MANAGING SUPPLIERS BEYOND TIER 1: AN EXPLORATION OF MOTIVATIONS AND STRATEGIES LEADING TO A NORMATIVE MODEL

DISSERTATION

Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of The Ohio State University

By
Ping Wang, M. Eng.

The Ohio State University
2007

Dissertation Committee:
Professor Douglas M. Lambert, Advisor
Professor Keely L. Croxton
Professor A. Michael Knemeyer

Approved by
Advisor
Graduate Program in Business Administration
ABSTRACT

The purpose of this research was to determine how the decision to manage suppliers beyond Tier 1 was made in a supply chain context. This research explored the reasons for managing suppliers beyond Tier 1, when to manage them, how to manage them, how the decision to manage them was made, and how to measure performance.

Traditional supplier relationship management focuses on managing the firm’s direct suppliers, that is, Tier 1 suppliers. However, many cost and quality problems can be traced back to suppliers beyond Tier 1. In some cases, a company will occupy a more advantageous position by developing relationships with indirect suppliers. In fact, forward thinking executives have begun to manage suppliers beyond Tier 1 in order to discover opportunities to improve their competitiveness.

Managing suppliers beyond Tier 1 will provide management with greater knowledge and more opportunities of possible benefit for the entire supply chain, since the cost and quality of raw materials have significant impacts on the final products. Proactively managing the supply base beyond Tier 1 will assist management in succeeding in the competitive business world. This research was intended to identify the potential opportunities for managing suppliers beyond Tier 1 directly.

The literature in interorganizational relationship management and related areas was reviewed to assess the critical aspects that needed to be considered in managing
interorganizational relationships. Four aspects were found to be critical: the formation and development of an interorganizational relationship; the purchasing context; the governance mechanism (or the governance structure); and the evaluation of performance improvements that result from the interorganizational relationship.

The purchasing context represents the basic conditions of purchasing including the importance of purchasing to the company, the product characteristics, and the supply chain network structure. The importance of purchasing to the company reflects the motivations for building a close relationship with a supplier.

The governance mechanism, which is about how to manage an interorganizational relationship, emerged as one of the most critical aspects, since it was the primary purpose of this research to explore why and how to manage suppliers beyond Tier 1. In order to develop a normative model that management could use as a reference, the motivations, strategies, and their associations in managing suppliers beyond Tier 1 were explored. It was also a purpose of this research to develop a framework of the decision-making process for managing suppliers beyond Tier 1.

The case study approach was chosen since it was the most appropriate research methodology to investigate the types of “why” and “how” questions this research raised. In addition, it is only during a case study interview that an investigator can probe unseen constructs (categories) and explore their logical associations. Furthermore, a case study approach guarantees the information richness by providing the interaction mechanism between an investigator and the informant.
A total of seven companies were included in the research and 10 interviews were conducted. In order to “maximize the variance,” these companies were carefully selected in consideration of their industries and their products. All seven are multi-billion dollar companies, with the unit price of finished products ranging from a few dollars to tens of thousand of dollars. They represented consumer packaged goods, durable goods, quick service restaurant chains, and retail industries. Data were collected from 15 supply chains of either raw materials or supply parts for finished goods, in which management had developed relationships with suppliers beyond Tier 1. These supply chains were either manufacturing dominated supply chains or retail dominated supply chains.

Data were collected from personal interviews. An interview guide with 18 interview questions was prepared to facilitate the interview process and to structure the data collection process. The questions served to collect data around four key research questions: “Why do you manage suppliers beyond Tier 1 directly?”; “How are the decisions to manage suppliers beyond Tier 1 made?”; “How is a supplier beyond Tier 1 managed?”; and “How is the management of a relationship with a supplier beyond Tier 1 evaluated?” Interviews were taped and transcripts were prepared for coding and analysis. A case report was compiled and sent back to the interviewees for verification.

Data showed clear patterns in the motivations and strategies for managing suppliers beyond Tier 1. There also existed patterns in the associations between the motivations and the strategies. A normative model was developed on the basis of
these patterns. Managers can use the normative model to identify the strategies for managing suppliers beyond Tier 1, and refer to the model with specific motivations and/or activities to establish their action plan. Based on the data collected, a framework of decision-making process was also developed, which can be used together with the normative model developed in this research for managing suppliers beyond Tier 1.

The most significant conclusion that could be drawn from this research was that the management of suppliers beyond Tier 1 was a reality. Indeed, practices in managing suppliers beyond Tier 1 were generalizable. In fact, the normative model was developed on the basis of generalized motivations and strategies. Another significant conclusion was that the decision-making process for managing suppliers beyond Tier 1 was generalizable. A five-step decision-making process was derived from the case study data and it should be replicable in a new environment when needed.

The research has a number of implications for both practitioners and academicians. Based on the findings, many decisions in managing suppliers beyond Tier 1 could be improved if a normative model showing the associations between motivations and strategies was available to managers. Also, a framework of the decision-making process would be of significant assistance in managing suppliers beyond Tier 1. In addition, improved understanding of the complexity of a trilateral interorganizational relationship could help management recognize quick-wins in the task of managing suppliers beyond Tier 1.
The academic contribution of the research relies on its triadic perspective. Conventional interorganizational relationship studies focused primarily on the motivations and strategies for managing a dyadic and direct interorganizational relationship, while this research focused more on a triadic relationship of companies from three different tiers in a supply chain. Findings from this research revealed that the type of product characteristics and the type of supply chain structures had an impact on how to manage a close relationship with a supplier beyond Tier 1.
Dedicated to my mother, Yonghui Tian

谨献给母亲，田永慧大人
ACKNOWLEDGEMENTS

It is a luxury to have so many wonderful people to thank for their contribution to the success of this endeavor. It would not have been possible to complete this dissertation without the encouragement and support of these individuals.

I am deeply indebted to the executives of the companies that participated in this research. They shared my enthusiasm for this topic, devoted their time, provided necessary data, and gave their insights to this research. Their invaluable experience related to this research topic not only revealed their way of analyzing and solving problems, but also built the foundation for the deliverables of this research.

I also want to thank the members of The Global Supply Chain Forum at the Fisher College of Business, who attended my presentations at several meetings during the progress of this research. They provided insightful comments and feedback to help me continue moving forward towards the success of this research.

I would like to gratefully and sincerely express my gratitude to Professor Douglas M. Lambert, Director of the Global Supply Chain Forum and Chairman of my dissertation committee. His patience, guidance, understanding, and encouragement, were essential to this research. As a mentor, role model, and critic, in the best sense, Professor Lambert not only displayed the highest standards of professional competence and conduct, but also demonstrated his scholarly demeanor.
and sincere concern and respect for the needs of his students. His uncompromised vision in business research and insurmountable enthusiasm in exploring the unknown will continue to benefit me throughout the rest of my life. It was my privilege to be his student, and his mentorship was paramount in providing a well-rounded experience consistent with my long-term career goals.

I would also like to express my sincere appreciation to Professors Keely L. Croxton and A. Michael Knemeyer, the remaining two members of my dissertation committee. I have been blessed with their remarkable insight and care from the beginning of this research. I am much indebted for their intelligent and inspiring advice throughout the course of this research. The precious time they devoted to providing guidance regarding the data collection, reading this manuscript and giving their critical comments is highly appreciated. Their support was invaluable to the success of this dissertation.

I would like to thank Professors Martha C. Cooper, Walter Zinn, and Thomas J. Goldsby. Together with the three professors on my dissertation committee, they provided me with multiple and rich environments for learning a tremendous amount of knowledge -- inside the classroom, in conducting research, and through informal conversations in casual situations. The close interaction with these remarkable professors was one of the best features of my logistics doctoral experience.

I want to thank Dr. Sebastián J. García-Dastugue, a past doctoral student of the logistics program, who provided many invaluable suggestions in facilitating my journey to this dissertation, both before and after his graduation. I also want to thank
Dr. Cuneyt Eroglu, another past doctoral student of the logistics program and my officemate and friend, with whom I shared most of my time and learning experiences at The Ohio State University.

I want to express my special appreciation to Dr. James M. Masters, who took me into the logistics field, nurtured my interest to become a scholar in logistics, and rendered all his support to my early career as a professional logistician. Without his motivational sparks, I would never have pursued my doctoral degree in logistics at The Ohio State University, a program from which he received his doctoral degree.

There are no words to express my gratitude to my parents, Linsen Wang and Yonghui Tian, who made me who I am today. I am especially obliged to my mother, who nurtured a dream to have a doctor in the family 30 years ago and devoted all her effort to make it happen. I would also like to thank my other family members for their many sacrifices and support of my journey to the dissertation.

I would like to thank my wife, Dr. Yuxuan Wang, for her support, encouragement, quiet patience, and unwavering love, which are undeniably the bedrock upon which the past seven years of my life have been built. Finally, I would like to thank my daughter, Dara, for always being understanding when I was busy with work and could not spend much time playing with her.
VITA

1984………………………. Bachelor of Engineering, Electronic Engineering, Dalian Naval Academy, China

1992………………………. Master of Engineering, Computer Engineering, Chinese Academy of Science, China

2002………………………. Master of Engineering, Logistics Massachusetts Institute of Technology


PUBLICATIONS


FIELDS OF STUDY

Major Field: Business Administration

Area of Specialization: Logistics

Minor Field: Mathematical Statistics
# TABLE OF CONTENTS

Abstract .......................................................................................................................... ii  
Dedication..................................................................................................................... vii  
Acknowledgements .................................................................................................... viii  
Vita................................................................................................................................. xi  
List of Tables................................................................................................................ xvi  
List of Figures ............................................................................................................. xvi

Chapters

1. **Introduction** ...................................................................................................... 1  
   Background .............................................................................................................. 3  
   The Business Problem .......................................................................................... 5  
   The Business Opportunity ................................................................................... 7  
   The Research Purpose .......................................................................................... 11  
   Research Objectives ............................................................................................. 12  
   Research Questions ............................................................................................... 12  
   The Scope of the Research ................................................................................... 13  
   Potential Contributions ....................................................................................... 13  
   Organization ......................................................................................................... 14  
   References ............................................................................................................. 16

2. **Literature Review** .......................................................................................... 20  
   Theoretical Foundations ....................................................................................... 21  
   Interorganizational Relationship Management ................................................. 22  
      The Development Process of an Interorganizational Relationship ................. 29  
      Basic Conditions for Building an Interorganizational Relationship ............... 35  
      Governance mechanisms ................................................................................. 40  
      Performance Evaluation of an Interorganizational Relationship ................. 40  
      Summary of Interorganizational Relationship Studies ................................. 41  
   Motivations ........................................................................................................... 42  
      Cost Motivations ................................................................................................. 42  
      Quality Motivations ............................................................................................ 43  
      Flexibility Motivations ....................................................................................... 44  
      Dependability Motivations ................................................................................. 45  
      Context-Specific Motivations .......................................................................... 46  
   Strategies .............................................................................................................. 48  
      Strategic Cost Management .............................................................................. 49  
      Total Quality Management .............................................................................. 50
## LIST OF TABLES

2.1 Selected Literature about the Development of Interorganizational Relationships ...........................................................24
2.2 Selected Literature about the Management of Interorganizational Relationships ..........................................................27
2.3 Key Issues in Supply Network Dynamics .................................................................39
3.1 Tactics for the Four Case Study Design Tests ...........................................................86
5.1 Overview of Case Study Companies .......................................................................154
5.2 Motivation: Cost .................................................................................................156
5.3 Motivation: Quality ............................................................................................159
5.4 Motivation: Dependability ..................................................................................162
5.5 Motivation: Context-Specific Motivations ..........................................................166
5.6 Strategy: Strategic Cost Management ....................................................................169
5.7 Strategy: Total Quality Management ...................................................................174
5.8 Strategy: Strategic Sourcing ................................................................................178
5.9 Strategy: Relationship Management ....................................................................182
5.10 Strategy: Context-Specific Strategies ..................................................................188
5.11 Associations between Motivations and Strategies ..............................................191
6.1 Associations between Motivations and Strategies ..............................................227
# LIST OF FIGURES

1.1 A Typical Supply Chain Network ................................................................. 4  
2.1 The Lambert, Emmelhainz, and Gardner Partnership Model .......................... 32  
2.2 The Golicic and Mentzer Partnering Process ............................................ 34  
2.3 Kraljic's Purchasing Portfolio/Product Classification ................................... 36  
2.4 A Conceptual Framework for Managing the Relationship Dynamics in a Supply Chain Network .................................................. 64  
2.5 A Normative Model for Managing Suppliers beyond Tier 1 ........................ 65  
2.6 A Framework of the Decision-Making Process ........................................... 67  
3.1 Codes of an Excerpt from the Transcript of Pilot Study .............................. 98  
3.2 An Illustration of the Coding Process ......................................................... 100  
4.1 Case A: Aluminum Can Supply Chain ......................................................... 111  
4.2 Case B: PET Bottle Supply Chain ............................................................... 112  
4.3 Case C: Paper Supply Chain ...................................................................... 119  
4.4 Case D: Ink Supply Chain .......................................................................... 120  
4.5 Case E: Sound-Card Electronic Component Supply Chain .......................... 121  
4.6 Case F: Fuel Pump and Fuel Tank Subassembly Supply Chain .................... 126  
4.7 Case G: Tire and Wheel Subassembly Supply Chain .................................... 127  
4.8 Case H: Faucet Supply Chain ..................................................................... 131  
4.9 Case I: Beef Supply Chain ......................................................................... 133  
4.10 Case J: Chicken Supply Chain .................................................................. 135  
4.11 Case K: Sauce Supply Chain ...................................................................... 138  
4.12 Case L: Label Supply Chain ...................................................................... 140  
4.13 Case M: Ajimoto Supply Chain ................................................................. 142  
4.14 Case N: Titanium Casting Head Supply Chain .......................................... 143  
4.15 Case O: Weight Cartridge Supply Chain ................................................... 148  
5.1 Cost Motivations and Associated Strategies ................................................. 193  
5.2 Quality Motivations and Associated Strategies ........................................... 197  
5.3 Dependibility Motivations and Associated Strategies .................................. 201  
5.4 Context-Specific Motivations and Associated Strategies .............................. 205  
5.5 The Normative Model for Managing Suppliers beyond Tier 1 ....................... 208  
5.6 The Normative Model with Secondary Motivations .................................... 209  
5.7 The Normative Model with Management Activities ...................................... 210  
5.8 Decision-Making Process for Managing Suppliers beyond Tier 1 .................. 212
6.1 The Normative Model for Managing Suppliers beyond Tier 1 .................226
6.2 A Framework of the Decision-Making Process of
Managing Suppliers beyond Tier 1 .......................................................229
CHAPTER 1

INTRODUCTION

Supplier relationship management has become a critical business process as a result of competitive pressures such as the need to achieve cost efficiency and the need to develop innovative products and successfully bring them to market [1]. It has been shown that a buyer can benefit from a well-managed supplier relationship in terms of superior product quality, shorter time-to-market, enhanced financial performance, and improved customer service [2]. However, traditional supplier relationship management typically focuses on managing the interorganizational relationship between a buying company and its direct supplier, or Tier 1 supplier. Globalization and outsourcing, together with supply uncertainty and technological innovation, are causing management to focus its attention on suppliers beyond Tier 1. In fact, many cost and quality problems can be traced to suppliers beyond Tier 1.

For example, Fiat, an Italian automaker, conducted a survey in 2002, which revealed that more than 75% of the product quality problems identified by its dealers were related to Tier 2 parts or beyond [3]. The Department of Defense reported that in 2003, the supply of anthrax vaccine to the Armed Forces in Iraq was delayed because all vaccine suppliers had outsourced high-quality glass bottles to the same bottle supplier who was working at full capacity [4]. In 2005, GM started to pay some Tier
2 suppliers directly because they were about to go out of business due to long cash-to-cash cycles [5].

Much has been written in both the academic literature and business press about the drivers and practices related to supply chain relationships. However, most of the literature on relationship management is based on relationships between a firm and its Tier 1 supplier or Tier 1 customer [6-9]. Less attention has been paid to relationships that extend beyond Tier 1. It has been acknowledged that a supply chain structure is a complex nested network with many suppliers and customers on different tiers [7-10]. There is a need to expand the scope of supplier relationship management from its current Tier-1-only standpoint to Tier-2-and-beyond.

As Remenyi, Williams, Money and Swartz (1998) put:

Business research is commonly aimed at helping to develop management understanding of how business organizations work. It is frequently suggested that the best business research should lead to the development of guidelines by which individuals in positions of responsibility can manage their business responsibilities more efficiently and effectively [11].

Thus, the motivation behind this dissertation is to develop a normative model for identifying opportunities to manage suppliers beyond Tier 1. The research addresses questions such as why, when, and how a supplier beyond Tier 1 should be managed, how the relationship could be evaluated, and what decision-making process should be used for undertaking these efforts. In addition, the research contributes to the supplier relationship management literature by identifying the similarities and differences between managing Tier 1 suppliers and managing suppliers beyond Tier 1.
Background

Supplier relationship management is a specific area in the interorganizational relationship management area, with a focus on how to deal with suppliers from a buying company’s perspective. It can be traced back in the literature to areas such as interorganizational relationship study, channel relationship study, or relational marketing, to name a few [12]. Past research has successfully identified the top concerns in relationship studies such as the channel structure, the governance mechanisms, the process of relationship formulation, and the maintenance and evaluation of a relationship [13]. One thing in common in the literature of interorganizational relationship management is that the unit of study is a dyadic relationship with a direct supplier or a direct customer.

However, in complex societies, interorganizational relationships should not be limited to the dyadic and direct ones. In today’s network economy, one dyadic interorganizational relationship is more likely to be influenced by other dyadic relationships [14]. Figure 1.1 shows the complexity of a typical supply chain network structure [15]. Therefore, the purely dyadic perspective of interorganizational relationships cannot explain all the behaviors in a dyadic interorganizational relationship.

In some cases, the company will be in a more advantageous position by establishing relationships with indirect suppliers or customers [16]. In fact, forward thinking executives have started to manage suppliers beyond Tier 1 in order to look for opportunities to improve their competitiveness [17]. Managing suppliers beyond Tier 1 is a perfect example of a trilateral interorganizational relationship with an
Figure 1.1

A Typical Supply Chain Network
indirect supplier. At this point, academics trail industrial practitioners in understanding the potential value of this approach.

A few academicians have recognized the importance of trilateral relationship management and the importance of managing suppliers beyond Tier 1. For example, from the area of interorganizational relationship management, Williamson (1985) voiced the importance of “trilateral relationship management” and called for studies on this issue [18-19]. It was only recently that a few studies explored the interorganizational relationships from a triadic perspective, but none of them offered a complete picture of why, when, and how to manage such a trilateral business relationship [20].

From the area of supply chain management, Lambert and Cooper (2000) and Lambert, Knemeyer and Gardner (2004) proposed the question, “[H]ow do we manage relationships beyond Tier1? [21]” They also called for research exploring why and how to manage suppliers beyond Tier 1, which would give management guidance on when there is the need to go beyond Tier 1. So far, there is no research that has attempted to provide this analysis.

The Business Problem

The increasing competition on cost and quality is forcing managers to creatively look at how they manage their companies’ supply base. Sometimes management has to reach further back in the supply chain to discover opportunities to improve competitiveness, but they then have to face the new challenges raised by the complexity of the upstream relationships. In the case of globalization and outsourcing,
the supply chain network structure will become even more complicated, which will make the task of discovering opportunities at a tier beyond Tier 1 more demanding.

For example, auto makers have been competing directly on cost for decades. Both General Motors (GM) and Ford had aggressive plans to push their Tier 1 suppliers to cut the cost by 5-7% per year [22]. The Tier 1 suppliers, mostly the subsystem assemblers, would in turn put even more stringent pressures on their own suppliers. Such aggressive cost reduction plans forced some suppliers beyond Tier 1 to cut corners in parts quality, which eventually caused consumer quality issues to surface. The consumer’s response to the low-quality product was straightforward and the car sales were far below the forecast. In 2005, management of both companies provided an incentive of $5,000 cash back to consumers on the purchasing of their cars or trucks. In that year, GM alone lost a total of $10 billion on car sales. Now GM is changing their cost reduction strategies to global sourcing and building partnerships with suppliers that can delivery the best cost and quality for GM [23].

The quality of raw materials or components from suppliers beyond Tier 1 is also an issue. For example, Fiat, an Italian automaker, found that 75% of the defects that entailed repairing or substituting a component were caused by parts that had been produced by second tier suppliers [24]. In the food industry, bovine spongiform encephalopathy (BSE) has been one of the biggest concerns for most quick service restaurant chains, and the beef supply needs to be managed back to ranchers at the fifth tier of the beef supply chain. However, in 2006, the United States Agriculture Department could only test 20,000 cattle out of roughly 35 million slaughtered [25]. Therefore, large restaurant chains such as McDonalds and Wendy’s had to apply the strictest safety guidelines by themselves to absolutely prohibit “downers,” cows with
BSE potential, from entering their supply chains [26], because the food safety concern is the highest priority in the restaurant business.

Globalization has introduced some problems as well. Usually, management of a multi-national corporation brings critical Tier 1 suppliers to a new market. However, local suppliers for raw materials or components from Tier 2 and beyond often lack either sufficient capacity or the necessary managerial capabilities of quality and process control [27].

Outsourcing strategies may also bring problems to the buying company. In an outsourced global supply chain, the OEMs outsource the manufacturing operations to contract manufacturers, and they thus lose visibility of the transaction between the contract manufacturers and the Tier 2 suppliers [28].

**The Business Opportunity**

Given that the problems attributable to suppliers beyond Tier 1 are still causing management headaches, forwarding thinking executives have recognized opportunities by directly managing suppliers beyond Tier 1. In fact, better managed business relationships with upstream suppliers will bring management new competitive advantages. The purchase of second tier raw materials or components accounts for more than 30% of sales [29], and the price volatility for raw materials such as steel and crude oil has significant impact on many businesses [30]. Ensuring the superior quality of raw materials or parts from suppliers beyond Tier 1 enhances the quality of final product, while securing the supply of raw materials or components helps management schedule production and satisfies customer demand without disruptions.
For example, the general procurement department at United Technologies Corporation (UTC) has corporate contracts with 240 suppliers of indirect goods and services at a tier beyond Tier 1, with a $6 billion annual spend. UTC’s management team formalized its supplier relationship management process, which classified suppliers based on their criticality to UTC operations. Twenty-two critical indirect suppliers were then managed by the team directly. In April 2001, management institutionalized a UTC500 program to reduce $500 million in purchasing costs from indirect suppliers within two years. To that end, the team regularly invited executives of the critical indirect suppliers to a forum to discuss topics such as supply management and low-cost sourcing strategies, to share best practices among peer suppliers, and to determine cost-saving objectives. Regular training on process control and continuous improvement tools were provided for senior managers of these critical indirect suppliers to align the business objectives with their operational strategies. By the end of 2005, the total saving was up to $1.4 billion [31].

In 2000, Fiat and General Motors (GM) established two joint ventures to reduce the cost of purchasing and improve parts quality in both Europe and South American auto markets. One is GM-Fiat Worldwide Purchasing BV, with operational headquarters in Ruesselsheim, and the other one is Fiat-GM Powertrain BV, with operational headquarters in Turin. Such Joint ventures play a role of considerable importance with respect to full manufacturing cost and quality. According to the calculation proposed by both companies themselves, the benefits of joint purchasing and quality control of the supply parts and powertrain systems from 2001 to 2005 would be €2 billion, of which a significant portion was directly related to the quality control of second tier supply parts [32].
Management can also reduce supply chain risks by establishing close relationships with suppliers beyond Tier 1. An AMR Research study of approximately 300 supply chain managers showed that supply disruption (49%) and logistics failure (17%) were the top two concerns that “keep managers awake at night [33].” In this research, both supply disruption and logistics failure are found to be highly related to suppliers beyond Tier 1. Better managed relationships with upstream suppliers can reduce such risks [34]. Even when some disruptions happen, for example, management can rely on the capability they have developed to quickly respond to any unexpected events.

For instance, Toyota has a history of building superior relationships with critical suppliers at each tier. On February, 1997, a fire erupted at one of Aisin Seiki’s plants. Aisin was the sole supplier of proportioning valves (P-valves), a brake-related part used in all Toyota vehicles. When the fire occurred, Aisin held only a small supply of stock. A costly shutdown of Toyota-group plants seemed unavoidable. Yet, through a self-organized effort by firms inside and outside the Toyota group to establish alternative P-valve production sites, assembly plants were reopened after only two days of shutdown. The effort was orchestrated with only limited direct control from Toyota and with no conflict over technical proprietary rights or financial compensation [35].

Close relationships with suppliers beyond Tier 1 in new product design can provide management opportunities to rely on upstream suppliers’ capabilities in innovation and R&D, which can give final products unique features that competitors cannot easily duplicate in the short-term. Partnering with upstream suppliers can also protect both companies’ intellectual properties from leaking. For example, Daimler
Chrysler has outsourced the fuel injection systems to Bosch for years. Bosch is both a Tier 1 and Tier 2 supplier to Daimler Chrysler for the engine performance management systems and some other electronic components. Both companies can freely share the information and Daimler Chrysler can completely rely on Bosch’s innovative capability in new ignition system design [36].

Similarly, General Motors (GM) relies on an ABS supplier’s R&D capability to provide ABS systems for the passenger cars [37]. All GM needs to do is to provide the supplier with the specifications for a new ABS system. GM, thus, also avoids investment in tooling and R&D and shortens the cycle time from mind to market. Ford did the same thing by outsourcing the design of airbag subassemblies for passenger cars to an independent second tier airbag supplier [38].

The researcher intended to recognize the potential opportunities for managing suppliers beyond Tier 1 directly. In fact, most publicly available practices of managing suppliers beyond Tier 1 are based on the auto industry, but the experiences in one industry cannot represent the full benefits of managing suppliers beyond Tier 1. Besides, publicly available information is highly segmented and has not been systematically integrated and documented. It is difficult for managers to refer to such segmented information without a holistic understanding of why and how to manage suppliers beyond Tier 1. Best practices from other industries could be helpful, but they are either inaccessible to the public or have not yet been explored.

Managing suppliers beyond Tier 1 will give management more insights from other supply chain members and more opportunities that could be beneficial for the entire supply chain. Proactively managing the supply base beyond Tier 1 will assist management in succeeding in the competitive business world.
The Research Purpose

The primary purpose of this research was to understand the motivations and strategies for managing suppliers beyond Tier 1. To that end, a conceptual research framework was developed on the basis of the literature review presented in Chapter 2. The conceptual research framework is provided in the end of that chapter.

Best practices in managing suppliers beyond Tier 1 from leading companies were collected from personal interviews. Data were collected concerning the motivations and strategies, the decision-making process, and the evaluation of managing suppliers beyond Tier 1, as well as the structure of the supply side of each of the supply chains. It was expected that these best practices would demonstrate patterns in the motivations, strategies, decision-making process, and performance evaluations.

The ultimate goal of this research was to develop a normative model for identifying opportunities to manage suppliers beyond Tier 1, with a generalized framework of the decision-making process to facilitate managers’ implementation of this normative model. The research explores the reasons to manage suppliers beyond Tier 1, how to manage them, how the decision to manage them is made, and how to measure their performance.

It was also a purpose of this research to explore the similarities and differences between dyadic interorganizational relationship management and triadic interorganizational relationship management in the context of supply chain management. Findings from this perspective yield theoretical contributions to the scholarship on supply chain management and interorganizational relationship management.
Research Objectives

The specific objectives of this research were:

1. To collect necessary data from purchasers of raw materials or components in supply chains from a variety of industries.
2. To identify the key motivations to manage suppliers beyond Tier 1 and the key strategies used in managing those relationships.
3. To develop a normative model for managing suppliers beyond Tier 1.
4. To generalize a decision-making process to facilitate the process of managing suppliers beyond Tier 1.
5. To generate ideas for future research opportunities.

Research Questions

The research was designed to find answers to the following questions:

1. Why do managers manage suppliers beyond Tier 1?
2. How are the decisions to manage suppliers beyond Tier 1 made?
3. How is a supplier beyond Tier 1 managed?
4. How is the management of a relationship with a supplier beyond Tier 1 evaluated?

In order to assist the researcher in gathering the data necessary to answer these research questions, an interview guide with 18 questions was prepared and is presented in Appendix A. These 18 questions were operationalized around the four research questions. A case study protocol, developed to ensure the data collection process was consistent, is described in detail in Chapter 3.
The Scope of the Research

Data were collected from supply chains that represented a variety of raw materials or components, supply chain structures, market presences, and industries. A total of seven companies participated in the research, representing a number of industries including consumer packaged goods, durable goods, quick service restaurant chains, and retail industries. Each participating company is multinational with sales of more than $1 billion in 2006. This research is focused on large companies, and the findings may not apply to SME’s, since SME’s might not have sufficient power to influence the approaches suppliers beyond Tier 1 are doing their business.

Individual raw material or component supply chains engaged with activities in managing suppliers beyond Tier 1 were investigated to develop an understanding of why, when, and how an item from Tier 2 and beyond was managed directly by the management of participating companies. The analysis of the motivations and strategies, however, was not restricted to the level of individual items. Based on findings from individual cases, the results are generalized into a normative model that incorporates motivations and strategies. Issues such as the decision-making process and implementation of the normative model are also described.

Potential Contributions

The research makes a number of contributions. First, it results in a normative model that managers can use to manage suppliers beyond Tier 1. Data were collected from both manufacturers and retailers to ensure that the framework is generalizable at
certain levels and to provide good coverage in applications. The normative model is operationalized with specific motivations and associated strategies to provide management a structured approach for implementation.

Second, it provides managers with a decision-making procedure to facilitate the process of managing suppliers beyond Tier 1. In addition to the normative model developed in this research, the decision-making procedure provides other necessary information required to efficiently and effectively manage suppliers beyond Tier 1. For example, the procedure shows that the task of managing suppliers beyond Tier 1 should not be limited to the purchasing department in a company. Rather, it requires inputs from other functions and other members in the supply chain.

Finally, it investigates upstream supplier relationship management from the triadic perspective by incorporating the lower-tier supplier who is in the middle of the buying company and a supplier at a tier beyond Tier 1. In addition, this research illustrates the interactions among the product characteristics, the supply chain network structure, the governance mechanisms, the decision-making processes of relationship formation, and the maintenance and evaluation of a relationship.

**Organization**

The rest of this dissertation is presented in Chapter 2 through Chapter 6. Chapter 2 contains a review of the literature used to develop the normative model. The literature in the areas of interorganizational relationship management, channel relationship management, and supply chain management were reviewed, and four main research streams were identified. Based on the four research streams, a conceptual framework for managing the relationship dynamics in a supply chain
network is developed, and a normative model with motivations and strategies for managing close interorganizational relationships is described in this chapter.

Chapter 3, research design, includes the purposes of the study, the research questions, the unit of analysis, and the research methodology. The research methodology is explored in considerable detail to ensure the robustness of the study. A research protocol also is described to explain how consistent data collection and analysis throughout the research project was ensured.

Chapter 4 starts with the data collection procedure and follows with brief introductions of the participating companies as well as their supply chains. In each supply chain, key information regarding why, when, and how to manage suppliers beyond Tier 1 is explained, and the formation and development of these relationships are described. The chapter ends with a summary of the 15 supply chain profiles.

The main findings of the research are presented in Chapter 5. This chapter begins with general results regarding motivations, strategies, and associations between motivations and strategies. It is explained how they are coded from the data collected. A normative model and a five-step decision-making process are then provided for managers to use when managing suppliers beyond Tier 1.

In Chapter 6, the research questions and conclusions are summarized; the normative model is briefly explained; major conclusions are provided; and managerial and academic implications are explored. Finally, the limitations of this research are described, and suggestions for future research are presented.
References


[38] Ibid.
CHAPTER 2

LITERATURE REVIEW

The research is focused on developing a clearer understanding of the motivations for managers to build close interorganizational relationships with suppliers beyond Tier 1 and the strategies to maintain these relationships. A normative model is built on a systematic review of the extant cross-functional literature focusing on interorganizational relationship management reviewed in this chapter.

This chapter is organized into nine parts: theoretical foundations; interorganizational relationship management; motivations to build close interorganizational relationships; strategies to build and maintain close interorganizational relationships; the associations between the motivations and the strategies; the evaluation of relationship performance; the decision-making process in developing interorganizational relationships; a normative model of managing suppliers beyond Tier 1; and a summary. A conceptual framework for relationship dynamics in a supply network and a framework of decision-making process are also developed.
Theoretical Foundations

Interorganizational relationship management study is well-grounded in theories from marketing, economics, and strategic management. Generally speaking, managing suppliers beyond Tier 1 falls into the area of interorganizational relationship management, and the generic interorganizational relationship management theories included in the relationship marketing literature are relevant to consider when examining this phenomenon. In particular, Eiriz and Wilson (2006) recognized five main theories in support of the research in relationship marketing, including transaction cost theory, theories of power, resource dependence theory, social exchange theory, and relationship contracting theory [1]. Aspects of each of these theories may have implications for how companies manage suppliers beyond Tier 1.

