study of the dutch chemical industry. *European Management Journal, 22*(4), 442-451.

Vickers, J., & Waterson, M. (1991). Vertical relationships: An introduction. *The Journal of Industrial Economics*, 445-450. Vieira, J., Yoshizaki, H., & Ho, L. (2009). Collaboration intensity in the Brazilian supermarket retail chain. *Supply Chain Management: An International Journal*, *14*(1), 11-21.

Vinay, V. P., Kannan, G., & Sasikumar, P. (2009). Conceptual study on 3PL/4PL/ new trends for service industry. *International Journal of Services Technology and Management, 12*(1), 3.

Vogt, W. P. (2005). *Dictionary of statistics & methodology: A nontechnical guide for the social sciences*. Thousand Oaks, CA: Sage.

Voss, C., Tsikriktsis, N., Frohlich, M., & Sridhar, M. S. (2002). Case research in operations management. *International Journal of Operations & Production Management*, *22*(2), 195-219.

Wagner, B. A., & Young, J. A. (2009). Seabass and seabream farmed in the Mediterranean: Swimming against the tide of market orientation. *Supply Chain Management: An International Journal*, *14*(6), 435-446.

Wagner, B. A., Macbeth, D. K., & Boddy, D. (2002). Improving supply chain relations: An empirical case study. *Supply Chain Management: An International Journal*, *7*(3/4), 253-264.

Wagner, S. M., & Lindemann, E. (2008). Determinants of value sharing in channel relationships. *Journal of Business & Industrial Marketing*, *23*(8), 544-553.

Wagner, S. M., Coley, L. S., & Lindemann, E. (2011). Effects of suppliers' reputation on the future of buyer–supplier relationships: The mediating roles of outcome fairness and trust. *Journal of Supply Chain Management*, *47*(2), 29-48.

Wagner, S. M., Grosse-Ruyken, P. T., & Erhun, F. (2012). The link between supply chain fit and financial performance of the firm. *Journal of Operations Management*, *30*(4), 340-353.

Wathne, K. H., & Heide, J. B. (2004). Relationship governance in a supply chain network. *Journal of Marketing, 68*(1), 73-89.

Watson, G. (2001). Sub-regimes of power and integrated supply chain management. *Journal of Supply Chain Management, 37*(2), 36-41.

Weber, R. (2004). The rhetoric of positivism versus interpretivism: A personal view. *MIS Quarterly, 28*(1), III-XII.

Weerakkody, V., Dwivedi, Y. K., & Irani, Z. (2009). The diffusion and use of institutional theory: A cross-disciplinary longitudinal literature survey. *Journal of Information Technology, 24*(4), 354-368.

Welch, J. A., & Nayak, P. R. (1992). Strategic sourcing: A progressive approach to the make-or-buy decision. *The Executive, 6*(1), 23-31.

Welman, C., Kruger, F., Mitchell, B., & Huysamen, G. K. (2005). *Research methodology*. Cape Town, South Africa: Oxford.

Wernerfelt, B. (1995). The resource-based view of the firm: Ten years after. *Strategic Management Journal, 16*(3), 171-174.

Whitfield, G., & Landeros, R. (2006). Supplier diversity effectiveness: Does organizational culture really matter? *The Journal of Supply Chain Management*, *42*(4), 16-28.

Wiengarten, F., Pagell, M., & Fynes, B. (2013). The importance of contextual factors in the success of outsourcing contracts in the supply chain environment: The role of risk and complementary practices. *Supply Chain Management: An International Journal*, *18*(6), 630-643.

Wiese, A., & Toporowski, W. (2013). CSR failures in food supply chains: An agency perspective. *British Food Journal*, *115*(1), 92-107.

Wilding, R., & Rein, J. (2004). Customer perceptions on logistics outsourcing in the European consumer goods industry. *International Journal of Physical Distribution & Logistics Management, 34*(7/8), 628-644.

Wilhelm, M. M. (2011). Managing coopetition through horizontal supply chain relations: Linking dyadic and network levels of analysis. *Journal of Operations Management, 29*(7-8), 663-676.

Williams, Z., & Moore, R. (2007). Supply chain relationships and information capabilities: The creation and use of information power. *International Journal of Physical Distribution & Logistics Management*, *37*(6), 469-483.

Williamson, O. E. (1975). *Markets and hierarchies, analysis and antitrust implications: A study in the economics of internal organization*. New York, NY: Free.

Williamson, O. E. (2008). Outsourcing: Transaction cost economics and supply chain management. *The Journal of Supply Chain Management*, *44*(2), 5-16.

Wilson, N. (1996). The supply chains of perishable products in northern Europe. *British Food Journal, 98*(6), 9-15.

Wiseman, R. M., & Gomez-Mejia, L. R. (1998). A behavioral agency model of managerial risk taking. *Academy of Management Review*, *23*(1), 133-153.

Wisner, J. D., Leong, G. K., & Tan, K.-C. (2005). *Principles of supply chain management: A balanced approach*. Mason, Ohio: Thomson/South-Western.

Wong, C. Y., Boon-itt, S., & Wong, C. W. (2011). The contingency effects of environmental uncertainty on the relationship between supply chain integration and operational performance. *Journal of Operations Management, 29*(6), 604-615.

Wong, C., Skipworth, H., Godsell, J., & Achimugu, N. (2012). Towards a theory of supply chain alignment enablers: A systematic literature review. *Supply Chain Management: An International Journal*, *17*(4), 419-437.

Wong, W. Y., Lai, K. H., & Cheng, T. C. E. (2011). Value of information integration to supply chain management: Roles of internal and external contingencies. *Journal of Management Information Systems*, *28*(3), 161-199.

Wu, F., Yeniyurt, S., Kim, D., & Cavusgil, S. T. (2006). The impact of information technology on supply chain capabilities and firm performance: A resource-based view. *Industrial Marketing Management*, *35*(4), 493-504.

Wu, Z., & Choi, T. Y. (2005). Supplier-supplier relationships in the buyer-supplier triad: Building theories from eight case studies. *Journal of Operations Management, 24*(1), 27-52.

Wu, Z., Choi, T. Y., & Rungtusanatham, M. J. (2010). Supplier-supplier relationships in buyer-supplier-supplier triads: Implications for supplier performance. *Journal of Operations Management, 28*(2), 115-123.

Wuyts, S., Stremersch, S., Van Den Bulte, C., & Franses, P. H. (2004). Vertical marketing systems for complex products: A triadic perspective. *Journal of Marketing Research, 41*(4), 479-487.

Xu, H., Koh, L., & Parker, D. (2009). Business processes inter-operation for supply network co-ordination. *International Journal of Production Economics, 122*(1), 188.

Xu, Y., & Wang, H. (2013). Logistics outsourcing risks evaluation based on rough sets theory. *Contemporary Logistics,* (11), 3-8.

Yan, T., & Dooley, K. J. (2013). Communication intensity, goal congruence, and uncertainty in buyer–supplier new product development. *Journal of Operations Management*, *31*(7/8), 523-542.

Yao, D., Yue, X., & Liu, J. (2008). Vertical cost information sharing in a supply chain with value-adding retailers. *Omega-International Journal of Management Science*, *36*(5), 838-851.

Yi, C. Y., Ngai, E. W., & Moon, K. L. (2011). Supply chain flexibility in an uncertain environment: Exploratory findings from five case studies. *Supply Chain Management: An International Journal*, *16*(4), 271-283.

Yin, R. K. (1994). *Case study research: Design and methods*. Thousand Oaks, CA: Sage.

Yin, R. (2013). *Case Study Research, 5th Ed + Applications of Case Study Research, 3rd Ed*. Sage.

Zhang, M., & Huo, B. (2013). The impact of dependence and trust on supply chain integration. *International Journal of Physical Distribution & Logistics Management*, *43*(7), 544-563.

Zhang, X., Song, H., & Huang, G. Q. (2009). Tourism supply chain management: A new research agenda. *Tourism Management*, *30*(3), 345-358.

Zhao, X., Huo, B., Flynn, B. B., & Yeung, J. H. Y. (2008). The impact of power and relationship commitment on the integration between manufacturers and customers in a supply chain. *Journal of Operations Management, 26*(3), 368.

Zineldin, M. (2002). Developing and managing a romantic business relationship: Life cycle and strategies. *Managerial Auditing Journal, 17*(9), 546-558.

Appendices

Appendix A: Research invitation to the logistics service providers in Stage 1

Dear ***:

I am Wen LUO, a student from the University of Waikato, currently conducting PhD research. The research concerns business (supplier/customer) relationships and supply chain networks in the New Zealand market.

According to the NZ government statistics report in the last couple of years, your company is one of the top companies in your industry. Therefore, I would be grateful for your participation in this research. Your background and experiences will be invaluable to us and the research. In this research, you only need to attend **a quick interview (around 30 to 45 minutes)**.

Participants in the study will benefit from:

1: From a personal view, this study can help you actively understand the change of relationship and provide you some fresh ideas to analyse the stability of relationship network and understand how to make relationships balance between different partners. We believe this kind of outcome can make your daily job more efficient and effective;

2: It can help your company to know how to build, manage, and keep a stable relationship network in the whole supply chain process;

3: This research can help your company to understand more about how different companies and relationships influence each other in the big supply chain network;

4: Shared, possibly innovative, solutions from other respondents for improved relationship management.

If you are interestedin our research, can we make an appointment for an interview? Thank you for considering our research invitation. We hope we can spend some productive time together in the near future.

The attachment is a general introduction of the research and the main interview questions.

Please accept our deepest thanks for your participation and help in this research.

Sincerely,

Wen LUO
Department of Management Systems
University of Waikato

Appendix B: Research invitation to the suppliers and the customers in Stage 2

Dear ***:

I am Wen LUO, a student from the University of Waikato, currently conducting PhD research. The research concerns business (supplier/customer) relationships and supply chain networks in New Zealand market.

According to the NZ government statistics report in the last couple of years, your company is one of the top companies in your industry. Therefore, we would be grateful to see your participation in this research. Your background and experiences will be invaluable to us and the research. In this research, you only need to attend **a quick interview (around 30 to 45 minutes)**.

In the last two years, we have already conducted similar research about supply chain relationships management in NZ logistics industry. After collecting data from most top NZ logistics companies, we provided a generalized and meaningful summary to all participants. Most of those participating managers were very happy to see a comprehensive picture of how their companies manage supply chain relationships in the whole NZ logistics industry. Furthermore, they believed that they really got some fresh management ideas from our report. Therefore, we believe this research can also bring some interesting ideas to you and your company.

Participants in the study will benefit from:

1: From a personal view, this study can help you actively understand the changes of relationship and provide you some fresh ideas to analyse the stability of a relationship network and understand how to make relationships balance between different partners. We believe this kind of outcome can make your daily job more efficient and effective;

2: It can help your company to know how to build, manage, and keep a stable relationship network in the whole supply chain process;

3: This research can help your company to understand more about how different companies and relationships influence each other in the big supply chain network; and

4: Shared, possibly innovative, solutions from other respondents for improved relationship management.

If you are interested in our research, can we make an appointment for an interview? Thank you for considering our research invitation, and hope we can spend some productive time together in the near future.

The attachment is a general introduction of the research and main interview questions.

Please accept our deepest thanks for your participation and help in this research.

Sincerely,

Wen LUO

Department of Management System
University of Waikato

Appendix C: Information sheet for PhD research

Current triadic relationship practices in New Zealand supply chain management

Overview

There seems to be a significant gap between academic theory on relationship management in supply chain and actual practices in the global area. We plan on conducting research to collect information about the current relationship management practices from relevant business organizations in New Zealand. We will try to identify the dynamics and significance of triadic relationship management in the New Zealand supply chain.

Who's responsible?

My name is Wen LUO, a PhD student from management system. You can phone me at 021-973183 or email me wl119@waikato.ac.nz. My chief supervisor is Chuda BASNET; he can be contacted through his email chuda@mngt.waikato.ac.nz.

What's the research study about?

There is a significant gap between the rhetoric of supply chain relationship development and the practices of real supply chain operations. And it is particularly acute in New Zealand. In the past ten years, global researchers have already developed many different approaches for managing supply chain relationship in other countries. The purpose of this study is to identify how stable the triadic relationship is in the supply chain process; and how a company collaborates with partners to make the overall relationship stable.

What will you have to do and how long will it take?

In general, the researcher will try to interview participants to get information about how they manage relationships with different partners. The schedule and place for interview will be co-developed by the researcher and participants. Generally, each interview will be around 30 to 45 minutes.

What will happen to the information collected?

All of the information will be categorized and discussed to reach a common agreement and find out the most valuable thinks for balancing triadic relationships in New Zealand supply chain practices. The final result will be discussed and tested. The final research findings will be written up in a PhD thesis. Afterwards, all of the information and notes will be destroyed. The report will be treated with the strictest confidentiality. No participants will be named in research reports, and every effort will be made to disguise their identity.

Expected Outcome from the Research

Participants in the study will benefit from four points:

1: This research can help your company to understand more about how different companies and relationships influence each other in the whole supply chain process;

2: It can help your company to know how to build, manage, and keep a stable relationship network in your supply chain process;

3: In personal view, this study can help you actively understand the change of relationship and provide you some fresh ideas to analyse the stability of relationship network and understand how to make relationship balance between different partners.

4: We believe this kind of outcome can make your daily job more efficient and effective (shared, possibly innovative solutions from other respondents for improved relationship Management)

Declaration to participants

If you take part in the study, you have the right to:

- Refuse to answer any particular question, and to withdraw from the study at any time before 1 June 2013.
- Refuse to provide any documents.
- Ask any further questions about the study that occur to you during your participation.
- Be given access to a summary of the findings from the study when it is concluded.

Appendix D: Interview questions

Part 1: Prerequisite questions

What is the main strategy of your company? What is your company's core capability?

According to your own knowledge and experiences, how do you describe relationships?

How do you describe the relationship between you and your key customers/suppliers?

Part 2: Detailed triadic relationship questions

Understandably, if we combine the relationships between you, your key customer (or supplier), and your logistics service provider together, we can make a triangular structure. Are there such triangular relationships in your business? If "Yes", can we talk about one such triangle?

1: In the detailed triangular case, who is your customer (or supplier), who is your logistics service provider, how long have you had the triangular structure with them?

2: Could you please describe any detailed relationship issues between you, your key customer (or supplier), and the logistics service provider?

3: How do you think about the relationship between your key customer (or supplier) and the logistics service provider? (Your subjective opinion)

4: Is the triangular structure stable (keep a certain form in the middle or long term)? Could you please explain why it is or isn't stable?

5: How do your company, the key customer (or supplier), and the logistics service provider and the relevant relationships influence each other in the triangular structure?

Appendix E: Consent form

Waikato Management School
Te Raupapa

THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

Consent Form for Participants

I have read the **Information Sheet for Participants** for this study and have had the details of the study explained to me. My questions about the study have been answered to my satisfaction, and I understand that I may ask further questions at any time.

I also understand that I am free to withdraw from the study at any time before 1st June 2013, or to decline to answer any particular questions in the study. I agree to provide information to the researchers under the conditions of confidentiality set out on the **Information Sheet**.

I agree to participate in this study under the conditions set out in the **Information Sheet** form.

Signed: _____

Name: _____

Date: _____

Researcher's Name and contact information:
PhD student: Wen LUO
Department of Management Systems, Waikato Management School
University of Waikato, New Zealand
Telephone: 0064-021-973183
Email: wl119@waikato.ac.nz

Supervisor's Name and contact information:
Associate Professor: Chuda BASNET
Department of Management Systems, Waikato Management School
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Email: chuda@mngt.waikato.ac.nz

Appendix F: Description for triads collected from both stages

Group 1: Static transactional triads (Stage 1)

Case J1 was formed by a NZ based delivery company (the LSP in this case), a global logistics service supplier (the supplier in this case), and a global computer seller (the client in the case). This triad was been built 4 years ago. The supplier worked as an information centre because it managed all of the order information and relevant logistics process in this case. The delivery company focused on physical order delivery. Therefore, the delivery company had operational daily contact with the final client about confirmation of the daily order. In this triadic case, because the NZ market was small, the computer seller and the global logistics service provider believed that a transactional link between them was enough to handle the customer requirement in NZ market. From the global logistics service provider's view, the delivery company was selected for physical delivery only. The minimum cost was the core issue for selecting a delivery company in the case. As a result, it was unnecessary to develop closer link with the delivery company. From the final client's view, it was better to keep process simple in the whole triad. Therefore, the client developed a very simple transactional link with the delivery company as well. This kind of situation has been sustained for 4 years.

Table F.1 presents the details of all relationship levels and activities in case J1. It is easy to find that the relationship level of all dyadic links did not have any change between the beginning stage and current stage. Accordingly, the whole triadic structure did not have any change at all. In detail, the global logistics service provider (the supplier in the table) developed four transactional relationship activities with the delivery company (the LSP in the table) and the client. These activities were sharing general order information, focusing on basic contract agreement, joint problem solving, and general order confirmation. In the link between the client and the LSP, they had three simple activities about sharing order delivery information, joint problem solving for order delivery, and general order confirmation. As a result, the triadic relationship structure of case J1 stayed in "Transactional" stage in the last 4 years.

Case J1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.1: Details of dyads and triad in case J1

Case J2 was formed by a NZ based delivery company (the LSP in this case), a global logistics service supplier (the supplier in this case), and a global vehicle manufacturer (the client in the case). This triad was built 6 years ago. The supplier worked as a bridge to link the client and the delivery company. As a result, the supplier controlled all business information and relevant logistics process in this case. The delivery company had operational daily contact with the final client about confirmation of the daily order. In this triadic case, because the customer order size from NZ market was small, the manufacturer and the global logistics service provider believed that a transactional link between them was enough to satisfy the NZ customers. From the global logistics service provider's view, the delivery company was selected for physical delivery only. The minimum cost was the core issue for selecting a delivery company in the case. As a result, it was unnecessary to develop closer link with the delivery company. From the manufacturer's view, the global logistics service provider was their direct supplier, it was unnecessary to have too much conversation with the delivery company besides daily order confirmation in the triad. Therefore, the manufacturer developed a very simple transactional link with the delivery company as well. This kind of situation has sustained for 6 years.

Table F.2 presents the details of all relationship levels and activities in case J2. It is easy to find that the relationship level of all dyadic links did not have any change between the beginning stage and current stage. Accordingly, the whole triadic structure did not have any change at all. In detail, the global logistics service provider (the supplier in the table) developed four transactional relationship activities with the delivery company (the LSP in the table) and the client. These activities were sharing general order information, focusing on basic contract agreement, joint problem solving, and general order confirmation. In the link between the client and the LSP, they only had one simple relationship activity about confirmation of order delivery. As a result, the triadic relationship structure of case J2 stayed in "Transactional" stage in the last 6 years.

Case J2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	Static transactional structure without dynamics					

Table F.2: Details of dyads and triad in case J2

Case J3 was formed by a NZ based delivery company (the LSP in this case), a global logistics service supplier (the supplier in this case), and a NZ based card manufacturer (the client in the case). This triad was built 3 years ago. The supplier controlled all business information and relevant logistics process in this case. Once the card manufacturer sent order to the supplier, the supplier asked the delivery company to pick and delivery order according to the manufacturer's requirement. In this triadic case, because the NZ market was small, the supplier put their man effort on other markets. As a result, the supplier did not want to waste their resource and effort to develop collaboration with partners in NZ market. Accordingly, the supplier developed two transactional links with the delivery company and the manufacturer at same time. From the manufacturer's view, the global logistics service provider was their direct supplier, it was unnecessary to have too much conversation with the delivery company besides daily order confirmation in the triad. Therefore, the manufacturer built a transactional link with the delivery company as well. This kind of situation has been sustained for 3 years.

Table F.3 presents the details of all relationship levels and activities in case J3. It is easy to find that the relationship level of all dyadic links did not have any change between the beginning stage and current stage. Accordingly, the whole triadic structure did not have any change at all. In detail, the global logistics service provider (the supplier in the table) developed four transactional relationship activities with the delivery company (the LSP in the table) and the client. These activities were sharing general order information, focusing on basic contract agreement, joint problem solving, and general order confirmation. In these four activities, the joint problem solving needed efforts from all three parties. In the process, all three parties sit together to discuss the resolution if they identify any problem in the triadic case. Since the whole process ran smoothly, the three parties did not put effort on joint problem solving quite often. Besides the joint problem solving, the client and the LSP had one more relationship activity. It is confirmation of order delivery. In the last three years, the triadic relationship structure of case J3 stayed in "Transactional" stage without any change.

