LOGISTICS CONTRACTING EFFECTIVENESS: THE PERSPECTIVE OF THAI ELECTRONICS MANUFACTURERS

Santi Visuddhisat

A Dissertation Submitted in Partial
Fulfillment of the Requirements for the Degree of
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ABSTRACT

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The World Bank, which produces the Logistics Performance Index, has consistently ranked Thailand in the top tier but in a degrading order: ranked 31 in 2007; 35 in 2010; and 38 in 2012. When looked at the micro level, Thailand is still in the lowest level of logistics development—physical distribution—where firms focus mainly on the outbound flow of finished products, from the end of the production line to the consumers. The Thai government has taken an integrative approach to logistics development, encouraging Thai companies, particularly small- and medium-sized enterprises, to invest in more advanced logistics management, i.e., internally-integrated or externally-integrated logistics. Accordingly, Thailand's logistics development strategy (2007 – 2011) set out five strategic agenda: (1) business logistics improvement; (2) transport and logistics network optimization; (3) logistics service internationalization; (4) trade facilitation enhancement; and (5) capacity building. The first agendum encourages firms to contract out logistics activities to LSPs, and this is the subject of this study.

Drawing from the literature and on the insights from customer managers—the ultimate judge of logistics service providers' performance—the current study empirically developed a 30-item, six-factor model that explains logistics contracting effectiveness. The dependent variable—logistics contracting effectiveness—was defined as "a logistics service provider's (LSP's) performance on a contract and the various outcomes customer managers use to measure it" and was measured with five

items borrowed from Knemeyer and Murphy's (2004) third-party logistics performance scale: (1) this contract has improved our logistics operations performance; (2) this contract has provided us more specialized logistics expertise; (3) this contract has reduced our logistics cost; (4) this contract has reduced our level of owned assets; and (5) this contract has reduced our employee base.

Overall, the customers appeared to be satisfied with their logistics service experience. Contractual customers, however, reported significantly higher agreement than transactional customers on all items except cost. Both types of customers agreed highly that the logistics contract provided them with more specialized logistics expertise and improved their logistics operations performance. While they agreed that the contract helped lower their logistics costs, they did not seem to be able to reduce much of their owned assets or headcounts.

The six significant factors contributing to the level of logistics contracting effectiveness include: long-term orientation, information sharing, risk aversion, conflict handling, trust, and proactive improvement. Based upon the research results, the current study suggests that to enhance logistics contracting effectiveness, both customer managers and LSP managers should emphasize developing long-term relationships, sharing appropriate information, and managing conflict effectively. Apart from these, LSP managers should also emphasize building competence trust and trust in integrity. For policymakers, this study suggests that they should emphasize raising the awareness of Thai manufactures, particularly the small- and medium-sized firms, about the benefits of internally-integrated logistics. They should be encouraged to contract out their logistics activities to competent LSPs from whom they will gain almost instant access to sophisticated logistics expertise and technologies without incurring a substantial upfront investment.

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CHAPTER 1

INTRODUCTION

1.1 Background

1.1.1 Logistics and Its Importance

In its most basic definition, logistics is the flow and storage of goods from their point of origin to the point of consumption. Logistics is also referred to by many other names: physical distribution, distribution, materials management, and supply chain management. Physical distribution and distribution refer to the outbound flow of goods from the end of the production process to the consumers. Materials management refers to the inbound flow of material to the production process. As the importance of coordinating the entire flow of material from the raw materials to the end consumer became recognized, the term logistics became widely used to reflect the broader notion of end-to-end flow. The term supply chain management has come into use to reflect the importance of forming alliances and partnerships to streamline the flow of materials from end to end (Stock and Lambert, 2000).

In 1991, the Council of Supply Chain Management Professionals (CSCMP) redefined physical distribution and changed the term to logistics. According to the new definition, logistics "is that part of the supply chain management that plans, implements, and controls the efficient, effective forward and reverse flow of goods and storage of goods, services and, related information between the point of origin and the point of consumption in order to meet customers' requirement" (CSCMP, 2013). Many authors use logistics and supply chain management interchangeably. However, as can be seen from CSCMP's definition, logistics is only a part of supply chain management. CSCMP (2013) defines supply chain management as "an integrating function with primary responsibility for linking major business functions and business processes within and across companies into a cohesive and high-performing business model. It includes all of the logistics management activities noted above, as well as

manufacturing operations, and it drives coordination of processes and activities with and across marketing, sales, product design, finance, and information technology."

The cost of logistics is high, second only to materials in manufacturing and the cost of goods sold in wholesaling and retailing. For Thailand, the total value of logistics cost in 2010 was approximately 1.64 trillion Baht, accounting for 15.2 percent of the gross domestic product (GDP). Transportation costs were the largest cost component (776.4 billion Baht), accounting for 47.2 percent of the total logistics cost, or 7.2 percent of the GDP (Office of the National Economic and Social Development Board – NESDB, 2011). Logistics justifies this high cost through its marketing-enhancing ability, providing time and place utility to products and efficient movement of products to customers (Bowersox, Closs and Cooper, 2003).

Logistics is important not only because of its high cost, but also due to its strategic role. Over the past three decades, the role of logistics has moved from an operational orientation to a tactical orientation, then to a strategic orientation (LaLonde, 1990). Renowned strategy scholar Michael E. Porter recognizes the importance of logistics to a manufacturing firm's overall competitive position, describing it as two of the five primary value-adding functions (inbound logistics and outbound logistics; see Figure 1.1) (Porter, 1985, 2008). Logistics has become a critical factor for competitive advantage (Christopher, 2005; Porter, 1985, 2008).

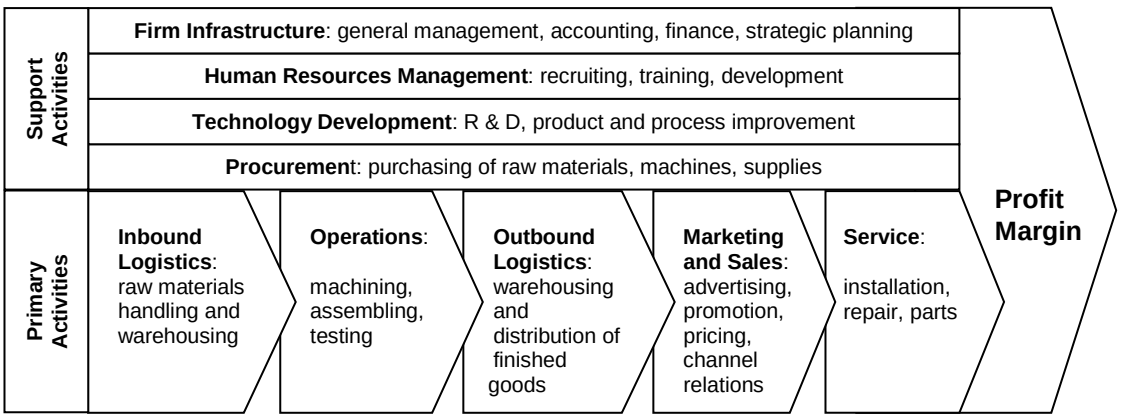

Figure 1.1 Value Chain Model for a Traditional Manufacturing Firm

Source: Porter, 1985.

Prior to the 1950s, logistics activities were typically performed purely on a functional basis and were kept in house until the late 1970s (Bowersox et al., 2003). Since the 1980s, there has been a trend toward using outside firms to handle logistics functions, beginning with public warehousing (Aghazadeh, 2003). This is especially true among larger firms, although they are capable of handling their own logistics. The most compelling reason to let logistics service providers (LSPs, also referred to as third-party logistics—3PL) take over logistics functions is the decision to focus on core competencies—a common supply chain strategy (APICS, 2013).

1.1.2 Logistics Outsourcing

Logistics was recognized as a separate industrial services industry only in the late 1980s (Ashenbaum, Maltz and Rabinovich, 2005). Early versions of logistics outsourcing involved transactional relationships with third parties offering single services e.g., trucking from Ryder, shipping from APL, overnight air from FedEx. The recent trend in contract logistics arrangements is toward long-term contractual relationships with providers of integrated services, such as transportation plus storage (APICS, 2013). The focus on long-term, contractual relationships between LSPs and their customers distinguishes contemporary contract logistics from the traditional transaction-based logistics services (Murphy and Poist, 2000).

LSPs are providers of industrial logistics services that perform logistics functions on behalf of their customers (Coyle, Bardi and Langley, 2003). There are two models of LSP operations: multi-client LSPs and contract LSPs. Multi-client LSPs house many customers in the same facility, managed by the same employees. This type of provider is generally small to medium-sized logistics firms willing to take on small customers for a shorter period of time, serving them with standard packages or with very minimal customization. Contract LSPs generally serve large customers requiring dedicated, customized services. They might have multiple customers but with a long-term agreement and generally these customers are not in the same facility. If the customers are in the same facility, the LSP operates as a separate business with dedicated equipment and employees.

LSPs often come from related businesses, such as freight forwarding, transportation, or warehousing, entering into the industry by extending their service

portfolio to meet the requirements of customers. A full portfolio might include traditional services such as warehousing, transportation, freight consolidation and forwarding, and newer services such as contract manufacturing, product testing, procurement, and reverse logistics (Aghazadeh, 2003).

The increasing importance of efficiency and a focus on core competencies have opened up many business opportunities for LSPs (Christopher, 2005). Manufacturing firms have increasingly relied on specialists to assume logistics activities previously performed in house, and the outsourcing of logistics services has grown steadily (Coyle et al., 2003). Studies often mention four primary reasons for outsourcing logistics functions:

1) Service improvement resulting from LSPs' focus and efficiency (Lynch, 2004)

2) Cost reduction realized from expertise and economies of scale of LSPs (Wilding and Juriado, 2004)

3) Asset reduction (Razzaque and Sheng, 1998), and

4) Headcount reduction (Bardi and Tracey, 1991)

Logistics outsourcing is not without its disadvantages. Immediately after an LSP takes over operations, cost and service can be negatively affected, as it takes some time for the LSP personnel to become accustomed to their customers' logistics system (Andersson, 1995) and higher initial costs resulting from duplication of resources (Ojala, Andersson and Naula, 2006). Reduction in fixed assets investment and higher capital turnover are of growing importance in modern business. By contracting out to an LSP, a company can pay for the capacity it needs and gain a greater degree of flexibility (Andersson, 1997). This is largely true for advanced markets with a predictable operational environment and a plentiful supply of logistics services. In many developing markets, the ownership of transport and warehousing assets may be the only way to secure flexible operations (Ojala et al., 2006). Debates over the advantages and disadvantages of logistics contracting out are likely to continue for some time. One thing that is certain is that contracting for logistics services is a growing and persistent trend (Andersson and Norrman, 2002).

The degree and scope of logistics outsourcing has increased significantly over time. In 2008, the total percentage of logistics expenditures directed to outsourcing

was 49 percent in North America, 61 percent in Europe, 57 percent in Asia Pacific, and 48 percent in Latin America. It was predicted that these percentages will continue to grow in all regions over the next few years (Langley and Capgemini U.S. LLC, 2008). Logistics outsourcing continues to be an area of great importance for companies to understand (Wallenburg, Knemeyer, Goldsby and Cahill, 2010).

1.2 Statement of the Problem

As stated, with a strong sense of the growing strategic importance of logistics, manufacturers have shifted their focus to their core business and sought competent LSPs to handle their logistics activities (Coyle et al., 2003). The importance of logistics contracting out is widely acknowledged and has been studied extensively for more than two decades in a great variety of aspects. For example, types and governance forms (Rogers and Daugherty, 1995; Golicic, Foggin and Mentzer, 2003; Lambert, Emmelhainz and Gardner, 1996; and Tokman, Elmadag, Uray and Richey, 2007), success factors (Frankel and Whipple, 1996; Gibson, Rutner and Keller, 2002; and Skjoett-Larsen, Thernoe and Andresen, 2003), and outcomes (Cruijssen, Cools and Dullaert, 2007; and Ellram and Krause, 1994). Studies have produced contradictory results. For example, Van Laarhoven, Berglund and Peters (2000) conducted a study in Europe and concluded that logistics contracting out, in general, is a successful phenomenon—the contracts have resulted in substantial cost reductions and service improvements, and the renewal rate is high. This study, however, has one major flaw—they did not include shippers that had terminated their partnership. Brekalo, Albers and Delfmann (2013), on the other hand, argued that the failure rate remains surprisingly high and is not entirely explained.

Despite much local discussion about the importance of logistics and the emerging role of LSPs, there are not many studies available for understanding logistics contracting out, especially in the developing markets such as Thailand. Most studies have concentrated on service quality and just a few have attempted to explain contracting effectiveness (e.g., why some contractual relationships succeed while others fail) and to provide advice on how to improve the practice of contracting out for logistics services.

1.3 Objectives of the Study

The objectives of this study are as follows:

1. To empirically develop a multidimensional instrument with good reliability and validity that logistics managers can use to assess the level of logistics contracting effectiveness
2. To offer some specific practical and policy recommendations, and
3. To contribute to the logistics policy debate and the body of logistics management knowledge

1.4 Research Questions

In order to achieve the abovementioned objectives, this study sought to answer two research questions:

1. What measures logistics contracting effectiveness?
2. What factors can logistics managers use to enhance contracting effectiveness?

1.5 Definition of Key Terms

Logistics service provider (LSP) is defined as a provider of industrial logistics services that performs logistics functions on behalf of its customers.

Logistics contracting effectiveness is defined as an LSP's performance on a contract and the various outcomes customer managers use to measure it. LSP performance refers to the perceived performance improvements that the logistics outsourcing relationship has provided to the customer (Knemeyer and Murphy, 2004) which include: operations improvement (Lynch, 2004), cost reduction (Wilding and Juriado, 2004), asset reduction (Razzaque and Sheng, 1998), and headcount reduction (Bardi and Tracey, 1991). The meaning of "LSP performance" can be seen in two ways: it can be considered from the point of view of the company that provides logistics services (LSP), or the company that employs LSPs (customer). In measuring logistics contracting effectiveness, noting that the ultimate judge of how well an LSP performs is the customers, this study gathered information from logistics executives in

customer firms in order to identify those aspects of contracting effectiveness which were important to them.

Contractual customers are customers that outsource part or all of their logistics activities to contract LSPs or multi-client LSPs on a long-term basis.

Transactional customers are customers that perform most of their logistics activities in house and seek services from multi-client LSPs on an *ad hoc* basis.

1.6 Significance of the Study

There were three reasons why this dissertation focused on the study of LSP performance and logistics contracting effectiveness. First, for developing markets, growing industrialization has resulted in higher demand for logistics services (Knee, 2003). Second, customer interest in contracting out a wider range of logistics services has increased and the scope of logistics service offering is expanding. The trend is towards more complex outsourcing, where several logistics activities or even the entire logistics function is contracted out (Andersson and Norrman, 2002). Finally, logistics performance can impact the economic performance of a country. High logistics performance can contribute to increased operational efficiency, improved accessibility to international networks, and increased trade volume (Sumantri and Lau, 2011).

The Thai government has placed strong emphasis on strengthening the domestic economy and further integrating Thailand into the global economy. Infrastructure and logistics development are the priority for this direction. Thailand's Logistics Development Strategy (2007–2011) has identified five strategic agenda: (1) business logistics improvement, (2) transport and logistics network optimization, (3) logistics service internationalization, (4) trade facilitation enhancement, and (5) capacity building. The first agendum encourages firms to contract out logistics activities to competent LSPs (NESDB, 2007), and this is the subject of this dissertation.

1.7 Scope of the Study

Although logistics services have expanded to cover newer, higher value-added activities such as final assembly, transportation and warehousing remain the two most

frequently outsourced logistics functions (Coyle, Langley, Novack and Gibson, 2013). Also, other than inventory carrying costs, transportation and warehousing are the two largest cost factors in logistics service (Swenseth and Godfrey, 2002). This study thus focused on the evaluation of these two key services. Transportation, in general, is said to be a physical movement of products from one place to another. It is one of the major activities within logistics, where the creation of time and place utility is performed (Coyle et al., 2003). If the transportation is outsourced to an LSP, the transport-related services are: tendering and contracting carriers (e.g., airlines), forwarding services, and tracking and tracing in-transit movements.