In addition, Heide (1994) stated that the theoretical approaches in interorganizational governance study were marketing channels literature, resource dependence theory, transaction costs theory, and relational contracting theory [2]. Under the individual organization context, the transaction cost analysis based on the least-total-cost method has been used to determine a firm’s activity boundary in order to provide guidance on the “make-or-buy” decision [3]. By the same token, management can apply the least-total-cost concept to determine the company’s activity boundary in a supply chain context.

Scholars of general relational theory in marketing have identified the presence of uncertainty, frequency of transactions, and the presence of specific assets as the drivers of vertical integration [4]. It has been shown that they are also drivers for
collaborative relationships lying within the spectrum between market governance and vertical integration [5].

The area of strategic management also provides theoretical support for the interorganizational relationship study by describing the relationship between the relationship management activities and business strategies. The practices of supply chain management, along with their associated benefits (lower cost, higher quality, reliable delivery, and reduced cycle time) are linked closely with the strategic management literature [6].

Managing suppliers beyond Tier 1 falls into the area of interorganizational relationship management and the theoretical foundations in support of the generic interorganizational relationship management study also serve as the theoretical foundations of the research of managing suppliers beyond Tier 1. This review of literature focuses on identifying the key aspects in interorganizational relationship management literature that are relevant to managing suppliers beyond Tier 1. In the next section, the literature on the areas related to the interorganizational relationship management study is reviewed.

**Interorganizational Relationship Management**

In order to identify the essential aspects for managing suppliers beyond Tier 1, literature on interorganizational relationship management from different areas of academic inquiry are reviewed. Historically, there are two perspectives in the interorganizational relationship (IOR) management area. One perspective focuses on comparing alternative transaction governance mechanisms (e.g., markets, hierarchies, and mixed modes) [7]. As summarized by Ring and van de Ven (1994),
These research streams provide extremely useful insight about conditions leading to the formation of IORs, and they can help researchers when they make comparative static decisions regarding alternative organizational designs and incentive schemes for different kinds of transactions. However, scholars from these research streams have ignored process. Although knowing the inputs, structure, and desired outputs of a relationship provides a useful context for studying process, these factors do not tell us how a relationship might unfold over time [8].

The second perspective focuses on process. They continued,

process, however, is central to managing IORs. As agents for their firms, managers need to know more than the input conditions, investments, and types of governance mechanisms required for a relationship. These process issues also have important temporal implications for performance. The ways in which agents negotiate, execute, and modify the terms of an IOR strongly influence the degree to which parties judge it to be equitable and efficient. These processes also influence motivations to continue in, or terminate, the relationship over time. Interaction processes among cooperating parties may cast a positive, neutral, or negative overtone to the relationship, influencing the degree to which parties settle disputes arising out of the IOR.

The process perspective of interorganizational relationship study will be used in this research, since it reflects the dynamic nature of an interorganizational relationship. In fact, the above two paragraphs jointly present the essential aspects in managing interorganizational relationships, which are:

1. The development of interorganizational relationships, from emergence to continuation or termination of the relationship.
2. Basic information of the purchasing context -- “the input conditions,” as well as the “channel structure.”
3. The “types of governance mechanisms” are determined by the motivations and strategies. The dynamic nature of a governance mechanism will be illustrated by the “interaction processes among cooperating parties.” The “temporal nature” of an interorganizational relationship also supports the argument of “dynamic.”
4. The interorganizational relationship has “important temporal implications” on performance, and it will be evaluated from the “equitable and efficient” perspectives.

Actually, the majority of the literature on interorganizational relationship management supports these four essential aspects. Selected pieces related to the development of interorganizational relationships are presented in Table 2.1.
<table>
<thead>
<tr>
<th>Areas of Study</th>
<th>Research Topics</th>
<th>Selected Publications</th>
<th>Contributions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchasing strategy</td>
<td>Purchasing context</td>
<td>Kraljic (1983)</td>
<td>Portfolio dimensions: Importance of purchasing versus complexity of supply market</td>
</tr>
<tr>
<td></td>
<td>Purchasing portfolio</td>
<td>Gelderman and Semeijn (2006)</td>
<td>Portfolio dimensions: importance of purchasing versus: supply risk, market uncertainty, technical complexity and difficult to obtain (manage); characteristics of product and industry (such as modularity)</td>
</tr>
<tr>
<td>Development of inter-organizational relationships (IORs)</td>
<td>The formation and maintain of IORs</td>
<td>Spekman and Carraway (2006)</td>
<td>(1) Purchasing context, (2) Formation and development process of IORs, (3) Governance mechanisms</td>
</tr>
<tr>
<td></td>
<td>Partnerships</td>
<td>Lambert et al (1999)</td>
<td>(1) Formation and development process of partnerships, (2) Drivers, facilitators, and management components, and (3) Performance evaluation</td>
</tr>
<tr>
<td>Key aspects of IORs</td>
<td>Interorganizational governance</td>
<td>Heide (1994)</td>
<td>(1) Three stages of the development of IOR (initiation, maintenance, and termination); (2) different strategies were applied in different stages</td>
</tr>
<tr>
<td></td>
<td>Developmental process of interorganizational relationships</td>
<td>Ring and Van De Ven (1994)</td>
<td>Five key aspects: (1) Basic inputs, including product, and network structure; (2) Three stages of the development of IOR (emerge, grow, and dissolve) (3) Motivations and strategies determine the type of governance structure, (4) IORs are important temporal implications and will be evaluate from &quot;equitable and efficient&quot; perspective, and (5) Dynamic nature of IORs</td>
</tr>
</tbody>
</table>

Table 2.1

Selected Literature about the Development of Interorganizational Relationships
Table 2.1 Continued

<table>
<thead>
<tr>
<th>Relationship marketing</th>
<th>Theoretical foundation of relationship marketing</th>
<th>Heide (1994)</th>
<th>Marketing channel, resource dependence, transaction cost, and relational contracting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channel relationship</td>
<td>Factors that matter in channel relationship studies</td>
<td>Lambert and Cooper (2000)</td>
<td>(1) Motivation, (2) strategies, (3) network structure, (3) control variables (facilitators), and (4) performance measurement. Network factors include the length and width of a supply network, as well as a supplier's position in the network. Control variables include characteristics of product, firm size, and industry</td>
</tr>
<tr>
<td>Channel relationship</td>
<td>Factors that matter in channel relationship studies</td>
<td>Antia and Frazier (2001)</td>
<td>Dyadic relationship factors; control variables (basic conditions); (supply) network factors (density and centrality); and channel system factors (specific investment, environmental volatility, and obligation criticality). Dyadic factors include relationalism, interdependence asymmetry and interdependence magnitude</td>
</tr>
<tr>
<td>Supplier relationship management (SRM)</td>
<td>SRM as a corporate strategy; SRM on firm performance; development of SRM</td>
<td>Lambert (2006)</td>
<td>(1) Process perspective of supplier relationship management; (2) suppliers should be management differently regarding their different importance to the purchasing firm; and (3) managerial resources spent on activities of managing a variety of suppliers will determine the type of the relationship</td>
</tr>
<tr>
<td>Customer relationship management (CRM)</td>
<td>Customer segmentation, CRM development process</td>
<td>Ring and Van de Ven (1996)</td>
<td>CRM has three stages: (1) initiation, (2) maintenance, and (3) termination. At each stage, strategic importance, the relationship economic values, and management activities are all different</td>
</tr>
</tbody>
</table>

Continued
Table 2.1 Continued

<table>
<thead>
<tr>
<th>Supply (chain) network structure</th>
<th>Interactions among dyadic IORs</th>
<th>Lambert (2006)</th>
<th>Factors in a supply network that affect IORs include: (1) competitive priorities, (2) strategies, (3) supply network length and width, and (4) organizational culture issues such as managerial philosophies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Supply network dynamics</td>
<td>Hameri and Paatela (1998)</td>
<td>Factors affecting supply network dynamics: (1) product characteristics, (2) network structure, (3) organizational cultural, (4) IT system (network infrastructure), and (5) relationship effectiveness</td>
</tr>
<tr>
<td></td>
<td>Partnerships, partnering process, and the benefits of partnership</td>
<td>Lambert et al (1996, 1999)</td>
<td>(1) A partnership model including drivers, facilitators, management components, outcomes, and feedbacks; (2) three types of partnerships; (3) partnering process; and (4) the benefits of partnership</td>
</tr>
<tr>
<td>Partnership structure</td>
<td></td>
<td>Golicic and Mentzer (2006)</td>
<td>(1) Trust, commitment, and dependence affect the relationship magnitude; and (2) the relationship magnitude determines the type of relationships</td>
</tr>
<tr>
<td>Logistics outsourcing</td>
<td></td>
<td>Knemeyer et al (2003)</td>
<td>(1) Levels of partnership development, (2) key relationship marketing elements (trust, commitment, investment, dependence, communication, attachment, reciprocity, and shared benefits); and key relationship outcomes (retention, referrals, and recovery)</td>
</tr>
</tbody>
</table>

These four aspects are presented next as the four key research streams, which are the development process of an interorganizational relationship, the basic conditions, the governance mechanisms, and the performance evaluation. Selected pieces related to the management of interorganizational relationships are presented in Table 2.2, including motivations and strategies for interorganizational relationship management, the associations between motivations and strategies, the evaluation of relationship performance, and the decision-making process of managing interorganizational relationships.
<table>
<thead>
<tr>
<th>Research Topics</th>
<th>Areas of Study</th>
<th>Selected Publications</th>
<th>Contributions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivations</td>
<td>Competitive priorities</td>
<td>Wheelwright (1984)</td>
<td>There are a number of reasons related to cost, quality, flexibility, dependability</td>
</tr>
<tr>
<td></td>
<td>Partnership</td>
<td>Upton (1994)</td>
<td>Service</td>
</tr>
<tr>
<td></td>
<td>Supply management</td>
<td>Carter (2006)</td>
<td>Social purchasing responsibilities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jutter (2005)</td>
<td>Risks</td>
</tr>
<tr>
<td>Strategies</td>
<td>Purchasing Strategies</td>
<td>Burt (1989)</td>
<td>Total cost management</td>
</tr>
<tr>
<td></td>
<td>Manufacturing strategies</td>
<td>Dean and Bowen (1994)</td>
<td>Total quality management</td>
</tr>
<tr>
<td></td>
<td>Sourcing</td>
<td>Venkatesan (1992)</td>
<td>Strategic sourcing</td>
</tr>
<tr>
<td>Associations</td>
<td>Capabilities and strategic</td>
<td>Eisenhardt et al (2000)</td>
<td>A buying company can either have some resources and capabilities to meet its business objectives (i.e., make), or to acquire such resources or capabilities from suppliers (i.e., buy)</td>
</tr>
<tr>
<td>between</td>
<td>management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>motivations and</td>
<td>The associations between</td>
<td>Peterson et al (2005)</td>
<td>R&amp;D capability and supplier integration</td>
</tr>
<tr>
<td>strategies</td>
<td>motivations and strategies</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Order fulfillment</td>
<td>Croxton et al (2001)</td>
<td>Logistics capabilities and corresponding strategies</td>
</tr>
<tr>
<td></td>
<td>Strategy: intecedent and</td>
<td>Cagliano et al (2005)</td>
<td>Associations between motivations (supplier selection criteria) and strategies (integration strategies)</td>
</tr>
<tr>
<td></td>
<td>performance</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Partnership</td>
<td>Lambert et al (1996),</td>
<td>Associations between motivations (drivers) and strategies (management components)</td>
</tr>
</tbody>
</table>

Table 2.2

Selected Literature about the Management of Interorganizational Relationships
<table>
<thead>
<tr>
<th>Performance measurement</th>
<th>Logistics partnership</th>
<th>Lewis and Lambert (1991)</th>
<th>Relationship performance can be measured on the purchasing side, supplier side, or on both side</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Supply chain performance</td>
<td>Lambert and Pohlen (2006)</td>
<td>(1) Metrics can be &quot;hard&quot; indicators or &quot;soft&quot; perceptions, (2) metrics should be selected to be good to the whole relationship or the whole supply chain, and (3) Metrics need to tie back to business objectives</td>
</tr>
<tr>
<td></td>
<td>Buyer-supplier relationship</td>
<td>Jap (2001)</td>
<td>Outcomes are affected by management activities, which are influenced by environmental factors, organizational properties, and interpersonal states</td>
</tr>
<tr>
<td>Decision-making process</td>
<td>IOR management</td>
<td>Mintzberg et al (1976)</td>
<td>Decision-making has content perspective and process perspective. The process perspective is adapted here</td>
</tr>
<tr>
<td></td>
<td>Purchasing</td>
<td>Ellram (1995)</td>
<td>Five steps of purchasing partnerships: preliminary phase, identifying partners, screen and select, establish relationship, and evaluate</td>
</tr>
</tbody>
</table>
The Development Process of an Interorganizational Relationship

The first stream deals with the development stages of an interorganizational relationship, from formation and maintenance to termination. This stream of research generally explores the difference in the interorganizational relationship management across different life-cycle stages, and literature can be found from areas including interorganizational relationships, relationship marketing, channel relationships, supplier relationship management, customer relationship management, supply network structure, and partnership.

Ring and van de Ven (1994) identified three stages of the development of an interorganizational relationship, which were emerging, growing, and dissolving. These three stages are in accordance with the three stages recognized by Heide (1994), which are initiation, development, and termination [9]. The dynamic features at each of the stages in the development reflect the difference in the importance of the purchasing to the company, the channel structure or supply network structure, and the management activities in managing and controlling the interorganizational relationship.

For example, from the area of channel relationship study, Antia and Frazier (2001) argued that the development of an interorganizational relationship is affected by motivations, network factors, dyadic relationship factors among channel members, and control variables such as the characteristics of the component purchased and the corresponding industry [10]. In addition, they found that network factors were important in interorganizational relationships.
Eiriz and Wilson (2006), from the perspective of relationship marketing, argued that the management activities would determine the development of a business relationship.

The set of marketing activities oriented to establishing, developing, maintaining (Morgan and Hunt, 1994) and terminating relational exchanges. Thus, marketing relationships are seen here as the outcome of relationship marketing activities though these need not necessarily be active or conscious activities (despite a widespread assumption to this effect in the literature).

In this perspective, relationship marketing is concerned with dyadic and multilateral relationships as well as with networks of relationships, and it shares with other disciplines a concern over strategic alliances, partnerships and strategic networks. It embraces intra- and inter-organizational relationships as well as relationships between organizations and individuals.

It is also important to recognize that marketing activities may also affect marketing relationships indirectly, tangentially or inadvertently – though they surely will affect marketing relationships, unless the activities are entirely without consequence. We therefore include in “marketing activities” those that might be passive, or habitual, or dictated by other organizations and pressures [11].

These perspectives are important to this research in managing suppliers beyond Tier 1, because the development of the relationship is viewed as the outcome of different relationship marketing activities and the level of management involvement. This perspective is also supported by studies in the areas of supplier relationship management and customer relationship management [12]. The types of management activities and the level of management involvement will determine how a relationship between a buying company and one of its suppliers beyond Tier 1 is managed.

The Global Supply Chain Forum (GSCF), a group of non-competing firms and a team of academic researchers, defines supplier relationship management as “the supply chain management process that provides the structure for how relationships with suppliers are developed and maintained [13].” The supplier relationship
management process is managed by a team with members from other functions as well as representatives from other companies in the supply chain. In other words, management activities in the supplier relationship management process are coordinated with inputs from purchasing, operations, logistics, finance, R&D, sales, and marketing functions. Through the cross-functional coordination, information from both the suppliers and customers are provided to the supplier relationship management activities.

The requirement of inputs from other companies to coordinate activities is also acknowledged by other studies in supplier relationship management. For example, Carr and Pearson (1999) defined supplier relationship management as the coordination of activities on the supply side [14]. Although they neglected the importance of the inputs from customer to supplier relationship management, they recognized the importance of coordinating activities with other companies in supplier relationship management. Mentzer et al (2001) concluded that there was consensus that a supply chain was comprised of multiple-tiers of suppliers and customers, and “a key characteristic of supply chain management is the coordination of activities between these interdependent organizations [15].”

Literature in customer relationship management also articulated that the process for managing customer relationships had three stages: relationship initiation, relationship maintenance, and relationship termination [16]. The economic value or the strategic importance to the firm should be different at each stage, thus various activities need to be practiced to maximize the benefits to the whole relationship [17].

Partnering between firms is regarded as a way to find and maintain competitive advantages [18]. Normally, partnership is described as a term for closely
integrated and mutually beneficial relationships that enhance supply chain performance [19]. In this research, the following definition of partnership provided by Lambert et al (1996) is used:

A partnership is a tailored business relationship based on mutual trust, openness, shared risk and shared rewards that results in business performance greater than would be achieved by the two firms working together in the absence of partnership [20].


---

**Figure 2.1**

The Lambert, Emmelhainz, and Gardner Partnership Model
Research in partnerships covers topics such as the benefits of a partnership and the formation process of a partnership [21]. The benefits of an appropriate partnership include the potentials to improve both parties’ competitive advantage [22]. For example, according to Lambert et al (2004), “The ability to effectively and efficiently build and maintain tailored business relationships may become a key competency for executives looking for competitive advantages [23].”

There are some partnership models available to provide structures for the factors that influence partnership formation, management over time, and outcomes. These models can be used by academics for partnership research or by managers to facilitate the development of an appropriate relationship [24].

For example, in the Lambert, Emmelhainz, and Gardner (1996, 1999) model, as shown in Figure 2.1, the factors that influence the partnership formation, management over time, and outcomes include both drivers and facilitators. Drivers are the “compelling reasons to partner,” while the facilitators are the “supportive environmental factors that enhance partnership growth.”

Drivers and facilitators jointly define a spectrum of all possible interorganizational relationships, and determine if a partnership is appropriate for a particular purchasing context and what form it should take. The appropriate type of partnership can be realized by determining the contents and levels of joint activities and processes that build and sustain the partnership [25]. This model illustrates the dynamic nature of a partnership, with expectations of outcomes set by drivers, and with feedback to components, drivers, and facilitators.

Figure 2.2 presents another model for the partnering process. The Golicic and Mentzer (2005) model is developed for researchers “to study the nature of the interorganizational relationship structure (i.e., the magnitude and type of a
relationship) to fully explain and understand a growing phenomenon -- the existence of various forms of relationships in the supply chain. It is also important for practitioners to have this understanding to better manage interorganizational relationships [26].”

In the Golicic and Mentzer model, the relationship structure, which is the focus of this model, is composed of the relationship magnitude and the type of relationship. The relationship magnitude has three dimensions, which are trust, commitment, and dependence. Trust, commitment, and dependence will affect the magnitude of a relationship, and the magnitude of a relationship will in turn determine the relationship type. According to the magnitude of the relationship, the types of relationships are defined as arms length, cooperative, and integrated relationships.
Finally, the type of relationship will determine the value of the relationship. This model is actually a static one, without the feedback from performance evaluation (relationship value) to trust, commitment, and dependence, the starting points of the model [27].

These two partnership models share two commonalities. One is that management activities determine the types of relationships, and the other one is that different types of partnerships have different values. These two perspectives will be brought into this research. An extra perspective the Lambert, Emmelhainz, and Gardner model can provide for the current study is that management activities and the level of management involvement in each activity are determined by a combination of drivers and facilitators. In this research, the drivers and facilitators can be equated with motivations and situational factors.

In summary, previous studies revealed that the development of an interorganizational relationship was the result of the basic “input conditions,” the governance mechanisms, and the measurements of the performance of an interorganizational relationship. These three aspects jointly build the scope of this research. Literature related to these three aspects will be reviewed in the balance of this chapter.

**Basic Conditions for Building an Interorganizational Relationship**

Two types of basic conditions are recognized as important for building and managing an interorganizational relationship: the product characteristics and the network structure (or channel structure). It is often argued that the characteristics of
product and market have an impact on types of relationships selected [28]. Most studies within this stream follow the purchasing portfolio model introduced by Kraljic (1983) [29]. According to Kraljic, a firm’s supply strategy depends on two factors: (1) profit impact and (2) supply risk.

Figure 2.3 shows Kraljic’s classification scheme that defines different buyer-seller contexts on the basis of an item’s profit impact and supply risk [39]. Purchasing portfolio sometimes is also referred to as purchasing context or product/social context.

### Supply Risk

<table>
<thead>
<tr>
<th>Profit Impact</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Non-critical</td>
<td>Strategic</td>
</tr>
<tr>
<td>High</td>
<td>Leverage</td>
<td>Bottleneck</td>
</tr>
</tbody>
</table>

Spekman and Carraway (2006) provided a similar portfolio model by substituting items in Kraljic’s portfolio model to reflect appropriate strategies for items in each quadrant [31]. They gave a few examples to illustrate each pair of item (supplier)-strategy in the portfolio model, or the “purchasing context” as they called it, which are listed as follows:

1. Partnership – strategic suppliers (i.e. market leaders, specific know-how, and balance of power may differ among buyers-suppliers).
2. Competitive bidding – leverage suppliers (i.e. many competitors, commodity products, and a buyer dominated segment).
3. Securing continuity of supply – bottleneck suppliers (i.e. technology leaders, few – if any – alternative suppliers).
4. Systems contracting – non-critical suppliers (i.e. large supply, many suppliers with dependent position, and a reduction in the number of suppliers) [32].

There are other similar schemes to define the product/social context of a purchasing by pairs of dimensions. For example, in order to better represent a purchasing context, researchers have adjusted the two dimensions to the “strategic importance versus difficulty in managing purchasing situations” [33] or to the “strategic importance versus technological complexity” [34]. A clearly defined purchasing context or supplier classification has been regarded as the first necessary step [35], but not a sufficient one, for building a successful collaborative buyer-supplier relationship [36]. Actually, the strategic importance to the company can be regarded as the reasons or motivations to build an interorganizational relationship. The motivations for managing interorganizational relationships will be reviewed in detail in the section titled “Motivations.”

It has also been argued that the network structure (or channel structure) has an impact on selections of different types of relationships [37]. The network structure can be operationalized either as the length and width of the supply network as well as the supplier’s position in the supply network, or as the network density and network
centrality [38]. Dyadic factors include relationalism (solidarity, flexibility, and information exchange) [39], interdependence asymmetry, and interdependence magnitude [40]. Control variables include firm size, industry [41], and product characteristics [42], which have been described as inputs to an interorganizational relationship in a previous subsection.

The impact of supply networks on interorganizational relationships between a focal purchasing company and all its suppliers is significant [43], especially “when the final products produced by the focal company incorporate complex design and engineering skills that are produced through a tier-structured, multi-level supply network [44].” Key factors in supply network dynamics are network structures, locations (domestic versus global presence), information technology, and organizational structure, as summarized by Hameri and Paatela (2005) [45]. Table 2.3 shows how these factors will affect decisions on managing the relationship in supply networks.

Factors in Table 2.3 cover topics including:

1. Competitive priorities, such as cost efficiency and quality pressures.
2. Strategies, such as strategic sourcing and increasing data transparency.
3. Product characteristics, such as product complexity/modularity and technical specialty.
4. Supply network structures, such as company boundary expansion and locations.
5. Organizational culture issues, such as managerial philosophies including emphasis on supplier relations and value through outsourcing, are also recognized as important factors in supply network dynamics [46].

All these factors will be considered in this research. In fact, product characteristics, the supply chain network structures, and organizational cultural issues are regarded as the facilitators in the Lambert, Emmelhainz, and Gardner Partnership Model, since their existence will facilitate or inhibit the process of developing an interorganizational relationship. In this study it is proposed that
### Table 2.3

<table>
<thead>
<tr>
<th>Key issues</th>
<th>Factors pushing towards tier-structure in supplier networks</th>
<th>Factors facilitating expansion and contraction of supplier networks</th>
<th>Factors forcing management procedures to extend across company boundaries</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Network structures</strong></td>
<td>• Cost efficiency</td>
<td>• Relocation of operations</td>
<td>• Quality pressures</td>
</tr>
<tr>
<td></td>
<td>• Serving multiple value networks</td>
<td>• Higher value offering</td>
<td>• More complex products</td>
</tr>
<tr>
<td></td>
<td>• Strategic outsourcing</td>
<td>• Technical specialty</td>
<td>• Reverse logistics</td>
</tr>
<tr>
<td></td>
<td>• Modular product design</td>
<td>• Alternating customer demand</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Full product life-cycle service</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Location</strong></td>
<td>• Global operations</td>
<td>• Pursuit for low-cost production</td>
<td>• Cost proximity</td>
</tr>
<tr>
<td></td>
<td>• Industrial parks</td>
<td>• Location changes</td>
<td>• Intensified production cycles</td>
</tr>
<tr>
<td></td>
<td>• Channel management</td>
<td>• Continuous cost pressures</td>
<td>• Planning in network</td>
</tr>
<tr>
<td><strong>Information technology</strong></td>
<td>• Integration can take place fast</td>
<td>• Standardized routines</td>
<td>• Virtual supplier contracts</td>
</tr>
<tr>
<td></td>
<td>• Simple interfaces, internet portals</td>
<td>• Packaged solutions</td>
<td>• Transparent exchange of data</td>
</tr>
<tr>
<td></td>
<td>• Ease of connectivity</td>
<td>• Rapid implementation</td>
<td>• Sharing of responsibility</td>
</tr>
<tr>
<td><strong>Organizational structures</strong></td>
<td>• Focus on suppliers</td>
<td>• Access to technology and know-how</td>
<td>• New managerial positions established</td>
</tr>
<tr>
<td></td>
<td>• Value through outsourcing</td>
<td>• Access to new business and customers</td>
<td>• Emphasis on supplier relations and customer integration</td>
</tr>
<tr>
<td></td>
<td>• Exploit network effort</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

managing suppliers beyond Tier 1 in a supply network should involve a consideration of product characteristics and supply network structures.

**Governance Mechanisms**

The third stream of research that influences the current study is research related to governance mechanisms for managing interorganizational relationships [47]. Studies within this stream primarily explore how to manage an interorganizational relationship [48]. A number of strategies can be used to manage an interorganizational relationship, especially in the supplier context. Most of the strategies are either transaction (short-term) or relationship (long-term) oriented [49].

A number of governance mechanisms can be found in the literature. As described in the previous subsection on the development process of an interorganizational relationship, the types of interorganizational relationships would be determined by the management activities that were involved in the relationship. The primary goal of this research is to understand why and how to manage a supplier beyond Tier 1, and detailed strategies will be reviewed thoroughly in following sections.

**Performance Evaluation of an Interorganizational Relationship**

The fourth stream concerns the performance evaluation of an interorganizational relationship. The performance of an interorganizational relationship could be evaluated either on the buying company side, on the supplier side, or on both sides. Since the performance of an interorganizational relationship is normally regarded as the last step in the decisions for managing a business
relationship, the decision-making process will be briefly reviewed, and a few
decision-making models will be described.

**Summary of Interorganizational Relationship Studies**

In summary, the review of literature focusing on interorganizational relationships and related business-to-business relationship management areas reveals that interorganizational relationship studies normally examine the contents of management activities when dealing with a supplier or a customer, as well as the level of involvement of management in each of the management activities. Management activities are also called “strategies” or “governance mechanisms.”

In addition to management activities, the review of literature also reveals that motivations for building a closer business relationship, the natural associations between motivations and strategies, basic inputs such as product characteristics, industry, firm size, and supply (chain) network structure, will all have impacts on the decisions to build, maintain, and terminate an interorganizational relationship.

In the next three sections, the motivations, strategies, and associations between motivations and strategies are reviewed to identify basic constructs or categories to develop a normative model for managing suppliers beyond Tier 1. The logical connections between those constructs are also reviewed. An underlying assumption of the literature review is that motivations and strategies in an interorganizational relationship with a Tier 1 supplier or customer will be applicable to a situation where the supplier is located beyond Tier 1.
Motivations

There are a variety of reasons for companies to develop close interorganizational relationships. The literature review reveals that most of these motivations are highly related to competitive priorities, which are cost, quality, flexibility, and dependability [50]. The situational motivations that are not highly related to the four competitive priorities are assigned to a construct titled “Context-Specific Motivations.”

A number of risks are also recognized as motivations to build close business relationships [51]. Since most of these risks are related to one of the four competitive priorities, these risk elements are classified into each of the four competitive priorities constructs accordingly [52].

Cost Motivations

Cost is the most important driver of supplier relationships [53]. Cost is not limited to the initial purchasing price; it extends to the total costs related to purchasing, including the cost to recover any quality flaw due to the purchasing [54]. Burt (1989) articulated this point:

Managing suppliers means aiming for the lowest “all-in-cost,” the lowest cost when all is said and done, not the lowest initial price per unit. Because poor quality is so expensive, procurement officers have to use more care in selecting suppliers than ever before; they must learn more about suppliers than they ever cared to know before. They need to engage in careful research and mutually beneficial relations with suppliers, not counterproductive test of strength [55].

In areas such as purchasing and supplier relationship management, a number of cost elements have also been recognized. For example, Ellram (1994) supported
Burt’s argument by proposing that the total cost related to purchasing was not just the cost of raw material or component [56]. Indeed, the cost of support (logistics costs, overhead cost) and the cost of production (such as lot size cost) should be considered when making purchasing decisions.

Recently, several studies in supply chain risks and vulnerability revealed that risk and vulnerability concerns would change the way suppliers are managed and even the supply chain network structure [57]. The cost related risk, defined as a cost issue that results in a significant impact on a company’s business, was identified as one of the most unpredictable factors that can disrupt a supply chain [58]. Thus, a variable titled “cost related risks” is also added into the cost motivation construct as a possible reason for managing suppliers beyond Tier 1.

**Quality Motivations**

Skinner (1969, 1974) asserted that there were many different ways to compete in a given market, and that the choice among strategic trade-offs determines a firm’s success [59]. Among the four basic competitive priorities named by Wheelwright (1994), quality ranks second [60].

The quality related issues include the rate of defective parts, the quality of a supplier’s value-added service, a supplier’s capability in process quality control, the role of a supply part as a quality differentiator in the final product, and part quality related risks [60]. From a product life cycle standpoint, the quality driver is normally more important than the cost driver in the product development and launching phases, while it becomes less important thereafter [61].
Quality related risks are also classified into the quality motivation construct. For example, safety is the biggest issue related to the quality of a product, especially for products with stringent government regulations [62].

**Flexibility Motivations**

Flexibility can be considered a crucial weapon to increase competitiveness in a turbulent marketplace [63], and it becomes particularly relevant when the whole supply chain is considered [64]. Flexibility is sought to respond to the many sources of uncertainty, including market demand, supplier lead time, and information delay, in order to better cope with internal and external variability [65].

In the manufacturing context, flexibility is regarded as a complex and multidimensional concept and difficult to summarize [66]. Garavelli (2003) defined “flexibility” as “the ability of a system to properly and rapidly respond to changes, coming from inside as well as outside the system [67].” He outlined different aspects of flexibility as follows:

1. Functional aspects: flexibility in operations, marketing, logistics, etc.
2. Hierarchical aspects: flexibility at shop, plant, company, or supply chain level.
3. Measurement aspects: flexibility measured by global metrics or context-specific metrics.
5. Time horizon: long-term versus short term flexibility.
6. Object of change: flexibility of product, mix, volume, etc.

In the supply chain context, a number of studies defined the dimensions of supply chain flexibility from the perspective of the “object of change,” as described by Garavelli (2003). For instance, among these studies, Vickery (1997) recognized product, volume, launch, access, and target market as the dimensions of flexibility in managing interorganizational relationships in a supply chain [68]. Viswanadham and
Srinivasa Raghavan (1997) include volume, mix, routing, delivery time, and new product design flexibility [69] as the dimensions of supply chain flexibility. An upstream supplier’s capacity for flexibility in one or more of the aforementioned dimensions can be a reason for a buying company to directly manage the supplier.

Flexibility in supply chain management becomes more important as the product life cycle shortens and competition increases [70]. In this research, the flexibility motivation category is defined by including elements that affect a supply chain’s agility, such as the capabilities to reduce total lead time, to adjust the new product development scheduling, to change manufacturing process flow and manufacturing capacity, to adapt modularity-based product design methods, to change the volume to be purchased or the lot size as required, and to mitigate the risks related to those flexibilities.

**Dependability Motivations**

In a competitive marketplace, dependencies exist between companies, and the dependency can be either time-based or function-based [71]. One company normally depends on other companies’ capabilities to increase its competitiveness in the market [72]. The time-based dependency is normally operationalized as the reliability of delivery and mobility [73]. According to Svensson (2002), “functional dependence refers to companies’ activities that are specialized and complement each other in channels or networks [74].” Technical support and innovation capability are examples of the “co-ordination of activities between companies in channels [75].” The compatibility between the top management of the companies is also reason of whether or not a buying company can depend on a supplier [76].
Dependability issues can influence management’s sourcing decisions. For example, in their study comparing single- versus multiple-sourcing situations across different industries and product types, Lambert and Harrington (1989) identified that delivery reliability and technical support were the focuses in single-sourcing situations, instead of price and quality as in a multiple-sourcing situation [77].

Beyond individual functional dependencies, the dependency between two companies also relies on the companies’ management philosophies. Lambert et al (1999) in their partnership model recognized the management compatibility or the similarities in both companies’ management philosophies as a factor to be examined in order to increase the likelihood of a successful partnership [78].