Case J3	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	Static transactional structure without dynamics					

Table F.3: Details of dyads and triad in case J3

Case K4 was formed by a NZ based delivery company (the LSP in this case), a global logistics service supplier (the supplier in this case), and a NZ based health product manufacturer (the client in the case). This triad was built 10 years ago. The manufacturer worked as an information centre because it managed all of the business information in the whole business process. They sent order to the supplier and the LSP at same time. After that, the supplier organized relevant logistics issues and the delivery company focused on order picking and delivering. The manufacturer focused exporting health product as cheap as possible. Therefore, to minimize own cost, the manufacturer selected the supplier and the delivery company according to cost consideration. Because of the strategy about cost competition, the manufacturer did not have enough financial resource to develop collaboration with partners. As a result, they developed two transactional links with the delivery company and the supplier at same time. Since the manufacturer controlled all business information and organized relevant business process in the triad, the supplier and the delivery company believed that a transactional link between them was enough for the business process in the triad. Therefore, case K4 has contained three transactional links for 10 years.

Table F.4 presents the details of all relationship levels and activities. The relationship level of all three dyadic links did not have any change between the beginning stage and current stage. In detail, the manufacturer (the client in the table) developed four transactional relationship activities with the LSP and the supplier at same time. These activities were sharing general order information, focusing on basic contract agreement, joint decision problem solving, and general order confirmation. In the link between the supplier and the LSP, they had two simple activities about sharing normal order information and the confirmation of daily order requirements. Overall, the case K4 did not have a triadic structural change in the last 10 years.

Case K4	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	Static transactional structure without dynamics					

Table F.4: Details of dyads and triad in case K4

Case L1 was formed by a NZ based sea freight service provider (the LSP in this case), a global shipping line (the supplier in this case), and a NZ based exporter (the client in the case). This triad was built 17 years ago. The shipping line worked as an information centre because it managed all business information and organized all logistics issues in this case. In the triad, the shipping line selected the sea freight service provider to provide port services for the exporter. From the exporter's view, the shipping line was an important supplier because the shipping line's capability of global reaching was important to exporting its products to other countries. The shipping line was also important to the NZ based LSP in the case because the shipping line offered business opportunity to the LSP. However, since the global shipping line was too big than the other two parties in the triad, the global shipping line tried to ask the other two parties to follow its own rule by using its power from company size. The exporter and the LSP were not happy with the situation. Therefore, both of them sustained transactional links with the shipping line. In the link between the LSP and the exporter, because the shipping line controlled all information flow in the triad, both the LSP and the exporter did not want to piece off the shipping line. As a result, they developed a transactional link as well. Overall, the case L1 sustained three transactional links in the last 17 years.

Table F.5 presents the details of all relationship levels and activities. In all of the three dyadic links, the shipping line (the supplier in the table) sustained two strong transactional links with the client and the LSP respectively. These two links did not show differences between the beginning stage and current stage. In the link with the LSP, the shipping line shared normal order information, performance report, and all business volume information with the LSP. Beyond that, they made common decision making about problem solving and order delivery. To ensure order delivery, they also had some senior manager's communication and order confirmation. In the goal congruence part, the shipping line and the LSP put effort on the contract agreement. The link between the supplier and the client was exactly same as the link between the supplier and the LSP. Besides these two links, the link between the LSP and the client had some differences between the beginning stage and current stage. In the beginning, because the supplier controlled information flow, the LSP and the client just talked about confirming the information of order delivery. However, with development of the business, the LSP and the client had more contact and communication because they wanted to dent the power influence from the supplier. As a result, in their current link, they developed a strong transactional link as well. This link included sharing information about orders and business volume, solving problem together, and having some senior manager's communication. Therefore, the triadic structure of case L1 had three strong transactional links at the moment. However, the relevant relationship activities in every link were not strong enough to push any link to a collaborative level. As a result, in the last 17 years, the whole triadic structure did not change even one dyadic link became stronger than before.

Case L1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information.	Contract	Joint problem solving;	None	None	Order confirmation;
Initial type	Strong transactional link					
Current activities	Normal information	Contract	Joint problem solving;	None	None	Order confirmation;
Current type	Strong transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	Joint problem solving	None	None	Order confirmation;
Current type	Strong transactional link					
Change in dyad	No evolution, but the current link is stronger than the initial link.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract	Joint problem solving	None	None	Order confirmation
Initial type	Strong transactional link					
Current activities	Normal information	Contract	Joint problem solving	None	None	Order confirmation
Current type	Strong transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.5: Details of dyads and triad in case L1

Case L2 was formed by a NZ based sea freight service provider (the LSP in this case), a global shipping line (the supplier in this case), and a NZ based importer (the client in the case). This triad was built 12 years ago. The shipping line worked as an information centre because it managed all business information and organized all logistics issues in this case. In the triad, the shipping line selected the sea freight service provider to provide port services for the importer. From the importer's view, the shipping line was an important supplier because the shipping line's capability of global reaching was important to help them import overseas products efficiently. The shipping line was also important to the NZ based LSP in the case because the shipping line offered business opportunity to the LSP. However, since the global shipping line was too big than the other two parties in the triad, the global shipping line tried to ask the other two parties to follow its own rule by using its power from company size. The importer and the LSP were not happy with the situation. Therefore, both of them sustained transactional links with the shipping line. In the link between the LSP and the importer, because the shipping line controlled all information flow in the triad, they did not want to piece off the shipping line. As a result, they developed a transactional link as well. Overall, the case L2 sustained three transactional links in the last 12 years.

Table F.6 presents the details of all relationship levels and activities. In all of the three dyadic links, the shipping line (the supplier in the table) sustained two strong transactional links with the client and the LSP respectively. These two links did not show differences between the beginning stage and current stage. In the link with the LSP, the shipping line shared normal order information, performance report, and all business volume information with the LSP. Beyond that, they made common decision making about problem solving and order delivery. To ensure order delivery, they also had some senior manager's communication and order confirmation. In the goal congruence part, the shipping line and the LSP put effort on the contract agreement. The link between the supplier and the client was exactly same as the link between the supplier and the LSP. Besides these two links, the link between the LSP and the client had some differences between the beginning stage and current stage. In the beginning, because the supplier controlled information flow, the LSP and the client just talked about confirming the information of order delivery. However, with development of the business, the LSP and the client had more contact and communication because they wanted to dent the power influence from the supplier. As a result, in their current link, they developed a strong transactional link as well. This link included sharing information about orders and business volume, solving problem together, and having some senior manager's communication. Therefore, the triadic structure of case L2 had three strong transactional links at the moment. However, the relevant relationship activities in every link were not strong enough to push any link to a collaborative level. As a result, in the last 12 years, the whole triadic structure did not change even one dyadic link became stronger than before.

Case L2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract	Joint problem solving	None	None	Order confirmation
Initial type	Strong transactional link					
Current activities	Normal information	Contract	Joint problem solving	None	None	Order confirmation
Current type	Strong transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	Joint problem solving	None	None	Order confirmation
Current type	Strong transactional link					
Change in dyad	No evolution, but the current link is stronger than the initial link.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract	Joint problem solving	None	None	Order confirmation
Initial type	Strong transactional link					
Current activities	Normal information	Contract	Joint problem solving	None	None	Order confirmation
Current type	Strong transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.6: Details of dyads and triad in case L2

Case L3 was formed by a NZ based sea freight service provider (the LSP in this case), a NZ based freight forwarder (the supplier in this case), and a NZ based importer (the client in the case). This triad was built 12 years ago. The freight forwarder worked as an information centre because it managed all business information and organized all logistics issues in this case. In the triad, the freight forwarder selected the sea freight service provider to provide port services for the importer. Since the NZ market was small, the total order volume was not big. Because of that, all three parties did not see any necessity to develop collaboration with partners in the triad. Furthermore, all of them wanted to keep the business process as simple as possible. Therefore, the whole triadic structure did not have big structural change in the last 12 years.

Table F.7 presents the details of all relationship levels and activities. In all of the three dyadic links, the link between the supplier and the client did not show any differences between the beginning stage and current stage. The supplier and the client developed 4 basic relationship activities in the link: sharing basic order information, focusing on contract agreement, solving problem together, and communicating about order delivery. Besides this link, the other two links about the sea freight service provider (the LSP in the table) showed slightly differences between the beginning stage and current stage. At the beginning, the LSP had three kinds of relationship activities with the supplier and the client at same time. They shared basic order information, developed basic contract agreement, jointly solved the problem in the service process, and confirmed order delivery at the moment. With the continuous business among the three parties, they became familiar with each other in the triad. To enhance the efficiency of logistics process in the triad, the LSP and the other two parties developed some new relationship activities to strengthen their links. In current stage, they shared performance report and customized information which they did not share before. Besides that, they developed more joint effort to facilitate order process. Moreover, their senior managers had more communication than before. As a result, the two links about the LSP became stronger than before. However, the new relationship activities were not strong enough to help the LSP developing collaborations with the other two parties yet. Therefore, the triadic structure of case L3 sustained at the "Transactional" stage in the last 12 years even though two dyadic links became stronger than before.

Case L3	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	customized information	Contract	Joint problem solving	None	None	Order confirmation
Current type	Strong transactional link					
Change in dyad	No evolution, but the current link is stronger than the initial link.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	customized information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Strong transactional link					
Change in dyad	No evolution, but the current link is stronger than the initial link.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.7: Details of dyads and triad in case L3

Case L5 was formed by a NZ based sea freight service provider (the LSP in this case), a global shipping line (the supplier in this case), and a NZ based exporter (the client in the case). This triad was built 15 years ago. The shipping line worked as an information centre because it managed all business information and organized all logistics issues in this case. In the triad, the shipping line selected the sea freight service provider to provide port services for the exporter. From the exporter's view, the shipping line was an important supplier because the shipping line's capability of global reaching was important to the exporter delivering products to overseas clients. The shipping line was also important to the NZ based LSP in the case because the shipping line offered business opportunity to the LSP. However, since the global shipping line was a global famous company, it preferred to ask the other two parties to follow its own rule by using its power from global market. The exporter and the LSP were not happy with the situation. Therefore, both of them sustained transactional links with the shipping line. Furthermore, they even tried to work together to against the negative power influence from the shipping line. Table 9 describes the details about relationship activities in the triad.

Table F.8 presents that all of the three dyadic links in case L5 showed certain change between the initial stage and current stage. The link between the sea freight service provider (the LSP in the table) and the exporter (the client in the table) became stronger than before; while the other two dyadic links became weaker in the triad. At the beginning, the shipping line developed two strong transactional links with the LSP and the client because it acted as the leading role in the triad. In the initial links with the LSP and the client, the shipping line shared information about normal order, performance report, and all business volumes. Beyond that, they also had joint effort on problem solving and order delivery. Moreover, they have some senior manager's communication. However, in the current stage, these two links were weaker than before. In the information sharing part, the LSP and the client did not share all business volume information with the supplier anymore. Furthermore, there was no more joint decision making about order delivery. The communication between senior managers in these two links also became less than before. On the other hand, the link between the LSP and the client had different change. In the beginning, they just talked about order information and order delivery. In the business process, they developed more relationship activities. In current stage, they shared performance report and all business volume information as well. Moreover, they made common decision about problem solving and order delivery. The communication between their senior managers also became more frequent than their communication in the initial stage. In a word, the link was stronger than before even though it was not strong enough to be identified as collaboration. As a result, all of the three dyadic links in case L5 had certain differences between the initial stage and current stage although the whole triadic structure still sustained at the "Transactional" stage.

Case L5	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract	Joint problem solving	None	None	Order confirmation
Initial type	Strong transactional link					
Current activities	Normal information	Contract	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No evolution, but the current link is weaker than the initial link.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	Joint problem solving	None	None	Order confirmation
Current type	Strong transactional link					
Change in dyad	No evolution, but the current link is stronger than the initial link.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract	Joint problem solving	None	None	Order confirmation
Initial type	Strong transactional link					
Current activities	Normal order information	Contract	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No evolution, but the current link is weaker than the initial link.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.8: Details of dyads and triad in case L5

Case M1 was formed by a NZ based logistics service provider (the LSP in this case) which trained and supplied professional logistics people, a NZ based delivery company (the supplier in this case), and a NZ based retailer (the client in this case). This triad was built 12 years ago. In the business process, the delivery company provided helped the client to pick and delivery order. Since the delivery company did not have enough people who had logistics skills and experiences, the delivery company outsourced experienced people from the logistics service provider (the LSP). Because the retailer sold products with low profit margin, the retailer wanted to reduce every kinds of cost as more as possible. As a result, the delivery company kept reducing charge rate to satisfy the retailer's requirement. To ensure own profit, the delivery company wanted the LSP to reduce charge rate as well. Both the LSP and the delivery company were unsatisfied with the situation because they kept loosing profit. As a result, the three parties developed three simple transactional links in the case and no party wanted to waste resource and effort to develop collaboration.

Table F.9 presents the details of all relationship levels and activities in case M1. It is easy to find that the relationship level of all dyadic links did not have any change between the beginning stage and current stage. In detail, the delivery company (the supplier in the table) developed four simple relationship activities with the LSP and the client at same time. These activities were sharing general order information, focusing on basic contract agreement, joint problem solving, and general order confirmation. In the link between the client and the LSP, because the supplier acted as a bridge to coordinate relevant process, the LSP and the client did not need to have too much contact. Therefore, they only talked about general order confirmation in the delivery process. Overall, the triadic relationship structure of case M1 stayed in "Transactional" stage in the last 12 years.

Case M1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.9: Details of dyads and triad in case M1

Case N1 was formed by a NZ based logistics service provider (the LSP in this case), a global beverage producer (the client in this case), and a water supplier (the supplier in the case). This triad was built 12 years ago. Since the producer was a global famous company, it had great bargaining power from its big company size. It worked as a leading role to coordinate all information flow and logistics issues in this case. In the process, the LSP delivered water from the supplier to the producer under the producer's command. At the beginning, the producer developed two basic transactional links with the supplier and the LSP because they did not have enough mutual understanding at the moment. The LSP and the supplier developed a transactional link as well because the producer controlled all communication between them. After couple of year's business trade, all three parties got familiar with each other. The producer found it was necessary to develop closer relationship with the LSP to facilitate the logistics process. As a result, the link between them had certain change. However, the two links about the water supplier did not have any change in the last 12 years. The main reason was that both producer and the LSP did not believe that a raw material supplier was a very important part in logistics process. Table F.11 describes the detail of the relationship activities in every link.

Table F.10 presents the details of all relationship levels and activities. In all three dyadic links, the two links about the supplier did not have any change between the beginning stage and current stage. In these two links, all three parties shared normal order information, made joint effort for problem solving, and communicated with each other for confirming order delivery. Besides these activities, the supplier signed contract agreement with the client as well. Compared with these two links, the link between the LSP and the client had big change. In the initial stage, they developed four basic relationship activities which were same as the relationship activities in the link between the supplier and the client. With the development of the relationship, the client and the LSP developed several new activities to make a more fluent logistics process. These new activities included sharing more information about forecast and all business volumes, made joint decision about order delivery, and developed more frequent communication between senior managers. The new relationship activities made the dyadic link stronger than before. However, these changes were not powerful enough to help both the client and the LSP developing a real collaboration. As a result, the link was stayed at transactional level. Accordingly, the three parties kept their "Transactional" triad for the last 12 years.

Case N1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	None	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Forecast information	Contract agreement	Joint problem solving	None	None	Frequent communication.
Current type	Strong transactional link					
Change in dyad	No evolution, but the current link is stronger than the initial link.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.10: Details of dyads and triad in case N1

Case N2 was formed by a NZ based logistics service provider (the LSP in this case), a domestic seller which sell construction materials (the client in this case), and a domestic manufacturer which produce construction materials (the supplier in the case). This triad was built 4 years ago. Since the seller was a big player in domestic market, it had great bargaining power in the market. It worked as a leading role to coordinate all information flow and logistics issues in this case. In the process, the LSP delivered construction materials from the manufacturer to the seller under the seller's command. At the beginning, the seller developed two basic transactional links with the manufacturer and the LSP because they did not have enough mutual understanding at the moment. The LSP and the manufacturer developed a transactional link as well because the seller controlled all communication between them. After couple of year's business trade, all three parties got familiar with each other. The seller found it was necessary to develop closer relationship with the LSP to facilitate the logistics process. As a result, the link between them had certain change. However, the two links related to the manufacturer did not have any change in the last 4 years. The main reason was that the manufacturer wanted focus on the production part. The manufacturer recognized that he logistics process was not its core business issue in the business triad.

Table F.11 presents the details of all relationship levels and activities. In all three dyadic links, the two links related to the manufacturer (the supplier in the table) did not have any change between the beginning stage and current stage. In these two links, all three parties shared normal order information, made joint effort for problem solving, and communicated with each other for confirming order delivery. Besides these activities, the supplier signed contract agreement with the seller (the client in the table) as well. Compared with these two links, the link between the LSP and the client had big change. In the initial stage, they developed four basic relationship activities which were same as the relationship activities in the link between the supplier and the client. With the development of the relationship, the client and the LSP developed several new activities to make a more fluent logistics process. These new activities included sharing more information about business forecasting, made joint decision about whole logistics process, and developed more frequent communication between senior managers. The new relationship activities made the dyadic link stronger than before. However, these changes were not powerful enough to help the two parties developing a real collaboration. As a result, the link was stayed at transactional level. Accordingly, the three parties kept their "Transactional" triad in the last 4 years.

Case N2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Forecast information.	Contract agreement	Joint problem solving; Joint decision for logistics process.	None	None	Order confirmation; Some senior manager's communication.
Current type	Strong transactional link					
Change in dyad	No evolution, but the current link is stronger than the initial link.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.11: Details of dyads and triad in case N2

Case O2 was formed by a global supply chain service provider (the LSP in this case), a global supermarket (the client in this case), and a procurement agent who help the supermarket purchasing products from NZ market (the supplier in the case). This triad was built 6 years ago. Since the supermarket had good reputation in global market, it had great bargaining power to in the triad. Accordingly, the supermarket worked as the big brother in this case by coordinating all information flow and business process in this case. In the process, the procurement agent focused on purchasing products which the supermarket needed from the NZ market. Once the process of procurement finished, the LSP picked and delivered products from the agent to the supermarket. All of the process was controlled and monitored by the supermarket in the first three years. In these three years, the supermarket developed two basic transactional links with the agent and the LSP because it did not understand the other two parties very much. The LSP and the agent developed a transactional link as well because the supermarket controlled all communication between them. All three parties got familiar with each other in these three years. From the fourth year, the LSP proposed a new logistics plan for the supermarket according to the experience in the last three years. This new plan could help the supermarket efficiently reducing total logistics cost. The supermarket accepted the plan and developed some new relationship activities with the LSP from the moment. In the new plan, the procurement agent still focused purchasing process. Furthermore, the agent wanted to keep a simple process in the triad as usual. As a result, the two links related to the agent did not change at all.

Table F.12 presents the details of all relationship levels and activities. In the two links related to the procurement agent (the supplier in the table), the four kinds of relationship activities were exactly same. They were sharing normal order information, signing basic contract agreement, made joint decision to solve problem, and communicating with each other to confirm the order delivery. These relationship activities were found in the initial link between the LSP and the supermarket (the client in the table) as well. However, as described in the last paragraph, this link was different in current stage. After implementing new logistics plan, the LSP and the client developed two more important relationship activities. They shared all business volume information and jointly designed whole logistics network to make a more efficient and effective logistics process. In this process, they also had more communication between senior managers than before. Because the new plan was still in the implementation stage, the link was not recognized as a real collaboration by both sides at the moment. Therefore, the whole triad stayed in the "Transactional" stage even one dyadic link became stronger than before.