Warehousing is another important logistics activity, storing products at and between point of origin and point of consumption. In addition to storage, there are two other major operations associated with warehousing: movement and information transfer (Lambert, Cooper and Pagh, 1998). Another term frequently used in association with warehousing is distribution centers (DCs). Compared to warehousing, the role of DCs is narrower. DCs handle fast-moving products in much smaller quantity and the main activities are receive and ship, while with warehouses, all of the products are kept and thus the activities include receive, store, pick and ship (Dawe, 1995).

1.8 Organization of the Study

This dissertation consists of five chapters. Chapter one introduces the reader to the topic of logistics and its importance, logistics outsourcing, and includes a statement of the problem, research questions, significance of the study, and contribution, definition of terms, and scope and limitations. Chapter two provides more details on the logistics industry and reviews the related literature to identify the factors that contribute to logistics contracting effectiveness and to propose an explanatory model. Chapter three describes the research methods, which include the research design, unit of analysis, population, sample size and sampling methods, operational definition of the variables, measurement, data collection, data analysis, and ethical considerations. The two statistical techniques, factor analysis and stepwise regression analysis, used in this study are also explained. Chapter four presents the

descriptive and inferential data analyses. The final chapter discusses the results in relation to the reviewed literature, limitations and suggestions for future research, and implications and conclusions.

1.9 Summary

Logistics is the flow and storage of goods from their point of origin to the point of consumption. Logistics costs are high, second only to materials in manufacturing and the cost of goods sold in wholesaling and retailing. For Thailand, the total value of logistics costs in 2010 was approximately 1.64 trillion Baht, accounting for 15.2 percent of the GDP. The role of logistics has evolved from an operational orientation to a tactical orientation, then to a strategic orientation (LaLonde, 1990). Its high cost and strategic role highlight the importance of logistics.

Logistics was recognized as a separate industrial services industry only in the late 1980s (Ashenbaum et al., 2005). Studies often mention three primary reasons for logistics outsourcing: logistics operations improvement (Lynch, 2004), cost reduction (Wilding and Juriado, 2004), and asset and headcount reduction (Bardi and Tracey, 1991; Razzaque and Sheng, 1998).

Despite much local discussion about the importance of logistics and the emerging role of LSPs, there are not many studies available for understanding logistics outsourcing, especially in the developing markets such as Thailand. Studying within the context of Thailand, this research attempted to answer two questions: "What measures logistics contracting effectiveness?" and "What factors can logistics managers use to enhance contracting effectiveness?"

This study focused on the two most frequently outsourced logistics functions: transportation and warehousing, and draws on the actual experience of customers in the Thai electronics manufacturing industry, the largest group of logistics service users.

CHAPTER 2

A REVIEW OF THE LITERATURE

2.1 Introduction

The objective of this chapter is to provide a background to the present study on logistics contracting effectiveness. It is organized in seven sections, beginning with this brief introduction. Section two provides more details on the logistics service industry (which was briefly touched upon in chapter one) to give a more complete picture of this unique subset of the industrial services industry that spans the boundaries between suppliers and customers. Section three discusses Thailand's logistics development and performance. Section four describes the logistics industry in Thailand. Section five reviews the literature related to the dependent variable: logistics contracting effectiveness. Section six derives thirteen independent variables hypothesized to be positively correlated with logistics contracting effectiveness. Section seven proposes an explanatory model of logistics contracting effectiveness. The final section summarizes the chapter.

2.2 Logistics Service – A Further Look at the Industry

2.2.1 Types of Logistics Service Providers

Logistics service was recognized as a separate industrial service industry only in the late 1980s. Along with the industry's growth, researchers have conducted numerous studies (Ashenbaum et al., 2005) assessing the use of LSPs both in single studies (e.g., Bardi and Tracey (1991) on U.S. transport outsourcing; Maltz (1993) on the use of private fleet; Rabinovich, Windle, Dresner and Corsi (1999) on outsourcing of integrated logistics functions; and Sink and Langley (1997) on the acquisition of third-party logistics services) and in annually-repeated, macro-level, longitudinal analyses (e.g., Langley and Capgemini U.S. LLC.'s (2005, 2006, 2007, 2008, 2009,

2010) annual study on the state of logistics outsourcing; and Lieb and Miller (2000), Lieb and Kendrick (2002) and Lieb and Bentz (2004, 2005) on the use of third-party logistics services by large American manufacturers).

LSPs often come from simple logistics businesses such as warehousing, transportation, and customs brokerage. Today, LSPs assume a greater role in supply chain operations, performing a wider range of more value-added activities such as material planning and final assembly. Chapter one briefly discussed two types of LSPs based on their mode of operations: multi-client LSPs and contract LSPs. LSPs can also be classified based on their asset ownership into three types: asset-based LSs, non-asset-based LSPs, and hybrid LSPs (Africk and Calkins, 1994). Asset-based LSPs offer physical logistics service primarily through the use of their own assets, typically a truck fleet or a group of warehouses or both. Non-asset-based LSPs generally do not own or lease physical assets but provide human resources and systems to manage the customer's logistics function. Hybrid LSPs are subsidiaries of asset-based LSPs specializing in project-based services with some of the physical services handled by the parent company.

Based on the degree of their involvement in the customers' logistics systems, LSPs can also be classified into solution providers, distribution providers, and transportation providers. Solution providers are most heavily involved in all aspects of the customers' logistics systems and offer a complete solution. Distribution providers are less involved but have a broader service offering, providing both transportation and warehousing-related services. Transportation providers are the least involved, providing only transportation-related services (Berglund, 2000).

Given the growth of the logistics service market, particularly in value added services and management and/or information-based services, it might be expected that most, if not all LSPs, are geared towards becoming solution providers. This, however, has not proved to be the case because the distribution and transportation providers still lack the required resources and technical skills. Apparently, these two types of providers compete solely on the basis of the most efficient asset utilization. Solution providers, on the other hand, seem to have the capability to address the growing demands of their outsourcing customers and deliver better logistics performance than transportation or distribution providers (Ojala et al., 2006).

For the past few years, solution providers have attracted increasing interest from both academic researchers and practitioners (Fulconis, Saglietto and Pachè, 2007). Accenture, a global consulting firm, calls this type of provider "fourth-party logistics – 4PL". They define a 4PL firm as "an integrator that assembles the resources, capabilities, and technology of its own organization and other organizations to design, build and run comprehensive supply chain solutions" (Sollish and Semanik, 2007: 281).

According to CSCMP, 4PL differs from 3PL/LSP in several ways: (1) 4PL is often a separate entity established as a joint venture or with a long-term contract between the primary customer and one or more partners; (2) 4PL acts as a single interface between the customer and multiple LSPs; (3) ideally, the 4PL manages all aspects of the customer's supply chain; and (4) it is possible for a major LSP to set up a 4PL firm within its existing structure (Alireza and Alagheband, 2011).

2.2.2 Selection of Logistics Service Providers

Sink and Langley (1997) argued that there is no one category of LSPs that is inherently superior to another. To select an LSP, Maltz (1995) suggested using cross-functional teams. This will maximize a firm's chances of picking an LSP most suited to its needs, and ensure that all the stakeholders can contribute to the selection and as a result, accept the final choice. Table 2.1 presents some important criteria commonly used in the evaluation of LSPs (Razzaque and Sheng, 1998):

Table 2.1 Important Criteria Commonly Used in the Evaluation of LSPs

Criterion	Definition	References
Capabilities/competence	The ability to meet customers' needs, provide a variety of services, wide geographic coverage and utilize specialized equipment.	Bradley, 1994; Harrington, 1994; Maltz, 1995.

Table 2.1 (Continued)

Criterion	Definition	Reference
Business experiences	How long the LSP has been in the business, the depth of its managmenet experience, the strength of its operating management, and the quality of its work force.	Bradley, 1994; Harrington, 1994.
Business development	Account gained and lost.	Bradley, 1994.
Financial strength/ stability	The LSP has good financial health with a stable outlook able to meet the initial and future contract-specific costs.	Bradley, 1994; Maltz, 1995
Service quality	The technical (outcome aspects, e.g., on-time delivery) and functional (process-related aspects, e.g., giving prompt service, appearance of contact personnel) quality of the services being offered by the LSP.	Bradley, 1994; Grönroos, 2007; Maltz, 1995
High and improving standards	The LSP has a formal quality process.	Bradley, 1994.
Reliability	The LSP, its employees and systems, can be relied upon to keep promises and perform with the best interest of the customers at heart.	Bradley, 1994; Grönroos, 2007.
Reputation	The LSP can be trusted and provides adequate value for money, and it stands for good performance and values which can be shared by customers and the LSP.	Grönroos, 2007; Maltz, 1995.
Price	The LSP offers competitive price and cost reduction program.	Bardley, 1994; Maltz, 1995.
Long-term relationship	Opportunities for both parties to develop long-term relationship.	Maltz, 1995.

2.2.3 Why Firms Outsource – Some Theoretical Explanations

Good research is grounded in theory (Mentzer, 2008). In order for a discipline to progress it must use and develop theory (Kuhn, 1962). Theory creates a systemized structure capable of both explaining and predicting phenomena, thereby enhancing our scientific understanding (Hunt, 1991). However, there still is a lack of theoretical research in the logistics field (Selviaridis and Spring, 2007) and scholars have urged greater use of theory in the research of logistics service (Mentzer, Min and Bobbitt, 2004; Schmenner and Swink, 1998). Theory underdetermination posits that a phenomenon can be explained by several theories. The following discusses three theories that seem best to explain logistics outsourcing: neoclassical economic theory, transaction cost economics, and resource-based view.

2.2.3.1 Neoclassical Economic Theory

Neoclassical economic theory posits that firms outsource to attain cost advantages from assumed economies of scale and the scope possessed by providers (Ang and Straub, 1998). This theory regards every business organization as a production function and their motivation is driven by profit maximization (Williamson, 1981). Firms produce and offer products and services to the market where they have a cost or production advantage and buy from the market where they have a disadvantage. Thus, the question of "make or buy" is a question whether the market can produce products and services at a lower price than internal production. In the context of logistics outsourcing, a company will keep its logistics function in house if this has production cost advantages, and will outsource when the market can offer production cost savings.

2.2.3.2 Transaction Cost Economics

According to C. Bourlakis and M. Bourlakis (2005), transaction cost economics was first formed in Coase's (1937) article "The Nature of the Firm" and was further advanced by Arrow (1970), Rugman (1981) and Williamson (1975, 1985). Transaction cost economists argue that sourcing decisions are rational decisions. To make such a decision, firms take into consideration various transaction-related factors such as asset specificity, environmental uncertainty, and other types of transaction costs (Ang and Straub, 1998). A firm can increase its efficiency by internalizing the

market when the transaction costs of an administered exchange are lower than those of a market exchange (Williamson, 1985).

There are four elements of transaction costs: search costs, contracting costs, monitoring costs, and enforcement costs. Search costs are the information costs incurred in finding and assessing possible partners. Contracting costs are the agreement negotiation costs. Monitoring costs are for checking whether the partners meet the predetermined performance standards and obligations. Finally, enforcement costs are costs incurred during the process of sanctioning a partner that failed to meet its obligations (Williamson, 1985). Based on these four costs, manufacturers can decide whether to insource—performing the logistics functions by themselves—or to outsource them to LSPs. For example, the manufacturer will decide whether transportation is better assigned to LSPs and whether warehouses should be contracted out instead of using private premises. When transaction costs are high, outsourcing is deemed to be relatively inefficient compared with internal administration.

2.2.3.3 Resource-Based View

According to the resource-based view (RVB), outsourcing is a strategic decision which can be used to fill gaps in the firm's resources and capabilities (Grover, Teng and Cheon, 1998). A firm can enjoy a sustainable competitive advantage when it has a resource that "provides economic value and must be difficult to imitate, nonsubstitutable, and be presently scarce and not readily obtainable in factor markets" (Powell, 1992: 552). While RVB emphasizes internal resources rather than external opportunities, due to limited resources, manufacturers have to focus on their core activities and outsource their noncore activities to external parties. However, they may have to retain certain noncore activities that are part of a defensive posture in house in order to safeguard their competitive advantage (Chew and Gottschalk, 2013). Logistics spans across operational, tactical and strategic management levels. While it is considered core at the strategic level, some of its aspects can be commodities at the operational level (Van Hoek, 2000). Some manufacturers decide to outsource logistics even though they see it as core and as delivering competitive advantage.

2.3 Thailand's Logistics Development and Performance

Evolving over the last four decades from narrowly-defined distribution management to the integrated management of the global supply chains, logistics development can be classified into four stages as follows.

1) Physical distribution: The first stage of the logistics development began during the 1970s when firms focused only on the outbound flow of finished goods from the end of the production line to the consumers. Developing markets, including Thailand, are in this lowest level of logistics management (Kamonchanok Suthiwartnarueput, 2007). At this stage, logistics activities are performed in a rather fragmented and uncoordinated manner with each function trying to optimize its own logistics performance (Stock and Lambert, 2000). Firms focus on managing finished goods distribution in a way that meets customer expectations at the lowest possible cost. There are two main reasons why they focus on finished goods distribution. First, finished goods are the largest single segment of the inventory to be managed; second, due to its proximity, visibility, and frequent contact with customers, finished goods distribution most directly impacts customer service expectations. However, researchers have suggested that firms should have a balanced, end-to-end view of both the inbound flow of raw materials, work-in-process, and the outbound flow of finished goods. A poorly-managed inbound logistics can financially negate all the good work done on the outbound distribution (LaLonde, 1994).

2) Internal integration: the second stage of logistics development occurred in the 1980s when physical distribution functions were integrated with pre-production activities, such as material sourcing and work-in-process inventory, to form end-to-end material flow management (Ojala et al., 2006). For firms that have not adopted an integrative approaching in managing their logistics functions, successful implementation of the integrated logistics concept can lead to significant improvements in profitability (Shapiro, 1984). A number of firms have been able to reduce the total distribution costs by integrating distribution-related activities such as customer service, transportation, warehousing, inventory management, order processing and information systems, and production planning and purchasing. Without this integrative approach, inventory tends to build up at the critical business

interfaces, such as supplier–purchasing, purchasing–production, production–marketing, marketing–distribution, distribution–intermediary, and intermediary–consumer. In addition to improving the flow of inventory, integrated logistics also improves transport and warehouse asset utilization and eliminates the duplication of departmental efforts (Stock and Lambert, 2000). Most newly-industrialized markets are at this internally-integrated logistics stage. Aspiring to become newly industrialized, most firms in developing markets have been working hard to become part of the world economy. The Thai government has taken an integrative approach to logistics development, encouraging Thai companies, particularly the small- and medium-sized enterprises (SMEs), to invest in more advanced logistics management, i.e., internal integration or external integration (Kamonchanok Suthiwartnarueput, 2007).

3) External integration: this third stage began in the 1990s and extended the concept beyond one firm to all firms involved in the whole supply chain, outsourcing the internally-supplied materials and products to external suppliers. Most developed and some newly-industrialized markets such as Hong Kong and Singapore are classified as being at this stage (Kamonchanok Suthiwartnarueput, 2007). Electronic data interchange (EDI), just-in-time processes (JIT), distribution requirements planning (DRP), and other manufacturing process management began to appear at this stage. By extending their logistics concept to include also external elements (e.g., suppliers and dealers), firms have been able to reduce their inventory—both raw materials and finished goods, thereby reducing their inventory holding and handling costs (LaLonde, 1994).

4) Global logistics: the fourth evolution took place from around 2000 when firms began to source parts and components in different countries for assembly in another country into products destined for markets in several others. Advanced markets such as the United States, the UK and Germany are in this category. In developed markets, a major force driving logistics management to be more efficient is the business practices of multinational corporations. Their logistics management techniques have brought about revolutionary changes in the international supply chain systems. These techniques have enabled them to carry out global marketing and

sourcing which are now becoming increasingly important determinants of the worldwide trading pattern (Ojala et al., 2006).