The four primary facilitators in every relationship are corporate compatibility, similar managerial philosophy and techniques, mutuality, and symmetry. ..... Facilitators reflect the degree of compatibility between the two firms and indicate the likelihood of partnership success. The more compatible the two firms, the better is the chance of partnership success. Facilitators should be assessed jointly by the two parties, because these measure the compatibility of the "combined environments" of the two organizations.

Any risks or vulnerabilities related to the dependency between two companies are also reasons to manage an interorganizational relationship closely. Management of the buying company, to diminish the disturbance or negative impacts that might result from these dependency issues at a tier beyond Tier 1, should work closely with suppliers at that tier.

**Context-Specific Motivations**

Besides the cost, quality, flexibility, and dependability motivations mentioned previously, there are some context-specific motivations that have been examined by researchers, such as a supplier’s financial health [79], social purchasing
responsibility [80], and situational factors. A supplier’s financial stability is crucial to a buying company because that will affect the supplier’s capability to deliver what is promised, especially when the item purchased is critical to the final product and there is no substitute supplier or it is difficult to switch to another supplier [81].

LaLonde and Masters (1994) argued that in the context of supply chain management, a supplier’s financial stability and environmental standards had become new criteria for managers in selecting suppliers and building long-term relationships:

Many firms have established deliberate plans, for example, to reduce their vendor base by up to 90 percent over a period of a few years. This represents a fundamental shift from the traditional purchasing philosophy which held that buying from many sources created competition and ensured low prices and high service. Under the supply chain approach, the firm very carefully reviews a set of potential sources according to a set of strict criteria including, for example, quality assurance programs, financial stability, environmental standards, and so forth. The firm then selects one or a small number of vendors and works to build a long-term relationship with each, based on the promise of close working relationships and nearly guaranteed order streams [82].

Socially responsible purchasing means that a firm proactively buys items from minority/women/small business [83]. Situational factors are factors closely related to the context of the proposed study in which the involvement of a Tier 1 supplier tends to complicate the motivations to go beyond Tier 1 [84]. For example, managers of a firm might feel that a Tier 1 supplier is incapable of managing the cost or quality of a Tier 2 part, so they want to deal with the Tier 2 supplier directly.

As a summary of this section, five kinds of motivations in interorganizational relationships are identified. They are classified into five constructs to develop a normative model for managing suppliers beyond Tier 1.
Strategies

A rich body of literature has identified a variety of strategies on supplier relationship management, such as relationship governance mechanisms, supplier selection and monitoring practices, supplier evaluation and performance measurements, supplier development, supply base consolidation, earlier supplier involvement, strategic alliance and partnership, strategic purchasing, and logistics integration [85]. Most of these strategies have overlapping activities in managing the drivers identified in the motivations section, such as cost and quality control, supplier certification, and supplier performance measurement [86]. In this research, some of these strategies for managing interorganizational relationships are disassembled into the activity level. The disassembled activities are regrouped according to the nature of the activities.

Those activities are categorized into five constructs: strategic cost management, total quality management, sourcing strategies, relationship management, and context-specific strategies [87]. Activities with short-term orientations in managing cost and quality are assigned into the first two constructs, respectively, while activities with long-term orientations in controlling cost and quality are categorized into the strategic sourcing and relationship management constructs. For example, sourcing a part to a qualified supplier with a long-term relationship orientation is classified as strategic sourcing instead of total quality management.
Strategic Cost Management

It is estimated that, on average, the direct purchasing cost accounts for 60% of a firm’s revenue [88], which means that the purchasing cost from Tier 2 suppliers will account for about 36% of a firm’s revenue, an amount significant enough to catch managers’ attention. Both managers and researchers have devoted much attention to finding ways to reduce the cost of raw materials. For example, total cost ownership studies identified a number of activities to minimize the total cost of purchasing. The two activities frequently employed to negotiate the purchasing price are volume leverage and group buy techniques [89], which are classified in this research as strategic cost management activities.

From a broader point of view, one not just limited to managing the purchasing cost and logistics cost, a number of other strategies have also been identified to control the total cost. Among these cost management strategies are targeting costing, competitive pricing, supplier cost structure analysis [90], and the total cost knowledge along the supply chain [91]. The cost targeting strategy achieves the overall cost goal by setting a target cost for purchasing an item and sharing cost information with suppliers in order to produce profitable final products [92].

Competitive pricing or competitive bidding, as well as volume leverage or group buy techniques, are also frequently used by purchasing organizations. For most commodities that are readily available in the market, these strategies can effectively help purchasing organizations achieve lower purchasing prices [96]. For example, since the unit price of an item is highly correlated to the volume purchased, increasing the purchasing volume is an effective way to lower the price. Knowledgeable
managers use “volume aggregation” or “group buy techniques” to increase their bargaining powers with their suppliers [97].

The acquisition of total cost knowledge across a supply chain or the analysis of supplier cost structure requires performing activities including the breakdown of supplier cost structures and sharing the supplier’s cost information with the purchasing company [94]. By working with key suppliers to understand the cost, management of the purchasing company can also use the supplier’s experience and expertise to generate more ideas in order to reduce the total cost of purchasing an item [95].

**Total Quality Management**

Total quality management (TQM) has been defined as a collection of activities to improve product quality and meet customers’ requirements. For example, Dean and Bowen (1994) defined total quality management as a managerial innovation that emphasizes an “organization’s total commitment to the customer and to continuous improvement of every process through the use of data-driven, problem-solving approaches based on empowerment of employee groups and teams [98].”

Although there are many different definitions and relevant practices of TQM, as acknowledged by Rungtusanathama et al (2005) [99], four basic aspects from Deming’s TQM theory are adopted in this research to represent TQM strategies. The four aspects are: (1) a customer focus, (2) continuous improvement, (3) structured problem-solving processes, and (4) employee empowerment [100]. In the context of supply chain management, the meaning of customer focus has been expanded by incorporating the supplier focus [101]. In fact, TQM activities have been applied
successfully by incorporating both customers and suppliers to meet their overall business objectives [102].

Most research has operationalized Deming’s TQM philosophy at the activity level by focusing on continuous improvement, problem-solving processes, and employee empowerment. For instance, this philosophy is operationalized by activities such as supplier monitoring, part quality “fire fighting,” and supplier’s employee training in the total quality management construct [103].

The purpose of monitoring suppliers is to continuously improve the quality of the supply parts. The quality “fire fighter” means that management from a buying company will manage a supplier whenever a quality problem occurs [104]. Similarly, companies might engage in training Tier 1 suppliers’ employees, or reach to suppliers beyond Tier 1, and empower the employees to solve quality problems [105]. These activities are included in this total quality management category.

**Strategic Sourcing**

Increased globalization and outsourcing have changed purchasing executives’ mindset with regard to the roles of sourcing in their organizations’ competitive advantages. Within the strategic sourcing category, management activities include global sourcing, sharing R&D capabilities, and limiting the strategic supply base [106]. Global sourcing becomes more popular as the cost pressure increases. In a study of the relationship between global sourcing and competitive advantage, Trent and Monczka (2002) note:

Today's competitive environment, more than at any other time in history, demands continuous improvement at increasingly dramatic levels. Firms that excel must implement strategies to achieve cost reduction, quality and
delivery improvement, cycle-time reduction, and improved responsiveness to customer, competitive, and financial market demands. As organizations search for new ways to gain competitive advantage, the development and execution of progressive global strategies and approaches become an increasingly attractive option [107].

Consequently, as argued by Kamath and Liker (1994), “closer relationships are needed and (management has) to focus their resources on a few strategically important suppliers [108].” Significant improvements in a company’s performance have been realized for both the purchasing companies and suppliers. For example, cost reduction has been shown as the primary benefit of closer interorganizational relationships, ranging from 15% to 30% [109].

Strategic sourcing should look at suppliers for both their resources and their capabilities, the two sources of competitive advantages distinguished by Teece, Pisano, and Shuen (1997) [110]. As explained by Murray and Wang, “Resources are inputs to organizational processes, and capabilities are a firm’s ability to combine, develop, and exploit its resources to create a competitive advantage [111].” Some suppliers might have a large stock of valuable resources and useful capabilities that the purchasing company does not have, but that are important to the purchasing company’s business objectives. To succeed in the global marketplace, management must find ways to quickly possess the resources and capabilities they do not have in order to develop rapid and flexible product innovation [112].

Thus, by strategically acquiring both resources and capabilities from suppliers, management of purchasing companies can form a unique base to build their own value-creating capabilities. As explained by Eisenhardt and Martin (2000), these capabilities can enable a firm to respond to specific markets and customers in distinctive ways that “lead to a competitive advantage over rivals [113].” In short,
managers can acquire suppliers’ resources and capabilities, such as R&D, technical support, and innovation capabilities, to build their own competitive advantages. In this research, such a strategy of acquiring a supplier’s capabilities is represented by the activity to “share R&D capability.”

Consolidating the supply base to maintain only a few strategic suppliers will help the buying firm deploy its limited resources and reduce overhead cost [114]. Strategic sourcing activities can be used as ways to accomplish four motivations including cost, quality, flexibility, and dependability [115]. A study of the sourcing policies in the automobile industry shows that strategic sourcing has associations with the first four motivation constructs identified in the previous section. For example, the imperatives for building closer relationships with suppliers in the automobile industry include:

1. Increasing importance of key performance criteria (e.g., delivery precision, quality, cost).
3. Production and product development activities become more globalized.
4. Outsourcing is increasing.
5. Companies reduce their supply base.
6. Product development time is decreasing.
7. Suppliers account for an increasing share of product development resources.
8. Use of JIT-deliveries is increasing [116].

**Relationship Management**

Activities with a long-term strategic orientation in closely managing suppliers beyond Tier 1 are assigned to a category titled “Relationship Management.” Relationship management oriented activities include choosing an appropriate governance mechanism, open communication, supplier quality certification, logistics.
process integration, and risks and rewards sharing. This construct aims for long-term relationships. Most of these activities will have multiple impacts on motivations.

Selecting an appropriate governance mechanism is a frequently mentioned approach in building and maintaining long-term business relationships. For example, a carefully designed contract with a fair risks and rewards sharing plan between a buying company and its supplier would enhance the long-term collaboration between them [117].

Open and effective communication is another frequently cited management activity in interorganizational relationship management. Strategic goals have to be clearly communicated among both parties in an interorganizational relationship. Watts and Hahn (1993) argued that, in the effort of developing long-term supplier relationships, for instance, the strategic objectives should focus on developing suppliers’ future capabilities in technology and product development, rather than on current quality and cost [118]. Good open and effective communication lies in the frequency, the personal involvement, and the genuineness of the effort [119].

In addition to appropriate governance mechanisms and open communications, logistics process integration was also an effective activity for managing close business relationships. In their study of logistics outsourcing, Lambert et al (1999) recognized that the reasons management outsourced logistics activities and integrated logistics processes were the hopes that “by joining forces, both organizations will improve efficiency, boost profitability, and improve customer services. When successful, these relationships can give both parties a competitive advantage in the marketplace [119].”

Logistics process integration can be operationalized as integrating the ordering, delivery, and payment activities, as well as jointly managing inventory. Logistics process integration can reduce cost, increase flexibility, improve delivery
reliability, and mediate conflicts between a Tier 1 supplier and its Tier 2 supplier [120].

**Context-Specific Strategies**

The last strategy construct covers situational activities that might not be appropriate to the first four strategy categories. Examples of such activities include adjusting a supplier’s organizational culture, price masking, and protecting the intellectual property of suppliers beyond Tier 1. Most of these activities are situational and context-specific, and they are primarily employed in response to the context-specific motivations identified in the motivation section.

Organizational cultural, or management philosophy, is “defined as the set of guiding principles, driving forces and ingrained attitude that communicate goals, plan, and policies to all employees and that are reinforced through conscious and subconscious behavior at all levels of the organization [122].” Adjusting a customer’s organizational cultural has been found to be effective in building a close relationship between a manufacturer and the customer. As Wheelright (1984) explained,

> Whether they are stated explicitly or only implied, such elements of an organization’s philosophy and customer are extremely important. They serve as an umbrella over various elements of strategy, and guide decision making within the organization. Such philosophy not only establishes the context within which day-to-day operating decisions are made but also set the bounds for the strategic options considered by the firm. Further, the philosophy guides the organization in making trade-offs not only among competing performance priorities (such as flexibility, delivery, cost, and quality) but between short-term and long-term goals and performance. Finally, the achievement of consistency among all activities of the firm tends to be linked directly to this philosophy and the degree to which it is shared throughout the organization.

Similar to the findings from the manufacturing perspective, researchers from the purchasing perspective also recognized the impacts that the organizational culture
had on the purchasing managers’ decisions on “which motivations matter most to the company, and which strategies will be appropriate [123].” Leenders et al (1994) argued that the need for adjusting organizational culture with regard to the service perspective of purchasing and the need for adapting to integrated procurement operations in organizations would ensure “suppliers to provide goods and services” from the “demand on supply chain management [124].”

As a summary of this section, five types of strategies are identified in managing an interorganizational relationship. Some of the strategies can be used for different motivations. In the next section, literature on the associations between motivations and strategies will be reviewed.

Associations between Motivations and Strategies

Motivations and strategies are interactively affecting management decisions to manage interorganizational relationships. In other words, it is the association between a motivation and a strategy that determines a governance mechanism to build and maintain an interorganizational relationship [125]. Most studies in interorganizational relationship management investigated the motivations and associated strategies in the way they naturally happened. Understanding their associations will provide the whole picture of how an interorganizational relationship was built and managed [126].

The review of literature on the associations between motivations and strategies is organized around each motivation category identified previously. The strategies that are tied to specific motivations under a motivation category are provided to illustrate the linkages between a motivation category and a number of strategy categories.
Cost Motivations and Associated Strategies

The cost motivation category is recognized as having associations with four strategy categories, which are strategic cost management, strategic sourcing, relationship management, and context-specific strategies. The connection between the cost motivation and strategic cost management has been described in the review of literature in strategic cost management. Activities used to reduce cost from a long-term perspective are classified into the strategic sourcing construct in this research. For instance, one of the purposes of global sourcing is to locate the low-cost suppliers globally [127], thus there is an association between the cost reduction motivation and the global sourcing strategy. By sharing a supplier’s R&D capability through integrating suppliers into new product development processes, management of the purchasing company can recognize opportunities in cost reduction at earlier stages of new product designs [128], another example of the association between the cost reduction motivation and the strategic sourcing strategy.

In addition to the cost management and strategic sourcing strategies, some studies reveal that cost can also be reduced by focusing on building and maintaining better relationships with suppliers [129]. For example, a partnership between a purchasing company and its supplier would allow both parties to improve their cost performance gradually [130]. Context-specific strategies such as price masking can also be an effective way to encourage suppliers to reduce the raw material or component price [131].
Quality Motivations and Associated Strategies

The literature shows that there are many approaches to solving quality related problems [132]. These approaches are covered by the four strategy constructs identified in the previous section: total quality management, strategic sourcing, relationship management, and other situational strategies.

Total quality management is the most popular and straightforward strategy to deal with quality problems, and management has applied numerous activities to improve quality issues listed in the quality motivation construct. For instance, a variety of quality control programs are applied by companies to reduce the defect rate of supply parts or to improve the quality of process control, such as Black Belt or Six Sigma [133].

A number of sourcing strategies can also be used to manage the quality issues. For example, when a manufacturer’s capacity permits, a single sourcing strategy will merit to quality assurance, although it will demerit price competition. As Burt (1989) notes:

…purchasing managers have long advocated the award of two or more contracts for the supply of critical materials. Presumably, competition drives prices down, and besides, does a big company care about a whole production line at the mercy of a small supplier? This is anachronistic thinking. When capacity permits, manufacturers are better off with single-source suppliers. A carefully selected and managed supplier offers the greatest guarantee of consistently high quality, namely, commitment to the product. Suppliers who feel part of the family permit manufacturers to subject them to rigorous inspection, certification, and education [134].

Building a long-term, close supplier relationship through projects such as a “supplier development program” is also an effective way to deal with the quality concerns [135]. For example, research shows that an appropriate incentive system (a
governance mechanism) can improve both companies’ performance in product quality [136].

Integrating logistics activities or processes has been recognized as a way to improve value-added service quality [137]. Management from both companies needs to work together to deploy these logistics activities in order to achieve the “global optimal,” not just the good for one company [138].

Finally, there might be unexpected quality issues or risks that can be solved by some strategies not included in the above four constructs, such as adjusting a supplier’s organizational culture, a strategy primarily used in dealing with new international suppliers [139]. The association between the quality motivation and the construct of context-specific strategies is open to further exploration.

**Flexibility Motivations and Associated Strategies**

Flexibility represents a company’s capabilities with respects to the total lead time reduction, the new product design cycle, the ability to change manufacturing process flow, the allowance in purchasing volume or production lot size, and the level of product modularity [140]. In some cases, management of a purchasing company needs to acquire such a capability to improve their competitiveness. One approach is to find the supplier who has such a capability, and another approach is to work with the supplier to develop such a capability.

In an environment with high uncertainties, flexibility will provide management competitive advantages to quickly respond to the market and better serve the end consumers [141]. Global sourcing is one of the direct approaches to acquire the flexibility capability from the global supply base. As product life cycles are
getting shorter and shorter, a supplier’s capabilities such as modular-based design, flexible manufacturing process, and flexible production lot size will be the new criteria that purchasing managers pursue [142]. Consolidating the supply base by allocating more volume to qualified suppliers with the flexibility capability is also an approach to directly gain more flexibility [143].

Relationship management strategies, on the other hand, will provide management indirect approaches to gain the necessary flexibility capability. Normally, it takes a longer time to build such a capability with an interorganizational relationship. However, once such a capability is established, it will become a unique and profitable relationship that competitors cannot copy [144].

\**Dependability Motivations and Associated Strategies**

In addition to cost, quality, and flexibility motivations, many authors showed that other criteria, namely dependability motivations, were in most cases equally or more important. Dependability is normally referred to as the reliability of delivery. However, other criteria such as innovation and technical support are also highlighted by many authors as dependability motivations if they are accompanied by a long-term orientation [145].

Cagliano (2005) and Lamming et al (2000) supported this point by arguing that in addition to delivery, new factors such as “innovative and unique products” will become important to the buying firm, in particular “when supply has a direct impact on competitive performance and consequently is strategically relevant [146].”

The dependability motivations that buying firms have can be achieved by using different management activities. Previous research recognized a variety of
activities that took place within the contexts of total quality management, strategic sourcing, relationship management, and context-specific strategies as defined in this research.

These activities include training and educating the supplier’s personnel [147], strategic supplier evaluation as a prerequisite of the sourcing decision [148], and supplier certification or development programs. These supplier certification or development programs include a variety of governance mechanisms with a long-term orientation such as raising performance expectations [149], recognition and awards [150], the promise of future benefits [151], and direct investment in the supplier by the buying firm [152].

For example, several authors who mentioned innovation and technical support as dependability motivations, that is, the ability of a supplier to provide design and technological capabilities to the purchasing company, agreed that a consolidated set of motivations with long-term orientations will be better achieved by management activities focusing on relationships rather than on transactions [153]

**Context-Specific Motivations and Associated Strategies**

Motivations classified into the category titled “Context-Specific Motivations” are recognized to have associations with a number of strategy categories including strategic cost management, relationship management, and context-specific strategies. Since only three major motivations are recognized in “Context-Specific Motivations” based on the review of literature, the associated strategies will be introduced in the ways that these motivations were investigated by the original authors.
For example, financial health has been recognized as a primary concern when a purchasing organization is beginning to build a close relationship with a supplier [154]. Understanding the supplier’s cost structure, an activity classified in the strategic cost management category, can enable management of the purchasing organization to identify signs of possible financial disasters. The concern of financial health can be also be managed by applying appropriate governance mechanisms such as the payment terms in a contract [155].

Social purchasing responsibilities mainly include environmental concerns and purchasing from diversified suppliers [156]. Research has shown that purchasing with environmental concerns can be performed by appropriate governance mechanisms such as preventing some raw materials from flowing into the purchasing organization’s supply channels [157]. Similarly, the goal of supplier diversification can be achieved by specifying a portion of the purchasing volume that has to be sourced from minority suppliers, women-owned business, and small enterprises [158].

As a summary of this section, the literature has shown patterns in the associations between motivations and strategies. These associations provide a clear picture of how motivations and strategies interact, and they can be used to develop the normative model described later in this chapter.

**Evaluation of Relationship Performance**

The performance measurement of managing suppliers beyond Tier 1 could be so complicated that it in itself might be a dissertation topic. For example, the performance outcomes of an interorganizational relationship can be focused on the buyer side, on the supplier side, or on both sides. Besides, the areas to be evaluated
also vary greatly [159]. Since the primary objective of this research is to develop a normative model illustrating “why” and “how” to manage suppliers beyond Tier 1, the research is focused on the detailed contents of motivation and strategy, rather than the detailed performance metrics. The performance related literature is not reviewed in detail here.

Since the motivations in interorganizational relationship management are reviewed mainly from the perspective of core competencies or competitive advantages, relationship performance will be measured on the business objectives identified in the motivation section. In this research, the performance metrics can be either “hard” performance indicators with numeric results, such as % of cost reduction, % reduction of defect rate, delivery accuracy, inventory reduction, lead-time reduction, and new product introduction rate improvements [160], or “soft” performance indicators perceived by managers, such as improved business relationships [161] and enhanced competitive advantages [162].

A Normative Model

Based on the review of literature in the four main streams of interorganizational relationship research, a conceptual framework for managing the relationship dynamics in a supply chain network is proposed, as shown in Figure 2.4. In this framework, the relationship dynamics in a supply chain network can be operationalized with respect to the relationship development stages, the dyadic factors of key dyadic relationships, and relationship values, with full consideration of the product, industry, market, supply network structure, and the motivations and strategies. In the middle of the left side of the framework, motivations and strategies
Figure 2.4

A Conceptual Framework for Managing the Relationship Dynamics in a Supply Chain Network
are enclosed with a dotted box, representing the normative model to be extensively explored in this research. The relationship values in the category of relationship dynamics on the right side will also be described in this research.

The normative model for managing suppliers beyond Tier 1 is developed to illustrate why and how to manage an interorganizational relationship, as shown in Figure 2.5. This model serves as the starting point to design case study instruments to collect field data with respect to why and how to manage suppliers beyond Tier 1. Necessary changes are made after field data are collected and analyzed.

![A Normative Model for Managing Suppliers beyond Tier 1](image-url)

**Figure 2.5**

A Normative Model for Managing Suppliers beyond Tier 1
The Decision-Making Process of Managing Interorganizational Relationships

The importance of a normative decision-making process model has been recognized by researchers from different areas related to interorganizational relationship management [163]. To generate a normative model of the decision-making process of managing interorganizational relationships is another primary research objective of this research. Based on a number of studies that have developed some practically proven models [164], the five-stage relationship development model developed by Lambert, Emmelhainz, and Gardner (1996), as shown in Figure 2.6, is selected and adjusted to reflect the key decisions to be made at each stage in developing relationships with suppliers beyond Tier 1.

Key decisions along the five stages are recommended in this model, including:

1. To review corporate, marketing, and sourcing strategies, as well as external environment changes that might facilitate relationship transitions, and to examine the supply chain structure and the characteristics of the product and the industry with regards to the strategic importance of the item, market availability, product/technical complexity, demand/supply uncertainty, and firm size and its position in the industry [165].
2. To identify key motivations for building a close interorganizational relationship and prioritize these key motivations.
3. To choose appropriate strategies for these motivations.
4. To implement proven business practices or activities to fulfill the strategies.
5. To measure and evaluate the performance of a close interorganizational relation either from the buying firm’s perspective or from the supplier firm’s perspective.
A Framework of the Decision-Making Process

Review Corporate, Marketing, Manufacturing and Logistics Strategies; Examine Supply Chain Structure and the characteristics of product/industry.

To identify key motivations for building close interorganizational relationship and prioritize these key motivations.

To choose appropriate strategies for each of these motivations.

To implement proven business practices or activities to fulfill the strategies.

To measure and evaluate the performance of an interorganizational relation from either perspective or combined.
Summary

Four main streams of relationship management studies have been recognized from the extant literature: (1) the process of forming and maintaining an interorganizational relationship; (2) the basic conditions such as the importance of purchasing (motivations) and the supply chain network structure; (3) the governance mechanisms (strategies); and (4) performance measurement.

The first stream is used to determine the process of forming and maintaining an interorganizational relationship. In fact, the four main research streams under summarization are identified from the review of literature in this stream. It is recognized that three distinct stages exist in the development of an interorganizational relationship.

The second stream looks at ways to determine purchasing strategies based on fundamental information such as the strategic importance of an item or raw material, production characteristics, external market conditions, supply chain network structure, firm size, and market position. The importance of purchasing to the buying company and the supply chain network structure in most cases will jointly affect the purchasing decision.

The third stream examines the governance mechanism in interorganizational relationship management. It deals with how a relationship is managed and why. Since the primary objective of this research is to develop a normative model for managing suppliers beyond Tier 1, the three topics related to the governance mechanism, motivations, strategies, and their associations, are reviewed in detail.
The last stream considers the performance evaluation of interorganizational relationships. The relationship with a supplier beyond Tier 1 will be measured against a higher-level buying firm’s strategic objectives and overall business performance. A framework of a multi-stage decision-making process is also developed, with key activities recommended at each stage.

The management of suppliers beyond Tier 1 is an unexplored area in the domains of supplier relationship management and interorganizational relationship management. This research focuses on investigating why and how to manage suppliers beyond Tier 1, and the normative model developed in this chapter is used as the starting point to choose an appropriate research methodology, which is to be discussed in Chapter 3, Research Design.
References


[8] Ibid.


[23] Lambert et al in [19].


[27] Ibid.


[31] Spekman and Carraway, 2006, as in [28].


[43] Ibid.

[45] Ibid.

[46] Ibid.


[58] Svensson (2004) as in [51].


[72] Upton (1994) as in [63].


[75] Ibid.

[76] Jutter (2005) as in [57].


[81] Ellram (1990) as in [79].


[84] Same as [79].


[86] Ibid.


[96] Zsidsin et al 2003 as in [91].


[104] Ibid.


[112] Teece, Pisano, and Shuen (1997) as in [110].


Lambert (2006) as in [1].


Ibid.


Teece, Pisano, and Shuen (1997) as in [110].


[130] Ibid.


[133] Ward *et al* as in [60].


[137] LaLonde and Masters (1994) as in [83].


[139] Leenders *et al* as in [122].

[140] Teece, Pisano and Shuen (1997) as in [110].


[149] Same as [147].

[150] Same as [148].

[151] Same as [147].

[152] Same as [147].

[153] Same as [79].

[154] Same as [79] and [83].

[155] Same as [79].

[156] Same as [79].


CHAPTER 3

RESEARCH DESIGN

In this chapter, the research methodology used in this study is presented. The overview of this research project is presented in the first section, as well as the unit of analysis, the organizational cooperation, and the goal of data collection.

The second section describes the research methodology with respect to the type of case study design, development of a set of standard case study instruments, and case study data analysis tactics. It also contains a description of the four tests used to ensure the robustness of a case study research.

In the third section, the pilot case study and sources of evidence are presented. A database that contains all evidence and makes them traceable is also described.

In the fourth section, the process of data analysis is described in detail. Since this research follows the “deductive” qualitative research methodology [1], data analysis techniques that support this methodology are presented.

The formats of the individual case study report and the overall case study report are included in the fifth section. Appendixes A and B contain the Interview Guide and Case Study Research Protocol and supplement this chapter.
Overview of the Case Study Research

The major purpose of this research is to develop a normative model for managers to manage suppliers beyond Tier 1. In addition, the decision-making process for managing suppliers beyond Tier 1 will also be explored.

The key research questions are:

1. Why do managers manage suppliers beyond Tier 1?
2. How are the decisions of managing suppliers beyond Tier 1 made?
3. How is a supplier beyond Tier 1 managed?
4. How is the management of a relationship with a supplier beyond Tier 1 evaluated?

The unit of analysis is the supply chain of a specific raw material or component of interest. Usually, different products have different supply chain structures. As each product has a variety of raw materials and components, the importance of individual raw materials or components on the final product will be different from each other. Therefore, management will have different reasons and strategies for managing a raw material or component at a tier beyond Tier 1 when necessary. The selection of a raw material or component supply chain as the unit of analysis in this research will better capture the essentials of managing suppliers beyond Tier 1.

The companies that participated in the case studies were not randomly selected; rather, they had previous associations with the university. Management of the companies showed interest in this research and a willingness to participate. Most interviewees had titles of VP in supply chain management, operations, or in purchasing, while a few had titles of senior manager or director in a purchasing group of a particular raw material or component.
This research was designed to collect data from six to eight companies, with on average two supply chains in which suppliers beyond Tier 1 were managed directly. The six to eight companies should represent completely different industries. It would be ideal to have two profiles of different, or unique, raw material or component supply chain from each company in order to “maximize the variance [2].”

**Research Method**

This research was designed to explore the motivations and strategies for managing suppliers beyond Tier 1. The case study approach was chosen for three reasons. First, the “why” and “how” research questions suggest using a case study approach [3]. Second, it is only during a case study interview that an investigator can probe unseen constructs and explore their logical associations [4]. Third, a case study will guarantee information richness by providing the interaction mechanisms between an investigator and the informant [5].

This research was designed in accordance with the five-stage case study research process recommended by Stuart *et al* [6]: to define the research questions, to develop the instruments, to gather data, to analyze data, and to disseminate findings. The research questions were described in Chapter 2.

It has been suggested that the amount and type of instruments should be a function of a researcher’s conceptual focus, research questions, and sampling criteria [7]. Little prior instrumentation and open-ended questions places the emphasis on certain types of validity such as *construct, descriptive/contextual,* and *interpretive,* while much preinstrumentation emphasizes *internal validity* and *generalizability* [8].
Basically, this research is *exploratory*, without prior knowledge of the parameters or dynamics of managing suppliers beyond Tier 1. There are, however, some *confirmatory* features in this research, with respect to the scope of the study and some variables in the conceptual framework [9]. Two basic instruments were prepared prior to fieldwork. One was an interview guide with interview questions based on the operationalization of the four key research questions, as shown in Appendix A. The other instrument was a standard case study format, the Case Study Protocol, as shown in Appendix B. The case study protocol has five parts: the overview of the research, research method, data collection, data analysis, and the reports of research findings. In fact, the presentation of this chapter is organized in this sequence.

Interview questions were developed and incorporated into a semi-structured interview guide [10]. Each investigator was very familiar with the guide, but had latitude to use a personal congenial way of asking and sequencing the interview questions, and to segment them appropriately for different respondents. The interview guide will be described in the Data Collection subsection titled “The Framework For Data Collection.”

The method of data collection and data analysis needs to be defined at the case study design stage [11]. Both data collection and data analysis are highly related to the research scope and research questions. Four tests have to be considered at the research design stage to guarantee high-quality case study research, as recommended by Yin (2003) [12]. The tests are construct validity, internal validity, external validity, and reliability. As shown in Table 3.1, tactics to ensure construct validity, reliability, and internal validity are to be done at the stages of research design, data collection, and data analysis. These tactics are described in the next two sections, Data Collection and Data Analysis.
<table>
<thead>
<tr>
<th>Tests</th>
<th>Case Study Tactics</th>
<th>Phase of Research in which Tactic Occurs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construct validity</td>
<td>• Use multiple sources of evidence</td>
<td>data collection</td>
</tr>
<tr>
<td></td>
<td>• Establish chain of evidence</td>
<td>data collection</td>
</tr>
<tr>
<td></td>
<td>• Use multiple informants and have them review draft case study report</td>
<td>composition</td>
</tr>
<tr>
<td>Internal validity</td>
<td>• Do pattern-matching</td>
<td>data analysis</td>
</tr>
<tr>
<td></td>
<td>• Do explanation-building</td>
<td>data analysis</td>
</tr>
<tr>
<td>External validity</td>
<td>• Use theories in single-case studies</td>
<td>research design</td>
</tr>
<tr>
<td></td>
<td>• Use the replication logic in multiple-case studies</td>
<td>research design</td>
</tr>
<tr>
<td>Reliability</td>
<td>• Use case study protocol</td>
<td>data collection</td>
</tr>
<tr>
<td></td>
<td>• Develop case study database</td>
<td>data collection</td>
</tr>
</tbody>
</table>


Table 3.1

**Tactics for the Four Case Study Design Tests**
The external validity is enhanced by following the embedded multiple-case sampling scheme recommended by Yin (2003) and Mile and Huberman (1994) [13]. Sampling over multiple companies adds confidence to the findings. By looking at a range of similar and contrasting cases, investigators of this research can “understand a single-case finding, grounding it by specifying how and … why it carries on as it does [14].” By following a replication strategy [14], investigators can “strengthen the precision, the validity, and the stability of the findings [15].”

Research findings are disseminated in two ways, written reports and presentations. Both individual case study reports and an overall case study report were prepared. Individual case study reports were sent to the corresponding participants for their comments on the accuracy of the data collected from their supply chain(s). Based on their comments, an overall case study report was developed and sent to all participants to share other companies’ best practices.