Case O2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Some communication.
Current type	Strong transactional link					
Change in dyad	No evolution, but the current link is stronger than the initial link.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.12: Details of dyads and triad in case O2

Case P1 was formed by a NZ based logistics service provider (the LSP in this case), a global freight forwarder (the supplier in this case), and a global vehicle manufacturer (the client in the case). This triad was built 4 years ago. The freight forwarder worked as an information centre because it managed all information flow in this case. After getting order requirement from the client, the freight forwarder organized logistics information process. At same time, the LSP provided order picking and delivering service under the command from the freight forwarder. In the triad, the client and the freight forwarder were not strategic important to each other. Furthermore, the both of them believed that the NZ market was too small in their global strategy. As a result, they did not have any interest to invest more resources and effort developing collaboration with the other parties in this triad. From the LSP's view, the other two parties were big players in the market. All the LSP needed was to follow the other two parties rule in the process. Therefore, the triad sustained three transactional links in the last 4 years.

Table F.13 presents the details of all relationship levels and activities. It is easy to find that the relationship level of all dyadic links did not have any change between the beginning stage and current stage. The three parties developed very similar relationship activities in every dyadic link. These activities included sharing general order information, focusing on basic contract agreement, and communicating with each other to confirm the order delivery. The only difference was that the supplier and the client developed joint problem solving. This activity was not found from the other two links. The main reason was that the link between the supplier and the client was the key link in the triad. The supplier and the client negotiated with each other and informed the LSP what they needed in the triad. They believed that the LSP was unnecessary to join their decision making process. In a conclusion, the whole triadic structure was kept at the "Transactional" stage in the last 4 years.

Case P1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.13: Details of dyads and triad in case P1

Case P2 was formed by NZ based logistics service provider (the LSP in this case), a NZ based courier delivery company (the supplier in this case), and a global computer seller (the client in the case). This triad was built 5 years ago. Since the global computer seller was not familiar with the NZ market, the LSP took control of all information flow and logistics process in the triad. After getting delivery requirement from the seller, the LSP organized all logistics process and asked the delivery company sending products to the designated place in right time. All the delivery company needed to do was following the command from the LSP. As a result, the delivery company developed and kept two simple transactional links with the LSP and the client in the last 5 years. In the link between the LSP and the client, the situation was more complex. In the initial stage, the computer seller was not familiar with the NZ market and the LSP. Accordingly, the seller and the LSP developed a simple link which was same as the other two links in the triad. Two years later, the computer seller and the LSP got more mutual understanding than before because the LSP demonstrated that it could supply good logistics service. As a result, the computer seller made a decision to give more business to the LSP. To keep the fluent process as before with more business volumes, the LSP and the computer seller developed more relationship activities than before. These activities made their dyadic link stronger from the moment.

Table F.14 presents the details of all relationship levels and activities. In the two links related to the delivery company (the supplier in the table), the relationship activities were very similar. There were two kinds of relationship activities between the client and the supplier: sharing normal order information and communicating with each other to confirm the order delivery. Besides these activities, because the supplier was selected by the LSP, these two parties developed two more relationship activities: singing contract agreement about delivery service and solving problem by joint effort. All of these four kinds of relationship activities could be identified in the initial link between the LSP and the client as well. However, they developed three more activities in the link after two years. These three activities included sharing all business volume information, making joint decision about order delivery, and developing some communication between senior managers. These new activities between the LSP and the client made their dyadic link stronger than before. However, the new link was not close enough to be identified as collaboration. As a result, the whole triad stayed in the "Transactional" stage even though one dyadic link becoming stronger than before.

Case P2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	All business volume information.	Contract agreement	Joint decision for order delivery.	None	None	Some senior manager's communication.
Current type	Strong transactional link					
Change in dyad	No evolution, but the current link is stronger than the initial link.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.14: Details of dyads and triad in case P2

Case P3 was formed by a NZ based logistics service provider (the LSP in this case), a global shipping line (the supplier in this case), and a global packaging company (the client in the case). This triad was built 5 years ago. The LSP worked as an information centre because it managed all of the business information and relevant logistics process in the triad. The shipping line focused on the service of supplying containers and sea freight for the client. The client selected the LSP and the shipping line because they could supply the lowest cost service than the other competitors. In the process, the LSP and the shipping line did not supply the client premium service because they needed to keep their profit by keeping lowest cost. As a result, in the triad, three transactional dyadic links were developed between the three parties from the beginning. In the last five years, the client had frequent quarrels with the LSP and the shipping line because of the service problems. However, the client did not change partners because of cost considerations. From the LSP and the shipping line's view, they wanted to keep long term business with the client because the global packaging company could offer bigger business order volume than other NZ based clients. Therefore, in the last five years, the triad kept three transactional dyads without any change.

Table F.15 presents the details of all relationship levels and activities. It is easy to find that the relationship level of all dyadic links did not have any change between the beginning stage and current stage. In detail, since the client selected the LSP and the shipping line by itself, the client built two exactly same links with the LPS and the shipping line at same time. There were four kinds of relationship activities in these two links: sharing normal order information, singing basic contract agreement, solving service problem jointly, and communicating for the order delivery confirmation. The other dyadic link was similar as these two links. The only difference was that the LSP and the shipping line did not sign contract agreement. The main reason is that both of them talk directly to the client. In this situation, they believed it is unnecessary to develop business contract between them in the triad. In the whole triadic process, their joint effort for problem solving did not help the three parties developing close relationships because they put effort to blame on others. In a word, this triadic case kept at an unbalanced transactional structure in the last 5 years.

Case P3	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.15: Details of dyads and triad in case P3

Case Q2 was formed by a global freight forwarder (the LSP in this case), a global shipping line (the supplier in this case), and a NZ based exporter (the client in the case). This triad was built 4 years ago. In this triad, the exporter outsourced all logistics service to the LSP and asked the LSP selecting suitable shipping line for them. To focus on own core competency, the exporter mainly negotiated relevant logistics service requirements with the LSP. In this situation, the LSP worked as an information centre to handle information flow through the whole triad and to coordinate relevant logistics process. After two years business trade, the LSP gained more trust form the client because their good service. To make the process and communications more fluent, they developed more frequent conversations and joint decision making. However, this kind of change was not strong enough to help them developing collaboration. As a result, their link was identified as a stronger transactional link than before. On the other hand, the two dyadic links about the shipping line did not have any change. The main reason is that the dyad between the LSP and the client dominated the whole triad. To keep the power form information management, the LSP was not happy to see too much direct communications between the shipping line and the client. From the client's view, it was unnecessary to have too many conversations with the shipping line if the LSP could handle the logistics process properly. As a result, the whole triad sustained at transactional structure in the last 4 years.

Table F.16 presents the details of all relationship levels and activities. In the beginning stage, the LSP contained two exactly same links with the supplier (the shipping line) and the client (the exporter) at same time by developing four kinds of relationship activities: sharing normal order information, signing basic contract agreement, solving problem jointly, and communicating for the confirmation of order delivery. In the current stage, the LSP kept same link with the supplier without any change. However, there were differences in the other link because the LSP and the client developed 3 more relationship activities: sharing all business volume information, jointly designing logistics route and order delivery, and developing more communications between senior managers than before. Even these new relationship activities could not help the LSP and the client developing collaboration. They made the original transactional link becoming stronger than before. In the third dyadic link of this triad, the shipping line and the client kept two basic relationship activities (sharing normal order information and communicating for the order delivery confirmation) without any change. Overall, the three parties kept a transactional triad without structural change even though one transactional dyad becoming stronger than before.

Case Q2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information; All business volume information.	Contract agreement	Joint design for logistics route and order delivery.	None	None	Some senior manager's communication.
Current type	Strong transactional link					
Change in dyad	No evolution, but the current link is stronger than the initial link.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.16: Details of dyads and triad in case Q2

Case R1 was formed by a global freight forwarder (the LSP in this case), a NZ based training system producer (the supplier in this case), and the producer's client (the client in the case). This triad was built 7 years ago. In this triad, the client purchased customized training system form the producer. After producer finished the production of system, the LSP helped the producer to organized logistic service delivering the customized system to the client. The whole process was controlled by the producer. After the negotiation about order delivery date with the client, the producer outsourced all relevant logistics service to the LSP by setting clear service requirements. After that, the LSP organized relevant information process and physical delivery process according to the requirements. The LSP did not talk too much with the final client except the information about order delivery. Since the business trade between the producer and the client was project based, they did not developed continuous business in the last 7 years. As a result, the producer did not outsourced logistics service to the LSP continuously. In this situation, all parties acknowledged that it was unnecessary to developed close links with others in the triad. As a result, the project based triadic case kept its transactional structure in the last 7 years without any change.

Table F.17 presents the details of all relationship levels and activities. It is easy to find that the relationship level of all dyadic links did not have any change between the beginning stage and current stage. The supplier (the system producer) contained two dyadic links with the LSP and the client by developing four exactly same relationship activities: sharing normal order information, signing project based contract, solving service problem jointly, and communicating for the order delivery confirmation. In the joint effort of problem solving, no party proactively work with others to prevent possible problems. It was a passive feedback to the arising problems in the logistics process. In the dyadic link between the LSP and the client, the relationship activities were even simple. They just shared information about basic order and communicated about the order delivery. These three transactional dyads did not exhibit any difference in the last seven years.

Case R1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.17: Details of dyads and triad in case R1

The triad R2 is very similar to the triad R1. The only difference is about the actors in the triad. Twenty years ago, the case R2 was formed by the same global freight forwarder (the LSP) in triad R1, a NZ based motorway constructor (the client), and an overseas construction material supplier. This triad was a project based triad. Excepting the different supplier and client, all process and relationship activities are exactly same as the triad R1. Table F.18 highlights the relationship activities in this triad. It is easy to identify that the relationship activities in all dyads are same as in triad R1. Overall, case R2 was retained at the transactional structure in the last 20 years without dynamics.

Case R2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Supplier-Customer dyad	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.18: Details of dyads and triad in case R2

Case S1 was formed by a NZ based logistics service provider (the LSP in this case), a NZ based fruit exporter (the client in this case), and a NZ based shipping service supplier (the supplier in this case). This triad was built 17 years ago. In the beginning stage, the LSP collected order from the exporter and organized the whole logistics delivery to the shipping service supplier. After that, the shipping service supplier managed the final shipping and loading services before exporting to the overseas market. Since the product stores of the exporter were decentralized, it was hard for the LSP efficiently collecting orders. The total transportation cost was very high. Collecting and delivering decentralized orders made the shipping service supplier difficult to integrate their shipping and loading process. As a result, the whole triadic case was inefficient. However, the exporter could not centralize their product stores because of their limited financial resource. In this situation, no party wanted to develop collaboration with others because of the low efficiency and low profit margin. From six years ago, the ownership of the exporter was changed because they were merged with a big business group. To enhance the process efficiency in the triad, the new management board put investment to centralize all products stores. Furthermore, they developed logistics service standard with the LSP and the shipping service supplier. According to the change, the exporter developed stronger relationships with the LSP and the supplier at same time. However, since all of the new relationship activities were still based on business orders. The two new relationships could not be identified as collaboration yet. In the link between the LSP and the supplier, they enhanced the frequency of their communication because the exporter wanted more seamless logistics process. Therefore, all of the three transactional dyads in this triad became stronger from six years ago.

Table F.19 presents the details of all relationship levels and activities. In the beginning stage, all three dyads contained same relationship activities: sharing normal order information, signing basic contract agreement, solving problem jointly, and communicating for the order delivery confirmation. In the current stage, all of these links became stronger because of additional relationship activities. The client (the exporter) developed three additional activities in its two relevant links. They worked with the LSP and the supplier to share real time information about all orders, design logistics service standards jointly, and enhance communication frequency between senior managers. Because of the client's coordination effect, the LSP and the supplier enhanced the communication frequency between their senior managers as well. Therefore, even this transactional triad did not have structural change; its three dyads became stronger than before.

Case S1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal order information	Contract	Joint problem solving	None	None	Frequent senior manager's communication for order delivery.
Current type	Strong transactional link					
Change in dyad	No evolution, but the current link is stronger than the initial link.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	real time information	Contract	Joint design for logistics service	None	None	Frequent manager's communication
Current type	Strong transactional link					
Change in dyad	No evolution, but the current link is stronger than the initial link.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	real time information	Contract	Joint design for logistics service	None	None	Frequent manager's communication
Current type	Strong transactional link					
Change in dyad	No evolution, but the current link is stronger than the initial link.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.19: Details of dyads and triad in case S1

Case T1 was formed by a NZ based logistics service provider (the LSP in this case), a NZ based food importer (the client in this case), and a European food exporter (the supplier in the case). This triad was built 4 years ago. In this triad, the client ordered food from the European supplier and outsourced all logistics service to the LSP. The LSP worked as an information centre to coordinate the logistics information flow between the supplier and the client. In the beginning stage, every party was not familiar with other parties in the triad. Accordingly, they developed three simple transactional dyads at the moment. After three years' business trade, to enhance the process efficiency and reduce the total cost, the client wanted to consolidate a number of small orders into several big orders. The LSP was happy to accompany with the client because they had similar goal in the triad. However, the European supplier resisted to the change because the NZ client's total order volume was too small with compared to other clients. As a result, in the current stage, the client and the LSP developed a stronger transactional link while their links with the supplier were not changed.

Table F.20 presents the details of all relationship levels and activities. In the beginning stage, all three dyads contained four same relationship activities: sharing normal order information, signing basic contract agreement, solving problem jointly, and communicating for the order delivery confirmation. The current link between the client and the LSP showed certain differences from its beginning stage. In the current stage, they shared more information about all business order volume. Besides that, they jointly designed the logistics process and enhanced the communication frequency to exchange ideas about order delivery. The transactional link was enforced by these additional relationship activities. However, these activities were not strong enough to elevate the link to the collaborative level. In the other two dyads which were linked with the European supplier, there were no any differences at all. In a word, the case did not show structural change from the triadic relationship view even though one of its dyads became stronger.

Case T1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint design for logistics process.	None	None	Frequent senior manager's communication for order delivery.
Current type	Strong transactional link					
Change in dyad	No evolution, but the current link is stronger than the initial link.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.20: Details of dyads and triad in case T1

Case U3 was formed by a NZ based delivery company (the LSP in this case), a stationary tool seller (the supplier in this case), and the seller's customer (the client in the case). This triad was built 12 years ago. Because of the low specialty of the stationary tools, the cost minimization was the core consideration in the triad. In this situation, all three parties developed three transactional dyads in the triad because all of them focused on minimizing own cost. With the continuous business trade in the triad, every party got used to the other two partners in the triad. Furthermore, because of the limited options in NZ market, no party wanted to replace their partners if there was no big change in the triad. As a result, the transactional triadic structure was kept without change in the last 12 years.

Table F.21 indicates that there was no any relationship activities' change in all three links. The supplier contained simple transactional links with the LSP and the client by developing three basic relationship activities: sharing normal order information, signing basic contract agreement, and communicating for the order delivery confirmation. Since the whole logistics process was very simple, the supplier did not see any significance to develop joint effort, incentive alignment, and resource sharing with the other two parties. The link between the LSP and the client was even simpler than the other two links. The LSP and the client just needed to talk about the information of order content and delivery time. As a result, the case did not show structural transition in its triadic relationship.

Case U3	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.21: Details of dyads and triad in case U3

Group 2: Static partnership triad (Stage 1)
This triad has already been described in Chapter Four, section 4.4

Group 3: Dynamic transactional triads (Stage 1)
The triadic relationship of L4 was formed by a NZ based port service supplier (the LSP in this case), a global shipping line (the supplier in this case), and a NZ based food exporter (the client in this case). This triad was built 5 years ago. In the beginning stage, all parties did not know the other two parties very well. There were three simple transactional links in the triad at the moment. Since the food for exporting contained was commoditized product, the profit margin was not high. Accordingly, to minimize cost in the process, the exporter did not invest too many resource and effort to develop close relationships with the LSP and the shipping line in the triad. In detail process, the LSP supplied all kinds of port services to the exporter; while the shipping line focused on the container management and overseas shipping services for the exporter. Since the exporter outsourced all exporting services to the shipping line, the shipping line gained the right to select a proper port service supplier for the exporter. In this process, the shipping line was the LSP's direct customer. To secure own profit, the shipping line forced the LSP to reduce service cost continuously through their bargaining power. As a result, the LSP was unsatisfied with the link with the shipping line. However, the LSP could not abandon the shipping line even it was an unfair business relationship. The main reason was that the business order volume from the shipping line was more than half of the LSP's annual total business order. In the continuous business trade, the LSP found that the exporter was the final client in the triad and the exporter was the key customer of the shipping line. To enhance profit, the LSP started to negotiate with the exporter directly. Finally, the exporter agreed to help the LSP securing their profit by setting certain specific conditions to the shipping line. As a reward, the LSP shared certain profit and cost saving with the exporter through developing collaborative link with the exporter. To keep long term business link with the key customer, the shipping line could not reject the new contract form the exporter even they were unhappy with the new situation. As a result, there was a structural transition of the triadic structure from two years ago. In the new triad, the shipping line kept two distant transactional links with the exporter and the LSP as before; while the LSP and the exporter shared a collaborative link.

Table F.22 compares the relationship activities' details of case L4 from the beginning stage and the current stage. In the beginning stage, all three links were exactly same with four basic relationship activities. In each link, the relevant parties shared normal order information, focused on the basic contract agreement, developed joint effort when they had problem, and communicated for the confirmation of order delivery. In the current stage, two links which were connected with the supplier (the shipping line) did not show any differences. On the other hand, there was a relationship's change in the link between the LSP (the port service provider) and the client (the exporter). Their link became as a collaborative dyad with the development of certain collaboration activities: sharing critical and customized information, developing long term business contract, designing relevant supply chain considerations together, holding communication between senior managers with high frequency, and sharing risks and cost savings in the logistics process. Because of the relationship change in this dyad, the whole triadic relationship transited from original transactional structure to current partnership structure 2 years ago.

Case L4	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract	joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract	joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract	joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Key information	Long term goal	Joint design for all supply chain issues	Sharing risk and cost saving	None	managers always have conversation
Current type	Collaborative link					
Change in dyad	Evolved from Transactional link to Collaborative link					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract	joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract	joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Dynamic triad transited from a transactional to a partnership structure**					

Table F.22: Details of dyads and triad in case L4

The triadic relationship of S2 was formed by a NZ based logistics service provider (the LSP in this case), a NZ based food producer (the supplier in this case), and the producer's client (the final client in this case) in NZ market. They started their triadic business relationship 14 years ago. In the beginning stage, the triad contained three simple transactional links. The client sent order to the producer; while the LSP helped the producer to organize all logistics issues. Since the food was not specific to the client, the client believed that keeping a distant transactional link with the producer was good enough to keep the business. In the link between the LSP and the producer, both parties were not strategic important to each other. As a result, they kept a transactional link as well. The link between the LSP and the client was even simple. They only communicated about order delivery and reception. This situation did not change until the occurrence of ownership's change in the LSP. Three years ago, the LSP was merged into a big LSP group which could supply more professional logistics services in the Australia and NZ markets. The new owner wanted to develop joint venture with the producer in the triad. The main reason was that the food producer grown into a NZ food market leader in the last 10 years. Because of the new LSP's professional logistics competency, the food producer was happy to develop joint venture with them as well. As a result, the LSP and the producer developed collaboration from 3 years ago. In the other two links with the client, the client was not significant to the producer and the LSP in the triad because of its small company size and small order volume. As a result, there were no differences in these two links.

Table F.23 compares the relationship activities' details of case S2 from the beginning stage and the current stage. In the beginning stage, the supplier (the food producer) contained two simple transactional links with the client and the LSP by developing four kinds of relationship activities: sharing normal order information, focusing on the basic contract agreement, developing joint effort when they had problem, and communicating for the general order requirement. The link between the LSP and the client was even simple. They just developed two relationship activities: sharing normal order information, and communicating for the order delivery. In the current stage, the two dyads which were linked with the client did not show any differences. On the other hand, the dyad between supplier and the LSP was transited from transactional level to collaborative level. Two parties developed a number of activities to facilitate collaboration between them. They signed a new contract for long term business and shared all relevant business information in the triad. Beyond that, they put joint effort to design logistics process and shared risk and any cost saving in the business process. To facilitate collaboration in the triad, the relevant board people and senior managers always communicated with each other. They even integrated their information system in certain level to share real time information. In a word, the whole triadic structure was transited from transactional stage to partnership stage.