The World Bank produces the Logistics Performance Index (LPI) every two years to assess countries' logistics performance in six key areas: (1) efficiency of the clearance process, (2) quality of trade and transport related infrastructure, (3) ease of arranging competitively priced shipments, (4) competence and quality of logistics services, (5) ability to track and trace consignments, and (6) timeliness of shipments in reaching destination within the scheduled or expected delivery time. These are evaluated on a scale of 1 (worst) to 5 (best). Based on the scores obtained, LPI classifies countries' logistics performance into four tiers. Thailand has been consistently ranked in the top tier but in a degrading order: ranked 31 in 2007; 35 in 2010; and 38 in 2012. Notably logistics competence scored almost the lowest (2.98), slightly better than customs (2.96) (The World Bank, 2012).

2.4 Thailand's Logistics Industry

With the entry of international LSPs in the late 1990s and the emergence of a number of local LSPs, Thailand's logistics service industry has become even more competitive. Thai LSPs, being smaller and less sophisticated, especially in information technology capability, have focused on local Thai customers, offering cheaper standard service packages. International LSPs, in addition to their complete range of specialized solutions targeted at multi-national corporations, have also adapted themselves to the local market, developing standard service offerings aimed at small- and medium-sized local companies (Logistics Bureau, 2002).

According to NESDB (2011), there were 18,399 LSPs registered with the Department of Business Development in 2011. As elsewhere, most of the local LSPs come from simple freight forwarding, transportation, or warehousing businesses. International LSPs came into Thailand mostly through the acquisition of, or partnering with, local LSPs to gain an immediate employee base and local expertise. For example, USA-based EGL Eagle Global Logistics bought a Thai LSP, WorldBridge, and changed the name to EGL Eagle Global Logistics (Thailand) Ltd. In August 2007, Apollo Management L.P. purchased EGL and merged it with CEVA Logistics

and now operates worldwide under the CEVA brand name (CEVA, 2015). Based on annual expenditure, the two most outsourced logistics functions in Thailand are transportation and warehousing, followed by freight forwarding and other supply-chain related services (Logistics Bureau, 2002).

The outsourcing concept is still considered to be quite new for Thailand. Multinational companies, due to their exposure to more advanced logistics management (e.g. externally-integrated or global logistics), better understand the strategic benefits of logistics outsourcing. Large local companies, on the other hand, are somewhat skeptical. These companies are willing to outsource only some external logistics activities—those performed outside their premises such as transportation and freight forwarding—and keep the internal or onsite functions (e.g., production warehousing, logistics administration) in house. For small- to medium-sized local firms, the understanding is even less because the scale of operations is limited, making benefits less discernible (Logistics Bureau, 2002).

With respect to human resources, the education system in Thailand previously did not provide for a workforce for the logistics industry. Although some universities have begun to include logistics courses in degrees such as business administration or industrial engineering, and have even developed logistics degrees for students, most logistics people in Thailand gained their knowledge directly from their companies. The in-house training of LSPs is still very important (Komonchanok Suthiwartnarueput, 2007).

2.5 Logistics Contracting Effectiveness

As stated in chapter one, logistics contracting effectiveness refers to an LSP's performance on a contract and the various outcomes customer managers use to measure it. Although seemingly a straightforward concept, there is a lack of consensus about what the term "performance" means and how it is to be measured. Some authors regard productivity and performance as analogous and use them interchangeably, while others argue that these two terms represent two different concepts and should be measured using different criteria (Euske, 1984; Kearney, 1985). For Mentzer and Konrad (1991: 34), performance is a function of effectiveness

and efficiency. They defined effectiveness as "the extent to which goals are accomplished," and efficiency as "the measure of how well the resources expended are utilized." Measuring performance is thus an evaluation of both effectiveness and efficiency in accomplishing goals.

The effectiveness component of performance measurement addresses the dual criteria of cost and service quality levels. Effectiveness can be measured as the ratio between the actual outputs and the normal level of outputs (Van Der Meulen and Spijkerman, 1985). To indicate that one is 100 percent effective implies full success at achieving a particular goal. Although effectiveness levels may be set arbitrarily (Mentzer and Konrad, 1991), it is important to consider what level of output would be required by the customers. The efficiency component compares an actual measure to a standard. The actual measure refers to the actual use of some company resource such as time (e.g., man hours or equipment hours), space, or unit of energy. The standard measure is usually expressed as the amount budgeted or planned, or a standard amount used.

Defining and analyzing outsourcing performance are not an easy task (Deepen, Goldsby, Knemeyer and Wallenburg, 2008). Empirical studies have shown that the dimensions of service performance vary from one industry to the next (Stank et al., 2003). As an industrial, business-to-business (B2B) service, logistics service is a somewhat intangible and subjectively experienced process, and in many cases, production and consumption activities take place simultaneously. As with other similar services, the quality of logistics service as it is perceived by customers may have two dimensions—a technical or outcome dimension and a functional or process dimension (Grönroos, 2007).

Technical quality is what the customer receives, e.g., a manufacturer gets its products transported from the factory to the customer. The technical quality of logistics service lends itself to more objective evaluation using direct quantitative measures, and data are usually easy and inexpensive to collect. Functional quality refers to how the customer receives the service and how he/she experiences the simultaneous production and consumption process, e.g., the truck driver has a neat appearance and strictly follows the safety rules and regulations of the customer while on the customer's premises. Functional quality tends to be more subjective. Measures

used can be either perceptual (no direct numerical measurement, even if some aspects of them may be quantified) or direct.

Conceptual and empirical models of LSP performance have been presented by many researchers, including Stank, Goldsby, Vickery and Savitskie (2003), Tracey, Fite and Sutton (2004), Knemeyer and Murphy (2004), and Rafiq and Jaafar (2007). Table 2.2 summarizes these four models.

Table 2.2 Summary of LSP Performance Models

Authors	LSPs Performance Dimensions
Stank et al. (2003)	Operational performance Relational performance Cost performance
Tracey et al. (2004)	Technology utilization Internal relationships External relationships Product development Transportation Inventory management
Knemeyer and Murphy (2004)	Logistics operations performance Marketing channel performance Asset reduction
Rafiq and Jaafar (2007)	Information quality Timeliness Order procedure Order release quantities Order accuracy Order quality Order condition Order discrepancy handling Personnel contact quality

Stank et al. (2003) developed a three-dimensional LSP performance scale consisting of operational, relational, and cost performances. For operational performance, they identified three items: “meets promised deadlines,” “delivers

undamaged orders," and "delivers accurate orders" (i.e., items ordered arrived, no unordered items). Given the wider range of activities being performed by LSPs, it is questionable if three items are adequate to capture the necessary aspects of LSP operational performance. Furthermore, if we consider that some logistics services, such as onsite warehousing, are produced and consumed simultaneously, some relational elements (e.g., responsiveness, assurance, and empathy in customer relational management) should be integral parts of the daily operations of LSP and should be included in operational performance measurement, but they are missing from Stank et al.'s (2003) scale.

Stank et al.'s (2003) model seems to be the only one that explicitly recognizes cost. This could be because the role of cost (or price) in the service quality context is not very clear and thus in reports on research into service quality, cost is not discussed much (Grönroos, 2007). Cost savings, nevertheless, are frequently mentioned in the literature as the main motive for logistics outsourcing (Zineldin and Bredenlow, 2003; Wilding and Juriado, 2004; Kremic, Tukel and Rom, 2006). According to social exchange theory, any relationship yields both utilities and costs, and parties will choose to uphold and extend a relationship as along as the cost-utility-ratio is satisfactory (Lambe, Wittmann and Spekman, 2001). However, logistics outsourcing does not always reduce cost. A study by Wilding and Juriado (2004) revealed that many customers choose to outsource primarily to benefit from the competencies of the LSP. Customers are aware of the fact that not every outsourcing decision decreases costs. Therefore, they do not expect cost cuts in the first place.

A substantial amount of literature in manufacturing and service operations supports treating cost as a separate dimension of service performance (Ferdows and De Meyer, 1990; Roth and Van Der Velde, 1991). Logistics service contracts usually involve incentives and penalties; thus there is an impact on price/cost due to incentives being paid to, or penalties being paid by, the LSPs. Taking incentives and penalties for good and bad service into account, the LSP's performance does affect its cost. Considering the above, the researcher agrees with Stank et al. (2003), that cost should be treated as a separate factor. Cost performance is related to two other performances: operational and relational. All three performances, together, contribute to the overall performance of LSPs.

To help further understand and conduct research in the area of supply chain management (SCM), Tracey et al. (2004) developed the Supply Chain Management Explanatory Model to measure a manufacturer's logistics performance within the supply chain context. This model consists of six dimensions: technology utilization, internal relationships, external relationships, product development, transportation, and inventory management. Of these six dimensions, the last two are applicable to LSPs. The transportation dimension has one seven-item subdimension termed transport effectiveness. Inventory management consists of two subdimensions namely, inventory control (7 items), and warehousing and packaging (6 items) (Table 2.3).

Table 2.3 Transportation and Inventory Management Performance Measurement

Transportation Dimension
Subdimension: Transport Effectiveness – Cronbach's alpha = 0.85
TR1 Outbound transportation delivers shipments in the condition they were presented for Transport
TR2 Inbound transportation meets delivery schedules
TR3 Inbound transport provides a timely reply to inquiries
TR4 Inbound transport reacts quickly to special requests
TR5 Outbound transport meets delivery schedules
TR6 Outbound transport provides a timely response to inquiries
TR7 Inbound transportation delivers shipments in the condition they were presented for transport
Inventory Management Dimension
Subdimension: Inventory Control – Cronbach's alpha = 0.94
IM1 We have accurate inventory records regarding the quantities of production material on hand
IM2 We update inventory records for production material promptly
IM3 Finished goods warehousing responds promptly for customer requests
IM4 Our packaging department facilitates efficient handling and transport of our outputs
IM5 We update finished goods inventory records promptly
IM6 We have accurate records concerning the quantities of finished product on-hand
IM7 We have accurate records concerning the location of finished goods in the warehouse System
Subdimension: Warehousing and Packaging – Cronbach's alpha = 0.85
IM8 Production support responds expediently to special requests
IM9 Our finished goods are warehoused with little damage or loss
IM10 Finished goods warehousing picks orders accurately
IM11 Labeling on our packaged products is accurate and distinguishable
IM12 We meet the packaging specification of our customers
IM13 Packaging sustains our production plan

Source: Tracey et al., 2004.

Tracey et al. (2004) distinguished inbound and outbound logistics functions (e.g., items TR2, TR3, TR7 for inbound transport, and TR5, TR6 and TR1 for the corresponding reverse activities) and measured them separately. However, should researchers assume that customers do not have different perceptions toward these two functions, they may combine similar items to reduce the number of measurement items. Doing so will help produce a more parsimonious scale. For example, items TR1 and TR7 may be combined and rephrased as "3PL transportation delivers shipments in the condition they were presented for transport."

Rafiq and Jaafar (2007) drew measures from two earlier studies of a focal company's logistic performance (Mentzer, Flint and Hult, 2001; Mentzer, Flint and Kent, 1999) and applied them directly in the LSP context. They proposed a logistics service quality scale consisting of 32 items classified into nine dimensions, as shown in Table 2.4.

Table 2.4 Rafiq and Jaafar's (2007) Logistics Service Quality Scale

Dimension	Measures
Information Quality CR = 0.96	1. The information communicated by the 3PL is timely. 2. The information communicated by the 3PL is accurate. 3. The information communicated by the 3PL is adequate. 4. The information communicated by the 3PL is complete. 5. The information communicated by the 3PL is credible.
Order Procedures CR = 0.96	1. Requisitioning procedures are effective. 2. Requisitioning procedures are easy to use. 3. Requisitioning procedures are simple. 4. Requisitioning procedures do not take much effort. 5. Requisitioning procedures do not take much time. 6. Requisitioning procedures are flexible.
Ordering Release Quantities CR = 0.82	1. Requisition quantities are not challenged. 2. Difficulties never occur due to maximum release quantities. 3. Difficulties never occur due to minimum release quantities.
Timeliness CR = 0.87	1. Time between placing a requisition and receiving delivery is short. 2. Deliveries arrive on the date promised. 3. The amount of time a requisition is on backorder is short.
Order Accuracy CR = 0.89	1. Shipments rarely contain the wrong items. 2. Shipments rarely contain an incorrect quantity. 3. Shipments rarely contain substituted items.

Table 2.4 (Continued)

Dimension	Measures
Order Quality CR = 0.73	1. Substituted items sent by the 3PL work fine. 2. Products ordered from the 3PL meet technical requirements. 3. Equipment and/or parts are rarely nonconforming.
Order Condition CR = 0.87	1. Material received from the 3PL depots is undamaged. 2. Material received direct from vendors is undamaged. 3. Damage rarely occurs as a result of the transport mode or carrier.

Source: Rafiq and Jaafar, 2007.

Rafiq and Jaafar's (2007) scale focuses on inventory management and contains many items that are not relevant to logistics services. For example, three order quality items—"substituted items sent by the 3PL work fine," "products ordered from the 3PL meet technical requirements," and "equipment and/or parts rarely nonconforming"—all deal with product specification/quality. They do not concern LSP (3PL) services, unless an LSP is involved in the final assembly of the products and the nonconformance is actually due to the LSP, not the manufacturer. In the context of logistics service, order quality should deal with order accuracy (correct item and quantity) and order condition (undamaged).

With respect to ordering release quantities, timeliness and order accuracy, for the items "requisition quantities are not challenged," "the amount of time a requisition is on backorder is short," and "shipments rarely contain substituted items," LSPs challenge requisition quantities only when the available inventory cannot meet the requested quantities. Backorder and substituted items are caused by the items ordered not being available. It should be the suppliers that fail to replenish the products, not the LSP, be held responsible for such low stock level or stock-out.

The above are just some of the problems with Rafiq and Jaafar's (2007) scale. Originally, Mentzer et al. (1999, 2001) developed these measures to evaluate a firm's in-house logistics performance. Applying them directly in an LSP context without proper modifications resulted in discrepancies, as discussed above.

Knemeyer and Murphy (2004) defined LSP performance as the perceived performance improvements that the logistics outsourcing relationship has provided the customer. Based on Morgan and Hunt's (1994) view, that trust is a key mediating variable within effective relational exchanges, they used a 17-item LSP performance scale (Table 2.5) developed by Newton, Langley and Allen (1997) to survey 388 U.S. companies using LSPs and concluded that customers with higher levels of trust toward their LSP exhibited a significantly higher perception of the LSP's performance.

Table 2.5 Knemeyer and Murphy's (2004) Third-Party Logistics Performance Scale

Logistics Operations Performance - Cronbach's alpha = 0.93
This relationship has improved our logistics system responsiveness.
This relationship has improved our logistics system information.
This third-party continuously works to reduce our costs, even if it means a reduction in their price.
This relationship has reduced our risk.
This relationship has provided us specialized services.
This relationship has improved our product/service availability.
This relationship has allowed us to achieve logistics cost reductions.
This relationship has improved our information technology.
This relationship has enabled us to implement changes faster/better.
This relationship has provided us more specialized logistics expertise.
Marketing Channel Performance - Cronbach's alpha = 0.82
This relationship has reduced our order cycle time.
This relationship has enabled us to move from a "push" to a "pull" system.
This relationship has increased post-sale customer support.
This relationship has expanded our geographic coverage.
This relationship has helped us integrate our supply chain.
Asset Reduction – Cronbach's alpha = not applicable
This relationship has reduced our level of owned assets.
This relationship has reduced our employee base.

Source: Knemeyer and Murphy, 2004.

Knemeyer and Murphy's (2004) scale differs from the three previous scales in that it focuses on measuring performance outcomes of LSP relationships. This is consistent with the current study, which defines logistics contracting effectiveness as an LSP's performance and the various outcomes customer managers use to measure it.