**Data Collection**

The process of data collection is described in this Chapter. The embedded multiple-case design method was selected for two reasons. First, an embedded case design will have multiple “units” available to analyze. In the context of the proposed research, a case company might have more than one product line or supply chain where management engages in different activities in managing suppliers beyond Tier 1. Embedded case design helps test construct validity, internal validity, and reliability within a single company. Second, the “replication” logic of a multiple-case design guarantees the external validity and the generalizability of the findings [17].
Eisenhardt (1989) recommended that six to 10 companies should be selected carefully for the purpose of generalizability in order to reach the theoretical saturation point [18]. Mile and Huberman (1994) recommended that a qualitative research study should not have more than 15 cases [19]. This research was designed to interview six to eight companies, and each company had on average two supply chains of interest.

Both manufacturers and retailers active in managing suppliers beyond Tier 1 were chosen. Purchased items from suppliers beyond Tier 1 ranged from raw materials to finished goods, with unit prices ranging from a few cents to hundreds of dollars. The chosen companies had previous associations with the University.

Data were collected from multiple sources of evidence, such as documentation, archived records, and personal interviews, as recommended by most qualitative researchers [20]. In the approach of the personal interview, multiple informants would be interviewed [21]. After conducting the pilot study and interviews with the second case study company, nevertheless, the researcher found that one source of evidence, i.e., the personal interview, could provide sufficient information. Indeed, regarding the motivations, the strategies, and the decision-making process, one knowledgeable informant could provide all the necessary information. All research questions were about “fact,” instead of personal “judgment” or “opinion.” Therefore, the respondent bias was not an issue in this research [22]. For the rest of the five companies, we did not ask for participation from multiple informants.

In managing the data, a case study database was built and a chain of evidence was used [23]. A case study database was built to increase the reliability of the entire case study. For each company, raw data such as the interview tape, notes taken during
the interview, the transcript and documents provided by the company, together with
the individual case study report, were put together as a case study database for future
independent inspection. A chain of evidence was also maintained to increase
information reliability. This principle would allow an external observer to follow the
derivation of any evidence, ranging from initial research questions to ultimate case
study conclusions [24]. With such a chain of evidence, an observer could move from
one part of the case study process to another, with clear cross-referencing to
methodological procedures and to the resulting evidence [25].

A presentation of the purposes of the study and the research methodology was
given to the companies in a meeting and follow-up phone calls and emails were made
to those who had shown their interest in the research. Once a company agreed to
participate, an appropriate manager would receive a letter or an email of introduction
and a brief overview of the research objective, together with a copy of an interview
guide and/or the case study protocol.

At the beginning of each interview, the investigator briefly introduced the
purpose of the research, asked for permission to audio-tape the interview, and
promised not to disclose any information without written permission from the
company. Each tape was transcribed for coding and analysis.

The Pilot Study

The purpose of this research was to develop a normative model that would be
flexible enough to be adapted to the realities in as many types of companies as
possible. Therefore, the structure of the normative model developed on the basis of
the review of literature and the interviews questions needed to be validated first by conducting a pilot study.

The goal of conducting a pilot study was to uncover any problems that might be involved within the normative model or in the process of collecting data related to the motivations and strategies for managing suppliers beyond Tier 1. A pilot study could also verify if the research questions were operationalized in the way the investigator wanted.

The company used as the pilot study was in the non-alcoholic beverage industry. In 1997, the management of the company started to manage raw materials suppliers (third tier suppliers) in the packaging context, after the cost of packaging materials had a significant financial impact on the company’s business performance.

The practices used by the pilot study company justified the structure of the normative model. For example, in order to get the raw material price down, management chose to increase their negotiation power by aggregating the demand of raw materials. Therefore, on the motivation side in the normative model, raw material cost (i.e., the cost of resin or aluminum) could be coded as a variable, and aggregating the demand could be coded as a strategy on the other side of the normative model. The association between raw material cost and employing volume leverage meant that if management wanted to reduce the cost of a raw material, they could aggregate the demand at a lower tier and employ volume leverage to increase their negotiation power.

Their practices could also provide enough information to generalize the decision-making process. They first recognized that cost was important to their business. Next, they went on to understand the supply chain structure and the cost elements at each node, and identified that it was the cost of raw materials that needed
to be managed directly. Possible strategies to reduce the cost were developed and management evaluated the motivations and strategies collectively. In the case of PET bottle, they implemented the strategies by overcoming any resistance from Tier 2 suppliers (i.e., converters) and Tier 3 suppliers (i.e., raw material suppliers). The management of suppliers beyond Tier 1 brought the desirable outcome that the cost of packaging material was more predictable.

The pilot study verified the normative model with respect to its fundamental structure, i.e., the motivations, the strategies, and their associations. In addition, the goal to generalize a decision-making process was also attainable since the pilot study showed an explicit flow of decisions that management made in managing resin suppliers.

All data collected from the three interviews in the pilot study were later corroborated by two additional managers in the company. It was found from the pilot study that one informant who was in charge of a raw material or component supply chain had sufficient knowledge about the motivations, strategies, and decision-making process. This conclusion was justified in the interviews with the second case study company from which three managers were interviewed. Thus, for the remaining research, it was not asked for participation from multiple informants in each company.

Based on the experience gained in the pilot study, some interview questions were adjusted to make them more straightforward and clear. One problem was the quality of the audio tape. A mini-tape recorder was used in the pilot study, and it was difficult to transcribe from each tape because of the poor quality of the recording. In later interviews, both a standard tape recorder and a digital recorder were used simultaneously to ensure the quality of the recording.
Two individual case study reports were prepared, with a brief summary of the company’s experience in managing suppliers beyond Tier 1. Both reports are provided in Appendix C, which is entitled “The Pilot Study.”

**The Framework for Data Collection**

An interview guide was developed on the basis of the four generic research questions. As shown in Appendix A, each of the four questions was operationalized into a few questions that framed the questions to reflect different and/or related perspectives.

Before asking motivations, a few general questions were added, including: “Are you directly managing suppliers beyond Tier 1?”; “Can you give us a few examples and describe the relationship?”; “What is the final product?”; “What is the raw material or component being managed?”; and “What does the supply chain structure look like?”

During the interviews, it was found that the informants were more likely to jump into the motivations immediately before having a chance to be asked about the supply chain structure. Thus, the question about the supply chain structure was usually asked in the middle of the interview.

**Why do managers manage suppliers beyond Tier 1?**

The first generic question was designed to collect data on the motivations of managing suppliers beyond Tier 1. It was operationalized into questions such as “Under what event the relationship was initiated?”; “What were the key drivers?”; “How are these motivations related to your company’s overall business strategies?”; or “What were these motivations driven by?”
Most informants gave the investigator brief stories about when and why management of companies went to suppliers beyond Tier 1 to directly manage raw materials or components. Some of them also gave clear and short expressions of what the motivations were. For example, a manager in the pilot study pointed out at the beginning of an interview that cost was the primary driver.

Usually, the informants would talk freely, but when the investigator felt something was interesting, questions would be asked to determine if there was valuable information related to this research, especially something not shown in the normative model.

When informants had no more information to add as motivations, the investigator would make a short summary, give some hints, or ask straightforwardly whether they had done “this” or “that.” For example, the investigator would ask, in addition to the A, B, and C motivations, whether the informant saw other reasons such as D or E that drove management to manage suppliers beyond Tier 1. Normally, the answers were “no,” since only a few strategic issues could drive management to spend extra resources to go beyond Tier 1, and such issues were well-kept in management’s mind.

Cost and quality were the two most-cited motivations. There were no problems in collecting data related to the two constructs.

Flexibility was apparently one of the key motivations that drove management to manage a direct supplier or customer closely, but no informant mentioned it as a motivation for managing suppliers beyond Tier 1. Sometimes the interviewer had to ask about the motivation of flexibility in a straightforward way. Surprisingly, most of the informants, at most, agreed that flexibility might become an issue to keep under oversight once management began the relationship, but was not the reason to begin
managing a direct supplier or customer. After this acknowledgement, the investigator stopped asking questions about flexibility.

Dependability-related motivations, especially an upstream supplier’s delivery reliability, were frequently mentioned by the informants. Top management compatibility, a potential motivation recognized in the literature for managing a direct supplier or customer, was not recognized as a reason to manage suppliers beyond Tier 1. Rather, in most cases, there was some resistance from top management of upstream suppliers beyond Tier 1 that managers of the participating companies had to overcome.

The situational motivations were put in a construct titled “Context-specific motivations.” Situational or context-specific motivations were less frequently mentioned by informants. Normally, by the end of each interview, the investigator would ask informants if there were situational motivations that had not been covered. It was found that there were three context-specific motivations, including market intelligence, social purchasing responsibilities, and financial health.

**How are the decisions of managing suppliers beyond Tier 1 made?**

The second generic question was designed to collect data about the decision-making process. In most cases, information about the decision-making process was mentioned by managers naturally when they were talking about the motivations or strategies. The five-stage interorganizational relationship development model developed in Chapter 2 was used as a prototype to generalize how the decision was made at each stage of the development process of the relationship with a supplier beyond Tier 1.

Questions that were operationalized under this generic research question were designed to lead informants into providing information along the whole relationship
development process. In order to fully understand the process of relationship development, this kind of questions was usually asked together with the question to be described next, “How does the relationship evolve?”

**How is a supplier beyond Tier 1 managed?**

The third generic question was designed to collect information about the strategies that management used to manage suppliers beyond Tier 1. Unlike the answers about motivations, most informants gave the information about the strategies in a subtle way. They usually talked about how they managed a supplier beyond Tier 1 when they answered questions about motivations. When the investigator felt that a strategy might be appropriate to a specific motivation but the informant did not mention it, the informant was asked whether or not they used “this” strategy.

Normally, the investigator did not encounter any problems in collecting data regarding the strategies. In fact, most of the activities were mentioned by informants in a natural way as they were talking about the motivations. Certain strategies were frequently used for some specific motivations. Only in a few cases did managers say that they were not sure if the strategy they used was the best, and they showed their intentions to know what others would do given a similar situation.

**How is the management of a relationship with a supplier beyond Tier 1 evaluated?**

The last generic research question was to understand how the performance of a relationship with a supplier beyond Tier 1 was evaluated. In some cases, informants mentioned the evaluation issue proactively. When necessary, the investigator probed the question by asking informants how they measured the performance improvements that resulted from managing suppliers beyond Tier 1. In most cases, they did not give
us numeric financial results due to confidentiality concerns, but all informants agreed that the management of suppliers beyond Tier 1 had met the objectives they expected.

Closing Questions

Most interviews were ended by asking informants if they had other interesting items related to managing suppliers beyond Tier 1 that had not been described, and if they had other raw materials or components management wanted to manage directly but had not done that yet. A few informants did provide us some new information about other raw materials, components, or areas they wanted to explore, but none of the informants added new information related to motivations and strategies.

Data Analysis

The research questions were designed to collect interview data for the purposes of the study. For example, research question one and three listed above were designed for the second research objective, that is, to identify motivations and strategies. Therefore, contents coded from the answers to these two questions were more likely interpreted as either motivations or strategies.

Two phases of data analysis were conducted, within-case analysis and cross-case analysis. The within-case analysis was performed on the basis of an interview transcript. A case study write-up was prepared and dispatched among investigators and informants for verification. If disagreements about the write-up existed, an investigator went back to check the original tape or contact the informants when necessary. Contents of interest were coded. Since the literature-based normative model was developed before data analysis, most of the codes were eventually expressed in the terms used in the normative model. In the cross-case analysis, pairs
of cases were first selected and the similarities and differences of codes within each pair were identified. Finally the similarities were consolidated into one of the motivations or strategies constructs in the normative model.

**Within-Case Analysis**

Since most data were collected with respect to motivations and strategies, in this section the coding process on motivations and strategies will be illustrated on the basis of the transcript of the pilot study. The transcript was first dissected meaningfully, keeping the relationships between each part intact.

Codes are tags or labels for assigning units of meaning to the descriptive or inferential information. Codes were first added to some key words that investigators believed meaningful. Since the motivations and strategies were most likely mentioned by the informant in a natural way, codes of motivation and strategies would be added to the transcript simultaneously. In the following paragraph, an excerpt from the transcript in the pilot study was used to illustrate the process of within-case analysis.

In the first run, key information was highlighted, and motivation elements were boxed while action elements were circled. Figure 3.1 shows the excerpt with information highlighted. For example, “less value to play with the bottle;” “the driver of the bottle price is the cost of resin;” “it is difficult to manage business around high uncertainty and volatility;” “the largest consumer on global basis;” “raise the volume;” “have management understand the cost structure” were information of interests and were highlighted.
“If we go back to history, PET bottle became important to our system as a packaging medium and it was provided by third party suppliers, or Tier 1 suppliers. This worked well at the outset. There was a lot of value in the system, both for (the case study company) and for the converters. But as the volume got bigger and the bottle became more commoditized, and the cost of the bottle went down, there is less value to play with. The key driver for bottle prices is not the conversion cost, but the cost of resin that the bottles are made of. That was something that we had no control of. It is difficult to manage the business around high uncertainty and volatility associated with the resin cost. …..We realized also that the volume of the entire system made us the largest consumer of PET bottles on a global basis… I thought I could first raise the volume, and have management understand the cost structure.”
Coding is the process to show the associations within codes. Coding was not delayed until the end of data gathering; rather, it was done whenever a new transcript came in [26]. In Figure 3.1, the expression of “less value to play with the bottle” seemed to be a motivation to do something. In fact, due to this reason, management of the company started to look at the cost structure of the PET bottle, and found that “the key driver for bottle prices is the cost of resin.” Since they had “no control of the cost of resin,” they wanted to manage the resin suppliers to cut the resin price. Thus, it was one of the motivations for managing converters (Tier 2 suppliers) and resin suppliers (Tier 3 suppliers). In order to cut the resin price, management of the company needed to “raise the (resin) volume.” Since the case study company is “the largest consumer of PET bottle on the global basis,” it is possible to raise the resin volume big enough for a resin supplier to negotiate resin prices on the global basis. The “cost of resin” was coded as “the cost of raw material”, while “to raise the volume” was coded as to “employ volume leverage,” as shown in Figure 3.2.

The information that “it is difficult to manage business around high uncertainty and volatility” also contains motivation elements. The resin price had high uncertainty and volatility that management wanted to control. In order to do that, management of the case study company had management of the converters and resin suppliers develop themselves and understand the whole process. “High uncertainty and volatility” was coded as “price volatility” while to “have management understand the cost structure” was coded as to “gain total cost knowledge,” as shown in Figure 3.2. Information such as “less value to play with the bottle” and “the largest consumer of PET bottles on the global basis” was not included in Figure 3.2 since they were not the direct motivations for managing suppliers beyond Tier 2.
Figure 3.2

An Illustration of the Coding Process

(Key driver of bottle cost is) the cost of resin
(Code: Cost of raw materials)

It is difficult to manage business around high uncertainty and volatility
(Code: Price volatility)

Raise the volume (Code: Employ volume leverage)

Have management understand the cost structure
(Code: Gain total cost knowledge)
In summary, on the basis of the data from the pilot study, the motivations and strategies could be successfully collected and coded, and the association of them could be recognized and illustrated as pairs of motivation-strategy. Inappropriate elements could be reasonably ruled out without affecting information richness concerning motivations and strategies.

**Cross-Case Analysis**

After more than two cases were transcribed, a cross-case analysis was performed. Two coding tactics can be used in the cross-case analysis. One is to group codes into categories or constructs and then look for within-group similarities coupled with inter-group differences. This process is also referred to as “pattern coding” or “axial coding.” The other coding technique, known as “open coding” or “selective coding,” was also employed.

Pattern codes are explanatory or inferential codes, ones that identify an emergent theme, configuration, or explanation [27]. For example, in the normative model, there is a construct titled “Cost.” From the within-case coding processes, investigators found a variety motivations related to cost. These codes of motivations were put together under a construct called “cost” for further analysis. This process is called pattern coding, and the “cost” construct is also called as a pattern code. After pattern coding, similar motivations or strategies from each pair of motivation and strategy that had been identified in the within-case coding process were grouped into a number of categories. This is an analogue to the cluster-analytic and factor-analytic devices used in statistical analysis [28]. Explanation building was then conducted by doing “if-then” analysis for those situations when individual case study evidence did
not support the normative model, or when it was difficult to identify common patterns by conducting cross-case analysis [29].

For example, in the two supply chains identified from the pilot study, the price volatility was mentioned by managers from the supply chains of both packaging materials. In addition, management in both supply chains applied similar strategies to reduce the price volatility, such as to aggregate demand, to gain total cost, and to negotiate a longer term deal. Therefore, there existed the within-group similarities that showed the patterns.

The inter-group differences could be easily found among motivations, such as the differences between cost and quality motivations, and among strategies, such as the differences between strategic cost management and total quality management. Thus, it will not be described here.

**Organizing the Summary**

In addition to the within-case and cross-case analysis, organizing the summary of identified motivation and strategy in a data accounting sheet can also help to analyze the data. It also makes it easier to recognize the “theoretical saturation point.” When a new interview was completed and motivations and strategies were coded, they were put into data accounting sheets, which had a group of motivations or strategies as one dimension and the case ID as another. A matrix with specific motivations and management activities is provided to show the associations between motivations and strategies, which will be described in Chapter 5. When no new motivation and strategy appeared in all the data accounting sheets, the theoretical saturation point was reached and the data collection process could be stopped.
Actually, the “saturation point” was recognized after collecting data from five companies. Nevertheless, the investigator continued to interview participants from two additional companies to enhance the “saturation point.” The summary of motivation and strategy based on the data accounting sheets will be described in Chapter 5.

Since each motivation construct should have more than one associated strategy construct, the summary of the association between motivations and strategies was illustrated by putting one construct of motivations on the left side, all constructs of strategies in the middle, and the detailed management activities of each strategy on the right side. This summary is presented in Chapter 5. Presenting the summary of the association in this way could clearly represent how each individual motivation was reached by a selection of strategies. Aggregating the associations between motivations and strategies at the construct level gives us an empirically based normative model, which will be described in Chapter 5.

In summary, in order to conduct a high-quality case study, the necessary conditions (the four tests) to conduct a case study research at the design stage are considered, and the common techniques to collect and analyze data are described. A case study protocol was used to guarantee consistent data collection and analyses throughout the research project. Some approaches of presenting the summary of findings were also prepared at the research design stage.
References


[21] Ibid.


[23] Ibid.


[25] Ibid.


[27] Ibid.

[28] Ibid.

CHAPTER 4

DATA COLLECTION

In this chapter, data collected from personal interviews are presented. A total of seven companies participated in the research and 10 interviews were conducted. Each interview lasted from 55 minutes to about two hours. The purposes of data collection were: (1) to recognize the supply chain network structure on the supply side, (2) to gather the data necessary to identify motivations and strategies related to managing suppliers beyond Tier 1, (3) to recognize the associations between motivations and strategies, and ultimately (4) to develop a normative model for identifying opportunities to manage suppliers beyond Tier 1.

This chapter starts with the data collection procedure and follows with brief overviews of each participating company as well as the particular supply chains analyzed. In each of the supply chains, practices with respect to why, when and how to manage suppliers beyond Tier 1 are provided, and the decision-making process for managing suppliers beyond Tier 1 is briefly described. This chapter ends with a summary of the 15 distinct supply chains analyzed in the research.


**Data Collection Procedure**

The seven companies that participated in this research were carefully selected with respect to their industries and their products. Each of the companies has multi-billion dollar sales, with finished product unit prices ranging from a few dollars to tens of thousand of dollars. A total of 15 distinct supply chains of either raw materials or supply parts for finished goods were studied. In each supply chain, the companies had extensive managerial activities with their suppliers beyond Tier 1. These activities include negotiating purchasing prices, jointly developing new products, directing a primary supplier (Tier 1 supplier) to a designated secondary or third tier supplier, and establishing long-term relationships, to name a few.

The data collection process started with presenting an overview of the research purposes to potential participating companies. To those companies interested in the research, a research proposal and an interview guide were provided. Interviews were scheduled with those companies who were willing to participate. Most interviews were conducted with senior managers who had been in their position for several years and were very well-acquainted with the business. For the first two companies, interviews were conducted at the companies’ headquarters and three senior managers from each company were interviewed.

This is in accordance with the “multi-participant” rule that is widely used in case study research. Data collected from the interviews were corroborated later by short conversations with more than two additional managers from each company. After comparing the data from each interviewee at the same company, it was determined that one senior manager had enough knowledge to provide the
information necessary for this research. In order to save management resources, multiple informants were not requested from the remaining five companies.

The interviews started with a brief introduction of the research objectives and research methodology. The first interview question was, “Are you directly managing suppliers beyond Tier 1?” In order to facilitate managers answering this question, it was useful to follow up with a short explanation of “Tier 1” and “directly managing.” Any suppliers who provide raw-materials/components/end-items/finished-goods to the case study company are defined as Tier 1 suppliers of the case study company. During the interview process, some managers also called the Tier 1 suppliers “direct suppliers” or “primary suppliers.” In this manuscript, the three terms are used interchangeably without any distinction.

Similarly, any suppliers who directly provide raw-materials/components/end-items to the Tier 1 supplier are defined as Tier 2 suppliers of the case study company, and so on and so forth. Suppliers at Tier 2 and beyond are jointly defined as suppliers beyond Tier 1. Sometimes, managers also called them “upstream suppliers.” Both terms are used in this manuscript interchangeably with no distinction.

The activities regarding “directly managing” are defined as any direct interactions between the case study company and a supplier beyond Tier 1. The activities might take the form of information sharing, price negotiating, new product design, quality assurance, and order/delivery/payment, to name a few.

An interview guide with 18 interview questions was prepared to facilitate the interview process and to structure the data collection process, as shown in Appendix A. As described in Chapter 2, these interview questions serve to collect data around four key research questions: “Why do you manage suppliers beyond Tier 1 directly?”;
“How are the decisions of managing suppliers beyond Tier 1 made?”; “How is a supplier beyond Tier 1 managed?”; and “How is the direct relationship evaluated?”

Company I

Company I is one of the biggest non-alcoholic beverage companies in the world, with more than $10 billion revenue in 2006. The company uses about 58 billion metal containers (aluminum cans) and about 60 billion plastic containers (PET bottles) annually for its packaged soft drink products. A senior purchasing executive in charge of the company’s overall purchasing, including metal and plastic containers, was interviewed. Also interviewed were the directors of the purchasing groups for both types of packaging material. The supply sides of the aluminum can (Case A) and PET bottle (Case B) supply chains are mapped in Figure 4.1 and Figure 4.2.

Case A: Aluminum Can Supply Chain

The company was motivated by two triggering events to manage beyond Tier 1 to the aluminum suppliers. One was an unprecedented increase of aluminum price in the early 1990s, which caused $350 million in unbudgeted expenses related to aluminum can purchasing. The other event was Russia’s dumping of aluminum, which made the aluminum price dramatically volatile in a short time window. In its aluminum can supply chain, management of the company was directly managing three tiers of suppliers: aluminum suppliers, sheet rollers, and can makers, as shown in Figure 4.1.
Figure 4.1

Case A: Aluminum Can Supply Chain

- **Aluminum Suppliers**
  - London Metal Exchange (LME) standard commodity
  - Limited number of suppliers in US and globally

- **Rollers**
  - 3 in each region

- **Can Producers**
  - 4 in US
  - 3 in Europe

- **The Focal Company**
  - ~45% of domestic demand
  - 30 billion cans in US
  - 58 billion cans globally

Notes:
- 45% of the price of aluminum can
- 90% of the price volatility of the aluminum can
- 30% of the price of aluminum can
- 5% of the price volatility of the aluminum can
- 25% of the price of aluminum can
- 5% of the price volatility of the aluminum can
Figure 4.2

Case B: PET Bottle Supply Chain

10~12 global resin Suppliers → Converters → Bottle Suppliers → The Focal Company

Note:
- 50~60% of the price of plastics bottles comes from the purchasing cost of resin.
- 3~5 converters in each region, and hundreds globally
- ~20 bottle suppliers in the US, and less than one hundred globally
- 60 billion PET bottles globally

50~60% of the price of plastics bottles comes from the purchasing cost of resin.
There are a number of bottlers in the first tier, while there are three to four can makers in each country (region). Currently, there are about three rollers in the country or region such as the US and Europe, and there are a limited number of aluminum suppliers globally. The small number of players at each tier is due to the high capital investment on the production facility. For example, it will cost $6 million for a can maker to build a 2 billion can production facility.

The cost of aluminum accounts for 45% of the cost of the finished aluminum can, while the cost of rollers and the cost of can makers represents 30% and 25% of the cost of aluminum cans, respectively. The price volatilities from the aluminum can suppliers, the rollers, and the can makers represent the final source of price volatility of the aluminum can at 90%, 5%, and 5%, respectively. The high price volatility influenced by the aluminum suppliers made it difficult to manage the price and supply of the aluminum cans.

Management found that the company’s overall consumption of aluminum cans made it the largest customer of aluminum cans in the world. To overcome the supply shortage and price volatility of the raw materials, the chief purchasing officer proposed to the board that Tier 2 suppliers should be managed directly. Management first went to can makers, consolidated their volumes, and used the aggregated volume to negotiate the price of the aluminum sheet with the rollers.

The company split its annual demand in the country among the domestic rollers there, which would keep price competition among the rollers. Management then signed contracts with rollers on the basis of annual demand, and asked them to hedge their aluminum prices through their metal suppliers on London Metal Exchange (LME) to secure the aluminum price and reduce the degree of price volatility.
After successfully aggregating the demand of aluminum sheet and cutting the aluminum price from the aluminum suppliers, management planned to roll out this successful experience globally. Aluminum is a global commodity, and the aluminum suppliers also like to work with people who require large volumes. Management of the company convinced rollers in other countries that they would not be hurt by relinquishing their purchasing power over aluminum to the company.

Management of the company managed all relationships back to the aluminum suppliers. Management negotiated the price, but it was not involved in the middle transaction. In fact, all aluminum was delivered from the LME warehouses, not from the aluminum suppliers. As explained by the manager, “We cut the deal, but we do not have to get involved. They look at us as buyers, even though we are not involved in the deal, face-to-face every day.”

In addition to the base cost and price volatility, transparency is another motivation to manage the purchasing of aluminum or aluminum sheets. Understanding what the rollers expect for the actual cost, management could ensure they had the best price on aluminum sheet. The innovative capability of the rollers or can makers was also a reason management worked closely with suppliers beyond Tier 1. For example, the manager mentioned that management had to work with the rollers who helped them understand the aluminum sheet, and with the can makers who had already worked expensively with the rollers. By doing so, management could “capture the innovation dollars that the rollers have already put into the sheet.”

Concern with the environment was also an important reason to work with the scrap suppliers, another type of aluminum supplier. Management realized that it was a significant environmental issue to produce recycled aluminum cans, and that they had to take “a producer’s social responsibility.” The company worked with a recycling
company, instead of taking the cans back directly and recycling them themselves, since the recycling company could handle the recycling process more efficiently than the company could themselves.

The issue of quality was not recognized as a primary motivation for directly managing the can makers and the rollers. However, after the relationships were established, management could “learn something about quality from our suppliers.”

The benefits of going back upstream to directly manage the can makers and rollers are multiple. First of all, the corporate objectives in cost control were satisfied, and there was no unbudgeted expenditure on aluminum can purchasing since then. The better relationships built between the company and its upstream suppliers helped the company go further back in the supply chain to identify more opportunities for improvement.

With 10 years’ of experience managing its Tier 2 suppliers, management of the company is now planning to move further upstream to manage directly its Tier 3 suppliers, working with them to purchase aluminum ingot and hedge the aluminum price at LME. By doing so, management of the company can better secure the aluminum supply and control the price volatility.

**Case B: PET Bottle Supply Chain**

The company’s PET bottle supply chain is schematically illustrated in Figure 4.2. In this figure, the suppliers are classified into three tiers: resin suppliers, converters, and bottle suppliers (or bottlers). There are 10 to 12 resin suppliers globally. There are three to five converters in each region and hundreds in total globally, while there are less than one hundred Tier 1 bottle suppliers globally.
The bottle was originally provided by third-party suppliers, or Tier 1 suppliers. This worked well at the beginning, because there was significant value in the system, both for the company and for the converters. As the volume became larger, however, the bottle became more commoditized and its cost went down. Management of the company found that the key driver for bottle prices was not the conversion cost, but the cost of resin used to make the bottles. The cost of resin accounts for 50-60% of bottle cost.

In 1999, management started to examine how to take responsibility for the resin within the packaging content in order to have more control over cost. Without managing resin suppliers directly, management had no control over the resin price. There were other elements related to resin cost over which management had no control such as the high uncertainty or volatility associated with the resin cost. High price volatility made it difficult to manage the bottle price.

Management also found that the company’s overall volume made it the largest consumer of PET bottles in the world, with 14% of the global PET bottle consumption. In 1999 management unbundled domestic converters’ prices and assumed the responsibility for managing the unbundled costs. By combining the volumes purchased by various converters, better prices could be negotiated with the resin suppliers.

In 2003 management started to leverage the firm’s global resin volume to negotiate a better resin price. The vehicle for achieving this was a cross-enterprise purchasing organization. With this organization, managers of the beverage company were receiving the necessary knowledge of the resin cost and conversion cost of packaging. The issue of price volatility was also addressed by understanding the cost and negotiating for the right product at the right price. After recognizing that the
bottle price volatility was highly correlated to the resin price volatility, management tried to negotiate resin prices with resin suppliers for longer terms to stabilize the resin price.

The biggest barrier that management encountered when attempting to manage Tier 2 and Tier 3 suppliers in this supply chain was the reluctance to change by the Tier 2 suppliers. The Tier 2 suppliers had become comfortable with their previous practices. Therefore, management had to help Tier 1 and Tier 2 suppliers jointly understand that the resin cost was important to all of them and that the only way to lower the resin cost was to take advantage of volume leverage. Building close relationships with suppliers beyond Tier 1, establishing trust and confidence among them, and sharing risks/rewards helped make the “cross-enterprise” project successful.

**Company II**

Company II is one of the biggest greeting card companies in the world, with revenue of more than $4 billion in 2006. The company owned four brands with more than 20,000 SKUs and produced 1.6 billion cards worldwide.

Three distinct supply chains were recognized as managing suppliers beyond Tier 1. They are the paper supply chain, the ink supply chain, and the electronic component supply chain in the sound-card business.

The company’s supply chain network structure varies in terms of the type of raw materials (in bulk versus in finished good formats), the type of end products (core products with the company’s brands versus non-core products), and its supply chain presence (domestic versus global). For example, a paper supplier could be either a Tier 2 supplier, as in most domestic and global situations, or a Tier 3 supplier, as in
the sound card situation. The supply side of the paper, ink, and sound-card electronic component supply chains is mapped in Figures 4.3, 4.4, and 4.5, respectively.

**Case C: Paper Supply Chain**

The company’s paper supply chain can be mapped as shown in Figure 4.3. In this case, the paper suppliers are Tier 2 suppliers. The company had a long history of working with paper suppliers to ensure the paper quality and supply in the US market. In the context of their global presence, however, the initial motivation behind managing the paper suppliers was the increase in printing capacity at Tier 1, which required more high-quality paper.

When the company moved into China, local paper mills could not produce sufficient-quality paper for the company’s brand products. There were only a few global suppliers that could provide paper at acceptable levels of quality, and their combined supply capacity was limited. In addition, their paper prices were very high. Management decided to persuade some of their high-end paper suppliers in the United States to enter the new market with them. Those original suppliers imported paper into the new market, and the supply shortage issue was solved, but the price was still higher than management’s expectation. Thus, cost was still a primary motivation for managing the Tier 2 paper suppliers.

In addition to the supply capacity and cost motivations that prompted management to manage paper suppliers, there were other motivations including financial risks. The original paper suppliers that were brought into the new market by the company were not familiar with the operations in the new country and had no experience dealing with the company’s local printers. Thus, the financial risk of not
Figure 4.3

Case C: Paper Supply Chain
Figure 4.4
Case D: Ink Supply Chain
Figure 4.5

Case E: Sound-Card Electronic Component Supply Chain
receiving payment would be high for the paper suppliers. Therefore, management in the company had to take the responsibility for managing the transactions between paper suppliers and local printers, namely their Tier 2 suppliers and Tier 1 suppliers, although this was not their initial intention.

Improving local paper mills’ paper quality was the best way to reduce both the cost and the financial risk. As Figure 4.3 illustrates, the domestic paper mills in China could only provide both low-end greeting-card paper and packaging paper. Management at the company decided to work with the domestic paper mills to make them qualified paper suppliers, but it took time for these mills to develop suitable managerial skills and manufacturing capabilities. The complexity of operations between Tier 1 and Tier 2 suppliers was the biggest barrier that management met in managing paper suppliers in the new market, and the management is still seeking additional ways to simplify it.

**Case D: Ink Supply Chain**

In the domestic market in the United States, the focal company had long-steadily relationships with end-item suppliers, such as ink suppliers. The focal company and the ink suppliers worked together to develop ink sets specific to the case study company’s products. In the new market in China, the big difference between its paper supply chain as described previously and its ink supply chain was that most of its ink suppliers had been established in this market for many years when the management of the company decided to enter.