Case S2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Sharing all business information	Long term common development goal	Joint design for whole process	Sharing risk and cost saving	IT system integration	Full communication between senior managers and board people
Current type	Collaborative link					
Change in dyad	Evolved from Transactional link to Collaborative link					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal order information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal order information	Contract agreement	joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Dynamic triad transited from a transactional to a partnership structure**					

Table F.23: Details of dyads and triad in case S2

The triadic relationship of U1 was formed by a global logistics service provider's NZ branch (the LSP in this case), a commodity product seller (the supplier in this case), and the seller's client (the client in this case). This triad was built 8 years ago. At the beginning, all three parties wanted to keep the whole process simple and clear. They believe that the arm-length transactional relationship was proper for the logistics process of the commoditized product. As a result, there were three transactional dyads in the triad at the moment. From 4 years ago, to deal with the change of consuming behaviour, the seller changed their business style from physical store selling to online selling. This was a big strategy change to the seller. This change made connivance for the client's shopping. However, to secure the customer service level, the new selling style required more fluent logistics process than before. As a result, the LSP developed collaboration with the seller from the moment. From the client's view, the online selling made their procurement process easier. However, the cost minimization was still the key for the commoditized product. Accordingly, the client did not have any interest to develop collaboration with the seller and the LSP. Therefore, from 4 years ago, the whole triadic structure had a transition because of the relationship change in the dyad between the LSP and the seller.

Table F.24 compares the relationship activities' details of case U1 from the beginning stage and the current stage. In the beginning stage, the supplier (the food producer) contained two simple transactional links with the client and the LSP by developing three kinds of relationship activities: sharing normal order information, focusing on the basic contract agreement, and communicating for the general order requirement. The link between the LSP and the client was even simple. They just developed two relationship activities: sharing normal order information, and communicating for the order delivery. In the current stage, the two dyads which were linked with the client did not show any differences. On the other hand, the dyad between supplier and the LSP was transited from original transactional level to collaborative level. Two parties developed a number of activities to facilitate collaboration between them. They signed a new contract for long term business and shared all relevant confidential business information in the triad. Beyond that, they put joint effort to design whole logistics process for facilitating seamless order delivery. To make the collaboration more fluent, the relevant board people and senior managers always communicated with each other through their integrated information system. In a word, the whole triadic structure was transited from transactional stage to partnership stage.

Case U1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Sharing confidential information, Sharing all business information	Long term common development goal	Joint design for whole process	None	IT system integration	Full communication between senior managers and board people
Current type	Collaborative link					
Change in dyad	Evolved from Transactional link to Collaborative link					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal order information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal order information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Dynamic triad transited from a transactional to a partnership structure**					

Table F.24: Details of dyads and triad in case U1

The triadic relationship of U2 was formed by a global logistics service provider's NZ branch (the LSP in this case), a NZ based transportation company (the supplier in this case), and a department of NZ government (the client in this case). This triad was built 7 years ago. The client outsourced all logistics services to the LSP. The LSP selected the transportation company as the main supplier to supply all transportation and delivery services to the client. The LSP was the information centre of whole process. They organized all business communication between the other two parties. In this situation, the supplier and the client just needed to communicate about order confirmation and order delivery. In the process of selecting transportation service supplier, both of the LSP and the client focused on the cost minimization. The main reason was that the transportation service was not special to them. They could change to other cheaper transportation company at any time. In this situation, they believed that it was unnecessary to develop collaboration with the transportation company. As a result the LSP and the client kept transactional dyadic links with the transportation company in the last 7 years without any change. The relationship between the LSP and the client was more complex. In the initial stage, the client did not understand the LSP very much. As a result, they signed a short term (two years) contract with the LSP. Form the LSP's view, the client was a strategic important customer because of the client's government background. Therefore, the LSP tried their best to supply the client good services more than the client's expectation. Accordingly, the client made a decision to develop long term collaboration with the LSP through a joint venture plan. Accordingly, the whole business triad transited to a partnership triad 5 years ago.

Table F.25 compares the relationship activities' details of case U2 from the beginning stage and the current stage. In the beginning stage, the LSP and the supplier (the transportation company) developed a transactional dyad with three simple activities: sharing normal business order information, signing basic transportation service contract, and communicating for the order delivery. The dyad was very similar as the link between the LSP and the client. The only difference was that the LSP and the client developed one more joint effort activity: putting joint effort to solve problem in the order delivery. Since the LSP worked as information centre in the triad to help the supplier and the client exchange ideas, the link between the client and the supplier was even simple. They only shared normal business order information and talked about order delivery. In all three links, the two dyads which were linked with the supplier did not show any differences in current stage. On the other hand, the link between the LSP and the client was transited from transactional level to collaborative level by developing a series of new relationship activities. First of all, besides sharing all business process information, they also shared more confidential information than before. Beyond that, with compared to the original short term contract, they renewed their contract by setting long term goal congruence. In the "joint effort" part, they began to design whole logistics process with each other. Furthermore, they shared certain risk and cost saving in the process. To make convenience for the LSP's process, the client also shared infrastructure with the LSP in certain situations. Finally, to make the whole process more fluent, the managers from both sides kept communication at all times. In a conclusion, the business triad transited from original transactional structure to partnership structure because of the relationship's change in the link between the LSP and the client.

Case U2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal order information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Sharing confidential information, Sharing all business information	Long term goal congruence	Joint design for whole process	Sharing risk and cost saving	sharing infrastructure	Full communication between senior managers.
Current type	Collaborative link					
Change in dyad	Evolved from Transactional link to Collaborative link					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal order information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Dynamic triad transited from a transactional to a partnership structure**					

Table F.25: Details of dyads and triad in case U2

The triadic relationship of V1 was formed by a NZ based logistics service provider (the LSP in this case), a global fashion cloths seller (the supplier in this case), and the seller's client in NZ market (the client in this case). This triad was built 4 years ago by developing three transactional links. In the initial stage, the cloths seller and the LSP did not understand each other very well. A simple transactional link was a good choice to both sides at the moment. In the link between the client and the seller, since the client's business order was not big enough, the client was not strategically important to the seller. Accordingly, their relationship was kept at transactional level as well. From the LSP's view, the seller was their direct customer and the seller had more communication about business order. Therefore, the LSP only wanted a simple transactional link with the final client in the triad. The two links which were connected with the client did not show big differences in the last four years. However, from 2 years ago, the LSP and the seller transited their dyadic link form transactional level to collaborative level. The main reason was the interdependency between them. In the seller's long term business strategy, they wanted to expand their market share in NZ. As a result, they needed to find a key supplier to guarantee good logistics services with long term stability. The LSP was one of the top five LSPs in NZ market. Furthermore, the LSP could offer more flexible services than a number of LSPs in NZ market. The LSP could be a reliable service supplier in the seller's strategy. From the LSP's perspective, they needed to develop collaboration with their customers who could offer big business orders. At the moment, the seller's total order volume showed an impressive annual enhancement. As a result, the seller and the LSP developed a closer relationship with more collaborative activities. The whole triadic structure was changed because of the dyadic link's evolution from two years ago.

Table F.26 compares the relationship activities' details of case V1 from the beginning stage and the current stage. In all three links, the link between the LSP and the supplier (the seller) was the only link with relationship's change. In the beginning stage, they developed four basic relationship activities: sharing normal business order information, signing basic logistics service contract, putting joint effort to solve problem in the delivery process, and communicating for the order delivery. This link was fundamentally changed in the current stage. Besides the relationship attribute of "incentive alignment", they developed collaborative activities in all other Relationship measures. In the "information sharing" part, they shared business confidential information which they did not share before. The contract was renewed by setting up long term goal congruence between them. Furthermore, they made common decision about the whole logistics network and relevant supply chain issues. Since the seller was an overseas company, the LSP shared own infrastructures with the seller in NZ market. Finally, the senior managers and board people from both sides developed broad and frequent communication to make the collaborative process more fluent. Besides this link, it is easy to observe that the other two links did not change in different stages. The client and the supplier (the seller) developed three simple relationship activities: sharing normal business order information, signing basic service contract, and communicating for the order delivery. The link between the client and the LSP was even simple. They only shared normal business order information and talked about order delivery. In a conclusion, the triadic structure evolved from original transactional stage to the partnership stage because of the dyadic relationship's change in the link between the LSP and the seller.

Case V1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Sharing confidential information	Long term goal congruence	Joint design for logistics network and supply chain issues	None	sharing infrastructure	Full communication between senior managers and board people
Current type	Collaborative link					
Change in dyad	Evolved from Transactional link to Collaborative link					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal order information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal order information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Dynamic triad transited from a transactional to a partnership structure**					

Table F.26: Details of dyads and triad in case V1

The triadic relationship of V2 was formed by a NZ based logistics service provider (the LSP in this case), a global supply chain organization (the supplier in this case), and the supply chain organization's customer (the client in this case) in NZ market. This triad case was started 5 years ago. The situation of this case is very similar as the case V1. In the beginning stage, the triad contained three simple transactional links. The supplier organized all supply chain process for the client. The supplier selected the LSP to supply the transportation services for the client. Since the client did not offer big order volume to the supplier, the supplier preferred to keep simple transactional link with the client. From the LSP's view, the client was not their direct customer and the supplier organized all process for the triad. Both of the LSP and the client believed that it was unnecessary to develop close link between each other. Therefore, the two links which were connected with the client did not changed in the last 5 years. On the other hand, the link between the supplier and the LSP showed big difference in different stages. The main reason was the interdependency of their strategy development. Form the supplier's view, it was compulsory to find a long term trustworthy NZ partner if they wanted to expand market share in NZ. The LSP developed a strategy for market expansion as well. Both organizations found that they could rely on each other to achieve their long term business goal. As a result, after finishing the first contract (three years), the dyadic link between them became collaboration two years ago.

Table F.27 compares the relationship activities' details of case V2 from the beginning stage and the current stage. In all three links, the link between the LSP and the supplier (the supply chain organization) was the only link with relationship's change. In the beginning stage, they developed four basic relationship activities: sharing normal business order information, signing basic logistics service contract, putting joint effort to solve problem in the delivery process, and communicating for the order delivery. This link was fundamentally changed in the current stage. Besides the relationship attribute of "resource sharing", they developed collaborative activities in all other Relationship measures. In the "information sharing" part, they shared more customized information and business confidential information which they did not share before. The contract was renewed by setting up long term goal congruence between them. Furthermore, they made common decision about business development and requirement. They even shared market with each other to achieve their co-development agreement. Finally, the senior managers and board people from both sides developed broad and frequent communication to make the collaborative process more fluent. Besides this link, it is easy to observe that the other two links did not change in different stages. The client and the supplier (the supplier) developed three simple relationship activities: sharing normal business order information, signing basic service contract, and communicating for the order delivery. The link between the client and the LSP was even simple. They only shared normal business order information and talked about order delivery. In a conclusion, the triadic structure evolved from the original transactional stage to the partnership stage because of the dyadic relationship's change in the link between the LSP and the supplier.

Case V2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	more customized information sharing, Sharing confidential information	Long term goal congruence	Joint making all relevant business decision	Sharing market	None	Full communication between senior managers and board people
Current type	Collaborative link					
Change in dyad	Evolved from Transactional link to Collaborative link					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal order information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal order information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Dynamic triad transited from a transactional to a partnership structure**					

Table F.27: Details of dyads and triad in case V2

Group 4: Dissolved triads (Stage 1)
Cases T2 and N3 have already been described in Chapter Four, section 4.6.

The triadic structure of K1 was formed by a NZ based courier service supplier (the LSP in this case), a NZ based freight forwarding company (the supplier in this case), and a NZ based sports product seller (the client in this case). This triad was built 7 years ago. The client selected the LSP and the freight forwarding company by themselves. Since the client sustained a cost competitive strategy in the market, they only cared about if the other two parties could supply cheap service or not. Otherwise, the client might change to other service supplier quickly. As a result, both of the LSP and the freight forwarding did not have interest to develop collaboration with the client. Furthermore, because the freight forwarding company believes that the process of courier delivery was very simple, it was unnecessary to develop collaboration with the LSP as well. Therefore, the whole triadic structure was kept at transactional stage in the first 6 years without any change. In the last year, the triadic structure was broken up because of the change in the client's supply chain strategy. After 6 years' logistics service outsourcing, the client found that the total cost was not reduced very much. Accordingly, they made decision to do all freight forwarding and order delivery by themselves. Consequently, the triad did not exist anymore because the client did not outsource logistics service to the LSP and the supplier anymore.

Table F.28 describes the detail relationship activities of K1. In all of the three dyads, the three kinds of relationship activities were exactly same at the beginning stage. In every link, the relevant parties shared normal order information, signed basic service contract, and communicated for the order delivery. The whole triadic structure did not exist anymore after the client stopped outsourcing logistics service to the LSP and the supplier.

Case K1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	None
Current type	No link anymore					
Change in dyad	The link disappeared.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	None
Current type	Strong transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	None
Current type	No link anymore					
Change in dyad	The link disappeared.					
Dynamics in triad	**Dynamic triad transited from a transactional to dissolve**					

Table F.28: Details of dyads and triad in case K1

The triadic structure of K2 was formed by a NZ based courier service supplier (the LSP in this case), a global freight forwarding company (the supplier in this case), and a global greeting card producer (the client in this case). The client started to develop NZ market 12 years ago. From the moment, the client outsourced their logistics to the global freight forwarding company. To facilitate the order delivery in domestic market, the freight forwarding company helped the card producer to select the NZ based LSP because the LSP could provide service with lower cost. Since the profit margin of the greeting card was not high, all of the three parties strictly controlled their cost. No party was interest to invest more resources developing close relationship with others in the triad. In this situation, the triad kept three simple transactional links bout 11 years. In the last year, the supplier had a change in their top management level. The new manager preferred to outsource the order delivery to another LSP because of his personal relationship with the new LSP's senior manager. From the client's view, the supplier helped them organize logistics issues. It was unnecessary to interrupt the supplier's choice if the change did not bring big change to their profit and management process. As a result, the original triad was broken. The original LSP was excluded from the supplier and the client's business strategy.

Table F.29 describes the detail relationship activities of K2. All of the three dyads were exactly same at the beginning. Every two parties shared basic order information and communicated with each other about normal orders. The basic contract agreement was used to connect them. However, after the client stopped outsourcing services to the Australia supplier, the supplier did not have any link with the other two parties anymore. On the other hand, the client and the NZ LSP developed closer relationship activities than before, such as, more customized information sharing, more frequent communication between senior managers, and joint effort for problem solving. However, these activities were not strong enough to help the two parties developing a real collaboration. Therefore, the link was still a transactional link; even it was stronger than before. The whole triadic structure did not exist anymore after the NZ LSP expanded business to the Australian market. The other two cases in Group 4 have similar situations as case K2. They did not sustain triadic structures anymore. The next segment will compare the group with original research propositions.

Case K2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	None
Current type	No link anymore					
Change in dyad	The link disappeared.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	None
Current type	No link anymore					
Change in dyad	The link disappeared.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	More customized information sharing	Contract agreement	joint problem solving	None	None	Frequent senior managers' communication
Current type	Strong transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Dynamic triad transited from a transactional to dissolve**					

Table F.29: Details of dyads and triad in case K2

Group 5: Active transactional triad (Stage 1)
Triad O3 has already been described in Chapter Four, section 4.7.

Group 6: Static transactional triads (Stage 2)
Case BA1 was formed by a NZ supermarket (the supplier), a transportation company (the LSP), and the supermarket's internal customer (the client). This triad was built 5 years ago. The client ordered products from the supermarket constantly. In the delivery process, the supermarket outsourced all order delivery services to the transportation company. In the initial stage, all parties did not understand other parties very well. Their dyads were very simple at the moment. Furthermore, since the supplier needed to get real time information about the order delivery, they helped to develop the link between the LSP and the client. In this situation, the LSP and the client did not have too much direct communications. In these five years, the supplier gradually enforced the dyads with the LSP and the client at same time. The reason is that the supplier gradually developed more mutual understanding with the LSP and the client through the constant and continuous order delivery process. Accordingly, the relevant two dyads became stronger than before. However, the strength of these two dyads was not sufficient to be identified as collaborative links. On the other hand, the dyad between the LSP and the client did not change at all because the supplier kept control this link to prevent opportunistic behaviours. The LSP and the client did not change their dyad at all.

Table F.30 presents the details of relationship activities and relationships types in all dyads and triad. The dyad between the LSP and the customer did not change between the initial stage and current stage. This dyad kept two basic relationship activities: sharing normal order information and communicating for order perception. On the other hand, the two dyads linked with the supplier both became stronger in the triad. In the initial stage, because of the lack of mutual understanding, the supplier only developed basic relationship activities with the LSP and the customer. These activities included sharing normal order information, making basic contract agreement, joint problem solving and communicating for the order confirmation in the process. After gradually enhancing mutual understanding through continuous business orders in the last 5 years, the supplier developed more relationship activities with the LSP and the customer at same time to secure the fluent triadic process. These activities included sharing performance report and all business volume information, joint decision making for order delivery, and certain high degree of communications between senior managers. However, because of the limited order size and functional products and services, all three parties did not have interest to develop collaboration. The two dyads linked with the supplier only became as stronger transactional dyads rather than real collaborative dyads. As a result, the triad was retained at transactional structure without structural transition because all dyads were still transactional type.

Case BA1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract	Joint decision for order delivery.	None	None	Some manager communication.
Current type	Transactional link					
Change in dyad	No evolution, but the current link is stronger than the initial link.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract	Joint decision for order delivery.	None	None	Some manager communication.
Current type	Transactional link					
Change in dyad	No evolution, but the current link is stronger than the initial link.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.30: Details of dyads and triad in case BA1

Case BD1 was formed by a NZ based freight forwarding company (the LSP), a global shipping line(the supplier), and a NZ based food exporter (the client). This triad was built 7 years ago. The exporter worked as an information centre because it managed all business information and organized all logistics issues in this case. In the triad, the exporter actively assessed and selected the shipping line and the freight forwarding company because the exporter developed good business history with them in other projects. Therefore, the exporter developed two strong transactional links with the LSP and the supplier from the beginning. However, the supplier and the LSP did not know each other at the moment. As a result, the dyad between the LSP and the supplier was a very simple transactional link. Since the exporter's overseas market was very stable, all three parties prefer keeping the original process and relationship. Therefore, the three dyads did not change at all in the last 7 years.

Table F.31 presents the details of all relationship levels and activities. In all of the three dyadic links, the shipping line (the supplier in the table) sustained two transactional links with the client and the LSP respectively. These two links did not show differences between the beginning stage and current stage. In the link with the LSP, the shipping line shared normal order information, and all business volume information with the LSP. Beyond that, they made common decision making about problem solving and order delivery. To ensure order delivery, they also had some senior manager's communication and order confirmation. In the goal congruence part, the shipping line and the LSP put effort on the contract agreement. The link between the supplier and the client was exactly same as the link between the supplier and the LSP. Besides these two links, the link between the LSP and the client did not exhibit differences between the initial stage and current stage either. They only shared normal order information and communicated for basic order confirmation. As a result, in the last 7 years, the whole triad did not change at all.

Case BD1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract	Joint decision for order delivery.	None	None	Some manager communication.
Initial type	Transactional link					
Current activities	Normal information	Contract	Joint decision for order delivery.	None	None	Some manager communication.
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal order information;	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal order information;	None	None	None	None	Order confirmation;
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract	Joint decision for order delivery.	None	None	Some manager communication.
Initial type	Transactional link					
Current activities	Normal information	Contract	Joint decision for order delivery.	None	None	Some manager communication.
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.31: Details of dyads and triad in case BD1

Case BE1 was formed by a NZ based LSP (the LSP), a NZ food producer (the supplier), and the food producer's client. This triad was built 15 years ago. The supplier worked as an information centre because it managed all of the order information and relevant logistics process in this case. The LSP focused on physical order delivery and warehousing services. Therefore, the delivery company had operational daily contact with the final client about confirmation of the daily order. In this triadic case, because the NZ market was small, the client could not offer big business orders. In this situation, all three parties did not have interest to enforce their relevant dyads in the case. Therefore, the triad has retained three simple transactional dyads in the last 15 years.