It is, therefore, suitable for use in this study. The researcher thus decided to borrow five items from this scale that reflect the four most frequently mentioned reasons for logistics contracting out: operations improvement (Lynch, 2004), cost reduction realized from LSP expertise and economies of scales (Wilding and Juriado, 2004), asset reduction (Razzaque and Sheng, 1998), and headcount reduction (Bardi and Tracey, 1991). These five items are:

1) This contract has improved our logistics operations performance.
2) This contract has provided us with more specialized logistics expertise.
3) This contract has reduced our logistics cost.
4) This contract has reduced our level of owned assets.
5) This contract has reduced our employee base.

The literature has also identified a number of factors that may lead to successful logistics contractual relationships. The next section discusses these factors in detail.

2.6 Variables Contributing to Logistics Contracting Effectiveness

2.6.1 Top Management Championship

In order to ensure the success of logistics outsourcing, a number of factors are to be considered before (*ex-ante*) and after (*ex-post*) the implementation of the outsourcing process. The first and foremost is that the decision to outsource must come from the top (Razzaque and Sheng, 1998). While scholars have long recognized the strategic importance of logistics (see "Competitive Advantage: Creating and Sustaining Superior Performance" by Porter (1985), and "Update Logistics Skills for the Future" by LaLonde (1990)), surprisingly, a number of studies have revealed that many top managers are unaware of the true value of logistics and its potential contributions to sustainable competitive advantage (Hammer, 2004; Shapiro, Rangan and Sviokla, 2004). Logistics does not seem to be high on their agenda and consequently, they are often not actively involved in logistics outsourcing (Holter, Grant, Ritchie and Shaw, 2008).

In studying top management's involvement in logistics outsourcing, Chen, Tian and Daugherty (2010) suggested that research should focus on top management championship. Being a supporter, top management simply approves the project and

provides the necessary resources. Being a champion requires top management to assume a more active role involving in, participating in, and leading the project (Chatterjee, Grewal and Sambamurthy, 2002) to ensure its completion. Outsourcing logistics functions that were previously performed in house may face objections or even resentment from various functional departments, particularly the logistics people that may perceive the use of LSPs as a threat to their job security and develop a fear of being retrenched (Muller, 1991). These can only be solved through the intervention by top management, which usually results in changes to corporate cultures (Chen and Popovich, 2003).

The top management championship can be viewed as a unique intangible firm resource. It is a critical resource because the level of importance the top management places upon logistics directly influences the amount of other organizational resources they allocate to logistics outsourcing, which in turn affects the performance of the outsourced logistics functions in satisfying customer requirements (Novack, Rinehart and Langley, 1996). When top management provides the necessary championship, the logistics department will have adequate resources and authority to collaborate more intensively with LSPs (Sandberg, 2007), resulting in more frequent information sharing and joint operational planning of logistics activities with the LSPs (Chen et al., 2010). In championing a logistics outsourcing project, top management should send messages that such outsourcing is critical to the company's success, create a supportive environment for managers and LSPs to work together, and give the relationship the authority to make the necessary decisions and commitments (Davenport and Prusak, 1998; Ellram, 1991).

2.6.2 Contract Specificity

The complexity of logistics (Stank et al., 2003) and its primary function roles (Porter, 1985) may make logistics outsourcing a particularly challenging endeavor. Studies suggest that most problems within the supply chain can be attributed to a loosely-specified contract (Platz and Temponi, 2007). To ensure the success of logistics outsourcing, manufacturers must be able to precisely define their logistics requirements and to monitor their delivery by LSPs.

An outsourcing contract is a legally-bound, institutional framework codifying contracting parties' rights, duties, and responsibilities and specifying the goals, policies, and strategies underlying the arrangement. Legal experts have emphasized the need for a comprehensive contract because it is basically a reference point, specifying the relationship between the customer and the provider (Kern and Willcocks, 2000). However, studies on logistics contracts are underrepresented (Maloni and Carter, 2006). Table 2.6 summarizes some of the different aspects of logistics contracts that have been addressed (Olander and Norrman, 2012).

Table 2.6 Aspects Addressed by Logistics Research on Contracts

Aspects addressed	**Sources**
Provision buyers find important to include in contracts	Boysen, Corsi, Dresner and Rabinovich (1999)
Contract design, based on agency theory	Logan (2000)
Contract importance in the outsourcing process of advanced logistics services	Andersson and Norrman (2002)
Contracts in the dynamics of governing 3PL arrangements, based on multiple theoretical approaches	Halldòrsson and Skjøtt-Larsen (2006)
Contracts in relational governance, as a basis for flexibility, ongoing dialogue and exchange adaptation	Selviaridis and Spring (2010)

Source: Olander and Norrman, 2012.

An outsourcing contract serves two main purposes: facilitating exchange and preventing opportunism. A well-specified contract not only helps reduce the uncertainty faced by organizational decision-makers, but also helps prevent opportunism by restraining the contracting parties' ability to pursue their private interests rather than common benefits (Luo, 2002). This in turn promotes long-term, trusting exchange relationships (Poppo and Zenger, 2002).

Detailed specifications and monitoring are important for facilitating joint sense-making between the contracting parties (Vlaar, Van Den Bosch and Volberda, 2006).

Such formalization helps focus the parties' attention and forces them to articulate various aspects of the task and the relationship, which gives the parties a better general understanding of the task at hand and reduces the risk of misunderstandings. Drafting an extensive contract is a strenuous task, but it provides the contracting parties with a good learning process through which they successively encounter difficulties and agree on how these should be handled (Argyres, Berkovitz and Mayer, 2006). Frequent communications during the process can also help build relationships and several studies have indeed found that the contracting process can foster trust (Blomqvist, Hurmelinna and Seppänen 2005).

While a well-specified, long-term contract helps foster an enduring relationship because the market conditions, technologies, and customer demands are ever changing, the contract needs to be amenable (Webb and Laborde, 2005). On the other hand, a loosely-specified contract may bring about ambiguity, which Luo (2002: 904), citing Goldberg (1976), warned that it "creates breeding ground for shirking responsibility and shifting blame, raises the likelihood of conflict, and hinders the ability to coordinate activities, utilize resources, and implement strategies." All of these undoubtedly will degrade the relationship.

When formulating an outsourcing contract, the customer and the provider must decide on the best form of contract that can ensure performance, value, and return on the prospective investment (Davis, 2004). An outsourcing contract should include key elements covering the immediate and ongoing operations. According to Platz and Temponi (2007), there are three key elements relevant to the outsourcing contract: (1) performance elements; (2) financial elements; and (3) legal elements. These key elements are all indicators of a successful contractual relationship.

2.6.3 Performance Monitoring

There are two issues of risk associated with contracting: (1) whether contractors have the capacity to perform to the agreed standards, and (2) whether those standards are being attained (The Industry Commission of Australia, 1996). Pre-contract supplier qualifications evaluation can be used to deal with the first issue, and performance monitoring to deal with the latter. Many customers select LSPs based on their past performance records (Straight, 1999) and make use of performance measures

to assess their performance (Bhatnagar, Sohal and Millen, 1999). One important criterion customers use to prescreen an LSP is its ability to provide quantitatively measurable performance (Van Hoek, 2001), and researchers have suggested that performance standards should be included in the service contract (Platz and Temponi, 2007).

A successful contractual relationship requires a strong performance orientation (Van Laarhoven et al., 2000). Dean and Kiu (2002) highlighted the role of performance monitoring in ensuring that service delivery is as agreed in contracts and that service delivery consequently results in desirable service outcomes. Effective performance monitoring needs a well-designed performance measurement system that clearly and unequivocally tracks and simplifies reports. This system consists of three components: individual measures, a set of measures, and a supporting infrastructure (Neely et al., 2000). Individual measures are the measures that quantify the efficiency and/or effectiveness of actions. Individual measures may be grouped according to their characteristics to form a set of measures that combine to assess the performance as a whole. They must be compatible, comparable, and capture all aspects of the actual inputs and outputs (Mentzer and Konrad, 1991).

There are three types of measures: monitoring, controlling, and directing measures. Monitoring is somewhat backward-looking. The measures used are a set of metrics to track historical performance, which typically includes cost and service level components. Controlling measures, on the other hand, focus on ongoing performance. A process that is found to be exceeding its control standards must be refined and brought back into compliance. Directing measures are related to employee motivation and reward for performance. Typical examples are "pay for performance" practices used to encourage warehouse or transportation personnel to achieve higher levels of productivity. It must be cautioned here that increasing the level of performance of one aspect must not be done at the expense of the other aspects. For example, warehouse operator picks the materials in less than the standard time but with increased errors (e.g., wrong item or quantity) or damages. It is advisable that both positive and negative performances be measured (Bowersox et al., 2003).

Due to its multidimensionality, logistics service requires a large set of performance measures. One important criterion to consider in choosing a set of

performance variables is representativeness (Smith, 1993); that is, the set of measures should capture those dimensions of performance which both customers and LSPs find useful in measuring the performance of the outsourced logistics operations. From the customer's side, it is essential that they fully disclose their expectations for quality and services levels, and means for measuring performance within the outsourcing contract. From the LSP's side, it is not enough for them to just simply perform the functions they has been contracted to do; they must perform them up to appropriate predetermined standards.

Supply Chain Management Process Standards: Deliver, published by CSCMP, suggests a number of transportation and warehousing performance standards. Some suggested productivity metrics are: units processed per hour, day, month and/or week; and labor cost per piece (or pallet) received or issued. Utilization metrics include: amount of storage space utilized at end of day, week or month; and employees (regular full time, regular part time, temporary) used in each process versus employees available. Warehouse performance metrics include: hours required to complete each stage of the receiving process and hours overall (broken down by employee, product category/class, time period); accuracy level of each employee in terms of number of items handled, number of errors, and percentage correct decision (Supply Chain Visions, 2004).

The third component of performance measurement system, supporting infrastructure, enables data to be collected, sorted, analyzed, interpreted and disseminated. It is worth noting here that the human behavior element is equal to, if not more important than, the physical infrastructure. It should be carefully monitored to avoid problems such as deliberate manipulation or "grooming" of data by the LSP staff, which result in a reported performance that differs from the actual performance (Smith and Goddard, 2002).

2.6.4 Incentives and Penalties

According to the incentive theory, people's behaviors are motivated by external stimuli. They are likely to engage in behaviors that offer incentives and avoid behaviors that result in penalties (Bernstein, 2013). As stated, logistics contracts usually involve incentives and penalties. Incentives are important to the preservation

of quality standards. Contracting expert Cooper (2003) stressed the importance of using financial incentives to encourage good performance. The literature suggests many types of incentives namely, gain sharing, monetary payments for reaching certain goals, and contract renewal based on good performance by the contractor (Fernandez, 2005).

House and Stank (2001) argued that LSPs may not be motivated to put forth maximum effort if they are not provided with an opportunity to share financial rewards. Merely "keeping the business" is not a sufficient incentive to make an LSP apply the necessary effort to meet or exceed expectations. Cooper (2003) echoed this point, stating that the use of incentives can be particularly important for the success of long-term contractual relationship. Having such a relationship, contractors tend to be protected from competitions that encourage higher performance. Additional financial incentives may be needed to motivate the contractors to maintain a high level of performance.

A partnership formed between Melville Corporation, a leading specialty retailer in the US, and Mercantile Logistics, an international LSP, serves as a good example of gain sharing. The Melville/Mercantile partnership included shared financial savings in the contract. Melville's financial incentives plan mirrored their internal system, which provided bonus payments to employees after yearly targets were exceeded. They established attainable yearly productivity targets and shared all savings beyond these targets with Mercantile (House and Stank, 2001).

LSPs that consistently underperform must also face penalties. Without penalties for underperformance structured into the contract, it is possible that the LSP could settle for mediocre performance with little regard for the incentive (Platz and Temponi, 2007).

2.6.5 Proactive Improvement

Many studies have suggested that, in a situation of necessary change, being proactive is potentially a very effective strategy for service providers seeking to satisfy customers and increase loyalty (Beverland, Farrelly and Woodhatch, 2007). Unfortunately, most LSPs still adopt a rather passive stance toward change. They tend

to change their service delivery mostly in response to a request by the customer, not on their own initiative (Wallenburg et al., 2010).

Wallenburg et al. (2010: 8) defined proactive improvement as "an LSP, which given that a potential innovation is beneficial to its customer, proactively enhances the service provided to the customer." Some researchers argued that the LSPs' orientation towards innovation can be defined as proactive improvement (Engelbrecht, 2004; Deepen, 2007). This argument was consistent with Rogers's (1995: 11) definition of innovation—"an idea, practice, or object that is perceived as new by an individual or other unit of adoption." Therefore, proactive improvement made by an LSP can be considered as an act of innovation (Wallenburg et al., 2010). As stated earlier, the role of logistics has evolved from an operational orientation to a strategic orientation (LaLonde, 1990). Having a strategic nature, logistics outsourcing can enhance a firm's competitiveness through the utilization of the innovative capabilities of LSPs (Bhatnagar and Viswanathan, 2000) to create and implement an appropriate logistics solution. This solution needs to be continuously improved in order to meet the ever-changing customer demands (Wallenburg and Lukassen, 2011). Studies have found that customers expect their LSPs to drive service innovation continuously to increase the value provided to their customers (end-customers) (Flint, Larsson, Gammelgaard and Mentzer, 2005).

Proactive improvement provides both functional and relational values for the customers. For functional value, proactive improvement helps reduce costs incurred to, and increase benefits received by, the customers; effectiveness and/or efficiency are thus enhanced (Deepen et al., 2008). For relational value, proactive improvement helps reduce the risks and increase the trustworthiness of LSPs by screening out short-term oriented, opportunity-seeking LSPs (Wallenburg et al., 2010). This is because proactive improvement yields benefits usually only at a later stage of the relationship (e.g., contract renewal) (Kydd, 2000). Based upon social exchange theory (Thibaut and Kelley, 1959), customers should achieve higher benefits, in the form of better performance, from LSPs that display proactive improvement; and this increased value—functional and relational—received by the customers will raise the propensity that the customers maintain, and perhaps expand, the relationship with the LSPs (Lambe et al., 2001; Lemon, White and Winer, 2002).

2.6.6 Contract-Specific Investment

Logistics service consists of recurrent, complex services based on a long-term contract between an LSP and a customer. For this setting, the transaction cost theory predicts the occurrence of specific investment (Williamson, 1979, 2008) by the LSPs. Contract-specific investment refers to investment in physical or human assets that are dedicated to a particular contract and redeployment of these assets to some other contracts will entail considerable switching costs (Heide, 1994). The transaction cost theory regards contract-specific investment as a decisive factor on the level of transaction costs and the business relationship contract (Maloni and Carter, 2006).

Asset specificity is a precondition to meeting the specific requirements of the customer and to efficiently support recurrent transactions. According to Williamson (1996), there are four types of asset specificity. One is site specificity, where manufacturers opt to locate assets such as warehouse and factory proximate to each other to minimize transportation. Two is physical asset specificity, where an LSP's asset such as a warehouse built according to a customer's specifications. This warehouse will need some modifications before it can be used to serve other customers. Three, dedicated assets, are highly-specialized assets such as trucks designed to transport a certain type of cargoes (e.g., odd-shaped products) and their use is limited within a specific contract. Four is human asset specificity, which stems from experience on managing a manufacturer's logistics assets. Large, Kramer and Hartmann, (2011) extend the scope of contract-specific investment from physical and human assets to cover also intangible assets: procedures and systems.

The business model of contract logistics is essentially based on the creation of customer-specific services and hence on adaptations by the LSPs (Ellinger, Ketchen, Hult, Elmadag and Richey, 2008). The ability to adapt to customers' specific requirements is a crucial characteristic of LSPs (Hertz and Alfredsson, 2003). Customers expect tailored logistics solutions (Sink et al., 1996). In many cases, they insist on a specific location (site specificity), the usage of their equipment (physical asset specificity), and demand specific procedures or require periodical reports of specific key performance indicators (Large et al., 2011). Large et al.'s (2011) study revealed that LSPs accept their own adaptations as a crucial element of the logistics outsourcing relationship. It is suggested that LSPs should adapt their systems and

procedures to customers' specific requirements to ensure high relationship performance.