Due to this difference, the key motivations for managing ink suppliers were not capacity and quality as in the paper case. In stead, they were price and the ink
suppliers’ market intelligence. To negotiate a global price for a universal ink set and to protect the ink suppliers’ price information from leakage were the primary drivers for the decision by management in the focal company to manage ink suppliers in the new market.

In addition to purchasing cost, it was found that quality and consistency for the product were the other key motivations, as well as the control philosophy. The control philosophy was an obscure driver and was difficult to measure, but it did exist. The control mechanism reflects to some extent the company’s management philosophy or corporate culture. As mentioned by the purchasing executive in charge of the procurement of all end-items, “the farther away (a supplier in a new market is) from the nerve center of our company, the more you want to control it.” However, management indicated they only have an interest in controlling the purchasing price and quality, rather than the transactional details.

**Case E: Sound-Card Electronic Component Supply Chain**

Figure 4.5 shows the company’s sound-card electronic component supply chain. Paper suppliers and ink suppliers are also included in the figure in order to present a comprehensive picture of the sound-card supply chain network structure. For this product line, a sound-card module assembler makes the electronic portion of the sound-card and inserts it into a greeting card. In this case, electronic components suppliers are at the second tier, while paper suppliers and ink suppliers are at the third tier. The relationships between the company and the paper and ink suppliers are the same as those described for Cases C and D.
The sound-card, at the time the interview was conducted, would be launched in the stores in two weeks. It was an innovative product, and the time to market was one of the top priorities. The management team worked with the IC suppliers to make sure that “the song sounds exactly as what I want.” The team also coordinated Integrated Circuit (IC), speaker, and battery suppliers with the module maker to ensure everything fit well.

Company III

Company III is one of the biggest automakers in the world, and it has been managing suppliers beyond Tier 1 for about three decades. The company built manufacturing facilities in the United States about 15 years ago, and since then, management of the company\(^1\) has actively been managing suppliers beyond Tier 1. In 2006, the company sold more than one million cars in the North America market, and about 20\% of the total parts were purchased from directly managed upstream (Tier 2 or above) suppliers.

The automobile industry is fully integrated; therefore, only a limited number of players exist in each tier. Cost and quality are the two dominant drivers for most business decisions in this industry. The company had two levels of involvement in managing suppliers beyond Tier 1. A low level of involvement included the price negotiation and quality guarantee for a Tier 2 supply part as well as directing the Tier 1 supplier to buy this part. Out of the 20\% of the total parts purchased from directly managed upstream suppliers, about 5\% were conducted at this level of involvement.

\(^1\) From now on we refer the company’s North America Operation as “the company.”
The high level of involvement included more than cost and quality. At this level, the company was responsible also for the order, delivery, and payment. In some cases, the company also owned inventory at the Tier 1 supplier’s facility. The remaining 15% out of the 20% of the total parts purchased from directly managed upstream suppliers were conducted at this level of involvement.

The supply parts or raw materials from Tier 2 and beyond, which were under direct management, included almost all subassemblies and raw materials with high price volatilities such as steel, aluminum, and catalysts. However, detailed motivations and strategies for managing those subassemblies and raw materials were different.

In the case study company, the high-involvement model was preferred for the purchasing of subassemblies that satisfied three typical base conditions: (1) pre-processing of fabricated parts is required to meet functional condition; (2) sub-assembly of component parts is required to meet functional and testing condition; and (3) Sub-assembly of component parts is required to meet the firm’s assembly condition. The fuel pump and fuel tank subassembly supply chain, and the tire and wheel subassembly supply chain, representing the second and third base conditions, are selected to best represent the company’s high-involvement model. The supply sides of the two supply chains are illustrated in Figure 4.6 and Figure 4.7, respectively.

The low-involvement model, on the other hand, was preferred for the purchasing of most raw materials. Only for some particular raw materials, such as the precious metals required to manufacture the catalyst converter, did the company use the high-involvement model. The case study company has only one raw material supplier, which is a subsidiary under the same corporate umbrella with the case study.
Figure 4.6

Case F: Fuel Pump and Fuel Tank Subassembly Supply Chain
Figure 4.7

Case G: Tire and Wheel Subassembly Supply Chain
company. As the motivations and strategies for the low-involvement model have been covered by the high-involvement model, no example was selected to represent the low-level involvement model.

**Case F: Fuel Pump and Fuel Tank Subassembly Supply Chain**

Management of the company wanted the fuel pump and fuel tank to arrive assembled. In this case, the fuel pump needed to be installed into the fuel tank before the fuel tank was sealed and tested for pressure requirements. Figure 4.6 illustrates the supply side of the fuel pump and fuel tank supply chains. These activities had to be completed at the fuel tank supplier’s facility. To do this, the fuel pump and fuel tank suppliers would need to discuss the technical specifications during the product design stage.

However, it was impossible for the fuel tank supplier and fuel pump supplier to work together, because both suppliers’ parent companies were competitors. They were not permitted to share new product design information and know-how. Therefore, the focal company had to make special arrangements for the fuel pump and fuel tank sub-assembly supply chain. Again, motivations and strategies for each arrangement had to be evaluated before they were implemented.

**Case G: Tire and Wheel Subassembly Supply Chain**

Figure 4.7 shows the supply side of an arrangement for the tire and wheel subassembly supply chain. In this case, management of the company wanted the tire and wheel preassembled, but none of the tire suppliers or wheel suppliers were willing to undertake the mounting job. Management addressed this issue by placing a tire
mounting company between the company and its tire and wheel suppliers. Its annual purchase of tire and wheel subassemblies is $500 million dollars.

In this case, there were three tire companies and four wheel casting companies. There were three tire mounting companies at Tier 1, each of them located very close to one of the company’s three manufacturing facilities. Management needed to negotiate the prices with both Tier 2 suppliers, as well as to make arrangements for deliveries to tire mounting companies with both suppliers.

Company IV

Company IV is one of the biggest faucet makers in the world. It has manufacturing facilities in many countries, with more than 10 product lines in the faucet category. In 2006, the company had sales of $1 billion. In recent years, management of the company outsourced their manufacturing operations to contract manufacturers in China, while management still kept the responsibilities of managing the upstream suppliers in house. The upstream suppliers in the outsourcing situations would be the company’s Tier 1 suppliers if the company kept the manufacturing function in-house. Management was actively managing Tier 2 and Tier 3 suppliers after outsourcing, depending on the positions the contract manufacturers had in the supply chains.

A senior manager in the company’s China division was interviewed, and many examples he provided were China-related. One faucet product line was chosen to explore the motivations and strategies regarding managing suppliers at different tiers in this supply chain. In this example, management was managing the third tier suppliers directly.
This was the first case in this research in which outsourcing shifted original Tier 1 suppliers into Tier 3 supplier roles. Investigators realized that management of the case study company could have given up the responsibilities of managing the component suppliers to the contract manufacturers, although management chose to retain the direct relationships. Therefore, there must be reasons why the components suppliers were still under direct management, and the findings should have value to this research.

**Case H: Faucet Supply Chain**

Figure 4.8 shows the mapping of a faucet supply chain on the supply side. In this arrangement, management of the focal company managed directly the purchasing of raw materials such as resin and deliveries to a cartridge manufacturer. For most components, such as the leftover and threaded rod, management had to control the product design by providing the design print to ensure the quality. In most situations, component suppliers were at the third tier, while the contract manufacturer was at the second tier. Finished faucets were sold to a foreign trade company that later shipped the faucets to the United States and sold them to the focal company. There are many component manufacturers, and fewer contract manufacturers in China to which the case study company outsourced its manufacturing functions. There are only a few foreign trade companies dealing with the international shipping business with the company’s faucet products.

In this case, the most straightforward motivation of managing suppliers beyond Tier 1 was the cost, which was also the company’s purpose of outsourcing.
Case H: Faucet Supply Chain
However, cost was not the only one; in most cases quality and safety were also important drivers due to government regulations. Contractual relationships were typical in managing the third tier component suppliers, and management was satisfied with their efforts in managing these suppliers.

**Company V**

Company V is one of the largest quick service restaurant chains, with about 3000 stores in North American. In 2006, the company’s revenue was $4.1 billion dollars. Management at this company manages many of its suppliers back to Tier 3 and Tier 4, especially for the strategic items. They began to manage their suppliers beyond Tier 1 in the chicken business in the early 1990s, and rolled out successful practices to beef and other parts of their businesses gradually.

There were many reasons for managing suppliers back in their supply chains. At the strategic level, however, the reasons were the same for all supply chains. The main reasons identified were cost, quality, supply stability, and safety. Since each product supply chain had its unique characteristics, the approaches taken by management to achieve these goals were different. Different strategies would have different impacts on the company’s performance, but generally speaking, the stated goals were achieved.

**Case I: Beef Supply Chain**

Figure 4.9 shows the mapping of the beef supply chain on the supply side. Beef is a strategic item for the company’s burger product line. Annually, the company consumes about five million pounds of beef patties, which are purchased from five to
Figure 4.9

Case I: Beef Supply Chain
10 patty suppliers. The beef supply chain for the company’s burger business was managed all the way back to beef patty suppliers, trimmers, slaughter houses, and ranchers. The strategic reasons for managing suppliers beyond Tier 1 were (1) to stabilize the supply; (2) to assure the cost, quality, and volume; (3) to guarantee the safety; (4) to research and development (R&D); and (5) to process knowledge. It is also important for the company to secure the supply, especially when there might be shortages.

Although the strategic reasons for managing each of the suppliers beyond Tier 1 were the same, the approaches to realizing the goals were different because of the differing responses from the various patty suppliers. Some of the suppliers were very cooperative, while others were not. In general, whether the patty suppliers liked it or not, “this is how we are going to run our business,” said the senior VP in supply chain management. Her determination guaranteed the successful implementation of managing suppliers beyond Tier 1 in the case study company.

**Case J: Chicken Supply Chain**

Chicken was also a strategic item for the company. In many ways, the company’s chicken suppliers were second and third tier suppliers as they were fully integrated. In order to illustrate the entire chicken business, Figure 4.10 shows the mapping of the supply side, with the key activity representing each tier. The key activities in the chicken business are to raise the chicken, slaughter the chicken, portion and process the chicken, and bread and coat the fillet to prepare the chicken for use, as shown in the lower portion in the mapping. The company had a total of
Figure 4.10

Case J: Chicken Supply Chain
about 10 chicken suppliers, while 90% of its chicken purchase came from two or three chicken suppliers.

Breading and coating was also an important portion of the company’s chicken business, as shown in the upper portion of the mapping. A spicy and blend supplier at the third tier provides all necessary breading and coating materials to the company. To ensure the quality and taste of breading and coating materials, management of the company worked very closely with a fourth tier supplier on the breading and coating side of its chicken business. It was very unique that the fourth tier supplier, which provided oil and flour to the breading and coating company, was also a major supplier at the fourth tier in the chicken portion of the supply chain by providing feed to chicken farms.

Management of the company actually managed direct relationships with suppliers at each tier of the chicken supply chain. The strategic motivations are cost, quality, and supply stabilization, with additional focuses on the process knowledge, R&D capabilities, and product innovation. In order to take more social responsibilities, they also helped minority chicken suppliers by negotiating price with designating suppliers.

**Case K: Sauce Supply Chain**

The role of sauce in the company’s business could be either strategic or non-strategic. It was a strategic item when the sauce was for the purpose of supporting promotional items. In addition to the general motivations of cost and quality for every strategic item, the motivation for managing suppliers beyond Tier 1 in the sauce business was more specifically related to the company’s core
competency (health) and market position (target customer). The company relied on a few key sauce suppliers for innovative or promotional sauce supply.

Figure 4.11 shows the mapping of the supply side of the sauce supply chain. The company had a very good relationship with an oil supplier, which made it easier to manage the arrangement between some key sauce suppliers and the oil supplier. For example, since the oil supplier was familiar with the focal company’s business, the R&D team of the oil company could develop innovative or new oils to be used by a key sauce supplier to develop a sauce specific to the focal company’s business.

Company VI

Company VI is one of the biggest personal care product companies in the world. In 2006, the business unit we interviewed had $1.6 billion combined purchasing from Tier 1 and Tier 2 suppliers, among which 30%-40% was directly purchased from Tier 1 suppliers. The business unit had about 15 different product lines, and the total volume of its annual sales was about 20000 SKUs.

The company had contract manufacturers at its first tier. All suppliers of raw materials (ingredients) to make the formula and suppliers of packaging components were at its second tier. All commodities coming from Tier 2 suppliers could be categorized into three groups: all base ingredients, not including the fragrance and Ajimoto, a critical ingredient imported from Japan for a product line; all packaging components and the fragrance; and the Ajimoto.
Figure 4.11

Case K: Sauce Supply Chain
The first group, the base ingredients (not including the fragrance and Ajimoto), were purchased and managed by the contract manufacturers (Tier 1 suppliers), with no involvement from the case study company. The case study company managed directly the Tier 2 suppliers of packaging components (e.g., caps, labels, and bottles and tubes) and fragrance, since in the personal care business, the core competencies were based on packaging and fragrance.

**Case L: Label Supply Chain**

Figures 4.12 shows the company’s label supply chain, which is representative of supply chains for other packaging components (e.g., caps, bottles) and fragrance in terms of motivations and strategies. Similar to the faucet supply chain in Case H, outsourcing of the company’s manufacturing function made the original Tier 1 suppliers Tier 2 suppliers, while management kept the responsibilities for managing those Tier 2 suppliers in house.

In the label supply chain, there were about five label suppliers at its second tier, and about 25 contract manufacturers at its first tier. About 90-95% of the label supply went to about 10 contract manufacturers, while the remaining 5-10% went to the other 15 contract manufacturers. Management of the company worked directly with the label suppliers on new product design, price negotiation, and quality assurance. Management also arranged shipment from second tier suppliers to the contract manufacturers and owned inventory at the contract manufacturers’ facilities.
Figure 4.12

Case L: Label Supply Chain

- 5 Label Suppliers
- 10 Contract Manufacturers
- 15 Contract Manufacturers
- The Focal Company

90-95% of label purchasing
5-10% of label purchasing
**Case M: Ajimoto Supply Chain**

Figure 4.13 shows the supply side of the Ajimoto supply chain. Ajimoto was a key ingredient of a product line that accounted for about 15% of the business division’s sales. Ajimoto was actually the only formula ingredient that the company managed directly, because it was a single-sourced item and there was no substitute supplier in the United States. Management assigned a dedicated employee to manage the account to negotiate the price and secure the supply.

**Company VII**

Company VII is one of the three biggest golf equipment companies in the world. The company sales volume was over $1 billion in 2006. To illustrate the company’s experience in managing suppliers beyond Tier 1, the manager gave us two examples within the company’s golf equipment business unit, showing how management in the company managed Tier 2 suppliers “from new product design all the way to product industrialization.” One example is the titanium casting head supply chain and the other one is the weight cartridge supply chain for one of its product lines.

**Case N: Titanium Casting Head Supply Chain**

Figure 4.14 reveals the supply side of the titanium casting head supply chain. In this supply chain, there were three Tier 1 suppliers and only one Tier 2 supplier. In 2006, the total purchase from the Tier 2 supplier for the participating
Figure 4.13

Case M: Ajimoto Supply Chain
Figure 4.14

Case N: Titanium Casting Head Supply Chain
company’s product was about $20~35 million. There are two primary motivations for managing the second tier supplier, technological capability and cost.

Since the 1990s, a few Chinese companies have succeeded in applying advanced titanium casting technologies from aerospace materials into civilian usages such as titanium golf club head casting. One of the company’s Tier 1 suppliers (namely golf head suppliers) introduced this technology to the case study company. The supplier also introduced the company to a Tier 2 supplier (a titanium casting house) that was a pioneer in the advanced titanium casting technology. Major activities carried out by the Tier 2 supplier included purchasing titanium from titanium suppliers, producing titanium sponge, mixing the titanium sponge with other metals to make titanium alloy, and casting the alloy to ingot to produce the golf club head.

The case study company used a dual-sourcing policy at the Tier 1 level, which meant that for any titanium casting golf club head of a product line, the company purchased it from two out of the three Tier 1 suppliers. The largest Tier 1 supplier provides 60% of the focal company’s titanium casting golf club heads, which accounts for 30%-40% of the Tier 1 supplier’s business.

The Tier 2 supplier’s technological capability was one of the primary motivations for management in the company to manage the supplier directly. Managers in the company went to the second tier supplier with a list including: (1) new capability in titanium casting, (2) yield, (3) R&D capability, and (4) industrialization issues. Management from both companies worked together on this list, and they initiated a supplier development program to establish a close relationship between them. The company came to completely rely on the second tier supplier’s technological capability for innovative new product design and roll-out
issues. Cost is the other primary motivation for managing the second tier supplier directly. Titanium is a very expensive metal, and its price is highly volatile. Management told the Tier 2 supplier that “we are the ultimate customer.” They aggregated the volume from their three Tier 1 suppliers and used the volume leverage to negotiate “the right level of pricing” with the Tier 2 supplier.

The second motivation was to secure the supply. Since the three Tier 1 suppliers all purchased the titanium ingot from the same Tier 2 supplier, while the Tier 2 supplier had other businesses and customers using the same raw materials, having the direct connection with the Tier 2 supplier helped management secure the supply and stabilize the price.

The close connection with the Tier 2 supplier also helped management understand the “capacity, capability, and core price structure” of upstream suppliers, which was the third motivation. In addition, the good relationship with the second tier supplier further allowed management to go to the source of titanium, which was the third tier supplier, and understand the capacity, capability, and core price structure at the third tier.

Originally, the second tier supplier was a scientific facility, instead of a production facility. Management in the second tier supplier had a minimal understanding of new product design, prototyping, and process control. The golf business was a small part of the total enterprise for the second tier company, but it was growing and highly profitable. The margin from the golf business could be used to support other research activities by the second tier supplier. As both companies were mutually important to each other, both companies profited from a very close business relationship. In fact, management in the case study company had developed
the second tier supplier into a qualified supplier, especially in the area of production capability.

When management of the case study company initially approached the Tier 2 supplier directly, the Tier 1 suppliers showed a slight concern over their cost visibility, but they were generally very cooperative in the establishment of the direct relationship between the case study company and the second tier supplier. In fact, Tier 1 suppliers played a critical role to the company’s success and always behaved as thought leaders in new product development projects.

The close relationship with the Tier 2 supplier helped management of the case study company go further back to the raw materials supplier at the third tier. The third tier supplier provided two major raw materials to the titanium casting head business, the titanium sponge to cast the head and the titanium sheet to make head surface materials. The titanium sheet went to the same Tier 1 suppliers, but from a different Tier 2 supplier that specialized in sheet processing. As management had a chance to go to the third tier raw material supplier to understand the capability of the titanium sponge, they also checked the supplier’s titanium sheet capability. When the titanium price went up, management in the case study company could help the Tier 3 supplier source titanium globally.

The direct relationship between the company and the Tier 2 supplier has resulted in high performance for both companies. The golf business became the most profitable part of business for the Tier 2 supplier and the case study company was its biggest ultimate customer. The case study company built its leading position in the product line of titanium casting golf club heads.
Case O: Weight Cartridge Supply Chain

The second supply chain selected from Company VII is its weight cartridge supply chain which had three Tier 1 suppliers and one Tier 2 supplier, see Figure 4.15. The Tier 2 supplier provided ancillary components to the three cartridge manufacturers (which were Tier 1 suppliers for the case study company) who produced metal, wood, iron, and potter cartridges. The largest cartridge supplier provided 60% of the total cartridge demand from the case study company, while the other two cartridge suppliers provided 30% and 10% of the company’s total cartridge demand, respectively.

The cartridge supply chain was completely different from the titanium casting head supply chain in that cartridges were existing products and the motivations were driven less by technical capability and more by process capability. In this case, the Tier 2 supplier was managed by the case study company only on a project basis, instead of continuously. In the case of problems with supply, management of the company would be engaged in managing the Tier 2 supplier directly. Basically, they were trying to help their Tier 1 suppliers and ensure management’s commitment to the market.

The key motivations for managing the Tier 2 supplier include capability, agility, efficiency, and cycle time. The capability motivation covers all processes and technical aspects. Sometimes, the capability was related to new products; that is, the capability required was unknown to the case study company. Sometimes, the capacity already existed but not in the company’s supply chain. In either case, as the capability was not available in the company’s supply chain, it would take a longer time to
Figure 4.15

Case O: Weight Cartridge Supply Chain
generate. In another situation when the capacity did exist in the company’s supply chain, but not at the process control level the company desired, management needed to place a higher level of specification tolerance in the existing process and ensure the capability of process control improved gradually.

Whenever management felt the need to manage the Tier 2 supplier, they would do it. The level and longevity of management’s engagement would be determined by factors such as cost and scale. The relationship between the case study company and the Tier 2 supplier adjusted and changed over time. The manager explained that whenever the Tier 2 supplier’s problem was solved, such as when the quality was stable or the capacity was adequate, they would hand the control back to the Tier 1 suppliers.

The lack of either capacity or capability occurring at the Tier 1 level would sometimes affect the application of the Tier 2 components. In some situations, it was the Tier 2 supplier who came to the Tier 1 supplier and/or the case study company to raise the issues. In responding to the Tier 2 supplier, management of the company would step in and work with both Tier 1 and Tier 2 suppliers to fill the gaps.

The ancillary components of cartridges were single-sourced to the second tier supplier, which was similar to the titanium head supply chain. However, unlike the titanium head supply chain, other substitutable Tier 2 suppliers might exist in the global base, but management of the company showed no intention of finding them. They counted on the Tier 1 suppliers to control the risk of second tier supply shortage, since they believed that the two largest Tier 1 suppliers should have the knowledge to find substitutes.

At the Tier 1 level, management of the case study company applied a dual-sourcing strategy, due to concerns over volume, technical capacity, risk, version,
capability, and capacity generation. For some high-volume items they split the demand over all the three Tier 1 suppliers. Tier 1 suppliers never blocked management’s intention to manage the Tier 2 supplier. Rather, they were true enablers, helping management in the case study company manage the Tier 2 supplier.

It is hard to measure the performance of the direct relationship with the Tier 2 supplier in financial terms. The manager said that the Tier 2 components were critical to the company’s success, and the strong relationship with the Tier 2 supplier helped the company compete in the market and continue to lead the industry in terms of technology.

**Summary of Supply Chain Profiles**

A total of seven companies participated in this research from which 15 supply chains were selected to explore the motivations and strategies for managing suppliers beyond Tier 1. Items or raw materials under investigation came either from process-based industries such as aluminum can and paper, or from module-based industries such as fuel pump and fuel tank subassembly and faucet components. The unit price of the finished product ranged from a few dollars to tens of thousand of dollars.

The length of the supply side varied for the selected supply chains in which the activities of managing suppliers beyond Tier 1 took place. In some cases, management activities could be found at the fifth tier of supply, while in other cases they could be found only at the second tier. The width of a tier (the number of suppliers at a tier) also varied dramatically. In some cases, there were hundreds of suppliers in a tier of which only some could be actively managed. In other cases, there
were only a few dominant suppliers at a tier beyond Tier 1, all of which were actively managed by the case study companies. In three extreme cases, supply chains M, N, and O, there was only one supplier at a tier beyond Tier 1 with whom the focal company had a direct relationship. Overall, the complex characteristics of the products and supply chain network structures made this research more challenging.

Data were collected concerning the motivations and strategies for managing suppliers beyond Tier 1, and they will be described in the General Results section of Chapter 5 which follows.
CHAPTER 5

THE FINDINGS

In this chapter, the findings from the data collection are presented. The chapter begins with the general results with respect to motivations, strategies, and the associations between them. A normative model is developed for managers who might have interests in managing their suppliers at Tier 2 and beyond. Their decision-making process is outlined to assist managers’ consideration of forming these types of relationships in their supply chain.

General Results

Interviews were conducted with 12 senior executives from the seven companies. Individual interviews ranged in length from 55 minutes to about two hours. Interviewees held a variety of titles ranging from senior purchasing director to senior vice president of supply chain management, depending on which company she/he was working for. Overall, the interviewees had several years of experience in her/his own business department or division and had sufficient knowledge to answer all research questions.
Table 5.1 summarizes the profiles of the seven companies that participated in this research in terms of sales in 2006, the number of tiers of the supply chain investigated, and the number of people interviewed. All seven participating companies are multinational companies with annual sales volumes ranging from $1 billion to more than $10 billion. Fifteen supply chains were selected to explore the motivations and strategies for managing suppliers beyond Tier 1. In these 15 supply chains, management activities of the buying companies could be found at a tier ranging from the second tier to the fifty tier. One to three managers from each company were interviewed to collect case study data.

The rest of the chapter is organized as follows. Motivations and strategies will be first coded on the basis of data collected from the personal interviews and presented in data accounting sheets. The associations of motivations and strategies will then be derived on the basis of interviewees’ responses to the first and third key research questions. A typical decision process for managing suppliers beyond Tier 1 will be established, followed by an explanation of how the relationship performance will be evaluated. Finally, a normative model is provided to illustrate the motivations, strategies, and their associations, simultaneously.

**Motivations**

The first key research question was to explore the motivations for managing suppliers beyond Tier 1. Responses to this subject could be categorized into four sub-groups reflecting why a case study company directly managed a supplier beyond Tier 1. The four sub-groups of motivations are: Cost, Quality, Dependability, and Context-Specific Motivations.
<table>
<thead>
<tr>
<th>Case Study Company</th>
<th>Approximate 2006 Sales</th>
<th>Supply Chain ID</th>
<th>Number of Tiers Considered</th>
<th>Interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company # I</td>
<td>$40 billion</td>
<td>A</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Company # II</td>
<td>$4 billion</td>
<td>C</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>D</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>E</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Company # III</td>
<td>$20 billion</td>
<td>F</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>G</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Company # IV</td>
<td>$1 billion</td>
<td>H</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Company # V</td>
<td>$4.1 billion</td>
<td>I</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>J</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>K</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Company # VI</td>
<td>$1.6 billion</td>
<td>L</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Company # VII</td>
<td>$1 billion</td>
<td>N</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>O</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Table 5.1
Overview of Case Study Companies
Cost Motivations

In responding to the interview question of “why are you managing suppliers beyond Tier 1,” all managers mentioned some cost related concerns as the primary drivers to manage upstream suppliers. Table 5.2 contains a summary of the responses in the Cost subgroup.

As shown in Table 5.2, cost related motivations include: (1) unit purchasing cost, (2) cost knowledge across the supply chain, (3) price volatility, (4) logistics costs, (5) price information, and (6) foreign trade costs.

**Unit purchasing cost.** Managers in 12 of the 15 supply chains identified in this research indicated that unit purchasing cost was the main reason for managing suppliers beyond Tier 1. Three cost elements related to the unit purchasing cost are the raw material purchasing price (10 out of 15), the manufacturing processing cost at an upstream supplier’s facility (six out of 15), and the hidden costs that might occur at the tier of its direct customers (three out of 15).

**Cost knowledge across the supply chain.** Managers in 11 of 15 supply chains articulated the importance of cost knowledge over the supply chain when they made their decisions on managing upstream suppliers directly. The impact of this motivation on a firm’s performance is difficult to measure, although in most cases it is the preliminary requirement to managing a supply chain efficiently.

As explained by a manager related to supply chain B for the PET bottle, “you have to know the cost structure first before making your decision.” A manager related to supply chain N for titanium casting head said that they went to the third tier to gain the price information of the raw materials, and such knowledge really helped them understand the behaviors of Tier 1 and Tier 2 suppliers.
<table>
<thead>
<tr>
<th>Company</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
<th>Times Cited</th>
<th>% Cited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Chain</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
<td>G</td>
<td>H</td>
<td>I</td>
</tr>
<tr>
<td>Cost</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Unit purchasing cost</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>- Raw materials purchasing price</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>- Processing cost</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>- Hidden cost</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost knowledge across the supply chain</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Price volatility</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Logistics costs</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>- Transportation</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>5</td>
</tr>
<tr>
<td>- Staffing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price information</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Foreign trade costs</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 5.2**

Motivation: Cost
Price volatility. In addition to the unit purchasing cost and cost knowledge across the supply chain, price volatility across the supply chain was another frequently cited driver by managers interviewed (eight out of 15). Price fluctuations directly affect the company’s financial budget and competitive position. The manager in supply chain A mentioned that price could change more than 50% in a short period of time, and about 90% of the price volatility could happen at a tier beyond Tier 1. In supply chain N, a prototype was delayed because of the price volatility of the raw materials, which made Tier 1 suppliers reluctant to buy raw materials.

Logistics costs. Cost elements related to logistics activities were also frequently mentioned by managers (seven out of 15). Sometimes the logistics costs that occurred at an upstream tier could exert significant savings. In five supply chains, the transportation costs for outbound materials or items from upstream suppliers were regarded as so significant that directly managing the deliveries was worthy of management attention. For example, working directly with a Tier 2 supplier in supply chain I had saved the case study company $10 million dollars a year.

Other costs related to staffing such as order processing cost were also the reasons (three out of 15). For example, in supply chains F, a Tier 1 supplier would charge a 15% administration cost over the unit purchasing price of a Tier 2 item if the item was purchased by the Tier 1 supplier. Management recognized that the cost of direct purchasing was much lower than the administration cost charged by the Tier 1 supplier.

Price information. Management in four of the 15 supply chains mentioned that the pricing information was the motivation for managing suppliers beyond Tier 1. For example, in supply chain A, for the aluminum can, price information is restricted to “only a few people” in the aluminum can supply market. In supply chains C and D,
for the paper and ink, paper and ink suppliers did not want the case study company to disseminate the price information of paper or ink they sold to the case study company.

**Foreign trade costs.** Managers in three supply chains involved in international trade with or outsourcing to China (supply chains C, D, and H) mentioned that the costs related to customs, tariffs, and international trade issues were also a reason to deal with suppliers beyond Tier 1 directly. For instance, the purchasing manager in supply chain H, for the faucet, said that his company did not want to become involved with international business issues, so they had to negotiate with a contract manufacturer (a Tier 2 supplier) for delivery and payment terms in their contract. The contract manufacturer had better relationships with the international trading companies that exported the products to the United Stated and could obtain and control the costs related to international trading.

**Quality Motivations**

Quality related reasons are the second most mentioned motivation subgroup on the basis of interview data. Responses related to 13 out of 15 supply chains regarded quality as a primary driver to manage suppliers beyond Tier 1, as shown in Table 5.3. In supply chain A from Company I, no quality related motivations were identified. Actually in this company, both raw materials were “commodities,” meaning that the quality of the raw materials was standard in the market. The only quality related concern in supply chain B was the quality of recycled raw materials.

Supply chain M was another supply chain that did not mention any quality concern as a motivation. In this case, the raw material was supplied by only one foreign company in the market, so that to secure the supply is the primary concern of managers in the company.
<table>
<thead>
<tr>
<th>Company</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
<th>Times Cited</th>
<th>% Cited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Chain</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
<td>G</td>
<td>H</td>
<td>I</td>
</tr>
<tr>
<td>Quality</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Part/raw material quality</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Supply part as quality differentiator</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Quality transparency/visibility</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Safety/regulation</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Consistency/standardization</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

Table 5.3
Motivation: Quality
The quality related motivations include: (1) part or raw material quality, (2) supply part as a quality differentiator, (3) quality transparency/visibility, (4) safety/regulation, and (5) consistency/standardization.

**Quality of supply parts or raw materials.** The quality of supply parts or raw materials was the highest cited driver in the Quality category (10 out of 15). Most companies regard quality as one of the most critical factors that have significant impact on their market positions. All managers who agreed that part/raw material quality was a key motivation recognized the direct connection between the quality of part/raw material at a tier beyond Tier 1 and the competitiveness of the case study companies. For example, in Company II, the quality of paper and ink is critical to their greeting card business, so that management has to manage the suppliers of paper and ink closely.

**Supply part as a quality differentiator.** Using a supply part as a quality differentiator was another highly cited motivation. It was found in nine supply chains, representing five companies that participated in this research. Most of the parts or raw materials related to this motivation could be supplied by a moderate number of suppliers in the market. Since these parts or raw materials were most likely visible to the end consumers, it was easy for the end consumers to evaluate their quality. In Company VII, the Titanium casting golf head was a quality differentiator for the company’s final product, so managers wanted to manage the quality of its raw materials closely.

**Quality transparency or visibility.** Transparency or visibility was a motivation that could be used at two different levels. At a broader level, it could be referred to “knowing whatever happens at a tier beyond Tier 1”; while at a narrower level, it was referred to as “knowing everything related to the quality at a tier beyond Tier 1.” This
reason was mentioned by five out of 15 supply chains. For example, in supply chain C, for the paper, management has the knowledge of all the operations in a paper supplier and wants to know whatever happens in the site of a paper supplier.

**Safety or regulation.** Safety or regulation was a “must-follow” reason in industries where government has strong legislation or regulations governing a final product. Managers related to four supply chains viewed it as a motivation. The quality of the parts or raw materials at a tier beyond Tier 1 had the primary impact on the quality of the final product. For example, in supply chain J, for the chicken, the source of a quality issue in the chicken business needed to be traceable back to the third tier of the raw material supply chain, the chicken farms. Management of the company worked closely with the feeding material suppliers to ensure the quality of the chicken. In this research, this motivation was applicable to all four supply chains with safety regulation issues.