Table F.32 present the details of all relationship levels and activities in case BE1. It is easy to find that the relationship level of all dyadic links did not have any change between the beginning stage and current stage. The supplier developed four transactional relationship activities with the LSP and the client. These activities were sharing general order information, focusing on basic contract agreement, joint problem solving, and general order confirmation. In the link between the client and the LSP, they had three simple activities about sharing order delivery information, joint problem solving for order delivery, and general order confirmation. As a result, the triadic relationship structure of case BE1 has not reflected any dynamics since the triad was formed.

Case BE1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.32: Details of dyads and triad in case BE1

Case BE3 is very similar as case BE1. They only reflect differences from three perspectives. First of all, the final customers in two cases were different. Secondly, case BE3 was formed two years earlier than case BE1. Finally, as reflected in Table F.33, all three parties in case BE3 shared four same basic relationship activities in all three dyads. These activities included sharing basic order information, focusing on contract agreement, solving problem together, and communicating about order delivery. BE3 has retained at the "Transactional" stage for about 17 years without dynamics.

Case BE3	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information;	Contract agreement	problem solving;	None	None	Order confirmation;
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information;	Contract agreement	problem solving;	None	None	Order confirmation;
Current type	Transactional link					
Change in dyad	No change at all.					
Supplier-Customer dyad	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.33: Details of dyads and triad in case BE3

Case BF1 was formed by a NZ based importer (the supplier), a NZ based LSP (the LSP), and the importer's domestic client. This triad was built   10 years ago. The importer worked as an information centre because it managed all business information and organized all logistics issues in this case. At the beginning, all three parties developed three simple transactional dyads because they did not know each other very well at the moment. This situation was changed from three years ago. The client began to order more special products from the importer. Because of the order speciality, the importer and the client needed to enforce their dyad for ensuring quick response in the process. The other two dyads relevant to the LSP did not change at all because both the supplier and the client believed that the LSP was only an assistant role in the case and the LSP's services were not unique to them.

Table F.34 presents the details of relationship activities and relationships types in all dyads and triad. The dyad between the LSP and the customer did not change between the initial stage and current stage. This dyad kept two basic relationship activities: sharing normal order information and communicating for order perception. In the two dyads linked with the supplier, they developed same basic relationship activities with the LSP and the customer at the beginning. These activities included sharing normal order information, making basic contract agreement, joint problem solving and communicating for the order confirmation in the process. The dyad between the supplier and the LSP did not change. On the other hand, the dyad between the supplier and the customer became stronger because of three new developed activities: sharing performance report, joint decision making for order delivery and more frequent senior managers' communication. However, because of the limited order size, this dyad only became as stronger transactional dyad rather than a real collaborative dyad. As a result, the triad was retained at transactional structure without structural transition because all dyads were still the transactional type.

Case BF1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving; Joint decision for order delivery.	None	None	Order confirmation; Frequent senior managers' communication.
Current type	Transactional link					
Change in dyad	No evolution, but the current link is stronger than the initial link.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.34: Details of dyads and triad in case BF1

Case BG2 was formed by a NZ exporter (the supplier), the exporter's European customer (the client), and a global freight forwarding company (the LSP). This triad was built 9 years ago. Since the exporter's product was special to the customer, they developed a strong transactional link at the beginning to secure alignment between supply and demand. This situation was changed from 4 years ago because of the owner's change in the client company. The new owner only wanted products with low cost. The supplier was not satisfied with the change. Therefore, the dyad between the supplier and the client became weaker than before from the moment. In the whole process, since the supplier organized all logistics process, the LSP only needed to delivery products under the supplier's command. The change in the dyad between the supplier and the client did not impact the LSP at all. Accordingly, the LSP retained two transactional dyads with the supplier and the client without change in 9 years.

Table F.35 presents the details of relationship activities and relationships types in all dyads and triad. Two dyads linked with the LSP did not change at all. The supplier and the LSP developed four basic relationship activities: sharing normal order information, making basic contract agreement, joint problem solving and communicating for the order confirmation in the process. The dyad between the LSP and the customer was even simpler; they only had one relationship about communications for the order confirmation. On the other hand, the dyad between the supplier and the customer became weaker than before because of the ownership's change in customer's company. In the initial stage, they develop a number of activities to strengthen their relationships: sharing normal order information, sharing performance report, sharing all business volume information, making contract agreement, joint problem solving, making joint decision about order delivery, communicating for order perception and frequent senior managers' communications about whole triadic process. However, in current stage, they only kept four basic relationship activities: sharing normal order information, making basic contract agreement, joint problem solving and communicating for the order confirmation. From the perspective of triad, all three dyads were still retained at transactional type. As a result, the triad was retained at transactional structure without dynamics in the last 9 years.

Case BG2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Forecast information	Contract agreement	Joint problem solving; Joint decision for order process.	None	None	Order confirmation; Frequent senior manager's communication.
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No evolution, but the current link is weaker than the initial link.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.35: Details of dyads and triad in case BG2

Case BH2 was formed by a NZ based delivery company (the LSP), a bread producer (the supplier), and a supermarket (the client). This triad was built 6 years ago. The supplier worked as a bridge to link the client and the delivery company. As a result, the supplier controlled all business information and relevant logistics process in this case. The delivery company had operational daily contact with the final client about confirmation of the daily order. In this triadic case, because the customer order size from the market was small, every party did not have interest to develop closer business links with other parties in the triad. Therefore, the triad retained three simple transactional links which were built from the beginning stage until now.

Table F.36 presents the details of all dyads and triad in case BH2. It is easy to find that the relationship type of all dyads did not have any change between the initial stage and current stage. Accordingly, the whole triadic structure did not have any change at all. In detail, the bread producer (the supplier) developed four transactional relationship activities with the LSP and the market at same time. These activities included sharing general order information, focusing on basic contract agreement, joint problem solving, and general order confirmation. In the dyad between the client and the LSP, they only had one simple relationship activity about confirmation of order delivery. In total, the triad retained at transactional structure without structural dynamics in the last 6 years.

Case BH2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.36: Details of dyads and triad in case BH2

Case BI1 was formed by a NZ based transportation company (the LSP), a bakery product manufacturer (the client), and the manufacturer's raw material supplier (the supplier). This triad was built 15 years ago. The client controlled all business information and whole logistics process in this case. The LSP focused on order delivering from the supplier to the manufacturer. Since the order volumes were small, the supplier and the manufacturer believed that it was unnecessary to develop collaborative dyad between them. Furthermore, since the LSP was the key partner of the manufacture's competitor, the manufacturer preferred to keep simple link with the LSP in the triad for securing confidential information. Therefore, the triad retained three transactional links without change in the last 15 years.

Table F.37 presents the details of all dyads and triad in case BI1. It is easy to find that the relationship level of all dyadic links did not have any change between the initial stage and current stage. Accordingly, the case retained at transactional structure without any structural dynamics in the last 15 years. In detail, the client company developed four transactional relationship activities with the delivery company (the LSP) and the supplier at same time because they controlled all things in the triad. These activities included sharing general order information, focusing on basic contract agreement, joint problem solving, and general order confirmation. In these four activities, the joint problem solving needed efforts from all three parties. All three parties sit together to discuss the resolution if they identify any problem in the triadic case. Since the whole process ran smoothly, the three parties did not put effort on joint problem solving quite often. Besides the joint problem solving, the supplier and the LSP had two more relationship activities: confirmation of order delivery and sharing of normal order information.

Case BI1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.37: Details of dyads and triad in case BI1

Case BJ2 was formed by a NZ based transportation company (the LSP), a NZ wood exporter (the supplier), and the exporter's internal customer (the client). This triad was built 15 years ago. The supplier worked as an information centre because it managed all of the order information and relevant logistics process in this case. After getting order from the client, the supplier signed delivering contract with the LSP in the triad. The LSP only focused on supplying the physical distribution and transportation services in the process. Since the internal customer only wanted the cost as cheap as possible, it was hard to develop very close link between them and the supplier. Because of the cost restriction, the LSP did not want to collaborate with the supplier and the client as well. Therefore, the triad retained three simple transactional links in the last 15 years.

Table F.38 presents the details of all dyads and triad. It is easy to find that the relationship type of all dyads did not change at all between the initial stage and current stage. Accordingly, the whole triadic structure did not have structural dynamics as well. In detail, the supplier only developed four basic transactional relationship activities with the LSP and the client. These activities included sharing general order information, focusing on basic contract agreement, joint decision problem solving, and general order confirmation. In the dyad between the client and the LSP, they just had three simple activities about sharing order delivery information, joint problem solving for order delivery, and general order confirmation.

Case BJ2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.38: Details of dyads and triad in case BJ2

Case BL1 was formed by a NZ based delivery company (the LSP), a fish importer (the supplier), and the importer's customer (the client). This triad was built 16 years ago. The importer purchased fish from overseas according to the client's order. After that, the importer organized fish delving to the client as well. Since the order size was too small and unstable, no party see the necessity to develop collaboration in the process. Therefore, all parties retained transactional links in the triad without change.

Table F.39 presents the details of all dyads and triad. The relationship type of all three dyads did not change between the initial stage and current stage. In detail, the importer developed four transactional relationship activities with the LSP and the customer at same time. These activities included sharing general order information, focusing on basic contract agreement, joint decision problem solving, and general order confirmation. In the dyad between the customer and the LSP, they had only one simple relationship activity about the confirmation of daily order requirements because the importer controlled all process and information for them.

Case BL1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.39: Details of dyads and triad in case BL1

The situation in the case BL2 is similar to the situation in the case BL1. The only difference is the different customer and the length of this triad is 15 years. Table F.40 presents the details of all relationship dyads and triad in case BL2. All activities are exactly same as described in case BL1. The triadic structure of case BL2 retained at transactional structure without dynamics in the last 15 years.

Case BL2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.40: Details of dyads and triad in case BL2

Case BM1 was formed by a NZ based logistics service provider (the LSP), a domestic cloth seller (the client), and the seller's supplier. This triad was formed 16 years ago. The client organized all logistics process and the LSP focused on the physical delivery. Since the market was very small and competitive, all parties focused on minimizing own cost to survive. Therefore, they did not have enough resources and effort to develop collaborative links with other parties in the case. The case retained three transactional links without change in the last 16 years.

Table F.41 presents the details of all dyads and triad. It is easy to find that the relationship type of all dyads did not change at all between the initial stage and current stage. The customer developed same basic relationship activities with the LSP and the supplier. These activities included sharing general order information, focusing on basic contract agreement, and communicating with each other to confirm the order delivery. The dyad between the LSP and the supplier was even simple because the customer controlled the whole process. The LSP and the supplier only shared normal order information and communicated for order confirmation. The whole triad was retained at transactional stage without dynamics in the last 16 years.

Case BM1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.41: Details of dyads and triad in case BM1

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The case BM2 was formed 10 years ago. The situation in case BM2 is exactly same as the situation in the case BM1 except the different LSP and different supplier. The customer still controlled whole process and information exchange. Table F.42 presents the details of all dyads and triad. The relationship activities in every dyad were exactly same as the relationship activities identified in case BM1. The whole triad was retained at transactional structure without dynamics in the last 10 years.

Case BM2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F42: Details of dyads and triad in case BM2

The triad BO2 was formed by a food importer & wholesaler (the supplier), a global shipping line (the LSP), and a domestic client. This triad has already been built for more than 16 years. The LSP provided the global shipping and port services to the supplier; while the client managed all order information and whole logistics process. After sent order to the supplier, the client asked the supplier to sign shipping contract with the selected global shipping line. Therefore, the client worked as an information centre and focal firm in the triad even they did not sign the logistics outsourcing contract with the LSP directly. The customer orders were not large in the triad. As a result, the supplier and the client believed that a simple transactional link was sufficient to run the process. From the supplier's view, the LSP was selected by the client. The supplier did not have interest to develop close link with the LSP who could be influenced by the client. In the dyad between the LSP and the customer, the client also wanted to keep simple process because of the small order volumes. Therefore, they also hold a basic transactional relationship with the LSP in this triad even they had stronger relationship with the LSP in other business. In a word, the whole triad was retained at the unstable transactional structure without transition in the last 16 years.

Table F.43 compares the details of the triad and related dyads in case BO2. It is easy to tell that the relationship types of all dyads did not exhibit any differences between their initial and current stages. The supplier contained three basic relationship activities with the LSP and the client at same time. These activities included sharing normal order information, focusing on basic contract agreement, and order confirmation. At same time, the client and the LSP only developed two simple link activities about sharing order delivery information and communicating for order confirmation. The three dyads and related relationship activities were not changed in the last 16 years. Therefore, the whole triadic structure did not change either.

Case BO2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	General information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	General information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	*No change at all.*					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	General information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	General information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	*No change at all.*					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	order delivery information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	order delivery information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	*No change at all.*					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.43: Details of dyads and triad in case BO2

Case BP1 was formed by a NZ based logistics company (the LSP), a sports product importer (the client), and the importer's overseas supplier (the supplier in the case). This triad was built 10 years ago. The client organized all logistics process in the order delivery. The LSP did not communicate too much with the overseas supplier except order confirmation. The supplier's product and the LSP's service were not highly special to the client; the client did not have interest to work close with the supplier and the LSP. Therefore, the whole triad retained three simple transactional links in the last 10 years.

Table F.44 indicates that there was no any change about relationship activities in all three dyads. The customer contained simple transactional links with the LSP and the supplier by developing three basic relationship activities: sharing normal order information, signing basic contract agreement, and communicating for the order delivery confirmation. Since the whole logistics process was very simple and was controlled by the customer, the LSP and the supplier only communicated about the order confirmation in their dyad. The whole triad was retained at transactional structure without dynamics in the last 10 years.

Case BP1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.44: Details of dyads and triad in case BP1

Case BP2 was formed by a NZ delivery company (the LSP), a sports product importer (the client), and the importer's domestic supplier. This triad was built 15 years ago. In this case, the triadic process and all relationship activities in every dyad were exactly same as in case BP1. Table F.45 describes all relationship activities. The triad was retained at transactional structure without dynamics in 15 years at all because all dyads did not change between the initial stage and current stage.

Case BP2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.45: Details of dyads and triad in case BP2

Case BQ1 was formed by a NZ logistics company (the LSP), an electronic device importer (the supplier), and the importer's domestic customer. This triad was built 7 years ago. At the beginning, every party did not know other parties very well. The case developed three transactional links at the moment. The supplier organized all logistics information and process in the triad. This situation was changed from 4 years ago. The client enhanced order gradually from the moment. As a result, the client became as a strategic important partner to the supplier. To retain business with the client, the supplier enforced its original links with the client and the LSP to satisfy the client's requirement as quick as possible. Therefore, the case contained two stronger dyads now. The link between the LSP and the client did not change because they did not have too much direct communication.

Table F.46 presents the details of relationship activities and relationships types in all dyads and triad. The dyad between the LSP and the customer did not change between the initial stage and current stage. This dyad only kept one basic relationship activities: communicating for order perception. On the other hand, the two dyads linked with the supplier both became stronger in the triad. In the initial stage, because of the lack of mutual understanding, the supplier only developed basic relationship activities with the LSP and the customer. These activities included sharing normal order information, making basic contract agreement, and communicating for the order confirmation in the process. After gradually enhancing mutual understanding through continuous business order sin the last 4 years, the supplier developed more relationship activities with the LSP and the customer to secure the fluent triadic process. These activities included sharing performance report and forecasting information, joint problem solving, joint decision making for order delivery, and more frequent communications between senior managers. However, because of the limited order size in small domestic market and functional logistics services, all three parties did not have interest to develop collaboration. The two dyads linked with the supplier only became as stronger transactional dyads rather than real collaborative dyads. As a result, the triad was retained at transactional structure without structural transition because all dyads were still the transactional type.

Case BQ1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract	Joint order delivery	None	None	frequent managers' communication.
Current type	Transactional link					
Change in dyad	No evolution, but the current link is stronger than the initial link.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	forecasting information;	Contract	Joint problem solving	None	None	frequent managers' communication.
Current type	Transactional link					
Change in dyad	No evolution, but the current link is stronger than the initial link.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.46: Details of dyads and triad in case BQ1

Case BR1 was formed by a NZ transportation company (the LSP), a frame construction company (the customer), and the construction company's domestic supplier. This triad was built 8 years ago. Since the three companies worked basing on project base. It is hard for them to retain collaboration when they do not have project. Accordingly, the three parties retained general transactional links between each other in the triad. In the process, the customer company help to organize all process and information exchange while the supplier and the LSP only had communications about orders. This situation did not change in the last 8 years.

Table F.47 indicates that there was no change in all dyads and the triad. The customer contained simple transactional dyads with the LSP and the supplier by developing four basic relationship activities: sharing normal order information, signing basic contract agreement, joint problem solving and communicating for the order delivery confirmation. Since the customer control the whole logistics process, the supplier and the LSP were not necessary to communicate too much. They only shared normal order information and only communicated about order reception. The whole transactional triad did not have structural dynamics in the last 8 years because all dyads did not change.

Case BR1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.47: Details of dyads and triad in case BR1

Case BR2 was formed by a NZ transportation company (the LSP), a frame construction company (the supplier), and the construction company's domestic customer (the client). This triad was built 4 years ago. Similar as case BR1, this case was a project based case as well. Three parties retained transactional links in the triad in the last 4 years because they did not have interest to invest too much for collaborations in the project based relationships.

Table F.48 indicates that there was no any change about relationship activities and relationship type in all three dyads. The supplier contained simple transactional links with the LSP and the client by developing three basic relationship activities: sharing normal order information, signing basic contract agreement, joint problem solving and communicating for the order delivery confirmation. The link between the LSP and the client was even simpler than the other two dyads. The LSP and the client just needed to talk about the information of order and delivery time. As a result, the case did not show structural dynamics in its triadic relationship at all.

Case BR2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.48: Details of dyads and triad in case BR2

Case BS1 was formed by a NZ logistics company (the LSP), a technical machine manufacturer (the client), and the manufacturer's overseas supplier. This triad was built 4 years ago. Since the three companies worked basing on project base. It is hard for them to retain collaboration when they do not have project. Accordingly, the three parties retained general transactional links between each other in the triad. Moreover, the domestic LSP did not have too much communication with the overseas supplier because the supplier talked directly with the customer to arrange all process in the triad. This situation did not change in the last 4 years.

Table F.49 indicates that there was no change in all dyads and the triad. The customer contained simple transactional dyads with the LSP and the supplier by developing four basic relationship activities: sharing normal order information, signing basic contract agreement, joint problem solving and communicating for the order delivery confirmation. Since the customer control the whole logistics process, the overseas supplier and the domestic LSP were not necessary to communicate too much. They only communicated about order reception. The whole transactional triad did not have structural dynamics in the last 4 years because all dyads did not change.

Case BS1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.49: Details of dyads and triad in case BS1

Case BT1 was formed by a NZ logistics company (the LSP), a supermarket (the client), and the supermarket's domestic supplier. This triad was built 10 years ago. The supermarket organized all process and information. Since the NZ market is not big, the supermarket's order is limited. Furthermore, the supermarket tried to use their market power to ask the supplier and the LSP reducing cost continuously. The LSP and the supplier were not happy with the supermarket. Therefore, the case retained three basic transactional links without change in the last 10 years.

Table F.50 indicates that there was no change in all dyads and the triad. The customer contained simple transactional dyads with the LSP and the supplier by developing three basic relationship activities: sharing normal order information, signing basic contract agreement, and communicating for the order delivery confirmation. Since the customer control the whole logistics process and strictly control the communications between the supplier and the LSP, the supplier and the LSP only could share normal order information and only communicated about order reception. The whole transactional triad did not have structural dynamics in the last 10 years because all dyads did not change.