Due to the fact that contract-specific assets cannot be easily redeployed, LSPs will try to prolong the partnership with their customers because these assets can lose substantial value should the relationship end prematurely (Anderson and Weitz, 1992). Investing in contract-specific assets serves as tangible evidence indicating that the LSP cares for the relationship and that it can be trusted. The larger the amount that the LSP invests in contract-specific assets, the higher is the degree to which it is locked into the relationship. This LSP is less likely to engage in opportunistic or untrustworthy behaviors. Because these undesirable behaviors could threaten the relationship, and once the relationship is terminated, contract-specific assets become unproductive sunk cost (Ganesan, 1994).

Interestingly, a study by Knemeyer and Murphy (2004) revealed that a customer's perception of contract-specific investment is not related to the customer's level of trust in the LSP. One plausible explanation is that traditional logistics services, such as transportation and warehousing, have become, to some extent, commoditized (Van Hoek, 2000). However, another study by Kwon and Suh (2005) came back to the previous suggestion—that the supplier's asset specificity has a significantly positive impact on trust. The researcher would say that both were correct and the contradictory results could be due to the mode of operations—multi-client or contract. As was explained in chapter one, in the multi-client mode, resources are shared and services are standardized (this is consistent with Van Hoek's (2000) definition of commoditized logistics services), while in the contract mode, resources are dedicated and services are customized to meet the customer's specific requirements. Thus the effect of asset specificity could be low for the multi-client mode and become higher in the contract mode.

Investment in contract-specific assets can result in interdependency (Skjoett-Larsen, 2000). An LSP investing in special trucks to transport particular products for a specific customer is to some degree bound to the customer. On the other hand, the customer is also to some degree bound to the LSP, unless alternative LSPs have the same special trucks. Higher asset specificity leads to higher interdependence between the customers and the LSPs. In such a case, Williamson (1985) recommends joint

investment as a way to sustain an effective working relationship between parties in a contract.

2.6.7 Continuity

Continuity, or long-term expectation, refers to "the degree to which the parties anticipate that their relationship will continue into the future with an indeterminate endpoint" (Heide and Miner, 1992: 268). Continuity is an essential variable in the relationship between customers and LSPs (Langfield and Greenwood, 1998). Logistics services involving high asset specificity (e.g., site specificity, where a customer requests an LSP to set up a dedicated warehouse proximate to their factory) have a "lock-in" effect: for LSPs, it is difficult to transfer the assets created from the investment to another contract without incurring significant costs. For customers, switching to a new LSP can be an expensive proposition, since the current LSP has already invested in and developed specialized physical, human, and technological assets and therefore can provide the service for less than a new LSP that would have to incur the cost of these assets for the first time (Williamson, 1985).

A long-term relationship not only provides the required transition time to improve the business (Bradley, 1994), but also fosters a climate of trust and commitment (Dwyer, Schurr and Oh, 1987; Holcomb and Hitt, 2007). A number of empirical studies have reported a positive linkage between relationship length and trust. For example, K. S. Coulter and R. A. Coulter (2002) found that a long-term relationship relates to trust and that a customer's trust in a supplier may increase as the length of the relationship increases. Anderson and Weitz (1989) reported that trust may increase along with the age of a relationship. Dyer and Chu (2000) found that relationship length has a significant positive impact on trust within the context of supplier-automaker relationships in the United States, Japan, and Korea.

Commitment, defined as a desire to maintain a valued relationship (Moorman, Zaltman and Deshpande, 1992), plays a significant role in inter-firm relationships. The nature of commitment in interorganizational relationships is sacrifice and stability. That is to say, firms are willing to make short-term sacrifices to maintain their long-term stable relationship (Dwyer et al., 1987). Commitment is a multifaceted construct and should be viewed from three aspects: (1) affective commitment; (2) normative

commitment; and (3) continuance commitment. Affective commitment refers to the feeling of belonging and the sense of attachment to the organization. Normative commitment is concerned with the obligation that members feel to remain with an organization and build on generalized cultural expectations. Continuance commitment relates to perceived costs of leaving both financial and nonfinancial and is perceived from lack of alternatives (Allen and Meyer, 1990).

The stronger a customer expresses that its LSP relationship will continue in the future, the higher is the continuity of the relationship (Hofer, Knemeyer and Dresner, 2009). This, in turn, influences the level of commitment of their LSP. From the LSPs' standpoint, a stable relationship promotes their commitment to the level of quality expected by customers, especially when LSPs perceive a certainty of supplying to customer firm for an extended period (Lai, Cheng and Yeung, 2005). When commitment exists, firms work closely in order to achieve both their individual and joint goals. In other words, commitment can help increase coordination among the firms, enabling them to establish closer integration (Brown, Lusch and Nicholson, 1995).

With respect to performance management, principal-agent theory postulates that when principals and agents engage in long-term relationships, the principals will learn more about agents and thus be able to assess agent behavior more readily (Eisenhardt, 1989). In logistics outsourcing, customers build long-term relationships with LSPs through repeated ties or interactions, and these allow customers access to information about the reliability and performance of LSPs, which helps to reduce information asymmetries, increase awareness of specialized capabilities, and establish a basis for trust. When customers trust their LSPs and believe that they can rely on the LSPs to meet their obligations and that the LSPs will act fairly when the possibility for opportunism arises, the risk of adverse selection is reduced and the level of collaboration is improved (Holcomb and Hitt, 2007).

2.6.8 Trust

Moorman, Deshpande and Zaltman (1993: 82) defined trust as "a willingness to rely on an exchange partner in whom one has confidence." The contingency literature frequently mentions trust as a factor contributing to contracting effectiveness,

especially when task complexity and uncertainty are high or when the parties find themselves engaged in a long-term relationship due to high contract-specific investments or thin markets (Lawther, 2003). The lack of trust, on the other hand, is often cited as a reason why relationships turn out to be less effective than planned (Sahay, 2003).

Trust contributes to the success of contractual relationships in three interrelated ways. First, trust serves as a deterrent against opportunistic behavior. Trust between contracting parties reduces each party's motivation to behave opportunistically and increases the likelihood that they will forgo short-term advantages in favor or mutual long-term gains (Jeffries and Reed, 2000). Second, trust can be a cost effective substitute for authority and control mechanisms (Zaheer, McEvily and Perrone, 1998). When parties are discouraged from behaving opportunistically they tend to behave in ways that conform to mutual expectations, and their behavior becomes much more predictable. Predictable patterns of behavior help reduce the need for highly-detailed contract requirements and rigorous performance monitoring, thereby reducing the contracting and monitoring costs (Hill, 1990). Finally, in the literature on interorganizational relations, there has been a consistent argument that the existence of relationship based on trust between partners has a positive impact on the ability of the partners to adjust to changing environmental demands or unintended problems that may arise (Young-Ybarra and Wiersema 1999).

According to Komiak and Benbasat (2004), there are four types of trust that have the highest potential for explaining organizational-level performance impacts and coordination differences within supply chain relationships:

1) Calculative trust. Calculative trust is an ongoing, market-oriented, economic calculation for assessing the benefits and costs that can be derived from creating and maintaining a relationship (Paul and McDaniel, 2004). It reflects an assessment of a partner's likely cooperation, based on the partner's qualities and social constraints. This type of trust develops in the building phase of a contractual relationship (Kim and Prabhakar, 2004).

2) Competence trust. Competence trust refers to the technical, operational, human, and financial abilities of an LSP required to perform a task that it

says it can perform. This type of trust develops during the early interaction phase of the contracting process (Heffernon, 2004).

3) Trust in integrity. Trust in integrity is the belief that an LSP makes good faith agreements, tells the truth, and fulfills promises. Consistency and loyalty are two components of integrity. Integrity is based on experience from interpersonal relationships between the LSP and the customer and more specifically on their perceptions of each other's past behavior (Komiak and Benbasat, 2004).

4) Trust in predictability. Predictability refers to a customer's ability to forecast an LSP's future actions in a given situation based on its current patterns of behavior. Trust in predictability is a key to effective and uninterrupted operation of a supply chain. This type of trust can be developed when the customer has the ability to predict future outcomes with high probability of success (Komiak and Benbasat, 2004).

Trust can be developed directly through the consistent and predictable behaviors of the partners over an extended period. The literature offers a number of explanations. First, time spent building and fostering a relationship is perceived as an idiosyncratic investment by both partners. The longer the relationship continues, the greater is the perceived investment. Second, shared history makes exchange relationships more predictable (Selnes, 1998). A longer shared history implies that the relationship has successfully passed its most critical stages of development. This allows the partners to better understand each other's distinctive and peculiar behaviors and to predict each other's future behavior (Doney and Cannon, 1997). Finally, long-term relationships provide firms sufficient time to observe the moral characters of their partners to accurately screen out honest partners (Barney and Hansen, 1994).

The presence of trust in logistics service has many advantages: trust is associated with lower *ex post* transaction costs between customers and LSPs (Zaheer et al., 1998). At the individual firm level, LSP investments in dedicated equipment and adaptation of service processes are eased with the presence of trust (Sahay, 2003), and customers with a higher level of trust toward their LSPs exhibit a significantly higher perception of the LSP performance (Knemeyer and Murphy, 2004). At the integrated supply chain level, a higher level of trust in a channel relationship can lead to a higher level of customer satisfaction (Andaleeb, 1996).

To cultivate customers' trust, LSPs should emphasize: creating and enhancing their reputation in the industry (Grönroos, 2007), having an appropriate amount of asset specificity to signal the customers of their long-term commitment (Suh and Kwon, 2006), sharing appropriate information with customers (Bowersox, Closs and Stank, 2000), and improving customers' satisfaction level (Tian, Lai and Daniel, 2008).

2.6.9 Information Sharing

The RBV posits that a firm develops organizational assets and resources into distinctive capabilities that help the firm enhance its performance (Day, 1994). In the logistics contractual relationship, customers rely upon LSPs to offer the logistics services they need, and LSPs provide resources and assets that customers may not have (Lieb and Kendrick, 2003). Collaborating with LSPs not only can augment customer firms' resource alignment and utilization, but also facilitates the development of other capabilities such as flexibility, responsiveness, and learning capability (Esper, Fugate and Davis-Sramek, 2007). Compared to customers that consider outsourced logistics functions as an ordinary commodity, customers that closely collaborate with their LSPs are more likely to be capable of responding to market and customer needs and changes (Chen et al., 2010). Therefore, customer-LSP collaboration represents a unique capability a firm possesses that can enhance its competitiveness (Sinkovics and Roath, 2004).

Customer-LSP collaboration involves a close relationship that emphasizes information sharing (Chen et al., 2010). According to relational exchange theory, information sharing is one of the key determinants of efficient contract governance (Artz and Brush, 2000). It is one of the essential factors influencing trust between organizations (Ross, Chen and Huang, 2007) and is critical to the effective and efficient management of any relationship (Tian et al., 2008). In the current research, information sharing refers to the extent to which a customer and its LSP freely and actively provide useful, often proprietary, information to each other (Heide and John, 1992; Hofer et al., 2009). This goes beyond the routine exchange of operational information, e.g., advance shipment notice, flight bookings, shipment status. Information needs to be shared in a timely manner, allowing partners to respond

promptly and effectively to environmental events. Otherwise its value degrades, and consequently degrading the performance of the partnership (Kuo, Chen and Smith, 2005).

From the point of view of the principal-agent theory, information sharing helps reduce information asymmetry and improves decision transparency. A higher level of trust is believed to develop when information asymmetry is low and there is less behavioral uncertainty (Dyer and Chu, 2000). In the case of performance monitoring, information asymmetry is concerned more with whether customers can access information about LSPs' process quality performance and capability, such as LSPs' internal process quality data, quality control procedures, and quality improvement programs and the results of these programs. When LSPs refuse to share their own internal quality data with customers or they provide false information, customers will have to opt for outcome-based approaches to evaluate the LSP quality (Rungtsusanatham, Rabinovich, Ashenbaum and Wallin, 2007). With these approaches, customers can assess only final service quality and have no control over how LSPs achieve quality, and some hidden quality problems may not be detected.

On the other hand, when LSPs are open and are willing to share their internal quality data with customers, customers will have the information necessary to accurately assess the LSPs' quality management ability and behaviors. In situations characterized by high information sharing, behavior-based approaches are preferable to outcome-based approaches (Rungtusanatham et al., 2007). Open communication is required for joint performance towards shared goals in logistics alliances (Bowersox, Daugherty, Dröge, Rogers and Wardlow, 1989). Open communication means that accurate and relevant information should be communicated to the partner in a timely manner (Lehtonen, 2006). When there is open communication and cooperation between two parties, customers are able to observe and assess the LSPs' actual behaviors in managing quality. In this situation, customers are more willing to investing in behavior-based approaches (B. B. Flynn and E. J. Flynn, 2005; Robinson and Malhotra, 2005), which include assisting LSPs in solving operational problems or involving LSPs in designing their integrated logistics operations. All these practices positively affect the success of the logistics contractual relationship.

Sharing critical information, while necessary for both strategic and operational coordination among logistics partners, can put a company in a vulnerable position (Doney and Cannon, 1997). From the customers' point of view, although logistics services are enhanced when activities are coordinated under an integrated information sharing environment, there are some concerns about information sharing between customers and LSPs. For example, providing LSPs with sales outlooks could help them make timely warehouse space adjustments to accommodate the finished products; however, fear of information leakage (Li, 2002) may discourage customers from sharing this information with their LSPs. To solve such a problem, it is suggested that the customers and the LSPs jointly set information-sharing goals, determine the quality of the information, the extent of the sharing of information (Mohr and Spekman, 1996), and the frequency of different types of meetings, and which organizational levels are to take part in these meetings (Lehtonen, 2006).

2.6.10 Risk Aversion

Risk aversion (or risk avoiding) is "a concept in psychology, economics, and finance based on the behavior of humans, especially consumers and investors, while exposed to uncertainty to attempt to reduce that uncertainty" (Stamatis, 2014: 16). In business, risk aversion is about settling for a lower profit to avoid the risk of an uncertain return; in other words, being willing to pay more to avoid risks (Hilton, 1989). In logistics service, the LSPs' level of risk aversion is related to their attitudes toward risk that may cause quality related problems with services provided to customers. From the LSPs' point of view, reducing quality related risk implies increased equipment and labor costs and demands them to make more investments in quality management. For example, they need to select better but more expensive equipment over lower quality cheaper equipment, add quality control personnel, invest in quality improvement programs, and so on. As LSPs have control over the quality of their services, they will deliver the service quality that maximizes their expected return.

LSPs' attitudes toward quality related risk will influence their behavior in quality management and thus the quality of the services they provide to customers. Risk-neutral LSPs are more likely to produce substandard services due to limited

quality control. When dealing with these LSPs, rigorous performance monitoring becomes necessary, which increases the transaction costs. On the other hand, risk-averse LSPs are more likely to apply strict quality control procedures and invest in quality management practices to improve their process and service quality so that they can deliver better quality services to customers (Starbird, 1994). They are also more willing to cooperate with customers to improve their quality management capabilities so as to reduce their risk of quality problems and failures.

2.6.11 Alternative Dispute Resolution

Naturally disputes arise within many contractual relationships. The early literature suggests that, whenever the provider fails to perform according to the terms of the agreement, or when the parties disagree on the requirements of the contract, the customer will employ legal means to induce the desired behavior (Fernandez, 2005). However, the use of attorneys and the litigation process are very costly and can have harsh effects both directly and indirectly on the companies involved. Money and reputations are often squandered in lengthy courtroom disputes (Platz and Temponi, 2007).

Logistics outsourcing contracts need to take this into consideration and encourage the use of alternative dispute resolution (ADR) as the required approach to resolving issues between the customer and the LSP. ADR is not only less risky, less time-consuming, and less costly than the litigation process, but also allows the parties involved preserve their professional relationship while resolving a dispute (unless the dispute is concerning termination of the contract). The LSP may find that it is in its best interest to be flexible and employ a softer method to resolve a dispute outside the courtroom, which may help it retain the customer and safeguard its reputation in the market.