**Consistency or standardization.** In three supply chains, consistency or standardization was one of the motivations for managing upstream suppliers of items that end-consumer could “touch and tell the differences.” For example, in Company II, there was more than one supplier for a particular part or raw material, so “the consistency in color or in the feeling of touching” became important to the overall quality of a final product.

**Dependability Motivations**

This motivation subgroup includes any reasons related to: (1) delivery reliability, (2) production capacity or supply shortage, (3) R&D/innovation capability, and (4) the control of order, delivery, and payment from/at a tier beyond Tier 1, as shown in Table 5.4. Management in 12 of 15 cases mentioned that the reasons for
<table>
<thead>
<tr>
<th>Company</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
<th>Times Cited</th>
<th>% Cited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Chain</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
<td>G</td>
<td>H</td>
<td>I</td>
</tr>
<tr>
<td>Dependability</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Delivery reliability</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>7</td>
</tr>
<tr>
<td>Production capability/supply</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>shortage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>R&amp;D/innovative capability</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>6</td>
</tr>
<tr>
<td>Order, delivery and payment</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 5.4

Motivation: Dependability
managing suppliers beyond Tier 1 were related to motivations categorized in this subgroup.

**Delivery reliability.** It could be found from seven out of the 15 supply chains that delivery related aspects were the reasons for managing suppliers beyond Tier 1. Delivery related aspects included on-time delivery, the number and quality of parts/raw materials delivered, and “perfect orders” delivered. The delivery performance of a supplier at a tier beyond Tier 1 could sometimes directly affect the case study company’s performance, as well as the relationships among supply chain members. Six out of the seven supply chains are related to global sourcing. In these cases, management of the buying companies regarded the delivery responsibility belongs to the suppliers beyond Tier 1, instead of 3PLs or transportation providers.

For example, in supply chain H, for the faucet, the purchasing team of the case study company needed to manage the delivery of the components they purchased from third tier suppliers to the contract manufacturer at the second tier. Management of the company had to articulate the delivery terms in a purchasing agreement with the Tier 3 supplier with regards to time, quantity, and quality.

**Production capability/supply shortage.** Production capacity or supply shortage is one of the motivations hard to measure. This motivation could be found in seven of 15 supply chains. Generally, production capacity concerns either the capacity of production facility or the flexibility of production facility.

A limited production capacity will lead to supply shortage and price increase. In this manuscript, the limited production capacity or supply shortage is defined as any shortage of a part or raw material supply that causes a disruption in the case study company’s operations. For example, single sourcing has the risk of supply shortage. In Company VII, supply parts at Tier 2 level were single sourced. The production
capacity at a supplier beyond Tier 1 can lead to the risk of supply shortage as well. Managers from four of the seven cases mentioned that whenever there was a bottleneck regarding production capacity at a tier for a supply, securing the production capacity at this tier became critical to a firm’s business. For example, in supply chain L, for the label, the production capacity of a label supplier at the second tier was limited. Sharing demand information with this supplier and securing production capacity in advance provided the case study company with a unique competitive advantage regarding the lead time of the label supply. The lead time for label purchasing was reduced from the industry average of eight weeks to two to four weeks depending on the label.

The flexibility aspect of the production capability motivation was only mentioned by management in supply chain M as a motivation for managing suppliers beyond Tier 1. In this case, management of the case study company negotiated with some suppliers of packaging components to shorten the lead time by relying on the suppliers’ flexible manufacturing capabilities.

**R&D/innovation capability.** R&D or innovation capability was moderately cited as a driver to manage a supplier beyond Tier 1 directly (six out of 15 supply chains). In these cases, the supply part or raw materials were not directly related to the case study companies’ core business, but they could affect their core competencies. For example, in supply chain A, management worked directly with a roller (a second tier supplier) partly for its innovative capability.

At the time when the interview was conducted, the case study company was about to launch a new package, an aluminum bottle, for the company’s flagship product for which glass or plastic bottles had been used for decades. Relying on the second tier supplier’s innovative capability brought the company extra marketing
advantages. A manager in another case, supply chain L for the label, told us that a Tier 2 supplier in the supply chain was very innovative, and it could frequently develop new materials for the company’s product.

**Supplier’s capability of controlling order, delivery, and payment activities.** Management from three companies, representing four supply chains, pointed out that an upstream supplier’s capability in controlling order/delivery/payment activities was an important reason for working with the supplier. For example, in supply chain H, the first and second tier suppliers were normally small companies and not fully staffed. Therefore, they did not have enough capabilities for these order/delivery/payment activities, and management of the case study company had to buy directly from the upstream supplier and take over control. Given that the control of order/delivery/payment activities at an upstream supplier was important, the management’s dependability on such controls was a critical driver for managing the supplier directly.

**Context-Specific Motivations**

In addition to the motivations outlined above, managers from the case study companies also mentioned other context-specific motivations that would not be appropriately categorized into any of the four subgroups described above. They were assigned to the individual subgroup called “context-specific motivations.” Eight out of 15 supply chains had a variety of motivations that fell into this subgroup.

Table 5.5 reveals the context-specific motivations included in this subgroup. They are: (1) market intelligence, (2) social purchasing responsibility, and (3) financial health (cash flow).
<table>
<thead>
<tr>
<th>Context-Specific Motivations</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
<th>Times Cited</th>
<th>% Cited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market intelligence</td>
<td>x</td>
<td></td>
<td>x x x x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td>27%</td>
</tr>
<tr>
<td>Social purchasing responsibility</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td>27%</td>
</tr>
<tr>
<td>Financial health (Cash flow)</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td>27%</td>
</tr>
</tbody>
</table>

**Table 5.5**

Motivation: Context-Specific Motivations
**Market intelligence.** Market intelligence represents the information of a supplier’s presence in a market. This motivation was mentioned by managers related to four supply chains. For example, managers in Company II said the market-presence or market-position information was a motivation for managing a paper supplier directly. The supplier’s market position will be affected if the market intelligence information is leaked outside the two companies.

**Social purchasing responsibilities.** Social purchasing responsibilities include environmental concerns and purchasing from minority or small businesses. This type of motivation could be found in four supply chains. For example, environmental concerns drove management of Company I to work directly with recycling companies in collecting the packaging materials in order to “take a producer’s responsibility.” Management involved in supply chain C needed to pay attention to the origins of papers to be imported into a new market, as papers from some origins were banned in some regions due to environmental concerns. Management involved in supply chain J made a special arrangement with its upstream chicken supplier to nurture business with a lower tier minority chicken supplier.

**Financial health (cash flow).** The financial health motivation concerns situations under which a supplier providing items or raw material to a lower tier supplier might not get the money back forever or in a timely manner. This motivation could be found in four supply chains.

For example, when managers in supply chain C brought the company’s original paper suppliers into a new market in China, they had to work with management of the paper suppliers to specify new delivery and payment terms. In the new market, most local printers, namely buyers of the paper, had followed transaction styles completely different from those in North America. Normally, printers had to pay in full before the
paper was delivered, or had very limited credits offered by paper suppliers. The paper company might incur the risk of not being paid in full if management of the paper company set credit lines higher than guaranteed.

In supply chain G, most wheel suppliers could get account receivables paid eventually, but it might take longer than desired. This was because tire mounting companies were too small to have the financial resources to pay the wheel suppliers before they received payment from the case study company. A special payment arrangement was necessary for the wheel company to receive the desired cash-to-cash cycle.

**Strategies**

The third key research question was to explore the strategies companies used to manage suppliers beyond Tier 1. Responses to this subject could be categorized into five sub-groups: Strategic Cost Management, Total Quality Management, Strategic Sourcing, Relationship Management, and Context-Specific Strategies.

**Strategic Cost Management**

All 15 supply chains investigated had some kind of activities in managing cost related concerns, which can be categorized into the Strategic Cost Management subgroup. These activities typically are: (1) to employ the “volume leverage” or “group buy” strategy, (2) to gain total cost knowledge at each node across the supply chain, (3) to make a “volume guarantee” promise to an upstream supplier, (4) to negotiate a long-term deal, (5) to make the deal for the buyer only, (6) to use competitive bidding/pricing, and (7) to utilize price masking, as shown in Figure 5.6.
### Table 5.6

**Strategy: Strategic Cost Management**

<table>
<thead>
<tr>
<th>Company</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
<th>Times Cited</th>
<th>% Cited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Chain</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
<td>G</td>
<td>H</td>
<td>I</td>
</tr>
<tr>
<td><strong>Strategic Cost Management</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Employ volume leverage/group buy</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Gain total cost knowledge at each node</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>- Know all elements in the process</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>7</td>
<td>47%</td>
</tr>
<tr>
<td>- Apply cost model</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>4</td>
<td>27%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Unbundle cost</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>3</td>
<td>20%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Make volume guarantee</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>8</td>
<td>53%</td>
</tr>
<tr>
<td>Negotiate long-term (annual) deals</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>8</td>
<td>53%</td>
</tr>
<tr>
<td>Make the deal for the buyer only</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>5</td>
<td>33%</td>
</tr>
<tr>
<td>Use competitive bidding/pricing</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>3</td>
<td>20%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use price masking</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>2</td>
<td>13%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Employ volume leverage or group buy. One of the most frequently mentioned strategies was to employ volume leverage or the group-buy strategy in order to cut price with an upstream supplier for a particular item or raw material. This strategy could be found in 11 out of the 15 supply chains. In these cases, the number of upstream suppliers to cut the price with was typically small, but they had huge supply capacities. The number of the lower-tier suppliers who bought directly from the upstream suppliers, on the other hand, was relatively much larger, each of which had low purchasing volume.

In delegating to the lower-tier suppliers, managers in the case study companies negotiated the item or raw material price with an upstream supplier by using the aggregated volume. After getting the price down, management would either direct lower-tier suppliers to buy the item or raw materials at the designated price, or buy the item or raw material themselves and then turn around and resell it to the lower-tier suppliers.

As an example, management in Company I would first aggregate the volumes from aluminum can makers and negotiate the aluminum sheet price with sheet rollers. Subsequently, management aggregated the volumes from the sheet rollers and further negotiated the aluminum price with aluminum ingot suppliers. In this way, management could keep the price of aluminum cans as low and stable as possible.

Gain total cost knowledge along the supply chain. To gain total cost knowledge at each node along a supply chain was another frequently mentioned cost management strategy in this subgroup. Eleven supply chains exhibited a variety of tactics to gain the total cost knowledge along the supply chain, especially at the upstream levels. Among those tactics are to know all cost elements on the supply side, to apply a mathematical cost model, and to unbundle the total purchasing cost.
For example, management in Company I unbundled all cost elements on the supply side of the PET bottle supply chain. They also applied a cost model in supply chain A to find where the potential of cost savings existed. To know all the cost elements in the supply chain was regarded as necessary in order to keep the firm’s competitive advantages. The manager in Company III mentioned that over time, the knowledge of all cost elements on the supply sides of the three supply chains helped the firm gain competitive advantages, which had not been achieved by the Big Three automakers in the United States.

**Make a volume guarantee.** To promise a “volume guarantee” was a strategy used normally with the strategy of volume leverage. This strategy could be found in eight out of 15 supply chains. In these cases, in regards to their firm sizes or market shares, more than one upstream supplier was generally at an even position in the market. These upstream suppliers’ market positions could be enhanced if they had secured a fixed amount of business.

For instance, the aluminum sheet suppliers in supply chains A were very large in the aluminum can supply market, and all of them obtained promises in purchasing volume from management in Company I. In each of supply chains N and O, management of the case study company told the second tier supplier that they were the ultimate buyer of the components and promised the second tier supplier a fixed purchasing volume that was aggregated from its three Tier 1 suppliers.

**Negotiate a price for a longer term.** Conducting a price negotiation with a supplier beyond Tier 1 on a longer term (semiannual or annual) could be found in eight supply chains. Managers in six out of seven companies mentioned this strategy. For example, in supply chains I and J, the prices of raw materials were made much more stable than
before because “the price was negotiated on quarterly or semiannual basis, instead of on weekly basis.” This strategy was also used to lower the price.

**Make the deal for the case study company only.** “To make a deal for the case study company only” was a strategy mentioned by managers in situations under which Tier 1 suppliers also served the competitors of the case study company. It could be found in five supply chains. Managers in four out of the seven supply chains used some monitoring mechanism to guarantee the requirement that a deal could only be used in the purchasing of their volumes. The senior manager in Company VI said that they stipulated the requirement in the contracts but had no way to guarantee that.

**Use competitive bidding/pricing.** Competitive bidding was typically used in industries in which many upstream item suppliers were available for an item or raw material. This strategy was mentioned by managers in three supply chains, C, E, and H. All of the items under procurement were in new markets in China. When talking about this strategy, it was emphasized by managers that this strategy would be harmful for long-term relationships and better used only for non-strategic items. For example, in supply chain C, the purchasing team in the case study company used competitive bidding to procure non-strategic items such as packaging papers.

**Utilize price masking.** Price masking was cited as a strategy by managers in two supply chains. The purpose of using price masking was either to protect the pricing information of an upstream supplier from leaking to other buyers, as in the case of supply chain C for paper, or to prevent a Tier 1 supplier from using a price increase from a Tier 2 supplier as an excuse to increase the price of the Tier 1 part, as in the cases of supply chain C for paper and F for fuel pump and fuel tank subassembly.
Total Quality Management

Quality related concerns were the second frequently mentioned motivations. Associated activities conducted by management in case study companies were categorized into the second subgroup of strategies, the Total Quality Management subgroup. Representative activities in this subgroup are: (1) to conduct collaborative product development, (2) to implement supplier development programs, (3) to implement supplier certification programs, (4) to standardize upstream parts’ quality, (5) to implement process control, and (6) designate a quality “model”.

Table 5.7 reveals that managers in six out of seven case study companies mentioned activities related to quality management. The six companies represented 12 out of the 15 supply chains. Two supply chains that did not mentioned any quality related management activities belonged to the only company in which the items or raw materials involved were commodity-type products, meaning that they were standardized in the market.

Conduct collaborative product development. Collaborative product development was the most frequently cited example when managers talked about activities in managing the quality of supply items or raw materials at a tier beyond the Tier 1 level. This strategy could be found in eight out of the 15 supply chains. Product development included both new product development and incremental improvement projects.

For example, in supply chains C and D for the paper and ink, R&D teams in the case study company worked with paper and ink suppliers to improve product quality. The projects of joint product development in both supply chains led to the developments of proprietary paper and ink sets specific for the case study company.
<table>
<thead>
<tr>
<th>Company</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
<th>Times Cited</th>
<th>% Cited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Chain</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
<td>G</td>
<td>H</td>
<td></td>
</tr>
<tr>
<td>TQM</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Conduct collaborative product developments</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Implement supplier development programs</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Implement supplier certification programs</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Standardize Tier 2 parts' quality</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Implement process control methods</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Designate a quality &quot;model&quot;</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>

Table 5.7
Strategy: Total Quality Management
The proprietary paper and ink sets helped the case study company gain its competitive advantages.

**Implement supplier development program.** Some managers mentioned that they had to invest extra resources to develop an upstream supplier’s overall capabilities in order to improve product quality. The effort included the establishment of the necessary infrastructure, training employees from multiple levels, and implementing some quality programs such as “six sigma” or scorecards, to name a few. The strategy of supplier development could be found in six supply chains.

For example, a manager in Company II mentioned that as his company entered into China, most local suppliers in supply chain C could not provide qualified raw materials. The company made a great effort to help a few selected suppliers reengineer their manufacturing process, implement training programs at a variety of levels, and co-design new products for the company. As the manager said, “we have to help them develop, otherwise, we have to keep shipping everything from the UK or US to China.” Management in Company VII mentioned that the Tier 2 suppliers in both supply chains were introduced by the Tier 1 suppliers, but over time, through the effort in developing the Tier 2 suppliers as business partners, the case study company had established relationships as good as those with its Tier 1 suppliers.

**Implement supplier certification program.** A supplier certification program was moderately cited by managers. It could be found in six out of the 15 supply chains. The difference between the supplier certification program and the supplier development program described above is defined in this research as follows: the supplier certification program focuses on the certification of an upstream supplier’s product outcome, while the supplier development program focuses on the process that can help a supplier produce a qualified product.
For example, a manager related to supply chain H mentioned that all Tier 3 suppliers had to be certified before they sold their parts to contract manufacturers. In the mean time, management was trying to find more new suppliers that could be certified. As the international market grows, it becomes more and more difficult to find enough qualified suppliers for the company’s supply parts. Therefore, management wanted to keep some certified suppliers “in reserve.”

A supplier certification program was also an effective way to reduce the extent to which the case study company was involved in transactions between a Tier 2 and a Tier 1 supplier. For example, management in Company III eliminated the activity of inspecting the quality of supply parts coming from a Tier 2 supplier’s facility. The activity of examining the quality of the supply parts, when they were arriving at the Tier 1 supplier’s facility, was also eliminated. If quality problems were found to be related to a Tier 1 supplier, the company would go back to re-certify the Tier 2 supplier.

**Standardize Tier 2 parts’ quality.** Standardizing an item or raw material was a frequently cited strategy companies used to manage the product quality for a supplier beyond Tier 1. This strategy could be found in five supply chains. In five of the 15 cases, there were multiple suppliers for an item and the consistency in the product quality was critical for the focal company. For example, in Company III, the quality of most of its Tier 2 parts had been standardized, as the company wanted every part to follow the same standard, no matter whether the part was specific to one product line, to one product platform, or cross platforms.

**Implement process control method.** Process control was one of the approaches in total quality management and had been widely used in manufacturing companies. The method focuses on controlling the quality at each step so as to ensure the total quality.
This strategy could be found in five supply chains which belonged to three companies.

It seems that this strategy was favored by labor-intensive industries. Four out of the five supply chains in which managers mentioned this strategy involved extensive labor activities. For example, in supply chain J, managers in the case study company went back to the fifth tier, and each tier included some kind of labor intensive activity such as portion and processing.

**Design a quality “model.”** This strategy could only be found in two supply chains. It was used to guarantee that the quality of items or raw materials coming from different upstream suppliers was consistent. In these cases, although all items or raw materials satisfied the company’s specifications, they were not consistent across multiple suppliers. The company designated one supplier as a “model” for other suppliers to follow so that all the items seemed to be made by one company.

**Strategic Sourcing**

Sourcing activities with long-term orientation were categorized into the third subgroup, Strategic Sourcing. Typical activities related to sourcing are: (1) to implement global sourcing, (2) to share R&D capability, (3) to localize the supply base, (4) to undertake a multi-sourcing strategy, (5) to allocate supply capability, and (6) to reduce the supply base. This subgroup represents the strategies utilized in 13 out of the 15 supply chains. The key aspect of activities in this subgroup is that all of these activities are forward-looking. Table 5.8 contains a summary of activities used in the 13 cases.

**Implement global sourcing.** This strategy is used particularly in situations where supply parts or raw materials are available globally. Managers in 10 supply chains
<table>
<thead>
<tr>
<th>Supply Chain</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
<th>Times Cited</th>
<th>% Cited</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strategic Sourcing</strong></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>13</td>
</tr>
<tr>
<td>Implement global sourcing</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>10</td>
</tr>
<tr>
<td>Share R&amp;D capability</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>9</td>
</tr>
<tr>
<td>Localize supply base</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>7</td>
</tr>
<tr>
<td>Undertake a multi-sourcing strategy</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>5</td>
<td>33%</td>
<td></td>
</tr>
<tr>
<td>Allocate supply capability</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Reduce supply base</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

**Table 5.8**

*Strategy: Strategic Sourcing*
applied this strategy. Besides, one of the two companies that did not mention this strategy had already outsourced all of its production overseas.

For example, a manager involved in supply chain A explained that since its raw material was a globally commodity, the company had to source it globally to have better product availabilities and price. Another manager in charge of supply chain L said that since all suppliers of high-quality glass bottles were European companies, management needed to purchase the bottles from them to position the final products in the high-end market.

**Share R&D capabilities.** To share R&D capabilities of an upstream supplier was an important strategy when making sourcing decisions. To share R&D capabilities is subtly different from “to conduct collaborative product design” described in the “Total Quality Management” subsection. To share a supplier’s R&D capabilities means the buying company does not have some kind of R&D capabilities, while “to conduct collaborative product design” means both companies have similar R&D capabilities but they can compensate each other by working together.

This was the second most frequently mentioned strategy, involving nine supply chains, which represented five out of the seven participating companies interviewed in this research. For example, one of the Tier 2 suppliers in supply chain J for the chicken was an innovative supplier. Relying on the supplier’s innovation capability had helped the case study company produce many innovative products.

**Localize the supply base.** “To localize the supply base” means that management needs to make available in their domestic markets some items or raw materials originally sourced globally. It was a strategy used in conjunction with the global sourcing strategy mentioned previously. Among the 10 supply chains that applied the global sourcing strategy, seven applied the supply base localization strategy.
One manager in Company III said that in 1990s when the company entered into the US market, management of the company did not trust anyone. They brought their own suppliers and helped them set up joint ventures with local suppliers. Now that these suppliers have been successfully localized, management in the company could treat the localized suppliers as their original suppliers.

**Undertake a multi-sourcing strategy.** This strategy was used specifically in situations when the single-sourcing strategy was already in place. It could potentially nurture a moderate level of competition in a tier where the single-sourcing strategy was replaced by the multi-sourcing strategy since each of the multiple suppliers would like to compete on price and quality to gain more volume from the buying company.

An interesting example is supply chain B for the PET bottle. As mentioned previously, management in the company initially decided to reduce the supply base at the third tier. When management found that most of its Tier 3 suppliers purchased raw materials from one global resin supplier, they decided to consolidate the resin demand and reconfigure the third tier by splitting the aggregated demand with the original global resin supplier and other large resin suppliers. As a result, at the global level the original single sourcing of resin changed to multiple sourcing. Sourcing globally combined with the multiple-sourcing helped to reduce the resin price.

**Allocate supply capability.** The strategy of supply capability allocation was used to make sourcing decisions based upon the long-term supply capability of the current supply base. In other words, it was an upstream supplier’s capability to meet future demand that made management decide to buy from the supplier. The short-term benefits might not be obvious, but in the long-run it would be good for the company.

As an example, the focal company in supply chain A had an annual growth rate of about 4% while the industry average was only 1.5%. A manager involved in
supply chain A said that when they were selecting Tier 2 suppliers, they chose those who could match their demand growth, not just the industry average.

**Reduce supply base.** This strategy aims at reducing the number of suppliers at each tier in the supply base. Only two supply chains applied this strategy. In these cases, the supply commodities were available in the market, normally with a lot of suppliers. By reducing the supply base, management could focus their resources on a few important suppliers.

As an example, management of the converter companies at the second tier in supply chain B, for the PET bottle, used to purchase resin from many small regional resin suppliers at the third tier. Only after reducing the number of suppliers at that tier could management of the company work closely with fewer suppliers. At the beginning, the extra work of reducing the supply base would consume some extra management resources. But in the long run, it helped management achieve better performance with limited managerial resources.

**Relationship Management**

Activities related to relationships with upstream suppliers were categorized into the subgroup of Relationship Management. Strategies in this subgroup were found in all seven case study companies and the 15 supply chains, as show in Table 5.9. Relationship management seeks to establish or improve the relationship between the case study company and a supplier beyond Tier 1 so as to effectively and efficiently procure an item from the upstream supplier.
## Table 5.9

### Strategy: Relationship Management

<table>
<thead>
<tr>
<th>Company</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
<th>Times Cited</th>
<th>% Cited</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Supply Chain</strong></td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
<td>G</td>
<td>H</td>
<td>I</td>
</tr>
<tr>
<td><strong>Relationship Management</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Build long-term relationships</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Apply appropriate governance</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>structures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominate qualified suppliers</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Assign dedicated resources</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Increase process visibility</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Share information with selected supply chain members</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Deploy logistics activities</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>
Based on the data collected from the seven case study companies, seven distinct activities have been recognized as oriented toward a long-term relationship. They are: (1) to build long-term relationships, (2) to apply the appropriate governance mechanism, (3) to nominate qualified suppliers, (4) to assign dedicated resources, (5) to increase process visibility, (6) to share information with selected suppliers, and (7) to deploy logistics activities.

**Build long-term relationships.** This is the only strategy that could be found in all 15 supply chains. All seven companies we interviewed showed some long-term orientation when they were dealing with suppliers beyond Tier 1. The motivations included in all four subgroups identified previously could be realized through building and maintaining long-term relationships with suppliers beyond Tier 1.

For example, a long-term relationship could help management control both the cost and quality of a supply part. Cost and quality were two motivations normally in conflict, and it was difficult for any particular strategy to satisfy both of them simultaneously. The long-term relationship was useful even in a commodity market where most of the business relationships were transaction-based. A manager in supply chain A said that building a long-term relationship with a supplier of raw materials had helped the company stabilize the raw material price.

**Apply appropriate governance mechanisms.** Governance mechanisms are approaches to manage business-to-business relationships. Some mechanisms take the form of contracts that articulate every detail, while others take the form of close relationships by only outlining generic rules between two companies. This strategy could be found in nine supply chains. Management in the case study companies that applied this strategy clearly mentioned that they chose governance mechanisms appropriate for different items or suppliers, not just a standard written contract. Some
of the companies applied more than one control mechanism to manage the business relationship.

For instance, a manager in supply chain C mentioned that when management brought some of their paper suppliers into China, they made it clear in the contract which printers the paper suppliers should sell the paper to. A manager in supply chain C mentioned that in order to avoid conflicts between a paper supplier and printers, the case study company developed purchasing agreements with both suppliers’ presence, and articulated all technical details for supply parts and contingency plans for possible quality problems.

Nominate qualified suppliers. This strategy involves nominating some qualified upstream suppliers to lower-tier suppliers so that lower-tier suppliers have more options in selecting upstream suppliers. It is different from the “supplier certification” in the total quality management category in that a certified upstream supplier is currently supplying parts or components to a lower-tier supplier, while a nominated supplier might not. Being a certified supplier means the quality of the supply part has satisfied the focal company’s standard, thus some quality inspection activities in the lower-supplier’s facility can be eliminated. The supplier certification strategy focuses on quality control, while the supplier nomination strategy focuses on giving a lower-tier supplier some flexibility when selecting from the pool of nominated suppliers. This strategy could be found in seven supply chains. In these supply chains, the upstream suppliers who were nominated by the case study company were in a better position in the market, because being a nominated supplier of a leading company meant that the supplier had the capability to provide high-quality products.

For example, in supply chain H for the faucet, for some components there were many suppliers at the third tier, all of which could use the focal company’s design
prints to make qualified components. Therefore, the company gave its contract manufacturers the option of selecting component suppliers. Consequently, contract manufacturers had their choice with respect to the cost and innovation of a third tier component.

**Assign dedicated resources.** Dedicated resources include both equipments and staff. When applied appropriately, the strategy can strengthen the business relationships among supply chain member companies. A total of seven supply chains applied this strategy. Dedicated resources could be invested either by the case study company or by an upstream company.

For example, in supply chain L for the label, a label supplier established a dedicated manufacturing capacity for the case study company, which would guarantee the label supply especially during a surge in demand. This dedicated capacity helped the label supplier win more business from the case study company and strengthened their long-term relationship.

**Increase process visibility.** To increase process visibility is to make sure everybody know what others are doing. It is difficult to measure the benefits of increased process visibility among supply chain members, but improvement in visibility or transparency can build confidence for management in dealing with other companies. Increasing process visibility can be achieved in many forms, such as sharing demand information, sharing production process, and CPFR, to name a few. These activities could be found in six supply chains.

The manager in supply chain L pointed out the installation and alignment of SAP systems among the case study company and its Tier 1 and Tier 2 suppliers made closer relationships between them. Now that the Tier 1 supplier could log in the case study company’s system and place orders to the Tier 2 suppliers on behalf of the case
study company, the pipeline inventories from a Tier 2 supplier to the case study company was visible for all companies at the three tiers.

**Share information with selected suppliers.** In order to keep some information confidential, management of buying companies selected to share some information only with selected suppliers across the supply chain. This information included pricing, product design, or demand. This strategy could be found in four supply chains. It was normally applied together with strategies such as price masking and suppliers’ market intelligence protection. For example, the pricing information in supply chain A was limited in a few senior executives from leading companies at each tier in the supply chain.

**Deploy logistics activities.** This strategy was used to allocate the responsibilities of managing logistics activities among the supply chain member companies in the most efficient and effective ways. This is a less frequently mentioned strategy, with only four occurrences in the 15 supply chains. In these three cases, the benefit of economy of scale could be achieved by managing logistics activities efficiently and economically among the supply chain member companies. By undertaking these activities, the case study companies reduced not only logistical burdens for Tier 1 suppliers and beyond, but also consolidated their ties with upstream suppliers.

For example, in supply chain I for the beef, management of the case study company could achieve annual savings of two million dollars by delegating to its first tier suppliers the negotiation of the freight from Tier 2 suppliers. In supply chain L for the label, most logistics activities such as ordering and shipping were undertaken by a logistics division under the same corporate umbrella. In addition to the cost benefit, this strategy could also increase the delivery performance between Tier 2 and Tier 1 suppliers.
Context-Specific Strategies

Management in the seven case study companies also referred to a variety of context-specific strategies that were not appropriately categorized into the subgroups described previously (i.e., strategic cost management, total quality management, strategic sourcing, and relationship management). In this research, these strategies were assigned into the subgroup of “Context-Specific Strategies.” Twelve out of the 15 supply chains have strategies that belong to this category, as illustrated in Table 5.10. These strategies are: (1) to hire external expertise, (2) to take a producer’s social responsibility, (3) to develop buyer-specific upstream items, and (4) to protect suppliers’ market intelligence.

Hire external expertise. This strategy is used particularly in situations where a case study company wanted to control the cost and/or quality at a tier beyond Tier 1 but management in the company did not have sufficient knowledge. For example, in supply chain M for the Ajimoto, after management in the company identified the significant financial impact of a raw material’s price, they hired external expertise in the raw material market to quickly gain the price knowledge. This strategy could be found in seven supply chains.

Take a buyer’s social purchasing responsibility. To take a buyer’s social purchasing responsibilities means to take actions in protecting the environment, to build corporate citizenship images for the public, and to help minority/small businesses. This strategy could be found in four out of the 15 supply chains. As one manager in supply chain A said, as the environmental issue was getting more and more serious, they had to take a purchaser’s social responsibility. The company worked with retailers to collecting packaging materials for the recycling companies that make the packaging materials reusable.
<table>
<thead>
<tr>
<th>Company</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
<th>Times Cited</th>
<th>% Cited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Chain</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
<td>G</td>
<td>H</td>
<td>I</td>
</tr>
<tr>
<td>Context-Specific Strategies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hire external expertise</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>7</td>
<td>47%</td>
</tr>
<tr>
<td>Take a buyer's social purchasing responsibilities</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>4</td>
<td>27%</td>
</tr>
<tr>
<td>Develop buyer-specific upstream item</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protect suppliers' market presence</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5.10
Strategy: Context-Specific Strategies
The senior VP in supply chain K mentioned that to gain innovations from smaller suppliers, the company helped some small Tier 2 suppliers become cost competitive by using the company’s volume leverage to cut deals with their upstream chicken suppliers for a minority Tier 2 supplier. By doing so, the company could also improve its corporate citizenship image in public.

**Develop buyer-specific upstream items.** This strategy was found in situations where an upstream item was a commodity that was offered by many suppliers. Four supply chains applied this strategy. In order to differentiate final products from their competitors, management in the case study companies worked with upstream suppliers directly to develop items that were used exclusively for their own companies. A contract with technical details can be used to guarantee the exclusiveness.

**Protect a supplier’s market presence.** A supplier’s market presence might be one of the company’s competitive advantages. Managers from two supply chains clearly stated that this was the strategy that they had to use as the suppliers did not want their market presence to be exposed. For example, as Company II entered into a new overseas market, management in the company wanted some of their original ink suppliers to continue to provide ink sets in the new market at a global price. Some ink suppliers might not want their competitors to know that they had been already in that market. Other ink suppliers might not want other companies to know about the price they offered to the case study company. Management of the company had to take actions to protect the information of market presence from leaking.
Associations between Motivations and Strategies

In the previous two sections, motivations and strategies for managing suppliers beyond Tier 1 have been described on the basis of data collected from 15 supply chains. In this section, the associations between the motivations and strategies will be identified and presented by showing the linkages between each motivation and strategy. The associations between motivations and strategies will be first presented in a matrix with specific motivations and detailed management activities, as shown in Table 5.11. Motivations and strategies are subjectively grouped into four motivation categories and five strategy categories, respectively. Each specific motivation will be described in detail with its corresponding strategies.

Cost Motivations and Associated Strategies

Figure 5.1 reveals the linkages between cost motivations and the five groups of strategies identified before. As described before, the six cost-related motivations are unit purchasing cost, cost knowledge across the supply chain, purchasing price volatility, upstream logistics costs, price information, and foreign trade related costs.