Case BT1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.50: Details of dyads and triad in case BT1

Case BT2 was formed by a NZ transportation company (the LSP), a supermarket (the client), and the supermarket's overseas supplier. This triad was built 7 years ago. The supermarket organized all process and information. Since the NZ market is not big, the supermarket's order is small. Both of the LSP and the overseas supplier could not have large profit from the small orders. Therefore, the case retained three basic transactional links without change in the last 7 years.

Table F.51 indicates that there was no change in all dyads and the triad. The customer contained simple transactional dyads with the LSP and the supplier by developing four basic relationship activities: sharing normal order information, signing basic contract agreement, joint problem solving and communicating for the order delivery confirmation. Since the customer control the whole logistics process, the overseas supplier and the domestic LSP were not necessary to communicate too much. They only communicated about order reception. The whole transactional triad did not have structural dynamics in the last 7 years because all dyads did not change.

Case BT2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.51: Details of dyads and triad in case BT2

Case BT3 was formed by a NZ logistics company (the LSP), a construction material seller (the client), and the seller's domestic supplier. This triad was built 8 years ago. The seller organized all process and information. Since the seller's order size was limited in small domestic market, the supplier and the LSP did not have interest to develop collaborative dyads with the seller. As a result, the case retained three transactional links in the last 8 years.

Table F.52 indicates that there was no change in all dyads and the triad. The customer contained simple transactional dyads with the LSP and the supplier by developing three basic relationship activities: sharing normal order information, signing basic contract agreement, and communicating for the order delivery confirmation. The dyad between the LSP and the supplier was even simple; they only communicated about order reception and shared normal order information. The whole transactional triad did not have structural dynamics in the last 8 years because all dyads did not change.

Case BT3	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.52: Details of dyads and triad in case BT3

Case BV1 was formed by a NZ transportation company (the LSP), a domestic air conditioner producer (the client), and the producer's domestic supplier (the supplier in the case). This triad was built 15 years ago. Because of the low speciality of the supplier's product and the LSP's service, the producer did not have interest to develop close dyads with the supplier and the LSP. Furthermore, the producer strictly controlled the communication between the supplier and the LSP to prevent their opportunistic behaviour. Therefore, in the last 15 years, the triad retained three basic transactional dyads without change.

Table F.53 indicates that there was no change in all dyads and the triad. The customer contained simple transactional dyads with the LSP and the supplier by developing four basic relationship activities: sharing normal order information, signing basic contract agreement, joint problem solving and communicating for the order delivery confirmation. The dyad between the LSP and the supplier was even simple; they only communicated about order reception under the control of the customer. The whole transactional triad did not have structural dynamics in the last 15 years because all dyads did not change.

Case BV1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.53: Details of dyads and triad in case BV1

Case BW1 was formed by a producer which produced construction material (the supplier), a transportation company (the LSP), and the producer's domestic customer). This case was formed 12 years ago. The producer coordinates the logistics process and information in the triad. At the beginning, they did not understand each other very well. The transactional link was good choice to every party. From 3 years ago, the client enhanced order sizes and required more customization services. In this situation, the producer and the client developed closer transactional link to gain deep mutual understanding and quick response in the case. Now, the triad contained one stronger dyad than before. Since the LSP only supplied basic transportation services, both of the supplier and the customer did not see any necessity to develop collaborations with the LSP. Therefore, the two dyads linked with the LSP did not change in the last 12 years.

Table F.54 presents the details of relationship activities and relationships types in all dyads and triad. The dyad between the LSP and the customer did not change between the initial stage and current stage. This dyad only kept one basic relationship activities: communicating for order perception. The dyad between the LSP and the supplier did not change wither. They retained three basic relationship activities: sharing normal order information, making basic contract agreement and communicating for the order confirmation. On the other hand, the dyad between the supplier and the customer became stronger. In the initial stage, they only developed four basic relationship activities: sharing normal order information, making basic contract agreement, joint problem solving and communicating for the order confirmation. In current stage, they developed four more activities: sharing all business volumes information and forecasting information, making joint decision for order delivery and more frequent senior managers' communication. Even this dyad became stronger than before, it was not strong enough to facilitate a real collaboration. As a result, the triad still kept three transactional dyads. The triadic structure was retained at transactional structure without transition.

Case BW1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Forecasting information	Contract agreement	Joint problem solving; joint decision making of order delivery	None	None	Order confirmation; Some senior manager's communication.
Current type	Strong transactional link					
Change in dyad	No evolution, but the current link is stronger than the initial link.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.54: Details of dyads and triad in case BW1

The situation in the case BW2 was very similar to the situation in the case BW1. Except different customer and relationship length (11 years in BW2), the whole process and related relationship activities were exactly same in two cases. The dyad between the supplier and the new customer in case BW2 became stronger from 4 years ago. Table F.55 presents the details of all dyads. The triad retained at transactional structure without dynamics because the relationship type of three dyads did not change in the last 11 years.

Case BW2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
LSP-Customer dyad	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Supplier-Customer dyad	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Forecasting information	Contract	joint order delivery	None	None	Some manager's communication.
Current type	Strong transactional link					
Change in dyad	No evolution, but the current link is stronger than the initial link.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.55: Details of dyads and triad in case BW2

Case BX1 was formed by a domestic delivery company (the LSP), an academic dress designer and seller (the supplier), and the seller's domestic customer (the client). This triad was built 13 years ago. The seller coordinated the logistics process and information in the triad. At the beginning, all parties did not understand each other very well. The transactional dyad was good choice to every party. From 9 years ago, the client began to ask more customized products and wanted quick response from the supplier. Accordingly, the seller enforced the dyads with the client and the LSP at same time. From the moment, the case retained two stronger transactional dyads until now.

Table F.56 presents the details of all dyads and the triad. The dyad between the LSP and the customer did not change between the initial stage and current stage. This dyad only kept one basic relationship activities: communicating for order perception. In the two dyads linked with the supplier, the supplier only developed three basic relationship activities with the LSP and the customer in the initial stage. These activities included sharing normal order information, making basic contract agreement and communicating for the order confirmation. In current stage, these two dyads were strengthened by a number of new developed relationship activities: sharing forecasting information, joint design for order delivery and product, and more frequent communications between senior managers. However, because the total order volumes were still small in the limited domestic market, these dyads were not able to be promoted as real collaborations. All three dyads were still assigned as transactional type. As a result, the triad was retained at transactional structure without dynamics in the last 13 years.

Case BX1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint decision making for order delivery	None	None	Frequent managers' communication
Current type	Strong transactional link					
Change in dyad	No evolution, but the current link is stronger than the initial link.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Forecasting information.	Contract	Joint design of products.	None	None	Frequent manager's communication.
Current type	Strong transactional link					
Change in dyad	No evolution, but the current link is stronger than the initial link.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.56: Details of dyads and triad in case BX1

Case BY1 was formed by a NZ delivery company (the LSP), a cosmetic product seller (the client), and the seller's overseas' supplier. This triad was built 8 years ago. Because the seller focused on handmade product, it was impossible to purchase big order from the supplier. The supplier and the LSP did not see necessity to develop collaborative dyads with the seller with limited order volumes. Therefore, the case retained three basic transactional links without change in the last 8 years.

Table F.57 indicates that there was no change in all dyads and the triad. The customer contained simple transactional dyads with the LSP and the supplier by developing three basic relationship activities: sharing normal order information, signing basic contract agreement, and communicating for the order delivery confirmation. The dyad between the LSP and the supplier was even simple; they only communicated about order reception. The whole transactional triad did not have structural dynamics in the last 8 years because all dyads did not change.

Case BY1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.57: Details of dyads and triad in case BY1

Case BY2 was very similar to case BY1. Case BY2 was formed from 4 years ago. The only difference between cases BY1 and BY2 is the different overseas suppliers. All of the other situations and relationship activities were exactly same in two cases. Table F.58 indicates that there was no change in all dyads and the triad. The whole transactional triad did not have structural dynamics in the last 4 years because all dyads did not change.

Case BY2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.58: Details of dyads and triad in case BY2

Case BZ1 was formed by a NZ transportation company (the LSP), a cloth seller (the supplier), and the seller's domestic customer. This triad was built 6 years ago. Because of the low speciality of the seller's product and the functional transportation service, the customer did not have interest to develop collaborative dyads with the other two parties in the triad. The seller organized whole process and information in the triad. The case retained three transactional links without change in the last 6 years.

Table F. 59 indicates that there was no change in all dyads and the triad. The supplier contained simple transactional dyads with the LSP and the supplier by developing three basic relationship activities: sharing normal order information, signing basic contract agreement, and communicating for the order delivery confirmation. The dyad between the LSP and the customer was even simple; they only communicated about order reception. The whole transactional triad did not have structural dynamics in the last 6 years because all dyads did not change.

Case BZ1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.59: Details of dyads and triad in case BZ1

Case CA1 was formed by a NZ based logistics service provider (the LSP), a NZ wine seller (the supplier), and the seller's domestic client. This triad was built 4 years ago. The seller coordinated the logistics process and information in the triad. At the beginning, all parties did not understand each other very well. The transactional dyad was good choice to every party. In the first three years, the seller kept delivery high quality wine and service to the client. Accordingly, the client began to enhance the order size. In this situation, the seller and the client enforced their link from last year. The LSP only supplied basic transportation and warehouse services. The wine seller and the customer did not want to develop collaborations with the normal LSP. Therefore, the LSP kept two basic transactional dyads with the seller and the customer in the last 4 years.

Table F.60 presents the details of all dyads and the triad. The LSP and the supplier retained four basic activities in their dyad without change. These activities included sharing normal order information, signing basic contract agreement, joint problem solving and communicating for the order delivery confirmation. The dyad between the LSP and the customer was even simpler; this dyad only had two basic relationship activities: sharing normal order information and communicating for the order delivery confirmation. On the other hand, the dyad between the supplier and the customer became stronger from initial stage to current stage. In the initial stage, the supplier and the customer developed four basic relationship activities that were also developed in the dyad between the supplier and the LSP. in current stage, the supplier and the customer strengthened the dyad by developing three more activities: sharing all real time information in the process, joint design for the standard about order delivery and more frequent communications between senior managers. Because of the limited domestic market, the order volumes were not large to support the development of collaboration. As a result, all three dyads were still assigned with transactional type. The triad was retained at the transactional structure without transitions in the last 4 years.

Case CA1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	real time information	Contract agreement	Joint design for logistics service standard.	None	None	Frequent manager's communication for order delivery.
Current type	Strong transactional link					
Change in dyad	No evolution, but the current link is stronger than the initial link.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.60: Details of dyads and triad in case CA1

Case CC1 was formed by a NZ based logistics service provider (the LSP), a NZ based chemical manufacturer (the supplier), and the manufacturer's domestic customer. This triad was built 5 years ago. In this triad, the client and the supplier retained transactional dyads with the LSP at same time because the LSP kept increasing cost. On the other hand, the dyad between the manufacturer and the customer became stronger from two years ago because the customer gradually enhanced order volumes and required more special customized products.

Table F.61 presents the details of all dyads and the triad. In the dyad between the LSP and the customer, because the supplier organized all process and information exchange, they only kept transactional dyad with two basic relationship activities: sharing normal order information and communicating for order confirmation. In the two dyads linked with the supplier, there were four same relationship activities in the initial stage. These activities included sharing normal order information, signing basic contract agreement, joint problem solving and communicating for the order delivery confirmation. In current stage, the dyad between the suppler and the LSP did not change. On the other hand, the dyad between the supplier and the customer became stronger by developing three more activities: sharing forecasting information, joint design for order delivery process and more frequent communications between senior managers. Because of the small order volumes in limited market, this dyad did not evolve to a real collaboration. All dyads were retained at the transactional type. As a result, the triad was retained at transactional structure without transitions in the last 5 years.

Case CC1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Forecasting information	Contract agreement	Joint design for logistics process.	None	None	Frequent manager's communication
Current type	Strong transactional link					
Change in dyad	No evolution, but the current link is stronger than the initial link.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.61: Details of dyads and triad in case CC1

Case CC2 was formed by a NZ based logistics service provider (the LSP), a NZ based chemical manufacturer (the customer), and the manufacturer's overseas supplier. This triad was built 6 years ago. The manufacturer coordinated the logistics process and information in the triad. At the beginning, all parties did not understand each other very well. The transactional dyad was good choice to every party. With the gradual enhancement of mutual trust and commitment, the manufacturer began to enhance order volumes and ask for quick response from last year. As a result, both the LSP and the supplier enforced their dyads with the manufacturer from the moment. Since the manufacture directly control all process in the triad and the long distance between the LSP and the supplier, the LSP and the supplier kept basic transactional dyad without change.

Table F.62 presents the details of all dyads and the triad. The only static dyad between the LSP and the supplier kept two basic activities: sharing normal order information and communicating for order confirmation. In the two dyads linked with the customer, there were three same basic relationship activities in the initial stage. These activities included sharing normal order information, signing basic contract agreement and communicating for the order delivery confirmation. In current stage, both of two dyads became stronger by developing a number of different relationship activities: sharing more information about business volumes and forecasting, making joint effort for problem solving and logistics services design and more frequent communications between senior managers. Because of the small order volumes in limited market, this dyad did not evolve to a real collaboration. All dyads were retained at transactional type. As a result, the triad was retained at transactional structure without transitions in the last 6 years.

Case CC2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract	Joint design for logistics process.	None	None	Frequent manager's communication
Current type	Strong transactional link					
Change in dyad	No evolution, but the current link is stronger than the initial link.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Forecasting information	Contract	Joint design for service standard.	None	None	Frequent managers' communication
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static transactional structure without dynamics**					

Table F.62: Details of dyads and triad in case CC2

Group 7: Static partnership triads (Stage 2)

The triadic structure of BC1 was formed by a supermarket (the client in this case), a transportation company (the 7LSP in this case), and the supplier of the supermarket 15 years ago. In this triad, the LSP was selected by the supermarket to take their order from the supplier. In the link between the supplier and the supermarket, they were the key business partner to each other in NZ market in other business. Moreover, both sides found that they could mutual benefit each other in long term business cooperation. As a result, they developed a collaborative link from the first day in this triad. This relationship did not exhibit any change in the last 15 years. On the other hand, the supermarket believed that the LSP only supply basic transportation services. It was better to keep simple link with the LSP. Therefore, the supermarket annually reviewed the contract with the LSP. Furthermore, because of the power from the supermarket's large orders in small NZ market, they kept to ask the LSP decreasing the service cost. Beyond that, the supermarket also acted as a leading role in the whole triad by managing the link between the LSP and the supplier. From the supplier's view, the supermarket was their key client in NZ. They were also happy to keep a simple and clear link with the LSP under the control of the supermarket. Overall, case BC1 contained one collaborative dyad between the supermarket and the supplier; while the LSP retained two transactional links with the supermarket and the supplier. All of these three dyads did not change in the last 15 years.

Table F.63 compares the details of dyads and triad in case BC1. It is easy to find that the relationship type of all dyadic links did not have any differences between their initial and current stages. Therefore, the whole triadic structure did not reflect dynamics at all. The only collaborative link was between the client and the supplier. The client shared key business information and developed long term collaborative goal with the supplier. Moreover, they made common decision making for their unique logistics network and shared business risk and inventory cost in the collaboration. The frequent senior managers' conversation was a proper approach to help both sides to keep their business collaboration fluent. On the contrary, the LSP developed and retained simple relationship activities with the supermarket and the supplier, such as sharing normal order information, focusing on the confirmation of order, transactional contract agreement, and making joint effort for basic problem solving in logistics process. The whole triadic structure has been sustained at the partnership stage since it was built because the related three dyads did not change at all.

Case BC1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	*No change at all.*					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract	Just for problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract	Just for problem solving	None	None	Order confirmation
Current type	Collaborative link					
Change in dyad	*No change at all.*					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Key information	Long term goal	Design logistics network	Sharing risk & inventory cost	None	Frequent manager's communication
Initial type	Collaborative link					
Current activities	Key information	Long term goal	Design logistics network	Sharing risk & inventory cost	None	Frequent manager's communication
Current type	Collaborative link					
Change in dyad	*No change at all.*					
Dynamics in triad	**Static partnership structure without dynamics**					

Table F.63: Details of dyads and triad in case BC1

The triadic structure of BC2 was formed by a wholesaler (the client), a transportation company (the LSP in this case), and the supplier of the wholesaler. This case was formed 7 years ago. In this case, the LSP was selected by the supplier to deliver order to the wholesaler. In the dyad between the supplier and the wholesaler, they had good relationship history more than 30 years. Moreover, both sides found that they could be mutual benefit each other in long term business cooperation. As a result, they developed a collaborative link from the first day in this case. This relationship has not had any change in the last 7 years. On the other hand, both the wholesaler and the supplier believed that the LSP only supply basic transportation services. It was better to keep simple dyad with the LSP. Furthermore, the supplier and the wholesaler kept to ask the LSP reducing the cost of logistics service. The LSP was not happy with the requirements. They prefer to kept basic dyads with the supplier and the wholesaler as well. Overall, case BC2 has only one collaborative dyad between the wholesaler and the supplier; while the LSP only has two transactional dyads with the wholesaler and the supplier respectively. All of these three dyads did not change in the last 7 years.

Table F.64 compares the details of relationship activities in triad BC2. It is easy to find that the relationship type of all dyads did not change between the initial stage and current stages. In detail, in the dyad between the client and the supplier, the wholesaler has shared key business information and has developed long term collaborative goal with the supplier. Moreover, they also made common decision making for their unique logistics network and shared business risk and inventory cost in the collaboration. The frequent senior managers' conversation is a proper approach to help both sides to keep their business collaboration fluent. All of these relationship activities have not been changed at all in the last 7 years. On the contrary, the LSP has only sustained some simple relationship activities with the wholesaler, such as sharing normal order information, focusing on the confirmation of order and transactional contract agreement, and making joint effort only when they found some problems in the logistics process. The relationship activities in the link between the LSP and the supplier is even less. They only have basic order confirmation in the logistics process. All others have been managed by the client –the wholesaler. The whole triadic structure has been sustained in the partnership structure without transitions since it was built.

Case BC2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Key information	Long term goal	Design logistics network	Sharing risk & inventory cost	None	Frequent manager's communication
Initial type	Collaborative link					
Current activities	Key information	Long term goal	Design logistics network	Sharing risk & inventory cost	None	Frequent manager's communication
Current type	Collaborative link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dynamics in triad	**Static partnership structure without dynamics**					

Table F.64: Details of dyads and triad in case BC2

The triadic structure of BE2 was formed by a food producer and exporter (the client), a transportation company (the LSP), and the producer's material supplier. This triad was built 5 years ago. In this case, since the producer's product was premium goods, the supplier's material was highly special to the producer. Furthermore, the supplier and the producer had good relationship history in other business more than 15 years. They knew each other and trust each other very well. As a result, they developed a collaborative dyad from the first day in this triad. However, in their opinions, the LSP's transportation service was not critical to the business. Therefore, they retained transactional dyads with the LSP without change in the last 5 years.

Table F.65 compares the details of all dyads and the triad. It is easy to find that the relationship type of all dyads did not change between the initial stage and current stage. Because the customer organized all process and information exchange in the triad, the dyad between the LSP and the supplier was very simple. They only communicated about order confirmation. The dyad between the LSP and the customer was a little bit complex. The partners shared normal order information, signed basic contract agreement, made joint effort for problem solving in delivery process and communicated for basic order confirmation. In the only collaborative dyad between the customer and the supplier, they developed a number of activities about the six Relationship measures. The supplier and the customer shared forecasting demand and performance report. They also developed long term collaborative goal. Moreover, they made common decision making for their unique logistics network and shared business risk and inventory cost in the collaboration. In certain situation, the customer even provided financial help to the supplier if the supplier ran out of cash. The frequent senior managers' conversation is a proper approach to help both sides to keep their business collaboration. All of the relationship activities in three dyads have not been changed at all in the last 5 years. As a result, the triad was retained at the partnership structure without transitions since it was built.