ADR typically includes negotiation, mediation, and arbitration (Legal Information Institute, 2013). Negotiation is the most widely-used mode of dispute resolution and is almost always attempted first to resolve a dispute. It allows the disputing parties to meet outside the courtroom and have the control over the process and the solution. Mediation is also an informal alternative to litigation. If the disputing parties cannot resolve a dispute amicably by themselves, they may require a

neutral person to act as a mediator. Mediators are trained negotiators that possess special skills and procedures to help bring about understanding and agreement.

Similar to mediation, arbitration involves an independent third party. This can be an individual or a panel. What differentiates arbitration from negotiation and mediation is that, although all three methods settle disputes outside the courtroom, arbitration decision is final and binding, while negotiation and mediation are nonbiding.

Since ADR methods settle disputes outside the courtroom, public courts may be asked to review the validity of ADR methods. However, they rarely overturn ADR decisions if the opposing parties have formed a valid contract to abide by them (Legal Information Institute, 2013). It is advisable that the preferred method of ADR and third-party representatives for each of the firms be predetermined and stated in the contract (Long, 1994).

2.6.12 Joint Problem Solving

Studying collaborative relationships in the facility services context, Lehtonen (2006) suggested that the success of a contractual relationship is naturally related to the service provider's ability to meet performance expectations. Expectations concerning the level of service should be translated into formal requirements through service-level agreements. If problems appear, it is important to react to them immediately to prevent the accumulation of problems and to keep up with the development of the relationship and the service. When conflicts arise, the manner in which the parties solve them is important. The impact on the relationship of the chosen type of conflict resolution can be either productive or destructive (Mohr and Spekman, 1994; Pondy, 1967). It is important that the parties not blame each other but work together to find a mutually-satisfactory solution to the problem. Doing so could enhance the perceived success of the relationship. Nevertheless, if failures are caused by the LSP or its subcontractors, the LSP themselves should handle these failures so that the customer does not have to put effort into a solution.

2.6.13 Conflict

Following the principal-agent theory, conflict can be defined as "a process in which one party perceives that its interests are being opposed or negatively affected by the other party" (Wall and Callister, 1995: 517). Conflict exists for many reasons: competition for resources, coordination of systems, distribution of work, and involvement in decision-making. Organizational conflict may be categorized into four types: interpersonal (e.g., between co-workers or superiors and subordinates), bargaining and negotiation (e.g., between labor and management), intergroup (e.g., between departments), and interorganizational (e.g., between companies) (Putnam and Poole, 1987). This study focused on interpersonal (e.g., disputes between customer employees and LSP employees) and interorganizational conflicts (e.g., disputes between a customer firm and its LSP). Conflict may also be viewed as an episodic, singular occurrence, or as a cumulative experience. Given the long-term nature of contract logistics, this study views conflict as the cumulative perception experienced over multiple episodes (i.e., service transactions) between a customer and its LSP.

While conflict exists in many business relationships, it is believed to be especially important in the logistics contracting context in which performance aspects of the service delivery are often in competition with cost objectives. Given the substantial effect that outsourced logistics has on overall logistics performance and firm performance (Langley and Capgemini U.S. LLC., 2006; Stank et al., 2003), conflict needs to be managed effectively. This is particularly important when a customer relies on extensive service delivery from an LSP and, in turn, establishes a high level of dependence on the LSP and its services. Dependence heightens not only the risks associated with the relationship, but also the potential for conflict to occur (Cahill, Goldsby and Knemeyer, 2010). In the absence of effective conflict management, conflict can stress the relationship between LSPs and customers, and threaten the level of service the customers (user-customers) subsequently offer to their customers (end-customers) (Murphy and Poist, 2000).

Conflict in a business relationship may be "functional" as well as "dysfunctional" (Pondy, 1967). Combined with a good relationship, a high level of conflict (i.e., frequent conflict) can translate to functional conflict. This type of conflict does not degrade cooperation or reduce effectiveness, but it can actually be

used as an interactive tool for improvement and innovation (Gadde and Hakansson, 1993). On the other hand, a high level of conflict coupled with an unsatisfying relationship can translate to dysfunctional conflict. LSPs should aim to avoid this type of destructive conflict or reduce its consequences. Too little coherence can develop into destructive conflict and ultimately a diffusion of focus from the relationship (Hakansson and Montgomery, 2003).

2.7 Logistics Contracting Effectiveness Conceptual Framework

Logistics contracting effectiveness refers to an LSP's performance on a contract and the various outcomes customer managers use to measure it. The relevant literature reviewed in the preceding section suggests that there are 13 variables that might impact the level of logistics contracting effectiveness (Table 2.7).

Table 2.7 Variables Contributing to Logistics Contracting Effectiveness

Variable	Impact	Theory / Discipline	Mentioned in
Top management championship	Positive (+)	Logistics management, change management	Chatterjee et al. (2002); Chen and Popovich (2003); Chen et al. (2010); Davenport et al. (1998); Razzaque and Sheng (1998); Sanberg (2007).
Contract specificity	Positive (+)	Interorganizational relations, contract management.	Andersson and Norrman (2004); Blomqvist et al. (2005); Kern and Willcocks (2000); Luo (2002); Maloni and Carter (2006); Olander and Norrman (2012); Platz and Temponi (2007); Poppo and Zenger (2002); Web and Laborde (2005).
Performance monitoring	Positive (+)	Quality and reliability management, contract management	Bhatnagar et al. (1999); Dean and Kiu (2002); Platz and Temponi (2007); Van Hoek (2001); Van Laahoven et al. (2000).
Incentives and penalties	Positive (+)	Incentive theory of motivation, contract management	Cooper (2003); House and Stank (2001); Platz and Temponi (2007).
Proactive improvement	Positive (+)	Social exchange theory	Beverland et al. (2007); Deepen et al. (2008); Flint et al. (2005); Lambe et al. (2001); Lemon et al. (2002); Thibaut and Kelley (1959); Wallenburg et al. (2010); Wallenburg and Lukassen (2011).
Contract-specific investment	Positive (+)	Transaction cost economics, relationship marketing	Hertz and Alfredsson (2003); Large et al. (2011); Maloni and Carter (2006); Skjoett-Larsen (2000).

Table 2.7 (Continued)

Variable	Impact	Theory / Discipline	Mentioned in
Continuity	Positive (+)	Principal-agent theory, transaction cost economics	Artz (1999); Eisenhardt (1989); Hofer et al. (2009); Holcomb and Hitt (2007); Lai et al. (2005); Langfield and Greenwood (1998).
Trust	Positive (+)	Contingency theory, interorganizational relations	Andaleeb (1996); Jeffries and Reed (2000); Knemeyer and Murphy (2004); Komiak and Benbasat (2004); Lawther (2003); Sahay (2003); Young-Ybarra and Wiersema (1999); Zaheer et al. (1998).
Information sharing	Positive (+)	Principal-agent theory, relational exchange theory	Artz and Brush (2000); Kuo et al. (2005); Mohr and Spekman (1996); Tian et al. (2008).
Risk aversion	Positive (+)	Principal-agent theory	Starbird (1994).
Alternative dispute resolution	Positive (+)	Contract management	Lawther (2003); Long (1994); Platz and Temponi (2007); Sclar (2000).
Joint problem solving	Positive (+)	Principal-agent theory, interorganizational relations	Lehtonen (2006); Mohr and Spekman (1994); Pondy (1967)
Conflict	Negative (−)	Principal-agent theory	Cahill et al. (2010); Murphy and Poist (2000).

From Table 2.7, the researcher developed the following conceptual framework of logistics contracting effectiveness (Figure 2.1):

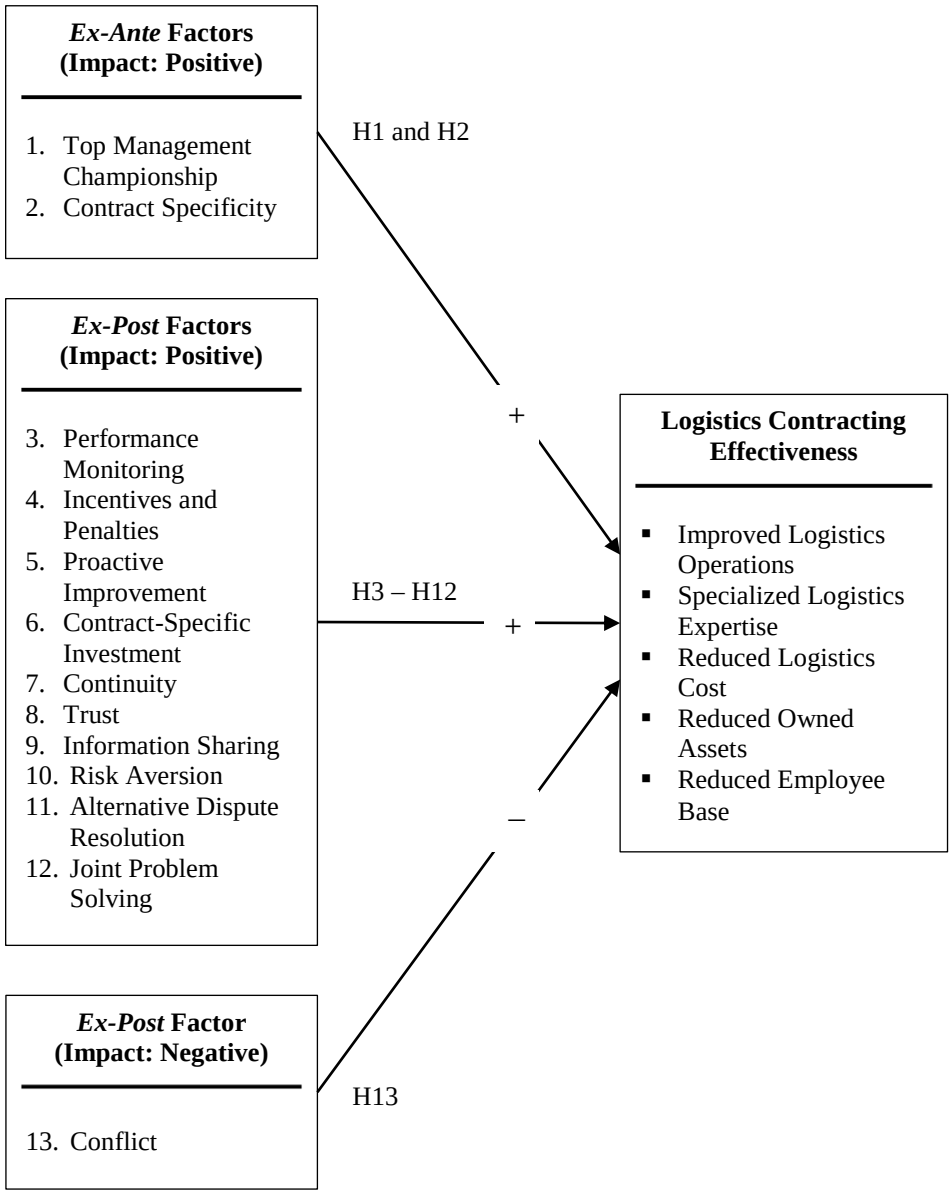

Figure 2.1 Conceptualization of Logistics Contracting Effectiveness

Based upon the conceptual framework, the researcher proposed the following hypotheses:

H1: The level of top management championship has a positive impact on logistics contracting effectiveness.

H2: The level of contract specificity has a positive impact on logistics contracting effectiveness.

H3: The intensity of performance monitoring has a positive impact on logistics contracting effectiveness.

H4: The use of incentives and penalties has a positive impact on logistics contracting effectiveness.

H5: The level of the LSP's proactive improvement has a positive impact on logistics contracting effectiveness.

H6: The level of contract-specific investment has a positive impact on logistics contracting effectiveness.

H7: The level of continuity expressed by the customer has a positive impact on logistics contracting effectiveness.

H8: The level of trust between the customer and the LSP has a positive impact on logistics contracting effectiveness.

H9: The level of information sharing between the customer and the LSP has a positive impact on logistics contracting effectiveness.

H10: The level of the LSP's risk aversion has a positive impact on logistics contracting effectiveness.

H11: The use of alternative dispute resolution has a positive impact on logistics contracting effectiveness.

H12: The extent of joint problem solving has a positive impact on logistics contracting effectiveness.

H13: The frequency of conflict between the customer and the LSP has a negative impact on logistics contracting effectiveness.

These hypotheses will be tested using stepwise regression analysis (discussed in detail in the next chapter). The regression equation can be written as follows:

$$\begin{aligned} \text{LogContEff} = b_0 &+ b_1\text{TopChamp} + b_2\text{ContSpec} + b_3\text{PerMon} + b_4\text{IncPen} \\ &+ b_5\text{ProImp} + b_6\text{ContSpecInv} + b_7\text{Contin} + b_8\text{Trust} \\ &+ b_9\text{InfoShare} + b_{10}\text{Risk} + b_{11}\text{ADR} + b_{12}\text{JointProb} \\ &- b_{13}\text{Conflict} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(1)} \end{aligned}$$

where

LogContEff = logistics contracting effectiveness

TopChamp = top management championship

ContSpec = contract specificity

PerMon = performance monitoring

IncPen = incentives and penalties

ProImp = proactive improvement

ContSpecInv = contract-specific investment

Contin = continuity

Trust = trust

InfoShare = information sharing

Risk = risk aversion

ADR = alternative dispute resolution

JointProb = joint problem solving

Conflict = conflict

2.8 Summary

LSPs can be classified based on their asset ownership into three types: asset-based LSPs, non-asset-based LSPs, and hybrid LSPs (Africk and Calkins, 1994). Based on the degree of their involvement in the customer's logistics systems, LSPs can also be classified into: solution providers, distribution providers, and transportation providers (Berglund, 2000). Some of the important criteria commonly used in the evaluation of LSPs include: capabilities, experience, service quality, reliability, reputation, and price.

Logistics development can be classified into four stages: physical distribution, internal integration, external integration, and global logistics. Like most developing countries, Thailand is still at the lowest level of logistics development. The Thai government has encouraged Thai companies, particularly SMEs, to invest in more advanced logistics management, i.e., internal integration or external integration (Kamonchanok Suthiwartnarueput, 2007).

Logistics contracting effectiveness, the dependent variable, is defined as an LSP's performance on a contract and the various outcomes customer managers use to measure it. This variable is measured with five items borrowed from Knemeyer and Murphy's (2004) third-party logistics performance scale: (1) this contract has improved our logistics operations performance; (2) this contract has provided us with more specialized logistics expertise; (3) this contract has reduced our logistics costs; (4) this contract has reduced our level of owned assets; and (5) this contract has reduced our employee base.

Also, through the literature review, this study identified 13 factors that may influence the level of logistics contracting effectiveness, namely: (1) top management championship, (2) contract specificity, (3) performance monitoring, (4) incentives and penalties, (5) proactive improvement, (6), contract-specific investment, (7) continuity, (8) trust, (9) information sharing, (10) risk aversion, (11) alternative dispute resolution, (12) joint problem solving, and (13) conflict. Based upon these 13 variables and the dependent variable, a logistics contracting effectiveness conceptual framework was developed (Figure 2.1) and 13 hypotheses were proposed.

CHAPTER 3

RESEARCH METHODS

3.1 Introduction

This chapter gives a detailed description of the research methods employed in the current study and includes: the research design, unit of analysis, population, sample size and sampling methods, operational definition of the variables, measurement, data collection, data analysis, pretest results, ethical considerations, and summary.

3.2 Research Design

This study adopted a mixed methods research—an approach combining both quantitative and qualitative procedures in a single study to collect and analyze data to answer a research problem (Creswell, 2012). The quantitative phase utilized a correlational design, collecting cross-sectional data to assess the association between the independent variables and the dependent variable: logistics contracting effectiveness. The utilization of the survey instrument was necessary because all of the variables in the model were perceptual measures of behavior that could not be captured by secondary/archival data. The qualitative phase involved a series of in-depth interview with six logistics executives to elaborate and illustrate the quantitative results.