Unit purchasing cost versus associated strategies. The unit purchasing cost could be reduced by management activities in the following four strategies: strategic cost management, strategic sourcing, and relationship management, see Table 5.11 for details. Management in most of the case study companies applied strategic cost management strategies to reduce an upstream item or raw material’s unit purchasing cost. Strategic sourcing such as global sourcing and supply base localization was also used to reduce the unit purchasing cost. For example, one of the main purposes of global sourcing was to procure a low-cost item, while supply base localization helped local suppliers produce qualified items at lower costs than overseas suppliers. A close
<table>
<thead>
<tr>
<th>Unit purchasing cost</th>
<th>Cost knowledge across the supply chain</th>
<th>Price volatility</th>
<th>Logistics cost</th>
<th>Price information</th>
<th>Foreign trade costs</th>
<th>Part/raw material quality</th>
<th>Supply items as quality differentiators</th>
<th>Quality transparency/visibility</th>
<th>Safety/regulation</th>
<th>Consistency/Standardization</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

Table 5.11

Associations between Motivations and Strategies
<table>
<thead>
<tr>
<th>Financial health (Cash flow)</th>
<th>Social purchasing responsibility</th>
<th>Market intelligence/know-how</th>
<th>Production capability/supply shortage</th>
<th>Order, delivery and payment control</th>
<th>Delivery reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Employ volume leverage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gain total cost knowledge</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Make volume guarantee</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Negotiate long-term deals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Make the deal for the buyer only</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Use competitive bidding</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Use price masking</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conduct collaborative product developments</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Implement supplier development programs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Implement supplier certification programs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Standardize part quality</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Implement process control methods</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Designate a quality &quot;model&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Implement global sourcing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Share R&amp;D capability</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Localize supply base</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Undertake multi-sourcing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Allocate supply capability</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reduce supply base</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Build long-term relationships</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Apply appropriate governance mechanisms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nominate qualified suppliers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Assign dedicated resources</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Increase visibility</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Share information with selected supply chain members</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Deploy logistics activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hire external expertise</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Take a buyer’s social purchasing responsibilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Develop buyer-specific upstream item</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Protect suppliers’ market presence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 5.1

Cost Motivations and Associated Strategies
relationship between a buying company and its supplier beyond Tier 1 was recognized by many managers as an effective way to reduce the purchasing cost. Sometimes, hiring external expertise would provide a company quick wins in reducing purchasing price.

**Cost knowledge across the supply chain versus associated strategies.** Cost knowledge had been achieved by companies through gaining total cost knowledge at each node, sourcing globally, building close business relationships with upstream suppliers, and hiring external cost expertise. For example, Company I had full operations in the “value chain” on the supply side, so they knew “everything of the cost elements in each step.” Company II had a lab to replicate all activities that should be done at each tier on the supply side. Having the full operations was a way to gain the total cost knowledge. Another way was to hire external expertise. As Company II entered a new overseas market, management of the company hired external expertise in the end item supply areas beyond Tier 1. As a result, they quickly gained cost knowledge at the Tier 2 level and achieved “tremendous savings.”

**Price volatility versus associated strategies.** Price volatility is normally accompanied with high unit purchasing price. A total of three strategies had associations with this motivation; they were strategic cost management, strategic sourcing, and relationship management. For example, “volume guarantee” in the strategic cost management strategy was found in Company I to be very effective in “smoothing the purchasing price.”

**Logistics costs versus associated strategies.** Logistics costs were found to be reduced by strategies including employ volume leverage, gain total knowledge across the supply chain, localize supply base, allocate supply capability, and deploy logistics activities. For example, supply base localization could easily reduce the inbound
transportation cost because of the shortened transportation distance from the point of supply to the manufacturing facilities or to the point of consumption. Inventory holding costs could also be reduced due to the reduced safety stock requirements as the lead time was reduced.

Relationship management was a very popular strategy used by management to reduce logistics costs. For example, after having established close relationships with upstream suppliers, management in the case study companies could deploy logistics activities from the point of cost-effectiveness. All logistics activities were allocated efficiently among the buying company and its upstream suppliers.

**Price information and associated strategies.** Price information could be protected by using price masking, applying appropriate governance mechanisms, and sharing information with selected supply chain members. Price information includes both the information of the price and process of pricing. In supply chain F for the fuel pump and fuel tank subassembly, the manager said the process of pricing was more important than the price itself. The case study applied both the price masking and the appropriate governance mechanisms to protect the information of pricing from leaking.

**Foreign trade related cost versus strategies.** Costs related to foreign trade could be reduced by strategies including employ volume leverage, gain total knowledge across the supply chain, localize supply base, apply appropriate governance mechanisms, and deploy logistics activities. For instance, costs related to customs or tariffs could be reduced by supplier localization or applications of appropriate governance mechanisms. Company II and Company IV, both with overseas production operations, mentioned that cost issues related to foreign trade could be solved by localizing supply base and cost-efficiently deploying logistics activities.
Quality Motivations and Associated Strategies

Five quality related motivations are recognized on the basis of data collected from personal interviews. They are the quality of supply parts or raw materials, supply parts as quality differentiators, quality transparency/visibility, safety issues or government regulations, and consistency/standardization. The linkages between quality motivations and strategies are presented by providing the interfaces between each motivation and four out of the five strategies, and the activities performed under each strategy. Figure 5.2 shows the associations between each quality motivation and the corresponding strategies.

**Quality of parts/raw materials versus associated strategies.** Quality of parts and raw materials was found to interface with three categories of strategies, including total quality management, strategic sourcing, and relationship management, see Table 5.11 for details. For example, quality of parts or raw materials could be improved by one or more activities in the total quality management strategy, including collaborative product design, implement supplier development/certification programs, standardize part quality, implement process control methods, and designate a quality “model.” It could also be improved by purchasing from suppliers who could offer items or raw materials with better quality, as practiced in supply chain L for the label and packaging components where management purchased high-quality glass bottles from European suppliers.

**Supply items as quality differentiators versus associated strategies.** Use of supply items as quality differentiators was one of the key motivations for managers to manage suppliers beyond Tier 1. A variety of strategies could be used to achieve this objective, including conduct collaborative produce design, implement supplier
Figure 5.2

Quality Motivations and Associated Strategies
development program, do sourcing globally, apply appropriate governance mechanisms, and develop buyer-specific upstream items. To conduct collaborative product design and implement supplier development programs focus on helping an upstream supplier develop high standard items or raw materials which would in turn make the final product differentiated from other products. For example, in Company V, the R&D team in the case study company works with beef and chicken suppliers to develop burgers that are different from that of competitors.

Management could obtain a high-quality supply item or raw material by purchasing directly from high-quality global suppliers. They also applied strategies associated with relationship management such as building long-term relationship, applying appropriate risks/rewards structure and nominating qualified suppliers were also used to obtain high-quality supply items or raw materials. A manager in Company VII said that having a long-term oriented relationship with a Tier 2 supplier motivated the supplier to continuously provide the case study company high-quality titanium casting heads that differentiated the company’s products from its competitors’ products.

**Quality transparency or visibility versus associated strategies.** Similar to the activities in the strategic cost management to gain total cost knowledge across the supply chain, there are activities that can be used to understand the quality elements at each node along the supply chain. Quality visibility could be achieved by some strategies in total quality management, share supplier’s R&D capability, and relationship management strategies. For example, in Company III, management gained the quality visibility through implementing collaborative produce design, supplier development programs and process control methods. In that sense relationship management and/or strategic sourcing would be the best strategies. The
motivation of transparency is more like a management philosophy, therefore any activities leading to closer working relationships and better understanding of each other would be appropriate for this motivation.

**Safety issues and government regulations versus associated strategies.** Three companies, Companies III, IV, and V, were in industries with strong safety requirements or government regulations. Companies IV and V regarded the safety issues or government regulations as reasons for managing suppliers beyond Tier 1. Management in Company V selected suppliers with the capability to meet the safety requirements or government regulations by increasing the process visibility across the whole supply base and preventing beef with BSE potential entering their supply channel. Management in Company IV provided the design of components or the formula for the raw materials used to produce these components. The two approaches were categorized into relationship management.

**Consistency or standardization versus associated strategies.** The motivation of consistency or standardization was mentioned by managers in supply chains where one item was supplied by a number of upstream suppliers. In addition to ensuring the quality of each item supplied by different suppliers, it was also important to make the quality consistent. In a key product line in Company II, management had to make sure each package “looks and touches as the same.” Management in the company designated a quality “model” that other suppliers had to follow. Another approach used by the company was to jointly develop a “standardized” ink set with its ink suppliers that could be provided by every supplier, which is classified as “to develop buyer-specific upstream items.”

Management in Company IV applied a different strategy to ensure consistency among supply components. They provided each supplier, from Tier 1 to
Tier 3, the same score card to follow. Use of the same quality standard and operation procedures could guarantee the quality consistency. This activity is classified as “to apply appropriate governance mechanisms.”

**Dependability Motivations and Associated Strategies**

Figure 5.3 shows the interfaces between dependability related motivations and associated strategies. Based upon the data collected from personal interviews, four specific dependability motivations were found to be interfaced with four of the five categories of strategies. The four specific dependability motivations are delivery reliability, production capability or supply shortage, the capability of controlling the order, delivery, and payment, and R&D or innovative capability.

In most cases, the motivations to obtain delivery reliability and the capability of order, delivery, and payment indicated that Tier 1 and Tier 2 suppliers did not have these capabilities so that the management in the case study companies had to assume the responsibilities. No activity in the strategic cost management strategy was recognized as associated with the four specific dependability motivations.

**Delivery reliability versus associated strategies.** Strategies used to improve delivery reliability include supplier development/certification programs, supply base localization, building long-term relationships, apply appropriate governance mechanisms, nominate qualified suppliers, assign dedicated resources, deploy logistics activities, and hire external expertise. For example, managers in Company II and Company IV mentioned that supply base localization could improve delivery performance. Better supplier relationships could improve delivery reliability as a result of increased mutual understanding and aligned business objectives.

**Production capacity or supply shortage versus associated strategies.** The motivation of looking for upstream suppliers’ production capacities was achieved by
Figure 5.3

Dependibility Motivations and Associated Strategies
case study companies through strategic sourcing, relationship management. To ensure the total purchasing volume, the amount to be assigned to each individual supplier was examined by balancing total supply capacity over a supply chain, and reasonably allocated.

The motivation of production capacity could also be achieved by applying appropriate governance mechanisms, assigning dedicated resources, and increasing the process visibility. For example, management in supply chain J shared the demand forecast information with suppliers beyond Tier 1 so that the suppliers could reserve the required production capacity for the case study company.

Sometimes, the lack of production capacity will result in supply shortage. Management in Company I used a “group buy” approach to aggregate volume to secure the supply. Sourcing globally was another approach used by management in Company I to secure supply. Supply shortage would be very high if a raw material was single sourced. In this case, management should either change to multiple-sourcing (as in supply chain B for PET bottle), or assign a full-time dedicated staff to work with the single-sourced supplier (as in supply chain M for Ajimoto.)

**Order, delivery, and payment controls versus associated strategies.** This is one of the motivations when management goes further back to the supply chain. In this situation, the transactions between upstream suppliers and their direct customers become more complicated. In most cases, these transactions were unreliable in terms of order, delivery, and payment activities and controls. Three strategies could be identified on the basis of the interview data, namely, building long-term relationships, assign dedicated resources, and increase process visibility.
For instance, when management in the Company III localized its supply base, the order/delivery/payment activities were considered as important factors. From the cost point of view, if the cost of managing these activities by suppliers is much higher than by the case study company, the company would assign dedicated staff to do that. When management in Company II brought its domestic paper suppliers into China, they had to undertake the responsibilities of these activities. Doing so increased the complexity of the transaction between paper suppliers and printers, and management was still looking for more efficient ways to reduce the complexity.

**R&D or innovation capability versus associated strategies** The motivation of sharing an upstream supplier’s R&D or innovative capability could be achieved by conducting collaborative product design, sharing R&D capability, building long-term relationships, applying appropriate governance mechanisms, and developing buyer-specific items. Establishment of projects to collaboratively develop new products was the most popular approach used by companies to share an upstream supplier’s innovative capability. Sharing a supplier’s R&D capability and multi-sourcing was also used for this purpose.

For example, in supply chain A for the aluminum can, management could share a roller’s innovative capability by establishing long-term relationship with the roller. Management in supply chain J for the chicken articulated in the contract that benefits due to a supplier’s innovation would be shared by both companies. In supply chain L for the label, any ideas about innovative component development would be accepted by the case study company if the new component could meet the company’s quality and safety requirements.

A manager in Company III explained that they could always rely on the fuel pump supplier’s R&D capability, no matter whether it was in the product design stage
or in the installation stage in the fuel tank supplier’s facility. Management in Company II mentioned that the case study company worked together with the ink supplier to develop buyer-specific items to share ink suppliers’ innovative capability.

**Context-Specific Motivations and Associated Strategies.**

Context-specific motivations include market intelligence/know-how, social purchasing responsibility, and financial health. These motivations have interfaces with strategies in two strategy categories: relationship management, and context-specific strategies. Figure 5.4 illustrates the interfaces between context-specific motivations and associated strategies. Since most of these motivations in this subgroup were context specific, there were only one or, at most, two strategies associated with each motivation.

**Market intelligence/know-how versus associated strategies.** Market intelligence represents the information of a supplier’s market presence or know-how that the supplier does not want to release. Strategies used to protect suppliers’ market intelligence included applying appropriate governance mechanisms, sharing information with selected supply chain members, and preventing a supplier’s market presence information from leaking. For example, in Company II, some of the company’s ink suppliers did not want other companies know that they had been in China already. Management of the company had to apply appropriate approach to perform the transaction with ink suppliers so that the ink suppliers’ market presence information could be kept from leaking.

**Social purchasing responsibility versus associated strategies.** Social purchasing responsibilities include environmental concerns and supplier diversity. Environmental concerns could be found in three supply chains and supplier diversity motivation
Figure 5.4
Context-Specific Motivations and Associated Strategies
could be found in one supply chain. In order to protect the environment, management in Company I initiated a recycling project for packaging materials, which involved both retailers and recycling companies.

Management in supply chain J took actions to nurture minority businesses, in order to have a diversified supply base and acquire more innovative ideas from the diversified suppliers. For example, the senior VP mentioned that she used her company’s volume leverage to negotiate a better deal for minority suppliers so their innovations would not be hindered by their lack of price competitiveness.

**Financial health versus associated strategies.** Financial health was about the smoothness of cash flow between an upstream supplier and its direct customer (a lower tier supplier of a buying company). It interfaced with three strategies in the category of relationship management, including building long-term relationships, applying appropriate governance mechanisms, and increasing process visibility. The financial health motivation could be found in four supply chains, C, D, G, and H. In the cases of supply chains C, D, and H, the Tier 1 and Tier 2 suppliers were in China where financial transactions were not as smooth as in the United States. A clearly established contract would be helpful, but building a long-term business relationship and increasing process visibility were also effective ways to reduce the financial health risk.

In the case of supply chain G, most of the Tier 1 suppliers, the tire-mounting companies, were set up by management of the company due to the subassembly requirement and had insufficient financial capability to own the tire and wheel inventory themselves. Therefore, it was necessary to make a special payment arrangement made in the contract, a type of governance mechanism.
The Normative Model for Managing Suppliers beyond Tier 1

The major purpose of the study was to develop a normative “model” for managers to manage suppliers beyond Tier 1. Figure 5.5 shows a normative model with motivations, strategies, and the associations between motivations and strategies. Each subgroup of motivations has interfaces with four or five subgroups of strategies, suggesting that for each type of motivation, there exists more than one type of strategy.

The normative model with detailed specific motivations in each motivation subgroup is presented in Figure 5.6, while the normative model with detailed activities in each strategy subgroup is presented in Figure 5.7. Managers can use the normative model to develop the strategies for managing suppliers beyond Tier 1, and refer to the model with detailed motivations and/or activities to establish their action plan. A five-step decision-making process for managing suppliers beyond Tier 1 is described in the next section.
Figure 5.5
The Normative Model for Managing Suppliers beyond Tier 1
Figure 5.6

The Normative Model with Specific Motivations

- Unit purchasing cost
- Cost knowledge over supply chain
- Price volatility
- Logistics cost
- Price information
- Foreign trade costs
- Part/raw material quality
- Supply items as quality differentiators
- Quality transparency/visibility
- Safety/ regulation
- Consistency/Standardization
- Delivery reliability
- Production capability/supply shortage
- Order, delivery, and payment control
- R&D/innovative capability
- Market intelligence/know-how
- Social purchasing responsibility
- Financial health/cash flow

Cost

Quality

Dependability

Context-Specific Motivations

Strategic Cost Management

Total Quality Management

Strategic Sourcing

Relationship Management

Context-Specific Strategies
Figure 5.7

The Normative Model with Management Activities
Decision-Making Process for Managing Suppliers beyond Tier 1

One of the purposes of this undertaking was to develop a decision-making process for managing suppliers beyond Tier 1. An empirical decision-making process is presented in Figure 5.8. This process is derived from the data collected from personal interviews when investigating the motivations and strategies for managing suppliers beyond Tier 1.

This empirical model includes five steps:

1. Review corporate, marketing, manufacturing, and logistics strategies, the supply chain network structure, and customer requirements.
2. Identify items or materials to be managed directly.
3. Evaluate/prioritize motivations, and choose appropriate strategies.
4. Implement strategies.

Step 1: Review corporate and functional strategies, supply chain structure and customer requirements

Managing suppliers beyond Tier 1 is an unexplored area in supply chain management. From the perspective of the GSCF supply chain management framework, it involves concepts from both the supply chain network structure and the supplier relationship management process. Suppliers beyond Tier 1 are playing more important roles in the process of fulfilling corporative strategic objectives. For instance, some companies regarded low-cost as their number one priority, while others focused on quality or innovation. The impacts that suppliers beyond Tier 1 have on those strategic objectives should be different. Therefore, a review of the corporate strategy is the first necessary step.
Decision-Making Process for Managing Suppliers beyond Tier 1
Strategic inputs from functional areas such as purchasing, manufacturing, marketing, logistics, R&D, and finance are required when making decisions in managing suppliers beyond Tier 1. Case study data revealed that these inputs were taken by using a cross-functional approach. For example, when management in Company III was making decisions about managing suppliers beyond Tier 1 directly, they had to first review the corporate strategy and functional strategies. Offering high-quality products at lower costs than their competitors is at the top of the corporate strategic objectives, and all functional strategies had to follow this direction. Cross-functional meetings, sometimes with involvement from customers and suppliers, were held periodically to ensure that all strategies were aligned and executed accordingly.

In addition, it is necessary to evaluate the type of supply chain network structure. Management needs to know the number of tiers on the supply side of a product supply chain, the number of suppliers at each tier, and the position of a supplier in its market. The type of supply chain structure and the position of an upstream supplier in the supply chain will determine how many managerial resources are required to manage the upstream supplier. A clear mapping of the supply side of a supply chain can help management recognize the business relationships among supply chain members.

**Step 2: Identify items or raw materials to be managed directly**

Once the corporate strategy and business objectives are understood, management needs to identify items or raw materials to be managed directly. Most case study companies used some methods to classify all items or raw materials. For example, management in Company V used a two-by-two matrix to categorize items or raw materials, the two dimensions of the matrix being the complexity to the company
and purchasing volumes. A manager said they had to look further back in the supply chain to manage the items that were strategically important to the company.

Any single-sourced item or raw material must be identified before making decisions. Data collected from personal interviews show that many of the motivations are related to single sourcing, regardless of the tier at which the single-sourcing takes place. Unless there was only one supplier in the market, as in the case of supply chain N, management should choose the multiple-sourcing strategy, rather than the single-sourced strategy.

The must-be-managed items or raw materials beyond Tier 1 should be identified. The items or raw materials involve issues such as intellectual property, conflicts between an upstream supplier and its direct customers, and safety regulations.

Once these three types of items or raw materials are identified, other items or raw materials that might have potential implications for the company’s business should be recognized. Next, these “have-to” items and “want-to” items need to be prioritized on the basis of their importance to the company. For example, a manager in Company I said that the next possible areas to manage were the costs of secondary packaging materials and the converting cost at the Tier 2 level. A manager in Company V said they would like to go further back in the supply chain to manage tomato growers directly.

Inputs from functions including manufacturing, logistics, and R&D are also necessary for this step. From the data collected it was found that the “make-buy” decision was critical to the supply chain network structure, and the inputs from the above mentioned functions were critical to the make-buy decision.
Step 3: Evaluate motivations and choose appropriate strategies

Once the items that must be managed or need to be managed have been recognized, management should evaluate the motivations for managing the suppliers of these items. The evaluation process needs to be carried out with considerations of the financial budget and all possible strategies (as shown in Figure 5.7 and 5.8) associated with these identified motivations.

For every possible strategy associated with an identified motivation, a cost-benefit analysis should be conducted to examine the economic feasibility of each motivation-strategy pair. A manager in Company III said that for each decision made, they completed a cost-benefit analysis. They would not proceed if it was not cost-effective to directly manage a supplier beyond Tier 1.

Step 4: Implement strategies

The next step is to implement the selected strategies. It is important to gain input and commitment from other functions identified in previous steps, and to implement these strategies under the supervision of a cross-functional team. For example, in Company II, the purchasing team acquired support from outside the purchasing function, and the activities such as volume leverage, price masking, supplier certification, supply base localization, appropriate governance mechanism, and hiring external expertise, to name a few, were supervised by a team with representatives from multiple functions.

Step 5: Measure/evaluate performance

The last step is to evaluate the improvements in performance that result from managing suppliers beyond Tier 1. Generally speaking, it is difficult to find the direct connection between the activities that have been completed at a tier beyond Tier 1 and the company’s performance, especially when the motivations are non-numeric ones.
Case study companies applied a variety of approaches to measure the performance improvements that result from managing suppliers beyond Tier 1. Some of the approaches were financial metrics, while others were non-financial. In fact, most of these metrics are internal ones, and do not fully consider the performance of the suppliers beyond Tier 1 being managed.

At this step, the GSCF’s seven-step framework for measuring supply chain management performance can be adopted to measure the performance improvements that result from managing suppliers beyond Tier 1. The seven steps in the framework are:

1. Map the supply chain from point-of-origin to point-of-consumption to identify where key linkages exist.
2. Use the customer relationship management and supplier relationship management processes to analyze each link (customer-supplier pair) and determine where additional value can be created for the supply chain.
3. Develop customer and supplier profit and loss (P&L) statements to assess the effect of the relationship on profitability and shareholder value of the two firms.
4. Realign supply chain management processes and activities to achieve performance objectives.
5. Establish non-financial performance measures that align individual behavior with supply chain management process objectives and financial goals.
6. Compare shareholder value and market capitalization across firms with supply chain objectives and revise process and performance measures as necessary.
7. Replicate steps at each link in the supply chain [1].

In the context of managing suppliers beyond Tier 1, the performance improvements can be measured through supplier relationship management. Since a direct relationship between a buying company and one of its suppliers beyond Tier 1 would be affected by other suppliers between these two companies, the framework might need some adjustments before implementation. For example, the customer-supplier pair mentioned in Step 2 might be analyzed by incorporating a third company (such as the Tier 1 supplier between them).
Typical activities conducted in this step include: (1) measure performance periodically, (2) evaluate strategies that have been implemented, and (3) adjust strategies as necessary. Incremental improvements are the keys in the case study companies. For example, managers from Company II and Company III mentioned that their practices in managing suppliers beyond Tier 1 had evolved over time into their current status.

Incremental improvements can be justified by periodically reviewing the strategies for managing suppliers beyond Tier 1. Once management realizes that current types of management activities and the levels of management involvement are not appropriate or cost-effective, they can either change the types of management activities or the level of involvement in the existing relationship, go further back in their supply chain to manage another tier of suppliers, or relinquish control of managing a supplier beyond Tier 1 to a lower-tier supplier. The process of managing suppliers beyond Tier 1 is dynamic, and the performance evaluation is the driving force to keep the relationship in motion.

A Concluding Note

The findings of the research were presented in Chapter 5. Chapter 6 contains a summary of research findings, the conclusions and suggestions for future research.
References

CHAPTER 6

SUMMARY AND CONCLUSIONS

In this chapter, a summary of the research and the major conclusions are presented. The first section contains a brief summary of the purpose of the study and the research design. The research questions and findings are reviewed in the second section. The following sections are comprised of the normative model, the decision-making process, major conclusions, and implications for practitioners and academicians. Chapter 6 closes with suggestions for future research.

Summary of Research Purpose and Design

The purpose of this research was to determine how the decision to manage suppliers beyond Tier 1 is made in the supply chain context in terms of the motivations and strategies, as well as determine the decision-making process used to select individual items or suppliers beyond Tier 1. Topics explored included the reasons to manage suppliers beyond Tier 1, how to manage them, how the decision is to be made, and how to measure the performance.

A review of the literature in interorganizational relationship management, relationship marketing, supplier relationship management, and partnership was used to develop a methodological framework and to prepare the interview guide for collecting data from personal interviews in the field research phase of the project.
A total of 15 companies were approached. Oral presentations were made to 14 of them, with a brief introduction of the purposes of the research, research methodology, and potential contributions of the research. After receiving a research protocol and interview guide, management from six companies decided to participate. The last company was approached via email with the research protocol and interview guide, and they participated in this research. A total of seven companies participated in this research. Data were collected about 15 supply chains, and the tier of suppliers being managed ranged from the second tier to the fifth tier.

All seven participating companies are multinational companies with annual sales volumes ranging from $1 billion to more than $10 billion. The industrial groups included were consumer packaged goods, durable goods, and retail. Unit purchasing prices for items or raw materials of interest range from a few cents to hundreds of dollars, while the retail prices for finished goods range from several dollars to tens of thousand dollars.

The data were collected by personal interviews. Senior executives with titles of VP or senior director in purchasing, operations, and supply chain management from each company were interviewed. Each interview was audio-taped after receiving permission. The length of the interviews ranged from 55 minutes to about two hours. An individual case study report was written within 24 hours after an interview, and a transcript was prepared from each taped interview in order to accurately collect each interviewee’s comments.

At the beginning of the data collection phase of the project, three managers from the first two participating companies were interviewed, in order to gain broader knowledge of the motivations and strategies used in their companies and to avoid any possible bias from individuals. Data collected were verified later by discussions with
two additional senior managers from each company. After analyzing the data, it was determined that within the scope of this research, one senior manager should have the sufficient knowledge to answer all questions without any bias. In order to facilitate the data collection process and save management resources in the participating companies, it was not asked that multiple informants be provided by the remaining five companies.

The overall research findings were presented in a meeting with representatives from five of the seven participating companies. The overall case study report was sent to each of the senior managers who participated in the data collection process. Necessary adjustments were made on the basis of their comments and suggestions.

**Review of the Research Questions and Findings**

In this section, the findings are reviewed with respect to each of the key research questions posited in Chapter 3.

1. **Why do managers manage suppliers beyond Tier 1?**

   This question was designed to explore the motivations for managing suppliers beyond Tier 1. Four types of motivations were identified from the data collected from personal interviews. They are cost, quality, dependability, and context-specific motivations. The motivations are different from company to company, depending upon a company’s business objectives and core competencies. Yet, even within the same company, the motivations will vary from item to item, because the supply chains for different items are different. Normally, one type of motivation could be served by more than one type of strategy.
An item could be viewed from two dimensions, that is, the strategic importance to the firm and its availability in the market. The strategic importance was evaluated based on the impact of the item on a company’s business, while the availability in the market was evaluated by the possibility of freely acquiring the same item in the market. For a strategically important item, the key type of motivation is quality; while for a highly available item, the key type of motivation is cost. In most cases, there is more than one type of motivation for managing suppliers beyond Tier 1.

2. How are the decisions to manage suppliers beyond Tier 1 made?

A five-step empirical decision-making process was developed in this research. The first step was to review corporate and functional strategies, map a supply chain structure on the supply side, and understand customer requirements. Cross-functional inputs from each process team were necessary to align the functional strategies with the overall supply chain objectives.

With this kind of information in mind, the next step was to identify upstream items or raw materials with the most potential to be managed directly. Three kinds of items or raw materials were most likely to be managed directly. They were strategic items, single-sourced items, and items that must be managed. One type of must-be-managed items had a significant cost impact to the buying company, such as aluminum and PET resin. Another type of must-be-managed items is the case where the Tier 1 and Tier 2 suppliers have conflicting interest so that the buying company has to manage the Tier 2 suppliers, as in the case of the fuel pump and fuel tank subassembly. The motivations for managing these three kinds of items should be prioritized in order to ensure the effectiveness of the decision-making process and the success of implementation.
The third step was to examine the pairs of motivations and associated strategies under the constraints of the supply chain structure and financial budget. Cost-effectiveness or trade-off analysis should be conducted for each pair of motivation and potential strategy, and options of execution plans should be audited based on the results of the trade-off analysis. Results with the best trade-offs might lead to a combination of appropriate strategies for a group of potential motivations, which will increase the complexity of the management of suppliers beyond Tier 1. Execution plans should be developed carefully at this step.

The fourth step was to implement the selected strategies under the supervision of the supplier relationship management team. Prior to the implementation of the execution plans, the team should have gained all necessary inputs and commitments from other cross-functional supply chain management process teams. During the execution process, real-time information from the order fulfillment, manufacturing flow management, supplier relationship management, and product development and commercialization processes might be required to make adjustments whenever necessary.

The last step was to measure and evaluate the performance of strategies that had been implemented. Decisions to be made in this step included how often the performance should be measured, what criteria should be used to evaluate the performance, who should participate in the evaluation process, and how to adjust strategies when necessary.

All five steps had to be considered at the beginning of the decision-making process for managing an upstream supplier. The five-step decision-making process is best applied with the normative model that is summarized in the next section.
3. **How is a supplier beyond Tier 1 managed?**

   This question was designed to explore the strategies for managing suppliers beyond Tier 1. Five distinct types of strategies were recognized; they are strategic cost management, total quality management, strategic sourcing, relationship management, and context-specific strategies. Each strategy can be used to serve different types of motivations.

   Strategic cost management strategy is comprised of activities such as volume leverage, the attainment of total cost knowledge over a supply chain, volume guarantee, making a long-term deal, restricting a deal to the buyer only, and competitive pricing. Representative activities in the total quality management strategy include collaborative product design, supplier development programs, and the implementation of process control, to name a few. The interview data revealed that these two strategies were exclusive, since cost and quality were the two conflicting motivations. In most cases, however, the two strategies were implemented together, with different focuses and different levels of involvement.

   The strategic sourcing strategy includes activities such as global sourcing, supply base localization, sharing new product design capabilities, and multiple-sourcing. Strategic sourcing strategy was used to find the right supplier for the right item at the right time.

   The relationship management strategy consists of activities such as having a long-term orientation in a business relationship, applying appropriate governance mechanism, nominating qualified suppliers, and increasing the visibility among supply chain members. In contrast to the strategic sourcing strategy, relationship management strategy emphasizes incremental improvements in an existing relationship with respect to a motivation. In most cases the strategic sourcing strategy
and the relationship management strategy were implemented together to complement each other.

Context-specific strategies are situation-dependent. Most of them were used for the situational motivations. No particular pattern was found regarding the association between this kind of strategies and other strategies.

4. How is the management of a relationship with a supplier beyond Tier 1 evaluated?

The performance of managing a supplier beyond Tier 1 is measured in two different ways, specific “hard” metrics and management’s general perceptions. Normally the cost and quality motivations were measured with numeric criteria, while other motivations such as dependability, risk, and other situational factors were measured by management perceptions.

The Normative Model

A major purpose of the study was to develop a normative model for managing suppliers beyond Tier 1. Figure 6.1 is a duplication of the Figure 5.5, which represents the normative model developed in this research. Table 6.1 is a duplication of Table 5.11, which presents in detail the specific motivations and associated management activities.

Managers can use the normative model to identify the strategies for managing suppliers beyond Tier 1, and refer to the model with detailed motivations and/or activities to establish their action plan. It is better to apply this model together with the framework of the decision-making process for managing suppliers beyond Tier 1.
that was developed in this research. The framework of the decision-making process for managing suppliers beyond Tier 1 is presented in Figure 6.2.