Case BE2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Forecasting information	Long term goal	Design logistics network	Sharing risk, sharing inventory cost	Financial help	Frequent manager's communication
Initial type	Collaborative link					
Current activities	Forecasting information	Long term goal	Design logistics network	Sharing risk, sharing inventory cost	Financial help	Frequent manager's communication
Current type	Collaborative link					
Change in dyad	No change at all.					
Dynamics in triad	**Static partnership structure without dynamics**					

Table F.65: Details of dyads and triad in case BE2

The triadic structure of CA2 was formed by a wine seller (the client), a distribution centre (the LSP), and a wine producer (the supplier). The triad was formed 4 years ago. The seller and the producer had relationship history before. In this case, the seller expanded business to other market. They purchased large orders from the producer continuously. Therefore, the producer and the seller developed closer collaborative link from the beginning in the triad. However, the distribution centre was a new LSP to the producer and the seller. The producer and the seller did not fully trust the LSP in such a short term. As a result, the producer and the seller developed and retained two simple transactional dyads with the LSP in these 4 years.

Table F.66 compares the details of all dyads and the triad. It is easy to find that the relationship type of all dyads did not change between the initial stage and current stage. Because the customer organized all process and information exchange in the triad, the dyad between the LSP and the supplier was very simple. They only communicated about order confirmation and shard normal order information. The dyad between the LSP and the customer was a little bit complex. The partners shared normal order information, signed basic contract agreement and communicated for basic order confirmation. In the only collaborative dyad between the customer and the supplier, they developed a number of activities. The supplier and the customer shared forecasting demand and customized information. They also developed long term collaborative goal. Moreover, they made common decision making for their unique logistics network and customized package for the wine products. They also shared business risk and inventory cost in the whole process. The senior managers always had conversations to secure the collaborative dyad and whole triadic process as fluent as possible. All of the relationship activities in three dyads have not been changed at all in the last 4 years. As a result, the triad was retained at the partnership structure without transitions since it was built.

Case CA2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Customized information	Long term goal	Design logistics network	Sharing risk & inventory cost	None	Always manager's communication
Initial type	Collaborative link					
Current activities	Customized information	Long term goal	Design logistics network	Sharing risk & inventory cost	None	Always manager's communication
Current type	Collaborative link					
Change in dyad	No change at all.					
Dynamics in triad	**Static partnership structure without dynamics**					

Table F.66: Details of dyads and triad in case CA2

The situation in case CA3 is similar to the situation in the case CA2. These two cases were formed by the same wine seller and the same wine producer. They also developed collaboration in this case from the first day. The transportation company in case CA3 was a backup LSP to the distribution centre in case CA2. Since the LSP in this case was only a backup, the producer and the seller retained simple transactional dyads with the new LSP as well.

Table F.67 describes details of all dyads. By comparison with the relationship activities identified from case CA2, case CA3 only reflected one small difference about dyad between the LSP and the supplier. In this case, the LSP and the supplier only communicated about the order confirmation. Similar as in case CA2, the three dyads in case CA3 did not change between the initial stage and current stage wither. As a result, the triad was retained at the partnership structure without transitions for 3 years.

Case CA3	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Customized information; forecasting demand	Long term goal congruence	Design logistics network; customized packing design	Sharing risk, sharing inventory cost	None	Always senior manager's communication
Initial type	Collaborative link					
Current activities	Customized information; forecasting demand	Long term goal congruence	Design logistics network; customized packing design	Sharing risk, sharing inventory cost	None	Always senior manager's communication
Current type	Collaborative link					
Change in dyad	No change at all.					
Dynamics in triad	**Static partnership structure without dynamics**					

Table F.67: Details of dyads and triad in case CA3

Group 8: Static collaborative triad (Stage 2)

The triadic structure of BK1 was formed by a fish exporter (the supplier), a global freight forwarding company (the LSP), and the exporter's overseas' customer. This triad was formed 10 years ago. In the triad, the exporter already developed close relationships with the LSP and the client in other business respectively before. In the dyad between the exporter and the client, since the exporter exported special fish to the client, the client really needed to work closer with the exporter to secure the fish supply. Furthermore, the exporter and the client already worked with each other more than 5 years before this case. In this case, the client expanded their market. They asked the exporter to select a trustworthy LSP to secure quick response in logistics process. Therefore, the exporter selected the freight forwarder which was their strategic partner from 10 years ago. Accordingly, the exporter developed two collaborations with the client and the LSP from the first day in this triad. In this process, the exporter organized all information. The LSP did not have too much direct communications with the client in this situation. Therefore, the dyad between the client and the LSP was a simple transactional link. The triad retained the three dyads without change in the last 10 years.

Table F.68 describes the details of all dyads and the triad. In the only transactional dyad between the LSP and the customer, they only shared normal order information and only communicated about basic order confirmation. In the other two collaborative dyads, partners developed more relationship activities to facilitate the collaborative process. In the link between the supplier and the LSP, they developed long term common goal and shared information about all business volumes. Moreover, the logistics network was designed through their joint decision making. The frequent senior manager's communication also helped both sides to integrate their IT system for information sharing. Finally, sharing risk and cost reduction helped the LSP and the supplier to align their business incentives in a long term. In another collaborative dyad, the link between the supplier and the customer, both sides shared all relevant business information, risks and cost savings in the business process. Moreover, through the full communication between key peoples and cross team management, both sides made the joint decision about whole business process and customized orders in the triad. All of the three dyads did not show any differences in the last 10 years. Consequently, the whole triadic structure has remained in the collaborative stage since it was built.

Case BK1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Long term goal	Design logistics network	Sharing risk and cost	IT integration	Frequent managers' communication
Initial type	Collaborative link					
Current activities	Normal information	Long term goal	Design logistics network	Sharing risk and cost	IT integration	Frequent managers' communication
Current type	Collaborative link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Long term goal	Joint design for whole process	Sharing risk and cost	None	Full communication
Initial type	Collaborative link					
Current activities	Normal information	Long term goal	Joint design for whole process	Sharing risk and cost	None	Full communication
Current type	Collaborative link					
Change in dyad	No change at all.					
Dynamics in triad	**Static collaborative structure without dynamics**					

Table F.68: Details of dyads and triad in case BK1

Triad BU1 has already been described in Chapter Six, section 6.3.1.

Triad BU1	Relationship attributes					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	All information	Long term goal	Joint design	Sharing risk and cost	None	Full communication
Initial type	Collaborative link					
Current activities	All information	Long term goal	Joint design	Sharing risk and cost	None	Full communication
Current type	Collaborative link					
Change in dyad	*No change at all.*					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	*No change at all.*					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	customized information	Long term common development goal	Design logistics network	Sharing risk and cost saving	IT system integration	Frequent communication
Initial type	Collaborative link					
Current activities	More customized information sharing	Long term common development goal	Design logistics network	Sharing risk and cost saving	IT system integration	Frequent communication
Current type	Collaborative link					
Change in dyad	*No change at all*					
Dynamics in triad	**Static collaborative triad**					

Table F.69: Details of dyads and triad in case BU1

Group 9: Dynamic transactional triads (Stage 2)

The triadic relationship of BB1 was formed by a wood product exporter (the supplier), a global freight forwarding company (the LSP), and the exporter's overseas client. This triad was formed 6 years ago. In the initial stage, every party did not know other parties very well. The triad only contained three simple transactional dyads. In the last 6 years, the dyad between the exporter and the client did not change at all. The reason was that the client's order was not stable even though their order size was large. The exporter did not want to waste time and resource to collaborate with an unstable partner. However, in the dyad between the LSP and the exporter, the situation was different. Since the LSP could help the exporter to greatly save cost by combining a number of small orders from different clients as one, the exporter preferred developing collaboration with the LSP to gain long term benefit in the future. The development of collaboration between them was facilitated by the good personal relationship between the senior managers in both companies from 3 years ago. Therefore, the triad transferred from a transactional triad to a partnership triad from that moment.

Table F.70 compares the relationship activities' details of case BB1 from two stages: the initial stage and the current stage. In the initial stage, the supplier had two exactly same transactional dyads with the client and the LSP. They only shared normal order information, focused on the basic contract agreement, and only communicated for the order confirmation. However, the current relationship activities of these two dyads showed certain differences. In the current dyad between the supplier and the client, they did not change at all. On the other hand, in the dyad between the supplier and the LSP, they developed a few collaborative relationship activities: sharing customized information, making long term common development goal, jointly solving problem and designing the process of delivery in the triad, sharing certain risks and cost savings, and full communications between key peoples from both sides. The third dyad, the link between the LSP and the client, did not show any difference between its initial stage and current stage. They only communicated about the order delivery in the triad. As a result, the triadic case BB1 transited from the unstable transactional structure to the stable partnership structure 3 years ago.

Case BB1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	customized information	Long term common development goal	Joint problem solving, Joint decision for delivery process,	Sharing risk and cost savings	None	Full communications between senior managers
Current type	Collaborative link					
Change in dyad	*Evolved from Transactional link to Collaborative link*					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all					
Dynamics in triad	**Dynamic triad transited from a transactional to a partnership structure**					

Table F.70: Details of dyads and triad in case BB1

The triadic relationship of BG1 was formed by a farm equipment producer and exporter (the supplier), a global freight forwarding company (the LSP), and an overseas client. This triad started 10 years ago. In the initial stage, the triad only contained three simple transactional dyads. The client sent orders to the supplier, the LSP helped to organize order delivering once the supplier finished order preparation. At the moment, the annual order size form the client was small. The supplier and the client did not have interest to develop collaboration for the small annul orders. From six years ago, the supplier made a decision to expand their market to the client's country. To get familiar with the new market, the supplier and the client developed a joint venture strategy. As a result, they developed a series of collaborative activities from the moment. In the dyads related to the LSP, both of the supplier and the client selected the LSP for cost minimization. They might change to other LSPs easily once other LSPs could offer logistics services cheaper than the current LSP. Therefore, this triad reflected a triadic structural transition because the transactional dyad between the supplier and the customer changed to collaborative dyad six years ago.

Table F.71 compares all dyads in case BG1. In the initial stage, the supplier developed two exactly same transactional dyads with the customer and the LSP. They shared normal order information, focused on the basic contract agreement, and communicated for the orders. The dyad between the supplier and the LSP did not change at all. However, the relationship activities in the dyad between the supplier and the customer changed a lot in current stage. The partners developed collaborative activities in all six Relationship measures now. They shared key information and made long term common development goal because of the joint venture strategy. Moreover, they made common decision making through the full communication between key peoples from both sides. In the process, they shared financial resources and cost as well. Accordingly, the dyad evolved from original transactional type to a collaborative type in the current stage. In the dyad between the LSP and the customer, they retained basic transactional link without change in the initial and current stage. They only communicated about the order delivery in the triad. As a result, the triadic structure in case BG1 has evolved from the unstable transactional structure to the stable partnership structure 6 years ago.

Case BG1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	customized information	Contract agreement	problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	*No change at all*					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None				Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	*No change at all*					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement				Order confirmation
Initial type	Transactional link					
Current activities	Key information	Long term goal	all supply chain issues	Sharing cost, rewards, and risk	sharing financial resource and infrastructure,	Full communication
Current type	Collaborative link					
Change in dyad	*Evolved from Transactional link to Collaborative link*					
Dynamics in triad	**Dynamic triad transited from a transactional to a partnership structure**					

Table F.71: Details of dyads and triad in case BG1

The triadic relationship of BJ1 was formed by a wood product manufacturer (the client), a global shipping line (the LSP), and the exporter's overseas supplier. This triad was formed 30 years ago. In the initial stage, every party did not know other parties very well. The triad only contained three simple transactional links. From 12 years ago, the manufacturer began to expand their domestic market to global market. Accordingly, they increased order volumes evidently. Because of the change in order volumes, the supplier began to develop collaboration with the manufacturer. The collaboration could help both sides lock-in each other and gained more profit in the continuous business. Besides this dyad, both of the supplier and the manufacturer believed that the LSP only offered normal shipping services. They did not have interest to collaborate with the LSP at all in the triad. Therefore, the two dyads linked with the LSP were retained at transactional type. Overall, the triad transited from a transactional triad to a partnership triad because the dyad between the supplier and the manufacturer evolved from a transactional dyad to a collaborative dyad.

Table F.72 compares the relationship activities' details of case BJ1 from two stages: the initial stage and the current stage. In the initial stage, the customer had two exactly same transactional links with the supplier and the LSP. They only shared normal order information, focused on the basic contract agreement, and only communicated for the orders. However, the current relationship activities of these two dyads show certain differences. In the current dyad between the supplier and the customer, they had collaborative activities in five Relationship measures. They shared key information and made long term common development goal because of the joint venture strategy. Moreover, they had common decision making through the full communication between key peoples from both sides. In the process, they shared financial rewards and cost. Accordingly, the dyad evolved from transactional type to collaborative type. At same time, the dyad between the customer and the LSP did not change at all. The third dyad, link between the LSP and the supplier, did not show any difference between its initial and current stage either. They only communicated about the order delivery and shared normal order information in the triad. As a result, the triadic case BJ1 transited from the unstable transactional structure to the stable partnership structure 12 years ago.

Case BJ1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Key information sharing	Long term common development goal	Joint design for all supply chain issues	Sharing cost and rewards	None	Full communication between senior managers and board people
Current type	Collaborative link					
Change in dyad	Evolved from Transactional link to Collaborative link					
Dynamics in triad	**Dynamic triad transited from a transactional to a partnership structure**					

Table F.72: Details of dyads and triad in case BJ1

The triadic relationship of BO1 was formed by a food producer (the supplier), a transportation company (the LSP), and the producer's domestic customer. This triad was formed 5 years ago. In the beginning stage, every party did not know other parties very well. The triad only contained three simple transactional dyads. From 2 years ago, the customer asked the producer to enhance the level of logistics service because they want more quick response for their customized demand. However, the customer demand was still small. In this situation, the producer needed to collaborate with the LSP to save total cost about logistics service and enhance service speed at same time. Furthermore, the customer asked did not want to pay more for their new requirements. As a result, both of the producer and the LSP were not happy with the customer. They only retained basic transactional dyads with the customer.

Table F.73 compares the details of all dyads and the triad of BO1. In the beginning stage, the supplier had two exactly same transactional dyads with the client and the LSP. They only shared normal order information, focused on the basic contract agreement, and only communicated for the order confirmations. In current stage, the dyad between the supplier and the customer did not change at all. However, the current link between the supplier and the LSP show certain differences. They developed collaborative activities in five Relationship measures. They shared customized information about the customer demand. Moreover, they had common decision making about problem solving and the design of whole delivery process. They also shared certain cost savings in the dyad. Frequent senior managers' communications could help them to secure the fluent process in the triad. The third dyad, link between the LSP and the client, did not show any difference between its initial stage and current stage. They only communicated about the order delivery in the triad. As a result, the triadic case BO1 transited from the unstable transactional structure to the stable partnership structure 2 years ago.

Case BO1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	customized information	Contract agreement	Joint problem solving, Joint decision for delivery process,	Sharing cost savings	None	Frequent senior manager's communication
Current type	Collaborative link					
Change in dyad	Evolved from Transactional link to Collaborative link					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all					
Dynamics in triad	**Dynamic triad transited from a transactional to a partnership structure**					

Table F.73: Details of dyads and triad in case BO1

The triadic relationship of BQ2 was formed by a computer system seller (the supplier), a transportation company (the LSP), and the seller's domestic customer. This triad was formed 7 years ago. In the beginning stage, every party did not know other parties very well. The triad only contained three simple transactional dyads. From 4 years ago, the seller began to collaborate with the LSP. The reason was that the sellers' product was very customized and specific. Furthermore, the LSP and the seller had more business trades in other business in these years. To gain quick response in the logistics process, collaboration between the seller and the LSP was necessary. However, from the client's view, their dyads with the seller and the LSP were project based. They did not need collaboration with the other two parties in project based business. Therefore, the triad hold one collaborative dyad and two transactional dyads now.

Table F.74 compares the relationship details of case BQ2 from two stages: the initial stage and the current stage. In the initial stage, the supplier had two exactly same transactional links with the client and the LSP. They only shared normal order information, focused on the basic contract agreement, solved problem jointly and only communicated for the orders. The dyad between the supplier and the customer did not change at all. On the other hand, the supplier and the LSP developed a number of collaborative activities in four Relationship measures. They shared customized information from the customer demand and made long term common development goal. Moreover, they had common decision making about problem solving and the design of whole delivery process. Frequent senior managers' communications could help them to secure the fluent process in the triad. The third dyad, link between the LSP and the client, did not show any difference between its initial and current stage. They only communicated about the order delivery in the triad. As a result, the triadic case BQ2 transited from the unstable transactional structure to the stable partnership structure 4 years ago.

Case BQ2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	More customized information sharing	Long term common development goal	Joint problem solving, Joint decision for delivery process,	None	None	Frequent senior manager's communication
Current type	Collaborative link					
Change in dyad	Evolved from Transactional link to Collaborative link					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all					
Dynamics in triad	**Dynamic triad transited from a transactional to a partnership structure**					

Table F.74: Details of dyads and triad in case BQ2

The triadic relationship of BS2 was formed by a mechanical equipment manufacturer (the client), a transportation company (the LSP), and the manufacturer's domestic supplier (supplying material and production parts). This triad was formed 10 years ago. In the beginning stage, the triad only contained three simple transactional links. Four years ago, the manufacturer began to expand their business to global market. The overseas customers asked more customization equipment. Therefore, the manufacturer needed to collaborate with the supplier to produce properly customized final products as soon as possible. In the links with the LSP, since the mechanical equipment did not need specific logistics services quite often, both the supplier and the manufacturer retained simple transactional dyads with the LSP.

Table F.75 compares the relationship details of case BS2 from two stages: the initial stage and the current stage. In the initial stage, the customer had two exactly same transactional links with the supplier and the LSP. They only shared normal order information, focused on the basic contract agreement, and only communicated for the orders. The dyad between the customer and the LSP did not change at all. On the other hand, the customer and the supplier developed a number of collaborative activities in five Relationship measures. They shared customized information and made long term common development goal because of the joint venture strategy. Moreover, they have had common decision making of the whole supply chain process through the full communication between key peoples from both sides. In the process, they shared costs and rewards as well. The third dyad between the LSP and the supplier did not show any difference between its initial and current stage either. They only communicated about the order delivery and shared very basic information about order in the triad. As a result, the triadic case BS2 transited from the unstable transactional structure to the stable partnership structure 4 years ago.

Case BS2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	customized information	Long term common development goal	Joint design for all supply chain issues	Sharing cost and rewards	None	Full communication between senior managers and board people
Current type	Collaborative link					
Change in dyad	Evolved from Transactional link to Collaborative link					
Dynamics in triad	**Dynamic triad transited from a transactional to a partnership structure**					

Table F.75: Details of dyads and triad in case BS2

The triadic relationship of CB1 was formed by a consumer product importer (the supplier), a transportation company (the LSP), and a NZ domestic customer. This triad was formed 11 years ago. In the initial stage, every party did not know other parties very well. The triad only contained three simple transactional dyads. This situation was changed 8 years ago. The importer was merged with another big business group. The ownership of the importer was changed as well. The new owner preferred to collaborate with several key customers to gain long term benefits. As a result, the importer and the customer in this triad developed a collaborative link form the moment because of the customer's large order volumes. On the other hand, both of the supplier and customer did not see the necessity to develop collaboration with the LSP who only supplied basic transportation services. Therefore, the whole triad only contained one collaborative dyad now.

Table F.76 compares the relationship details of case CB1 from two stages: the initial stage and the current stage. In the initial stage, the supplier had two exactly same transactional dyads with the client and the LSP. They only shared normal order information, focused on the basic contract agreement, and only communicated for the orders. The dyad between the supplier and the LSP did not change at all in the last 11 years. On the other hand, the supplier and the client developed a few collaborative activities in five Relationship measures. They shared all business volume's information and made long term common development goal. Moreover, they had common decision making about all issues related to the supply chain process. In the process, they shared certain costs and risks as well. Frequent communications between senior managers could secure the whole process as fluent as possible. The dyad between the LSP and the client did show any difference between its initial and current stage. They only communicated about the order delivery in the triad. As a result, the triadic case CB1 transited from the unstable transactional structure to the stable partnership structure 8 years ago.