3.3 Unit of Analysis

A unit of analysis is the most basic element of a scientific research project. That is, it is the subject, the "what" or "whom," that the study is about and from which the

analyst may make generalizations. It is an important element in a research design and later in the data analysis. There are several levels of units of analysis—individual, groups, organizations, social interactions, social artifacts, etc. (Babbie, 2013). The choice of level is crucial for explaining logistics contracting effectiveness. As most of the factors that were hypothesized to influence the level of logistics contracting effectiveness were at the contract level of analysis, the unit of analysis for this study was the individual contractual relationship between the customer and the LSP.

3.4 Population, Sample Size, and Sampling Methods

3.4.1 Population

In order to the identify factors that lead to logistics contracting effectiveness, this study obtained data from logistics people working in customer firms in the electronics manufacturing industry in Thailand. This industry was chosen because it has the largest group of customers of logistics services, providing a large enough population from which a sufficient sample could be drawn. It is also one of Thailand's most prominent industries within the manufacturing sector and was worth approximately US$ 56 billion and accounted for nearly US$ 31 billion in export revenues in 2011.

The main electronic exports are hard disk drives (HDD) and integrated circuits (IC), which account for about 34 percent and 26 percent of total electronic exports, respectively. The primary markets for these exports are China (18%), Hong Kong (17%), ASEAN (16%), the EU (14%) and the US (14%). In 2006, Thailand overtook Singapore and became the world's number 1 HDD and components manufacturing base, commanding around a 40 percent to 45 percent share of the worldwide HDD production. It is also a predominant producer of ICs and semiconductors, having one of the largest assembly bases for these products in Southeast Asia (Thailand Board of Investment, 2012).

The selection of respondents for both the quantitative and qualitative phases was based mainly on the customer profiles available from four large LSPs operating in Thailand. The profiles contain over 1,200 entries drawn from the Thailand Exporters Directory issued by the Department of Export Promotion, the Ministry of Commerce, and factory listings of the Industrial Estate Authority of Thailand. As these entries

were originally drawn from the two largest listings issued by the authorities covering a wide range (e.g., by products and size) of electronics manufacturing firms, the target respondents were expected to be representative of the population. By using these profiles, the accessibility to the target respondents was ensured because of the already established contracts.

3.4.2 Sample Size

Sample size affects the generalizability of the results to the population. In determining an appropriate sample size, three criteria need to be considered: the level of precision, the confidence (or risk) level, and degree of variability (Miaoulis and Michener, 1976). Yamane's (1967) simplified formula for calculating sample size assumes a 95 percent confidence level and degree of variability of .5. Based on this formula, at the level of precision ±5 percent, for an accessible population of 1,200, the appropriate sample size would be 300.

$$n = \frac{N}{1 + N(\mathrm{e})^2} = \frac{1{,}200}{1 + 1{,}200(0.05)^2} = 300$$

This sample size satisfied the case per variable ratio 20:1 required for the primary statistical technique used in this study—stepwise regression analysis (Coakes and Steed, 2003). Having 13 independent variables, it required a minimum of 260 observations. According to Hair, Black, Babin, Anderson and Tatham (2009), when a desired level of between 15 and 20 observations for each independent variable is reached, the result should be generalizable.

3.4.3 Sampling Methods

The stratified systematic sampling technique was used to select representative samples. First, the four LSPs participating in this study were asked to classify their current customers into two groups: contract mode customers and multi-client mode customers. Second, the LSPs drew an equal number of samples from each mode. In drawing the samples, the LSPs divided the total number of customers by the number of samples e.g., for LSP "A" there were 150 contract mode customers and 50 samples

to be selected. One hundred and fifty divided by 50 equals 3. LSP "A" randomly chose the first sample, and then selected the next 3rd number until it reached the required 50 samples. Figure 3.1 shows the steps discussed above.

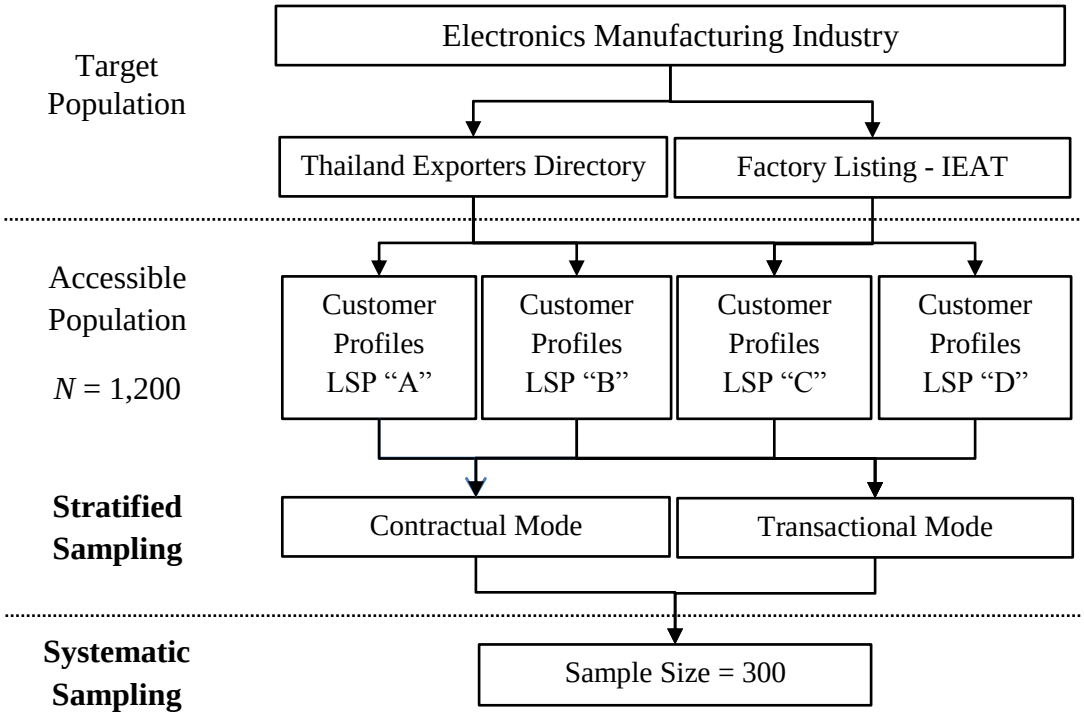

Figure 3.1 Sampling Methods Used in the Current Study

3.5 Operational Definition

An operational definition describes a variable in terms of how, specifically, it is to be measured. For quantitative research, the variables must be operationalized in order to obtain the data. Table 3.1 presents the operational definition of the variables used in this study.

Table 3.1 Operational Definition of the Variables

Variable	Operational Definition
Logistics contracting effectiveness	An LSP's performance on a contract and the various outcomes customer managers use to measure it. Five items were selected from Knemeyer and Murphy (2004) that reflect the four most frequently mentioned reasons for logistics contracting out—operations improvement (Lynch, 2004), cost reduction realized from expertise and economies of scales (Wilding and Juriado, 2004); asset reduction (Razzaque and Sheng, 1998) and headcount reduction (Bardi and Tracey, 1991)—to measure this construct.
Top management championship	The extent to which top management is involved in the logistics outsourcing project (Chen et al., 2010).
Contract specificity	The degree of specificity in the contractual requirements (Fernandez, 2005) measured in three aspects: performance, cost, and legal
Performance monitoring	The degree to which performance standards are used, intensity of performance is monitored, and the ease in accessing relevant quality data
Incentives and penalties	The extent to which a customer relies on incentives and penalties to sustain a high level of LSP performance
Proactive improvement	The degree to which an LSP, given that a potential innovation is beneficial to its customer, proactively enhances the service provided to the customer
Contract-specific investment	The extent to which an LSP invests in physical and human assets, procedures, and systems which are assigned for the purpose of the current contract only and would result in significant excess capacity if the contract terminated prematurely (Williamson, 1984)

Table 3.1 (Continued)

Variable	Operational Definition
Continuity	The degree to which an LSP anticipates that its relationship with a customer will continue into the future with an indeterminate endpoint (Gardner, Cooper and Noordewier, 1994; Heide and Miner, 1992)
Trust	The degree to which a customer is confident in and is willing to rely on an LSP, and its belief that the LSP makes good faith agreements
Information sharing	The extent to which critical, often proprietary, information is communicated between a customer and its LSP (Hofer et al., 2009)
Risk aversion	The degree to which a customer perceives that an LSP is willing to invest in quality equipment, quality management practices, and apply strict quality control procedures to avoid quality-related problems
Alternative dispute resolution	The extent to which a customer relies on alternative means (e.g., negotiation, mediation and arbitration) for solving disputes (Fernandez, 2005)
Joint problem solving	The extent to which a customer works together with its LSP to identify and solve problems (Fernandez, 2005)
Conflict	The frequency of interorganizational conflict measured at organizational, employee, and overall levels (Cahill et al., 2010)

3.6 Measurement

3.6.1 Scale Construction

The 13 variables discussed in the preceding section are all latent variables. This type of variable cannot be measured directly but indirectly by using a certain set of questions. Most of the questions used in this study were taken from related literature. Originally they had different rating scales (e.g., five or seven points). The researcher

felt that such differences could be confusing for respondents and may lead to less accurate data. Therefore, for consistency and clarity of presentation, it was decided to adopt a single rating scale.

Researchers seem to have their own favorite rating scale, ranging from 2 to 11 points or even more (101 points). Alwin (1997) suggested that one way to evaluate the effectiveness of various forms of survey questions is in terms of their reliability and validity of measurement. He conducted a study comparing two scale lengths, 7 and 11 categories, and found that the 11-point scales produced measures that were both more reliable and more valid. Another study by Preston and Colman (2000: 11) revealed that longer scales allow respondents to express their feelings more adequately. Shorter scales, having fewer response categories, are easier to analyze. However, the scores generated have comparatively little variance, which limits the magnitude of the correlations with other scales. As this study adopted a correlational design, scale sensitivity was important. Considering the above, the researcher decided to use 11-point (0 to 10) scales throughout the questionnaire except for the descriptive questions. Tables 3.2 to 3.15 present the variables, the questions used to measure each variable, and the sources from which the question were derived.

Table 3.2 Logistics Contracting Effectiveness Measures

Please indicate the level of your agreement with the following statements (0 = disagree; 10 = strongly agree):
1. This contract has improved our logistics operations performance.
2. This contract has provided us with more specialized logistics expertise.
3. This contract has reduced our logistics costs.
4. This contract has reduced our level of owned assets.
5. This contract has reduced our employee base.

Table 3.3 Top Management Championship Measures

Please indicate the extent to which your top management is involved in the logistics outsourcing project (0 = not at all; 10 = a great deal):
1. The effectiveness of top management in communicating their support for this contract 2. The participation of top management in formulating a strategy for logistics outsourcing 3. The participation of top management in establishing goals and standards to measure the logistics outsourcing 4. The adequacy of resources provided by top management to support this contract

Table 3.4 Contract Specificity Measures

Terms in contracts are sometimes very detailed and specific and at other times left open. For the current logistics contract, please indicate how specific the following contractual features are (0 = very open; 10 = very detailed and specific):
1. Scope of work, service levels and quality 2. Costing and pricing 3. Liability, method of dispute resolution

Table 3.5 Performance Monitoring Measures

Please indicate the level of your agreement with the following statements (0 = disagree; 10 = strongly agree):
1. We fully disclose our expectations for quality and service levels, and the standards for measuring performance. 2. We regularly measure our LSP's performance using the agreed-upon performance standards. 3. We have convenient access to information about our LSP's internal process quality data, quality control procedures, and quality improvement programs and the results of these programs.

Table 3.6 Incentives and Penalties Measures

Please indicate the extent to which you rely on the following incentives/penalties to sustain a high level of LSP performance (0 = not at all; 10 = a great deal):
Incentives: 1. Gain sharing (or the sharing of profits or savings) 2. Contract renewal based on good performance 3. Bonus for reaching certain goals 4. Others (please specify) …….. Penalties 1. Consequential damages 2. Transportation (or warehousing) at LSP's cost 3. Contract termination 4. Others (please specify) ……..

Table 3.7 Proactive Improvement Measures

Please indicate the level of your agreement with the following statements (0 = disagree; 10 = strongly agree):
1. Our LSP puts strong effort into continuously making logistics processes more effective. 2. When the situation changes, our LSP by itself modifies the processes, if this is useful and necessary. 3. Our LSP shows initiative by approaching us with suggestions for improvement of our logistics activities, even those outside its direct responsibility.

Table 3.8 Contract-Specific Investment Measures

Please indicate the level of your agreement with the following statements (0 = disagree; 10 = strongly agree):
1. This contract requires the LSP to make large specialized investments in order to perform the work. 2. This contract requires the LSP to adapt its procedures and/or systems to meet our specific requirements. 3. Of the investments made by the LSP, only a small portion can be easily transferred to another job/contract. 4. This contract requires the LSP to provide a dedicated staff with unique knowledge, skills, and experience, or be trained specifically to meet our requirements.

Table 3.9 Continuity Measures

Please indicate the level of your agreement with the following statements (0 = disagree; 10 = strongly agree):
1. Our LSP knows that we will continue using them after the existing contract expires. 2. Our LSP knows that we will outsource more activities to them. 3. Our LSP knows that we are willing to invest in our relationship with them.

Table 3.10 Trust Measures

Please indicate the level of your agreement with the following statements (0 = disagree; 10 = strongly agree):
1. We feel confident about the knowledge, skills, and expertise of our LSP in handling our logistics activities. 2. We generally trust our LSP to stay within the terms of the contract. 3. Whenever the LSP gives us advice on our logistics operations, we know that it is sharing its best judgment.

Table 3.11 Information Sharing Measures

Please indicate the level of your agreement with the following statements (0 = disagree; 10 = strongly agree):
1. Our LSP provides us with their operational information on a regular basis. 2. Our LSP provides us with summary service and usage reports on a monthly or quarterly basis. 3. We regularly provide our LSP our operational information to help them plan for our needs. 4. We keep our LSP informed in advance of impending changes in our service requirements. 5. In this relationship, it is expected that any information which might help the other party will be provided.

Table 3.12 Risk Aversion Measures

Please indicate the level of your agreement with the following statements (0 = disagree; 10 = strongly agree):
1. Our LSP uses higher-quality equipment even though it is more expensive. 2. Our LSP invests in quality management practices to improve its processes and service quality. 3. Our LSP applies strict quality control procedures to ensure that it can deliver better-quality services.

Table 3.13 Alternative Dispute Resolution Measures

Please indicate the extent to which you rely on each of the following means for resolving contract disputes (0 = not at all; 10 = a great deal):
1. Negotiation 2. Mediation 3. Arbitration 4. Litigation (reverse)

Table 3.14 Joint Problem Solving Measures

Please indicate the level of your agreement with the following statements (0 = disagree; 10 = strongly agree):
1. We always work together with our LSP to identify problems. 2. Whenever something goes wrong, we always work together with our LSP to solve the problem.

Table 3.15 Conflict Measures

Please indicate your level of agreement with the following statements (0 = disagree; 10 = strongly agree):
1. In our relationship with this LSP, we frequently run into conflicts on the organizational level. 2. On the operational level, conflicts between our employees and those of the LSP frequently occur. 3. On the whole, our relationship with this LSP is characterized by frequent conflicts.

3.6.2 Pretesting the Instrument

Pretesting is a necessary step in survey research. It is a try-out of the questionnaire to detect any problem with the questionnaire design that might lead to ambiguity of words, misinterpretation of questions, inability to answer a question, sensitive questions, and many other problems associated with the questionnaire as well as the process of administering the survey. The initial questionnaire consisted of 59 questions designed to obtain information pertaining to the respondents, the outcomes of the logistics contract, and the factors affecting logistics contracting effectiveness. This questionnaire was pretested with 28 respondents drawn from the target population the same way as the final questionnaire. The researcher administered the questionnaire face-to-face, discussed the questions with the respondents, and observed any confusion or hesitation on their part.