Figure 6.1
The Normative Model for Managing Suppliers beyond Tier 1
Table 6.1

<table>
<thead>
<tr>
<th>Motivations</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employ volume leverage</td>
<td>Conduct collaborative product developments</td>
</tr>
<tr>
<td>Gain total cost knowledge</td>
<td>Implement vendor development programs</td>
</tr>
<tr>
<td>Make volume guarantee</td>
<td>Implement supplier certification programs</td>
</tr>
<tr>
<td>Negotiate long-term deals</td>
<td>Standardize part quality</td>
</tr>
<tr>
<td>Make the deal for the buyer only</td>
<td>Implement process control methods</td>
</tr>
<tr>
<td>Use competitive bidding</td>
<td>Designate a quality &quot;model&quot;</td>
</tr>
<tr>
<td>Use price masking</td>
<td>Implement global sourcing</td>
</tr>
<tr>
<td></td>
<td>Share R&amp;D capability</td>
</tr>
<tr>
<td></td>
<td>Localize supply base</td>
</tr>
<tr>
<td></td>
<td>Undertake multi-sourcing</td>
</tr>
<tr>
<td></td>
<td>Allocate supply capability</td>
</tr>
<tr>
<td></td>
<td>Reduce supply base</td>
</tr>
<tr>
<td></td>
<td>Build long-term relationships</td>
</tr>
<tr>
<td></td>
<td>Apply appropriate governance mechanisms</td>
</tr>
<tr>
<td></td>
<td>Nominate qualified suppliers</td>
</tr>
<tr>
<td></td>
<td>Assign dedicated resources</td>
</tr>
<tr>
<td></td>
<td>Increase process visibility</td>
</tr>
<tr>
<td></td>
<td>Share information with selected supply chain members</td>
</tr>
<tr>
<td></td>
<td>Deploy logistics activities</td>
</tr>
<tr>
<td></td>
<td>Hire external expertise</td>
</tr>
<tr>
<td></td>
<td>Take a buyer’s social purchasing responsibilities</td>
</tr>
<tr>
<td></td>
<td>Develop buyer-specific upstream items</td>
</tr>
<tr>
<td></td>
<td>Protect suppliers’ market presence</td>
</tr>
</tbody>
</table>
Conclusions

The research described here represents the first attempt to explore the motivations and strategies for managing suppliers beyond Tier 1. The most significant conclusion that can be drawn from this research is that the management of suppliers beyond Tier 1 does appear to be a reality. Most of the participating companies started this practice a decade ago. Indeed, it could be concluded that their practices are generalizable, as indicated by the findings from this research.

The generalized motivations and strategies in the normative model could be used to structure management’s thinking when the topic of managing suppliers beyond Tier 1 was under description. Furthermore, the two-layer normative model could help management quickly move from the strategic planning stage into the operational execution stage and it could provide visible results for the desired strategies to be implemented.

Another significant conclusion was that the decision-making process of managing suppliers beyond Tier 1 is generalizable. The five-step decision-making process, which was derived from the case study data, should be replicable in a new environment when needed. Two critical steps in the decision-making process were the identification of items or raw materials to be managed directly, and the choice of appropriate strategies for the selected motivation(s). The product classification scheme used in this research and the normative model should be very helpful in prioritizing motivations and selecting appropriate strategies.
Figure 6.2

A Framework of the Decision-Making Process of Managing Suppliers beyond Tier 1
The last but not the least important conclusion was that the dynamics of the trilateral business relationship was complicated and further research is necessary. For example, the management activities between the buying company and a supplier beyond Tier 1 will be affected by the relationship between the supplier beyond Tier 1 and its direct customer, a Tier 1 supplier of the buying company. The types of management activities and the level of management involvement among the three companies will determine the types of dyadic relationships that develop among the three individual firms.

**Implications**

The research has a number of implications for both practitioners and academicians. The majority of the business practices and academic research on supplier relationship management was devoted to managing primary suppliers or Tier 1 suppliers. Leading companies have pioneered the management of suppliers beyond Tier 1, but the importance of doing so has not been well-recognized across industries. The academic research on this topic has fallen far behind the leading business practices. Most supplier relationship management studies focused only on managing direct suppliers. A well-documented generalization of best practices in managing suppliers beyond Tier 1 will be of interest to both practitioners and academicians. The purpose of this research is to address these unmet needs.

*Managerial Implications*

There was no model available for managers to manage suppliers beyond Tier 1. It was the emphasis of this research to develop a normative model that management
could refer to when there was the need to do so. Based on the findings, it would seem that many decisions in managing supplies beyond Tier 1 might be improved if a normative model showing the associations between motivations and strategies and a framework of the decision-making process were available to the managers.

For example, the normative model can be used by the manager in supply chain C to simplify the transactions between the Tier 1 and Tier 2 suppliers. In this case, after the existing paper suppliers were brought into China, the key concerns should have become the market intelligence (pricing information and market position) and financial risk, rather than quality. Accordingly, the product could be moved from the upper left corner to the lower left corner with lower strategic importance and lower availability. In addition to the price-masking strategy for the purpose of protecting pricing information, management should focus on relationship management strategy, such as increasing visibility. What management did in supply chains I and L provided good examples.

In addition, improved understanding of the complexity of a trilateral interorganizational relationship could help management recognize quick-wins in the task of managing suppliers beyond Tier 1. The findings suggest that there are five elementary aspects in a trilateral interorganizational relationship situation: product categorization characteristics, motivations, strategies, supply chain structures and the relationship dynamics, as described in Chapter 2. Only after understanding the dynamics of a trilateral relationship can management ensure a successful implementation of managing suppliers beyond Tier 1. For example, with considerations of the all factors, management in supply chain J successfully managed five tiers back to the supply origin. Both cost and quality were the key motivations.
**Academic Implications**

Although Williamson recognized the importance of the “trilateral relationship” two decades ago, little attention has been paid to the management of suppliers beyond Tier 1. Conventional interorganizational relationship studies focused primarily on two dimensions, the motivations and strategies. Findings from this research revealed that product characteristics and supply chain structures also had significant impact on how to manage a direct relationship with a supplier beyond Tier 1.

The addition of the two new dimensions into the interorganizational relationship management area provides researchers with new challenges to explore theoretically the similarities and differences between managing Tier 1 suppliers and managing suppliers beyond Tier 1. A few future research opportunities are described in the Future Research section.

**Limitations**

A limitation of this research is directly related to the nature of this research. As an exploratory study to answer “why,” “when,” and “how” types of research questions, the case study research methodology was selected because it is the most appropriate approach. In a case study research, the selection of informants represents one of the inherited limitations. This research is no exception. Although the field data showed that a single informant had sufficient knowledge to answer all questions within the scope of this research, the lack of corroboration with data outside participating companies was the most salient limitation of this research. The results
would be more robust if the data collected from the focal company had been corroborated by data collected from suppliers beyond Tier 1.

The companies that participated in the case studies were not selected at random but on the basis of previous connections with the university. Therefore, they may not be fully representative of all companies. Indeed, although these companies are top performing organizations in their own industries, and management from each firm has demonstrated their commitment to pursuing the excellence of their supply chains, these findings might not be applicable to smaller sized companies. The case study companies’ efforts in establishing and maintaining effective relationships with suppliers beyond Tier 1 could be replicated more easily by companies with similar operating scales. In addition, a validation of the normative model and the framework of the decision-making process at that level would encourage further application of the normative model.

**Contributions of the Research**

The major potential contribution of this research is a normative model that managers can use to manage suppliers beyond Tier 1. Collecting data from both manufacturing and retailing-dominated supply chains ensures that the framework is generalizable at the level of large manufacturing and retailing business, and provides good coverage in applications. The normative model with secondary level details provides management with a structured way of thinking. The secondary contribution is the decision-making procedure derived from managing suppliers beyond Tier 1. In other words, the research findings are not limited to a “model” showing what the
motivations are and how to achieve them. It includes a framework that can be used to make decisions to manage suppliers beyond Tier 1.

Rather than simply consolidating the existing theories, this research recognizes new dimensions to the motivation and strategy constructs in the interorganizational relationship management theory, and reveals areas where new theoretical development might be necessary. In the case of upstream supplier relationship management, two new constructs were identified, which makes another contribution to the interorganizational relationship management area.

**Suggestions for Future Research**

This research represents a unique insight into a little understood and seldom investigated area of managing suppliers beyond Tier 1. The following paragraphs address the possible directions for future research in the areas of interorganizational relationship management, supplier relationship management, and supply chain mapping.

1. Since this research included buying companies only, future research could consider including Tier 1 suppliers and suppliers beyond Tier 1 for broader perspectives in the management of suppliers beyond Tier 1.

2. The most promising research would be to work closely with two or three large companies in order to operationalize the normative model and the framework of decision-making process for managing suppliers beyond Tier 1, as well as the measurement of costs and benefits.

3. Considering the response to this research, it may be possible to use the data collected during this research to design questionnaires which could be sent to
executives in purchasing, logistics, operations, and supply chain management from a statistically valid sample of companies. This would remedy the problems of generalizability of the normative model and would enable statistical analysis on the basis of variables such as size of company, industry group, market presence, business performance, motivation, and strategy.

In summary, in the emerging competitive environment where globalization and sourcing increase the scope and complexity of doing business, the ultimate success of a single business will depend on management’s ability to integrate the company’s intricate network of business relationships. As managers extend their attention beyond the four walls of their company and look for opportunities from both supplier and customer sides, their attention should not be limited to the Tier 1 suppliers or customers. For example, executives are becoming aware of the importance of managing suppliers beyond Tier 1 and actively managing some suppliers beyond Tier 1.

This research indicated that managing suppliers beyond Tier 1 involves five closely interrelated elements: the supply chain network structure; the product characteristics; the motivations; the strategies; and performance measurement. In this research, the motivations and associated strategies for managing suppliers beyond Tier 1 were investigated and a normative model was developed to help managers structure their thinking when managing suppliers beyond Tier 1. The role the supply chain network structure plays in managing suppliers beyond Tier 1 is a promising area to explore thoroughly in future studies, and the measurement of the performance improvements that result from managing suppliers beyond Tier 1 needs to be operationalized.
Appendix A

Interview Guide:

Managing Suppliers beyond Tier 1
Appendix A

Interview Guide:
Managing Suppliers beyond Tier 1

Background

Name: ____________ Company (or SBU): ______________
# of Employees: ____________ Annual Sales in $: ______________
Industry: ________________ Division (Function): ______________
Job Title: ________________ Yrs in Position: ______________
Yrs in Function: ______________ Yrs with Co.: ______________
Yrs involved in the relationship mentioned later: ______________

General Questions

1. Are you directly managing suppliers beyond Tier 1? Please give us a few examples and describe the relationship. What is the final product? What is the raw material or component being managed? What does the supply chain structure look like?

Why do managers manage suppliers beyond Tier 1?

2. What event resulted in the relationship being initiated?

3. What were the key drivers?

4. How are these motivations related to your company’s overall business strategies? What are these motivations driven by?

How are the decisions to manage suppliers beyond Tier 1 made?

5. How did your firm build the relationship? Who was involved in the decision to have a relationship?
6. How do you manage the relationships between your firm and the first tier supplier? How many tiers have you been managing?

7. What is the impact of managing the supplier beyond Tier 1 on the existing relationships you have had with firms between you and the supplier?

**How is a supplier beyond Tier 1 managed?**

8. Why did you choose these practices to build and monitor the relationship?

9. Who is involved (which functions) in managing this relationship?

10. How does your firm monitor the relationship on an on-going basis?

11. Do you share risks/rewards/costs/benefits with the supplier?

12. How does your firm allocate resources and calculate costs of activities in building and monitoring this relationship?

13. Did you have any resistance from Tier 1 suppliers when you were trying to manage Tier 2 suppliers?

14. Do you have a specific, written contract/agreement for this relationship? Did you conduct a cost/benefit analysis before the implementation? Any documents? Did you conduct any other types of pre-implementation analyses? Any documents? May I have copies of them?

**How is the management of a relationship with a supplier beyond Tier 1 evaluated?**

15. How could you measure the performance of the relationship? How do you evaluate the effectiveness of these practices? Does your firm use the activity based
costing (ABC) system, total cost of ownership (TCO) analysis, EVA analysis, or other approaches for cost management? Are they effective?

16. Do you have any financial data to show how good the relationship is?

17. What were the benefits that you expected to see from the relationship? What benefits have you achieved?

Closing Question

18. Do you have any items that you are not managing but you are going to manage in the near future? Do you have any information to add? Did we miss any important issues in managing suppliers beyond Tier 1?
Appendix B

Case Study Research Protocol:
Managing Supplier Relationships beyond Tier 1
Appendix B

Case Study Research Protocol: Managing Supplier Relationships beyond Tier 1

I. Overview

A. Statement of Purposes:
   1. To develop a normative model for managing suppliers beyond Tier 1.
   2. To generalize a decision-making process in managing suppliers beyond Tier 1.
   3. To identify the similarities and differences between managing direct suppliers and managing suppliers beyond Tier 1.

B. Research Questions
   1. Why do managers manage suppliers beyond Tier 1?
   2. How are the decisions to manage suppliers beyond Tier 1 made?
   3. How is a supplier beyond Tier 1 managed?
   4. How is the management of a relationship with a supplier beyond Tier 1 evaluated?

C. Unit of Analysis: a raw material or component supply chain in which management directly manage suppliers beyond Tier 1.

D. Organizational Cooperation
   1. Willingness to participate
   2. Participants
      a. VPs in Supply Chain Management or in Purchasing
      b. Related managers from other functions/departments
E. Goal: 12-16 profiles of supply chains with direct relationships with suppliers beyond Tier 1

II. Methodology/Case Study Design

A. Develop a standard case study instrument: Case Study Protocol.

B. Each case is an experiment or a replication. It is not a single response to a survey.

C. Four Tests on Validity and Reliability

D. Within Case Analysis

E. Cross-case Analysis
   1. Open coding
   2. Axial coding/Pattern matching
   3. Selective coding
   4. Implications
   5. Conclude findings based on patterns and inferences

III. Data Collection

A. Three essential ideas
   1. Multiple sources of evidence: any 2 or more sources converging on same facts
   2. Case study database: makes information traceable, keeps in one place
   3. Chain of evidence: links questions asked, data collected, and conclusions drawn

B. Pilot Study
   1. Often choose a firm that is accessible and convenient
   2. Not a “pretest,” but helps refine data collection plans as well as content exploration and assessment procedures
3. Write-up content and procedural implications

C. Sources of Evidence

1. Documentation -- internal memos, reports, announcements, proposals, formal studies, news clippings, products/services agreements, etc.

2. Archival records -- accounting data, cost/benefits analysis

3. Interviews -- key source of information
   a. Key informants -- open ended interview; key events and options of those events -- why did your firm directly manage a low-tier supplier? Corroborate with other evidence
   b. Recording
   c. Focused -- respondent is interviewed for a short time period; certain set of questions such as operational performance measurements may not be open ended

D. Establish a Database: to improve case study reliability. The data base contains:

1. Case study notes
   a. Interview field notes
   b. Document analysis

2. Case study documents gathered, including any notes explaining documents
   a. Tabular materials: any summaries created/tabulated
   b. Narratives

IV. Data Analysis

A. Within-case Analysis

1. Exploring and Describing

243
2. Explaining and Predicting

B. Cross-case Analysis: Pattern Matching
   1. Product/component/raw material characteristics
   2. Supply chain structure
   3. Motivation contents
   4. Strategy/practice/activity contents
   5. Activities in building and maintaining a direct supplier relationship beyond Tier 1
   6. Cost elements pertaining to these activities
   7. Relationship evaluation
   8. Performance measurement
   9. Roles of relationship evaluations/performance measurements in decision support

C. Cross-case Analysis: Explanation Building
   1. Exploratory case studies: not to build or verify theories, but to develop ideas for further study
   2. Derive linkages among motivations, strategies, and cost/benefits

V. Format of Individual Case Study Report
   A. Company Background
      1. Final product, component, and raw material
      2. Industry
      3. Strategy
      4. Supply chain structure
      5. Key competitive issues
B. History of a direct relationship between the company and a supplier beyond Tier 1
   1. When was it developed
   2. Why (i.e., motivations)
   3. Who was involved
   4. How has it been changed/managed (i.e., strategies)
   5. Barriers
   6. Staged implementing process the buyer and suppliers beyond Tier 1 underwent

C. Motivations of initiating and maintaining this relationship

D. Strategies to manage this relationship

E. Decision-making process

F. Associations between motivations and strategies

G. Benefits of managing suppliers beyond Tier 1
   1. Financial benefits/performance in $$ value
   2. Operational benefits/perceived performance

VI. Format of Overall Case Study Report
   1. Overview
   2. Research questions
   3. Research design/methodology
   4. Presentation of direct relationships with suppliers beyond Tier 1
   5. Discussion of results
   6. Findings/conclusions/implications/recommendations
   7. Bibliography
   8. Appendices
a. Copy of research protocol
b. Copy of interview guide
c. Pilot case study write-up

VII. Timetable

A. Prepare case study research protocol and interview guide
B. Identify pilot case study firm
C. Conduct pilot case study
D. Identify additional case study firms
E. Conduct additional case studies
F. Case analysis/write up
G. Draft of final report
Appendix C

The Pilot Study

Case A: The Aluminum Can Supply Chain

Case B: The PET Bottle Supply Chain
Appendix C

Pilot Study

Case A: The Aluminum Can Supply Chain

The case study company is one of the largest non-alcoholic beverage companies in the world, with revenue of more than $10 billion in 2006. The company uses about 58 billion aluminum cans annually for its packaged non-alcoholic beverage products.

The supply side of the aluminum can supply chain is illustrated in Figure C.1, in which the suppliers are classified into four tiers: aluminum suppliers, rollers, can makers, and bottlers. There are a number of bottlers in the first tier, while there are three to four can makers in each country (region). Currently, there are about three rollers in the country or region such as the US and Europe, and there are a limited number of aluminum suppliers globally. The small number of players at each tier is due to the high capital investment on the production facility. For example, it will cost $6 million for a can maker to build a 2 billion can production facility.

In 1996, when a price surge in aluminum cost the company hundreds million of dollars unexpected spending on aluminum can purchasing, the aluminum can became important to the company. In the aluminum supply chain, the cost of aluminum accounts for 45% of the cost of the finished aluminum can, while the cost of roller and the cost of can maker represents 30% and 25% of the cost of aluminum can, respectively. The price volatilities from the aluminum can supplier, the roller, and the can maker represent the final price volatility of the aluminum can for 90%,
Figure C.1

The Aluminum Can Supply Chain
5%, and 5%, respectively. The high price volatility from the aluminum suppliers made it difficult to manage the price and supply of the aluminum can.

Management found that the company’s overall consumption of aluminum can made it the largest customer of aluminum cans in the world. Each year it purchases 45% of the domestic aluminum can supply, and 25% globally. There are many bottlers in the first tier. Originally they bought aluminum cans from can makers. Management did not need to negotiate the price of the aluminum can with the bottlers, since there was no contrition to the cost or cost volatility from that tier.

Management first went to can makers, consolidated their volumes, and used the aggregated volume to negotiate the price of the aluminum sheet with the rollers. There was no big resistance from the can makers when management aggregated their volumes, since there were only two to three can makers in each country, and “losing the purchasing power of the aluminum sheet does not hurt them too much.”

Management then signed contracts with rollers on the basis of annual demand, and asked them to hedge their aluminum prices through their metal suppliers on London Metal Exchange (LME) to secure the aluminum price and reduce the price volatility. At that time, the company grew at 5-6% annually, while the industry average was only at 3%. The volumes that the rollers received from the company were based on the company’s annual growth, which helped the rollers gain better positions than their competitors and easily handle their portfolios. The company split its annual demand in the country among the rollers there, which would keep price competition among the rollers.

After successfully aggregating the demand of aluminum sheet and cutting the aluminum price from the aluminum suppliers, management planned to roll out the
successful experience globally. Aluminum is a global commodity and the aluminum suppliers also like to work with people who have big volume.

The company’s significant volume made it possible for the company to go further up to the aluminum level in the global aluminum market. Some rollers felt that they would have the risk of loosing purchasing power and affecting their industrial relationships with their suppliers and customers. Management of the company needed to convince them that they would not be hurt by giving up the purchasing power of the aluminum to the company.

Management called this approach the “soft pool”, which was to pool the demand at the roller level, since this approach “had all benefits of risk pooling,” explained by the purchasing manager. In the “soft pool” approach, management negotiated the purchasing prices of the aluminum with a few aluminum suppliers, and the real prices were “masked” and only a few people in the industry knew what the real prices were. Management also allocated the demand volume among the metal suppliers, and were “trying to stay out of the logistics, quality, that sort of thing.” Management had no intention to be part of that; and they just wanted to keep the relationships.

Usually management did not know at what prices the metal suppliers hedged, but the approach made up competition among the metal suppliers. “It makes up competition, which will reduce our prices. Small companies cannot do this; they might not even know how much the competition is if we go back here.”

Currently, management of the company was managing all relationships back to the aluminum suppliers. Management negotiated the price, but did not involve in the middle of the transaction. In fact, all aluminum was delivered from the LME warehouses, not from the aluminum suppliers. As explained by the manager, “we do
cut the deal, but we do not have to get involved. They look at us as buyers, even though we are not involved in the deal, face to face every day.”

In addition to the cost and cost volatility, transparency is another motivation to manage the purchasing of aluminum or aluminum sheets. Understanding what the rollers looked forward for the actual cost, management could make sure they had the best price on the aluminum sheet. Management had talked to sheet suppliers for years about the cost knowledge at the tier of roller. “In the past they resisted it, and now they like that,” said the manager. The rollers now had both the secured supply and the promised volume on demand, with reasonable margins left for them. In order to build more open relationships with the rollers, the company’s demand information was also shared with the rollers through the can makers.

The can makers could actually put on the rollers when there was cost issue. What they discovered was that they were better off, because whatever the problem they ended up with rollers, they could say, “Hi, the beverage company was over here.” In order to avoid that, management paid the can makers a small amount of money to ask them to “track their past foot cost down.”

The innovative capability of the rollers or can makers was one of the reasons management of the company worked closely with suppliers beyond Tier 1. For example, the manager mentioned that management had to work with the rollers who helped them understand the aluminum sheet, and with the can makers who had already worked expensively with the rollers. By doing so, management could “capture the innovation dollars that the rollers have already put into the sheet.”

The environmental concern was also an important reason to work with the scrap suppliers, another kind of aluminum suppliers. The scrap of the aluminum can had the kind of source for almost about 75% of the raw material of the premium
aluminum. “It makes perfect sense to use it as identical substitute for premium materials,” explained the manager. Management realized that it was an environmental issue to make the aluminum can recycled, and that they had to take “a producer’s social purchasing responsibility.”

The company had been doing research on the scrap material and management had planned it into profit. The company worked for a stand-alone recycling company that wanted the company to do such a research. The recycling company acquired about the 75% of the scrap of the aluminum can sold by the company, and the case study company was their biggest supplier. The company could do that “because there is natural linkage to retail stores like Wal-Mart.”

The efficiency concern was the reason why the company worked with the recycling company, instead of taking the can back and making the can recycled by the company themselves. The manager explained, “We do not want to compete with other’s business because the efficiency is the driver…. If you change the rule of doing things, you can do it efficiently. You can even do it better, and it does not have to raise your cost.”

Compared to the current “soft pool” approach, a “hard pool” would be the next stage management of the company wanted to go. The manager reviewed that they bought the aluminum can from can makers from 1976 to 1995. From 1996 to 2006 they “did soft pool” in which they “went back from the can makers to the rollers, who can handle it at LME, with a financial tool named hedging.” Currently management had known the cost structures back to the aluminum market, and they thought the “hard pool” was “the next stage beyond soft pool.” The hard pool would be started from 2007, and management would “actually secure the raw materials.” This
evolution process reflected the relationship dynamics in the aluminum can supply network.

The quality issue was not recognized as the primary motivation for directly managing the can makers and the rollers. However, after the relationships were established, management could “learn something from our suppliers.” As the manager explained, “We can learn from the can maker and the roller. … That’s what we can do with our can makers.” If there was any quality problems reported from the can makers, management would call the rollers to come in to solve the quality problems.

There were moderate barriers to overcome as management moved to the rollers and the metal suppliers. Basically, can makers and rollers are reluctant to change. “If there is nothing to do with them, they will just set back, and do not try to improve,” explained by the manager. Management needed to tell them what to do and captured it in their negotiation.

The benefits of going back upstream to directly manage the can makers and rollers are multiple. First of all, the corporate objectives were satisfied, and there was no unbudgeted expenditure on aluminum can purchasing since then. There was no metrics in dollars saving, partly because the price of aluminum can had been well controlled. In addition, the supply shortage did not happen again.

The establishment of better relationships, “the friendships” with upstream suppliers, was another benefit gained from managing these upstream suppliers, which built necessary foundations for going another tier further back.

Other areas that might generate significant saving included the secondary packaging materials such as polymer, the vending equipment, coin changer, cooling system, and truck, which “accounted for a large percentage” of their revenue.
Case B: The PET Bottle Supply Chain

The case study company is one of the largest non-alcoholic beverage companies in the world, with revenue of more than $10 billion in 2006. The company uses about 60 billion PET bottles annually for its packaged non-alcoholic beverage products.

The supply side of the PET bottle supply chain is illustrated in Figure C.2, where the suppliers are classified into three tiers: resin suppliers, converters, and bottle suppliers. The number of first tier suppliers (bottle suppliers) is limited, while there are three to five converters in each region and hundreds in total globally. Currently, there are about 10 to 12 resin suppliers globally.

The PET bottle became important to the company as a packaging medium. The bottle was originally provided by third-party suppliers, or Tier 1 suppliers. This worked well at the beginning, because there was much value in the system, both for the company and for the converters. As the volume became larger, however, the bottle became more commoditized and its cost went down. Management of the company found that the key driver for bottle prices was not the conversion cost, but the cost of resin used to make the bottles. The cost of resin accounts for 50-60% of bottle cost.

In 1999, management started to examine how to take responsibility for the resin within the packaging content in order to exert more control over cost. Without managing resin suppliers directly, management had no control over the resin price. There were several other elements over which management had no control such as the high uncertainty or volatility associated with the resin cost. High price volatility made it difficult to manage the bottle price.
The Focal Company

10~12 global resin Suppliers

Bottle Suppliers

Converters

The Focal Company

Note:
- 50~60% of the price of plastics bottles comes from the purchasing cost of resin.
- 3~5 converters in each region, and hundreds globally
- ~20 bottle suppliers in the US, and less than one hundred globally
- 60 billion PET bottles globally

Figure C.2

PET Bottle Supply Chain
Management also found that the company’s overall volume made it the largest consumer of PET bottles in the world, 14% of the global PET bottle consumption. The traditional purchasers, converters, are typically small operations, thus their leverage tended to be very small. They were typically forced to buy resin from the local market. Therefore, in 1999 management unbundled converters’ prices and assumed the responsibility for managing the unbundled costs.

By combining the volumes purchased by various converters, better prices could be negotiated with the resin suppliers. Now the beverage company pays the converters for taking the resin they purchase and making bottles out of it. “We had to start with one of the dominoes. Once you got one down, then a few more go down. We haven’t finished the job actually, we are getting there. We are actually taking the global resin volume and beginning to negotiate,” said the resin purchasing director interviewed in the study.

In 2003, management started to leverage the firm’s global resin volume to negotiate a better resin price. The vehicle for achieving this was a cross-enterprise purchasing organization. With this organization, managers of the beverage company were receiving the necessary knowledge of the resin cost and the conversion cost of packaging.

Two events happened in parallel. First, management dismembered the company’s PET container value chain to activity, or element levels, in order to identify to which tier the firm should manage and from whom they should buy. That required fully understanding the total value chain for this product. The company had operations that bought resin, made pre-forms, and sold them to bottlers. This experience enabled management to thoroughly understand the cost structure along its PET bottle supply chain. They also employed field expertise, built partnerships with
converters, and asked them to bring their knowledge in house. Management felt comfortable in relying on the knowledge of converters or external expertise they brought in.

Some converters made PET chips and sold the chips to the bottlers. Others made pre-forms and sold them commercially. The beverage company bought chips from converters and made 50% of the pre-forms themselves. The other 50% of pre-forms were purchased from commercial suppliers. “There was no strategy behind it. We implemented the best solution for the situation,” explained the resin purchasing director. The resin cost was the biggest concern since it represented 50% of the bottle price.

Second, management needed to determine from whom they should buy chips, pre-forms, and/or bottles. In 2003, the beverage company was buying from a very large number of resin suppliers around the world. Most of them could provide a product of high enough quality to pass certification. Management wanted to reduce the number of resin suppliers from which they purchased. Management desired to increase the firm’s importance with a smaller set of targeted suppliers, so they could focus on other things, such as supplier relationship management. It was impossible to effectively manage all of the relationships if there were hundreds of suppliers.

Management applied a mathematical model to help them identify which suppliers would be selected to support the company’s business. Resin is a global commodity, so management selected resin suppliers globally. Management worked with fewer suppliers and was able to build close relationships with them.

Management needed to decide how many resin suppliers to include in the company’s supply chain. At this stage, they considered supply risk and secured redundant sourcing capacities to minimize risk. For example, on the global basis, if
four suppliers could provide all of the demand needed, management preferred to retain a total of 12 global resin suppliers.

At the same time, management believed that it was unhealthy if the beverage company and a resin supplier become too important to each other. Management needed to find the level of business relationship where both had the right level of engagement: they were important to each other, but certainly not reliant on each other. Again, management used the mathematical model that helped them check, understand, or divide the total resin volume.

Management wanted to consolidate demands from converters and then use the volume as leverage to negotiate the resin price with resin suppliers on the converters’ behalf. The biggest barrier management experienced when trying to engage resin suppliers (the third tier) was the converters’ reluctance to change. The converters were comfortable with what they were doing. The biggest challenge for management of the company was how to ask converters to relinquish over 50-60% of their purchase to the focal company since this would affect their leverage with suppliers for their remaining purchases.

Management initiated a “cross enterprise” project to transfer the importance of the volume consolidation to the converters. The cross enterprise project was to directly communicate with suppliers beyond Tier 1. Management found that communication was the most effective tool to help suppliers understand the processes in their business, how the businesses could be disengaged without hurting each other, and why the company’s value chain had to be restructured appropriately to “make it happen,” which was to reduce the total cost of bottles.

To overcome the converters’ reluctance, management promised to provide them constant volumes over a period of time. Some converters were not able to
operate at the level of management’s expectation. In addition, management had to understand what was an acceptable margin. If the margin was good for the converters, management of the converters would hand over the purchasing responsibility for the resin to the beverage company. Besides, management of the beverage company also assumed some of the converters’ risks. For example, whenever the resin price was up, it was the beverage company who would find ways to deal with that, not the converters. Another issue was how to protect the confidentiality of the price. The real price was only known by very few people in the industry. Once management of the beverage company received credit for preventing price information from leaking, they could obtain confidential information and retain it in their process. It was also a bit challenging for the resin companies to sell resin to the beverage company rather than selling to the converters, because resin companies were receiving significant pressure from the converter base.

In order to obtain the best price from the resin suppliers, management of the beverage company assured the suppliers that they would receive constant volumes, which were big enough to make the beverage company important to the suppliers. To overcome the reluctance from the converter base, management guaranteed them an acceptable margin. In short, converters gave up their purchasing responsibility for the acceptable margin and a stable business, while the focal firm undertook more responsibilities and risks for gaining lower bottle prices. The shared risks/rewards program was effective in this case.

The issue of price volatility was also solved by understanding the cost and obtaining the right product at the right price. After recognizing that the bottle price volatility was highly correlated to the resin price volatility, management tried to negotiate resin prices with resin suppliers for longer terms to stabilize the resin price.
To avoid passing the cost advantage to its competition, management of the beverage company limited the converter’s resin price to only their volume. They also utilized “price masking” techniques to prevent the real price information from leaking.

When a resin supplier could not make a deal at the price management desired, they would tell the supplier to come back in the next quarter. By doing so, management kept certain levels of price competition among resin suppliers.

While the container cost (bottle cost) was still the major driver for the company to manage beyond Tier 1, there were other opportunities for reducing costs at the second tier that management was investigating. For example, the energy cost was very high at the converter tier, so it was the next area to be explored. Converters were interested in issues such as how they could make the machines work faster and how they could potentially save energy. These issues were also important to the beverage company, thus management of the beverage company would eventually work with converters on these issues.

In addition to realizing cost benefits by managing converters directly, management also recognized opportunities to partner with converters in new product development. Packaging innovation is regarded as one of the most important competitive weapons for a beverage company’s success. Converters invested large sums of money in their conversion processes in order to produce innovative packaging materials. By partnering with converters in new product designs, management of the beverage company could benefit from the converters’ “innovation dollars.”

Management believed that the upstream portion of its supply chain was more important than the downstream. For example, they thought the converter base was
more important to the company’s business than the bottler base. Management now decided to go beyond the converter base to manage resin suppliers directly. The motivations were to simultaneously leverage volume and receive better rates on packaging materials and transportation. It was impossible to do everything at the same time, so management had to recognize which innovation was the priority. Again, they had a business structure and a business plan to accomplish this. They also recognized the fact that it was a multi-year strategy and they needed to manage back in the value chain piece by piece.

At the fourth tier of the supply were producers of crude oil. Because the resin business only accounts for 6-7% of the business of the oil companies, their interest levels in what the beverage company could bring to them was marginal. Organizing the supply base and ensuring that it was the right supply base led management to the next question, that is, how to jointly manage the price volatility? The volatility was not in the bottle conversion cost; it was in the oil price.

Although the quality was not as important as the cost in motivating management to go beyond Tier 1 in the supply chain, it was gaining management’s attention. The increasing usage of recycled PET resin led to concerns about bottle quality. Closer relationships with third-party recyclers and converters would help solve the quality issue.

The benefits of managing the converter base was measured by management’s perception of improvements in competitiveness and cost saving. There were no formal metrics for evaluating the benefits of managing the second tier suppliers at the converter base. In the beverage company, the benefits included decreased purchasing cost, reduced supply uncertainty, mitigated price volatility, and sustained market expansion.
BIBLIOGRAPHY


268


“The Mad Cow That Stoles Christmas.”