Case CB1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Long term common development goal	Joint design for all supply chain issues	Sharing cost and risks	None	Frequent communication between senior managers
Current type	Collaborative link					
Change in dyad	Evolved from Transactional link to Collaborative link					
Dynamics in triad	**Dynamic triad transited from a transactional to a partnership structure**					

Table F.76: Details of dyads and triad in case CB1

Group 10: Active transactional triads (Stage 2)
The triadic relationship of BH1 was formed by a bread producer (the supplier), a global freight forwarding company (the LSP), and the producer's overseas client. This triad was formed 8 years ago. In the initial stage, the triad only contained three simple transactional dyads. After receiving order from the client, the supplier prepared order and asked the LSP to deliver order to the client. The client was not sure if the supplier can supply them good product and services as they wanted. They did not order too much from the supplier at the moment. Accordingly, both sides only developed a simple transactional dyad to gradually get familiar with each other. Three years later, the client made decision to enhance order significantly from the producer because the producer's product was much better than the client's domestic supplier's product. Their dyad was transited from transactional type to collaborative type from the moment. The change of order volumes impacted the dyad between the producer and the LSP as well. Since the product could not be stored very long, it was necessary to develop a collaborative link between the producer and the LSP for enhance speed for the information coordination and the physical delivery in the whole process. Otherwise, both the producer and the client lost profit. However, the LSP did not have too much direct communication; they retained a simple transactional link as before. The whole triadic structure contained two collaborative dyads in the last 5 years.

Table F.77 compares the relationship details of case BH1 from initial stage and the current stage. In the initial stage, the supplier had two exactly same transactional links with the client and the LSP. They only shared normal order information, focused on the basic contract agreement, jointly solving problem and only communicated for the orders. However, the current relationship activities of these two dyads show certain differences. In the current dyad between the supplier and the client, they developed collaborative activities in 4 Relationship measures. They shared all relevant business information and made long term common development goal because they are key business partners to each other. Moreover, through the frequent communications between key managers from both sides, the supplier and the client also made common decision about all supply chain issues in the triad. In the current dyad between the supplier and the LSP, they had more customized information sharing. The senior managers always communicated with each other to secure the fluent collaborative process. Furthermore, they aligned their long term business goal and developed common decision for the development of whole logistics network in the triad. Because the supplier already developed two collaborations with the other two parties in the triad. The supplier could manage the whole logistics process very well. As a result, the LSP and the client only need to communicate about basic order delivery information. It was unnecessary to develop collaboration between them in the same triad. In a word, the triadic case BH1 transited from the unbalanced transactional structure to the nonadjacent collaborative structure 5 years ago.

Case BH1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	customized information	Long term goal congruence	Design logistics network	None	None	Always communication
Current type	Collaborative link					
Change in dyad	Evolved from Transactional link to Collaborative link					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	None	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	None	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	all information	Long term goal	Joint design for all supply chain issues	None	None	Frequent managers' communication
Current type	Collaborative link					
Change in dyad	Evolved from Transactional link to Collaborative link					
Dynamics in triad	**Dynamic triad transited from a transactional to a collaborative structure**					

Table F.77: Details of dyads and triad in case BH1

The triadic relationship of BN1 was formed by a seafood wholesaler and exporter (the supplier), a global freight forwarding company (the LSP), and an overseas customer. This triad was built 12 years ago. In the beginning stage, the triad contained three basic transactional dyads. After received order from the customer, the supplier prepared order and asked the LSP to deliver order to the customer. The customer was not sure if the supplier could supply good fishes and services as they wanted. Accordingly, they did not order too much from the supplier. Both sides only hold a simple transactional link to get familiar with each other gradually. Four years later, the customer made decision to give the supplier 80% of their annual orders since the supplier could supply fresh seafood to them on time continuously. The supplier was very happy to work with the large customer as well. Accordingly, they fostered a collaborative dyad from 8 years ago. At same time, the supplier and the LSP also developed business collaboration. The main reason was that the service performance of the LSP directly influenced the final customer's satisfaction to the supplier's products. If the LSP could not organize order delivery in shortest time, the customers could not have seafood as fresh as they wanted. In this situation, the customer might cease the business with the supplier because of the logistics problems. Therefore, the supplier needed to make sure that the LSP could supply the best service to satisfy the customer. To gain quick response in the whole logistics process, it was necessary for the supplier to keep close communication with the LSP and developed collaborative activities with them. Beyond this, the dyad between the LSP and the customer was also mediated by the supplier because both of the LSP and the customer want to keep their dyad as simple as possible in the triad.

Table F.78 compares the details of dyads in case BN1. In the initial stage, the supplier developed same transactional dyads with the customer and the LSP. They shared normal order information, focused on the basic contract agreement, and communicated for the basic orders. However, the current relationship activities of these two dyads showed great differences. In the current dyad between the supplier and the customer, they contained collaborative activities in four Relationship measures. They shared all relevant business information and made long term common development goal because they were key business partners to each other. Moreover, through the full communication between key people from both sides, the supplier and the customer also made common decision about all supply chain issues in the triad. In the current dyad between the supplier and the LSP, they had more customized information sharing and more frequent senior manager's communication than before. Furthermore, they aligned their long term business goal and developed common decision for designing logistics network in the triad. Because the supplier developed two collaborations with the other two parties in the triad. The supplier could manage the whole logistics process effectively. As a result, the LSP and the customer only needed to communicate about basic order delivery information. It was unnecessary to develop collaboration between them in the same triad. In a word, the triadic case BN1 has been evolved from the transactional structure to the collaborative structure for eight years.

Case BN1	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	customized information	Long term goal	Design logistics network	None	None	Frequent managers' communication
Current type	Collaborative link					
Change in dyad	*Evolved from Transactional link to Collaborative link*					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	*No change at all*					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	all business information	Long term goal	Joint design for all supply chain issues,	None	None	Full communication
Current type	Collaborative link					
Change in dyad	*Evolved from Transactional link to Collaborative link*					
Dynamics in triad	**Dynamic triad transited from a transactional to a collaborative structure**					

Table F.78: Details of dyads and triad in case BN1

The triadic relationship of BV2 was formed by an air conditioner manufacturer (the client), a global freight forwarding company (the LSP), and the producer's overseas supplier. This triad was formed 15 years ago. In the initial stage, the triad only contained three simple transactional dyads. The client offered order requirements to the supplier and the supplier asked the LSP to deliver order to the client. The client ordered general materials and parts from the supplier. Accordingly, both sides only developed a simple transactional dyad to get familiar with each other. Ten years ago, the client expanded their global business market. To satisfy global market requirement, the client began to order special materials and specific parts from the supplier. Both sides needed a collaborative relationship to respond quickly to the market requirements. The requirement of quick response impacted the LSP as well. They needed to collaborate with the supplier to fully satisfy the client's logistics requirements as soon as possible in the triad. Because the supplier organized information and delivery process in the triad, the LSP and the client only need a simple dyad. Therefore, the whole triad had two collaborative dyads 10 years ago.

Table F.79 compares the relationship details of case BV2 from initial stage and the current stage. In the initial stage, the supplier had two exactly same transactional links with the client and the LSP. They only shared normal order information, focused on the basic contract agreement, jointly solving problem and only communicated for the orders. However, the current relationship activities of these two dyads show certain differences. In the current dyad between the supplier and the client, they developed collaborative activities in 4 Relationship measures. They shared all relevant business information and made long term common development goal because they are key business partners to each other. Moreover, through the frequent communications between key managers from both sides, the supplier and the client also made common decision about all supply chain issues in the triad. In the current dyad between the supplier and the LSP, they had more customized information sharing. The senior managers also frequently communicated with each other to secure the fluent collaborative process. Furthermore, they aligned their long term business goal and developed common decision for the development of whole logistics network in the triad. Because the supplier already developed two collaborations with the other two parties in the triad. The supplier could manage the whole logistics process very well. As a result, the LSP and the client only need to communicate about basic order delivery and share normal order information. It was unnecessary to develop collaboration between them in the same triad. In a word, the triadic case BV2 transited from the unbalanced transactional structure to the nonadjacent collaborative structure 10 years ago.

Case BV2	Relationship measures					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	customized information	Long term goal	Design logistics network	None	None	Frequent managers' communication
Current type	Collaborative link					
Change in dyad	Evolved from Transactional link to Collaborative link					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	No change at all.					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract	Joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	all information	Long term goal	Joint design for all supply chain issues	None	None	Frequent managers' communication
Current type	Collaborative link					
Change in dyad	Evolved from Transactional link to Collaborative link					
Dynamics in triad	**Dynamic triad transited from a transactional to a collaborative structure**					

Table F.79: Details of dyads and triad in case BV2

Group 11: Dynamic partnership triad (Stage 2)
The triad BK2 has already been described in Chapter Six, section 6.3.2.

Triad BK2	Relationship attributes					
Dyad a (LSP-Supplier)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	Contract agreement	joint problem solving	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	Contract agreement	joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	*No change at all.*					
Dyad b (LSP-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Normal information	None	None	None	None	Order confirmation
Initial type	Transactional link					
Current activities	Normal information	None	None	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	*No change at all.*					
Dyad c (Supplier-Customer)	Information sharing	Goal congruence	Joint effort	Incentive alignment	Resource sharing	Communication
Initial activities	Key information	Long term goal congruence	Joint design for whole process	None	None	Frequent communication
Initial type	Collaborative link					
Current activities	Normal information	Contract agreement	joint problem solving	None	None	Order confirmation
Current type	Transactional link					
Change in dyad	*Evolved from Collaborative link to Transactional link*					
Dynamics in triad	**Dynamic triad from the partnership structure to the transactional structure**					

Table F.80: Details of dyads and triad in case BK2

Appendix G: Comparison of factors influencing dyadic relationships in logistics triads

Table G.82: Stability and dynamics of all logistics triads collected in Stage 2

Triad case	LSP – Supplier dyad	LSP – Customer dyad	Supplier – Customer dyad	Dyads showing dynamics
BA1	T	T	T	
BB1	T	T	T→C	c
BC1	T	T	C	
BC2	T	T	C	
BD1	T	T	T	
BE1	T	T	T	
BE2	T	T	C	
BE3	T	T	T	
BF1	T	T	T	
BG1	T	T	T→C	c
BG2	T	T	T	a, c
BH1	T→C	T	T→C	
BH2	T	T	T	
BI1	T	T	T	
BJ1	T	T	T→C	c
BJ2	T	T	T	
BK1	C	T	C	
BK2	T	T	C→T	c
BL1	T	T	T	
BL2	T	T	T	
BM1	T	T	T	
BM2	T	T	T	
BN1	T→C	T	T→C	a, c
BO1	T→C	T	T	a
BO2	T	T	T	
BP1	T	T	T	
BP2	T	T	T	
BQ1	T	T	T	
BQ2	T→C	T	T	a
BR1	T	T	T	
BR2	T	T	T	
BS1	T	T	T	
BS2	T	T	T→C	c
BT1	T	T	T	
BT2	T	T	T	
BT3	T	T	T	
BU1	C	T	C	
BV1	T	T	T	
BV2	T	T→C	T→C	b, c
BW1	T	T	T	
BW2	T	T	T	
BX1	T	T	T	
BY1	T	T	T	
BY2	T	T	T	
BZ1	T	T	T	
CA1	T	T	T	

CA2	T	T	C	
CA3	T	T	C	
CB1	T→C	T	T	a
CC1	T	T	T	
CC2	T	T	T	

Notes: T: stable transactional dyad; C: stable collaborative dyad; T→D: transactional dyad dissolved; C→D: collaborative dyad dissolved; T→C: changed from transactional to collaborative

Table G.83: Stages 1 & 2: Influence from positive relationship history

Supportive triads	Stages	Positive relationship history and large purchasing volumes encourage collaboration at the beginning of triads
Dissolved partnership triad	1	N3
Static partnership triads	1	O1
	2	BC1, BC2, BE2, CA2, CA3
Static collaborative triads	2	BK1, BU1
Dynamic partnership triad	2	BK2

Table G.84: Stages 1 & 2: Influence from relationship behaviour factors

Supportive triads	Stages	Resistance to change	Minimizing own costs
Dissolved triads	1	T2, K1, K2	T2, K1, K2
Static transactional triads	1	J1, J2, J3, K3, K4, L1, L2, L3, L5, M1, N1, N2, O2, P1, P2, P3, Q2, S1, T1, U3	J1, J2, J3, K3, K4, L1, L2, L3, M1, N2, O2, P1, P2, P3, Q2, R1, R2, S1, T1, U3
	2	BE1, BE3, BF1, BG2, BH2, BL1, BL2, BM1, BM2, BO2, BP1, BP2, BQ1, BR1, BR2, BS1, BT1, BT2, BT3, BX1, BY1, BY2	BE1, BE3, BF1, BG2, BH2, BL1, BL2, BM1, BM2, BO2, BP1, BP2, BQ1, BR1, BR2, BS1, BT1, BT2, BT3, BX1, BY1, BY2
Static partnership triad	1	Q1	
	2	BC1, BC2, BE2, CA2, CA3	BC1, BC2, BE2, CA2, CA3
Static collaborative triad	2	BK1, BU1	BK1, BU1
Dynamic transactional triads	1	L4, O1, S2, U1, U2, V1, V2	L4, O1, S2, U1, U2, V1, V2
	2	BB1, BG1, BJ1, BO1, BQ2, BS2, CB1	BB1, BG1, BJ1, BO1, BQ2, BS2, CB1
Active transactional triads	2	BH1, BN1, BV2	BH1, BN1, BV2
Static collaborative triad	2	BK1, BU1	BK1, BU1

Table G.85: Stages 1 & 2: Influence from personal factors

Supportive triads	Stages	Degree of interpersonal relationship is positively linked with the length and closeness of business relationships.	Degree of interpersonal relationship is negatively linked with the length and closeness of business relationships.
Dissolved triads	1	T2	K1, K2
Static transactional triads	1	J1, J2, J3, K3, K4, N1, N2, Q2, R1, R2, T1	L1, L2, L3, L5, M1, O2, P1, P2, P3, U3
	2	BB1, BD1, BF1, BG2, BL1,	BH2, BR2, BV2,

		BL2, BM1, BM2, BP1, BP2, BS1, CA1	
Static partnership triad	1	Q1	
	2	BE2, CA2, CA3	
Static collaborative triad	2	BK1	
Dynamic transactional triads	1	O1, S2, U1, U2, V1, V2	L4
	2	BG1, BJ1, BO1, BQ2, BS2, CB1	BB1,
Active transactional triads	2	BH1, BN1	

Appendix H: Sample of coding process

Case L4

> ……before the change of our relationship (the customer and the LSP), the customer is a large and powerful exporter in NZ. From the supplier's perspective, this customer's annual orders are more than the sum of all other customers' orders. Therefore, the customer is the only organization that can force the supplier to change the selection of LSP in this triad...... we know the customer is the real boss although the supplier is our direct customer. In order to maintaining long term business with the customer and the supplier, we (the LSP) try to help the customer by making their logistics process more efficient and sharing cost savings with them. With the development of our relationship, the customer talked to us directly from 5 years ago, furthermore, we developed a project to maximize our total profit. On the contrary, the supplier focused on maximizing their own profit. They tried to charge more from the customer and force us to decrease our charge rate. As a result, both the customer and us do not have any interest to collaborate with the supplier. However, because the supplier is more professional than other suppliers in global shipping area, the customer still kept business with the supplier……

In this passage, the interviewee is talking about the change of a triadic relationship. Several codes can be identified.

Firstly, "customer's annual orders are more than the sum of all other customers' orders", this massage indicates that the customer has strong purchasing power because they are the biggest customer of the supplier by offering large purchasing volumes. Therefore, the code "purchasing volumes" was recognized from this case.

Secondly, "we [the LSP] try to help the customer by making their logistics process more efficient and sharing cost savings with them", "we developed a project to maximize our total profit" these information shows that the customer and the LSP shared their cost and work together to help each other. These

activities can be categorized as "incentive alignment" and "joint effort"—two of the six relationship measures.

Thirdly, "because the supplier is more professional than other suppliers in global shipping area", this sentence indicates that the supplier has power from their resources—speciality in global shipping area.

Finally, we can see that the supplier's resource power is less than the customer's purchasing power because the customer can "force the supplier to change the selection of LSP". As a result, the customer can be identified as the focal firm in the triad and the dynamics of the triad is highly depends on the customer.

All cases collected in two research stages were coded though the same process showing above. After initial coding, the next step is to compare and contrast the codes identified from different cases. This process can help to identify the similarity and difference among cases. Furthermore, the comparison helped to classify all cases into different groups. The following section will explain how the coded case L4 was compared with other cases. To simplify the explanation in the appendix, only several representative cases were selected to compare with case L4. These cases can show how the key influential factors are recognized from the comparisons among different cases. Further, there are a number of codes in each case. The code of "purchasing volumes" is selected as the example to explain how different cases were compared between cases because "purchasing volume" show significant influence on determining dynamics of logistics triads in the present study.

Case O1

> …the sports company has a very large market in the global arena, we have strong logistics service globally, we can satisfy their requirements better than others, and that's why the sports company works closely with us at the moment……we are happy to collaborate with them; they are our key customer because they order much more than other customers……the final customer talks to us openly, they need a closer relationship with us to save their logistics costs, but

they do not like to see a close relationship between us and the supplier; they think we may take more from them …

In case O1, similar to the case L4, the message "we are happy to collaborate with them; they are our key customer because they order much more than other customers" indicates that the customer has strong purchasing power because they are the biggest customer of the supplier and LSP. Further, the message "they do not like to see a close relationship between us and the supplier; they think we may take more from them" shows that the customer can use power to control the relationship between the supplier and the LSP. By cross-referencing the identified "purchasing volumes and related power" from case L4 and O1, the "purchasing volumes" can be recognized as a common influential factor.

Case U1

> …when they [customer] began to offer large orders, they did not rely on the supplier to organize the process with us anymore, to ensure their [customer] profits, they started to have more communication with us and give orders to us directly, so, we do not get orders from the supplier now. However, the customer kept asking us to reduce our charge rate, to protect our profits, we must collaborate with the supplier…

In case U1, the message "the customer kept asking us to reduce our charge rate, to protect our profits, we must collaborate with the supplier" implies that the customer hold strongest power from their large purchasing volumes. The LSP and the supplier need to collaborate to against the customer's purchasing power. The "purchasing volume" shows its influence on organization's power. By comparing the code of "purchasing volume" in cases L4, O1, and U1, it can derive a conclusion that "purchasing volumes" is a significant factor to influence power games among organizations in logistics triads.

Appendix I: Co-Authorship Form

Co-Authorship Form

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This form is to accompany the submission of any PhD that contains research reported in published or unpublished co-authored work. **Please include one copy of this form for each co-authored work.** Completed forms should be included in your appendices for all the copies of your thesis submitted for examination and library deposit (including digital deposit).

Please indicate the chapter/section/pages of this thesis that are extracted from a co-authored work and give the title and publication details or details of submission of the co-authored work.
Figure 1.1 in Chapter One. Figure 2.24 (adapted conceptual framework) in Chapter Two.
Childrhous, P., Luo, W., Basnet, C., Ahn, H.J., Lee, H., & Vossen, G. (2013) EVOLUTION OF INTER-FIRM RELATIONSHIPS: A STUDY OF SUPPLIER-LOGISTICAL SERVICES PROVIDER-CUSTOMER TRIADS. International Journal of Industrial Engineering, 20(1-2), 126–140

Nature of contribution by PhD candidate	Provided ideas of balance theory, collected data, and analyzed data.
Extent of contribution by PhD candidate (%)	40

CO-AUTHORS

Name	Nature of Contribution
Childerhouse	Refined the base material into an academic formate
LUO	Literature review, data and analysis
Basnet	Supply Chain concepts
Ahn	Information systems concepts
Lee	Editing
Vossen	Final Edit

Certification by Co-Authors

The undersigned hereby certify that:
- the above statement correctly reflects the nature and extent of the PhD candidate's contribution to this work, and the nature of the contribution of each of the co-authors; and
- in cases where the PhD candidate was the lead author of the work that the candidate wrote the text.

Name	Signature	Date
Wen LUO		
Paul Childerhouse		10.2.15
Basnet	For D on behave off	"
Ahn	"	"
Lee	"	"
Vossen	"	"