It took the respondents more than 40 minutes to go through all 59 questions. Eight respondents were not able to answer questions pertaining to the *ex-ante* factors (top management championship and contract specificity) as they joined the firms after the outsourcing projects had already been implemented. Six were partially involved in the contract preparation process (writing up the scope of work) and were not able to answer questions about costing and pricing, liability, or method of dispute resolution. Fourteen said that they treated the quotations (which included terms and conditions) submitted by their LSPs as contracts and thus no formal contracts were signed.

While studies conducted in advanced markets suggest that logistics contracts usually include incentives and penalties (Cooper, 2003; House and Stank, 2001), this does not seem to be the case for Thailand. The respondents indicated that they would not provide financial incentives, particularly gain sharing, as this would involve disclosing certain sensitive financial data. For contract renewal/termination based on performance, this is generally assumed but not explicitly stated in the contract. With respect to "alternative dispute resolution," all of the respondents agreed that negotiation was the most commonly used. Only two had actually encountered such a situation—negotiating with their LSPs requesting settlements higher than the maximum liability stated in the contracts for their highly-priced electronics shipments that were damaged during transportation. However, the two respondents were not directly involved in the negotiation process.

Noting that the inability to answer a question could lead to a nonresponse, the researcher decided to remove the two *ex-ante* factors (top management championship and contract specificity) and two *ex-post* factors (incentives and penalties, and means for resolving contract disputes). While discussing the factor "alternative dispute resolution" with the respondents, a new factor, "service recovery," emerged. The researcher subsequently reviewed the literature pertaining to this factor and added two questions (see Additional Variable – Service Recovery, in the following section 3.6.3). The final questionnaire then consisted of 40 questions (see Appendix I).

3.6.3 Validity and Reliability Tests

Factor analysis (principal component with oblimin rotation) and a reliability test (Cronbach's alpha) were conducted to the assess construct validity and reliability of

the remaining factors. Validity is the extent to which a measure or set of measures correctly represents the construct (Hair et al., 2009). Although the items for each factor were tested in prior empirical studies, researchers should not take it for granted that these items will "behave" the same way in a new study. Reliability, the extent to which a measure or set of measures is consistent in what it is intended to measure, is a separate but interrelated condition that needs to be checked. Reliability differs from validity in that it relates not to what should be measured, but instead to how it is measured (Hair et al., 2009).

Table 3.16 shows that all items were correctly loaded onto the factor they were intended to measure, with loadings exceeding 0.55. This provided evidence for construct validity.

Table 3.16 Factors Affecting Logistics Contracting Effectiveness

Item	Factor							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Continuity								
Continue using the LSP	.913							
Invest in relationship	.894							
Outsource more	.768							
Contract-Specific Investment								
LSP dedicated team	.737							
LSP adapts procedures/ system	.632					-.413		
LSP makes large investment	.603			-.521		-.463		
Small portion of investment can be transferred	.583				-.485			
Information Sharing								
Operational information – Customer		.987						
Operational information – LSP		.947						
Summary report – LSP		.924						
Customer informs LSP in advance		.914						
Each party provides necessary information		.795						

Table 3.16 (Continued)

Item	Factor							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Conflict								
Organizational level conflicts			.943					
Frequent conflicts on the whole			.933					
Operational level conflicts			.873					
Trust								
Trust LSP to stay within terms				-.914				
Confident about LSP	.438			-.830				
LSP shares best judgment				-.786				
Risk Aversion								
LSP uses higher quality equipment					-.874			
LSP invests in quality management					-.804			
LSP applies strict quality control					-.732			
Proactive Improvement								
LSP makes process more effective						-.932		
LSP modifies process						-.930		
LSP suggests for improvement			.407			-.767		
Performance Monitoring								
Customer discloses expectations							.793	
Access to LSP quality information							.789	
Customer regularly measures LSP Performance				.455			.737	
Joint Problem Solving								
Customer works with LSP to identify problem								-.894
Customer works with LSP to solve problem								-.848
Reliability (Cronbach's alpha)	.878	.949	.913	.847	.764	.876	.675	N/A

Continuity items and contract-specific investment items loaded onto one factor. This was not unexpected. From the customers' point of view, indicating their intention to continue using their LSPs, they could ask them to depreciate the assets over a longer period than the initial contract, thereby lowering the depreciation costs per year. On the other hand, from the LSPs' point of view, contract-specific assets cannot be easily redeployed and will become sunk costs unless the business is continued, and LSPs will try to maintain a partnership with their customers as long as possible. Should the actual dataset also produce the same result, this combined factor may be labeled as "long-term orientation."

Some items coloaded onto two or more factors. This was an indication of the intercorrelation of the items/factors. For example, for the item "customer regularly measures LSP performance," while strongly loaded onto factor "performance monitoring" (0.737), it also moderately loaded onto factor "trust" (0.455) but moved in an opposite direction. This can be interpreted as customers having lower perceived trust tend to measure their LSPs' performance more intensely.

For reliability, the alpha coefficients for all factors, except performance monitoring, were above a 0.7 acceptable level, suggesting that the items had relatively high internal consistency. The researcher, therefore, concluded that the scales were valid and reliable, suitable for use in the final questionnaire.

As this dissertation was written in English and the literature reviewed was all in English, the initial questionnaire was developed in English. For a study to be conducted in Thailand, this raised two questions: should the questionnaire be translated into and offered in Thai; and can translation accuracy be ensured? The pretest respondents, being senior logistics executives working in large international electronics manufacturing firms, were good users of English. They indicated that they had no difficulty answering a questionnaire in English. Considering this, and to avoid translation errors that may have occurred, the researcher decided that the final questionnaire would be offered in English.

3.6.4 Additional Variable – Service Recovery

Service operations are complex, human-based processes involving the concurrent provision of many customer experiences and outcomes, and usually both

providers and customers are involved in the service production process (Johnston and Clark, 2005). As a result, in the delivery of service, failures are unavoidable; this in turn requires the need for service recovery (Hart, Heskett and Sasser, 1990). A service failure is a situation in which the expected outcomes of a service process or the process itself cannot be accomplished by the service provider or cannot meet the customer's prior expectations before taking the service from that provider (Spreng, Harrell and Mackoy, 1995). Service recovery is the activities and responses the service provider performs to correct, amend, and restore the loss experienced by the customer due to the service failure. These should be done as quickly as possible, either during or shortly after the service encounter (Grönroos, 2007).

Effective service recovery can help regain customer confidence and maintain customer satisfaction and loyalty (DeWitt, Nguyen and Marshall, 2008; McCollough, Berry and Yadav, 2000). Ineffective service recovery, on the other hand, could further increase customer dissatisfaction, which may result in lost customers and negative word-of-mouth (Berry and Parasuraman, 1991). Grönroos (2007) supported the above, asserting that service recovery can be an effective means of turning around a potentially dangerous situation as far as the perception of service quality is concerned, and a powerful way of enhancing good perceived quality. Unfortunately, many providers fail to understand the benefits of service recovery and only a few of them have well-established service recovery policies (Bitner, Booms and Mohr, 1994; Bowen and Lawler, 1992).

Based on the theory in social and organizational psychology, service research has taken justice theory as the dominant theoretical framework for service recovery (Tax and Brown, 2000; Wirtz and Mattila, 2004). This concept involves three different dimensions: distributive, procedural, and interpersonal. Distributive justice refers to the allocation of benefits and costs between the parties in a transaction. Maxham and Netemeyer (2002: 240) defined distributive justice as "the extent to which customers feel they have been treated fairly with respect to the final recovery outcome." Procedural justice relates to company complaint handling policies and procedures. One major determinant of customers' perceptions of procedural justice is the speed by which service recovery is performed (Blodgett, Hill and Tax, 1997; Tax, Brown and Chandrashekaran, 1998). The last dimension, interpersonal justice,

involves the manner in which employees treat and communicate with a consumer during the service recovery process. Maxham and Netemeyer (2002: 241) defined interactional justice as "the extent to which customers feel they have been treated fairly regarding their personal interaction with service providers throughout the recovery process."

Johnston and Michel (2008), based upon a review of the literature, suggested that a company's service recovery procedures lead to three distinct outcomes. The first outcome concerns recovering the customer — how to satisfy the customer following a failure, the impact of recovery on loyalty, the impact of recovery on delight, and the impact of recovery on profit. The second outcome is process recovery. This outcome deals with several process improvement issues following service failures which include: failure types and impact; profiling service failures; the links between operational factors and customer outcomes and financial outcomes; the impact of system reliability on service recovery; an operational framework for service recovery; and process improvement. The third outcome is employee recovery. Provider employees must be proactive in solving problems, even though in many cases, they find that the customer demands and established corporate policies are incompatible.

In this study, service recovery was operationalized as "the extent to which the customer realizes that, whenever something goes wrong or something unpredictable unexpectedly happens, the LSP contract employees are prepared and have the skill to handle the problem." This factor was measured with a 2-item, 11-point scale as shown in Table 3.17.

Table 3.17 Service Recovery Measures

Please indicate the level of your agreement with the following statements (0 = disagree; 10 = strongly agree):
1. If anything goes wrong, or something unexpected happens, LSP contact employees are prepared to make a special effort to handle the problem
2. LSP contact employees are skilled to handle unexpected problems

Thirteen hypotheses were proposed in chapter two. Based upon the above discussion of service recovery, the researcher added the 14th hypothesis:

H14: The level of service recovery effort has a positive impact on logistics contracting effectiveness.

3.7 Data Collection

3.7.1 Quantitative Data Collection

This study was designed to collect data from current contract logistics customers. A self-completion questionnaire survey was used because it is convenient, efficient, and inexpensive to administer. The researcher sought assistance from the management and sales representatives of the four LSPs to distribute the questionnaire. A short training session was held to train the sales representatives to make sure that they fully understood the questionnaire and were able to answer any questions the respondents might have.

The questionnaire was delivered personally on sales visits, or emailed or faxed to the respondents with a telephone call explaining the objectives and benefits of the study, and urging them to complete the questionnaire. Since it required only about twenty minutes for the respondents to complete the questionnaire, the sales representatives were asked to collect them the same day they were delivered. For those respondents that were unable to answer the same day, a follow-up call was made a week later. Using this method, the sales representatives were able to motivate the respondents to cooperate, answer the respondents' questions about the survey, and monitor the respondents' compliance with the instructions. This proved to be an effective approach, yielding a very high response rate: 84 percent (362 questionnaires distributed and 304 complete, usable questionnaires returned).

3.7.2 Qualitative Data Collection

The purpose of the qualitative phase was to obtain supporting evidence and contextual explanations for the quantitative results. Data were gathered through a series of in-depth interviews with logistics executives from one large LSP, two large,

two medium, and one small electronics manufacturing firms (referred as LSP1, L1, L2, M1, M2 and S1 respectively in chapter five for anonymity). These six respondents were appropriate for this study because of their logistics and experiences in operating/using LSPs. They were first- or second-line managers that were directly involved with the daily operations of their LSPs.

Due to the busy schedule and diverse locations of the target respondents, it was very difficult to organize focus groups. Individual interviews at the respondents' workplace were conducted instead. Two broad types of threats to validity are often raised in relation to qualitative research: bias and reactivity. Bias refers to a researcher, based on his/her theory, values, or preconceptions, that phrases a question in such a way that it encourages respondents to answer in a particular direction. Reactivity is the effect of the researcher on the respondents, causing them to behave differently from how they would normally (Babbie, 2013; Maxwell, 2002). For the current study, bias was avoided through the use of nondirective questions and the transcripts and interpretations were verified by the respondents for interpretive validity. Reactivity was avoided by interviewing the respondents at their workplace. This helped to ensure that the researcher was less of an influence on the respondents than was the setting itself (Becker, 1970).

3.8 Data Analysis

Quantitative data analysis was undertaken in two stages: descriptive analysis and inferential analysis.

3.8.1 Descriptive Analysis

The descriptive statistics served two purposes: the first was to explore the characteristics of the data—mean, standard deviation, skewness, and kurtosis were examined to detect any non-normality. The second purpose was to describe the respondents: firm size, number of LSP using, and years of using logistics services.

3.8.2 Inferential Analysis

Stepwise regression analysis was the primary statistical technique used in this study to determine the correlations between the predictor variables and logistics contracting effectiveness and to assess the strength of each predictor variable. This technique was chosen because it provides all of the predictors in the equation an equal chance to be considered and gradually eliminates the poor performing ones one by one.

Since all of the variables, including the dependent variable were latent variables, consisting of two or more measurement items, factor analysis was performed to confirm the validity of the constructs and to derive a factor score for each variable. Cronbach's alpha was used to test construct reliability.

There are a number of assumptions underpinning the use of regression: the ratio of cases to independent variables, multivariate outliers, multicollinearity and singularity, normality, linearity, homoscedasticity, and the independence of residuals (Coakes and Steed, 2003). The first assumption relates to sample size (see sections 3.4.2 and 4.3.1). The remaining assumptions were tested before running the regression analysis (Section 4.2).

Qualitative data were collected using in-depth interviews at the respondents' work place. Each session lasted about one half to one hour. Due to the respondents' concern about being audio recorded, only written notes were used. The researcher transcribed the conversations about their experiences pertinent to the research questions immediately after each interview. Using only written notes, interviews could not be transcribed verbatim. Since only one person—the researcher—examined and classified the interview responses, the respondents were asked in the subsequent interview to check the statements and interpretations. They agreed with most of the researcher's interpretations and provided clarifications and corrections. This approach ensures trustworthiness—that the transcripts and interpretations are accurate (Lincoln and Guba, 1985; Maxwell, 2002).

3.9 Ethical Considerations

This study did not ask any sensitive personal questions. Respondents were not asked to disclose their identity, the name of their company, or the names of their LSPs. Their participation was entirely voluntary and could be withdrawn at any time without having to provide a reason or justification and without prejudice. Filling in the questionnaire was treated according to the respondent's consent. For the personal interview, the researcher informed the respondents of the purpose of the study and asked for their verbal consent. Throughout the process, the researcher did not receive any unfavorable comments from the respondents concerning the conduct of this study.

3.10 Summary

This study adopted a mixed-methods research design, combining quantitative and qualitative approaches. The quantitative component was dominant, with the qualitative component supporting. The quantitative phase utilized a correlational design, collecting cross-sectional data to assess the association between the independent variables and the dependent variable, while the qualitative phase obtained information to elaborate and illustrate the quantitative findings. The unit of analysis was the individual contractual relationship between a customer and an LSP. The electronics manufacturing industry was chosen as the population of this study because it is the largest group of users of logistics services. Based upon the accessible population of 1,200, this study targeted at least 300 samples. The stratified systematic sampling technique was used to select the sample.

As was discussed in chapter two, through the literature review, the researcher identified 13 factors that may influence the level of logistics contracting effectiveness. However, the pretest respondents were unable to answer questions pertaining to two *ex-ante* factors (top management championship and contract specificity), and two *ex-post* factors (incentives and penalties, and alternative dispute resolution). Noting that the inability to answer a question could lead to a nonresponse, the researcher thus decided to remove these four factors from the final questionnaire. The respondents also suggested adding one variable—service recovery—in place of "alternative dispute

resolution." The researcher tested the scales using factor analysis and Cronbach's alpha and found them to be valid and reliable, suitable for use in the final questionnaire.

A total of 362 questionnaires were distributed and 304 complete, usable questionnaires were returned. This yielded an effective response rate of 84 percent. This study used stepwise regression analysis to determine the correlations between the predictor variables and logistics contracting effectiveness and to assess the strength of each predictor variable. This technique was chosen because it provides all of the predictors in the equation an equal chance to be considered and gradually eliminates the poor-performing ones one by one. Since all of the variables, including the dependent variable, were latent variables, consisting of two or more measurement items, factor analysis was performed to test the validity of the constructs and to derive the factor score for each variable. Cronbach's alpha was used to test construct reliability.

CHAPTER 4

RESEARCH FINDINGS

4.1 Introduction

This chapter consists of six sections, beginning with this brief introduction. Section two discusses the data examination and assumption testing. Section three, on the descriptive statistics, gives the reader a demographic profile of the respondents to the survey. Section four discusses the factor analysis—the factor extraction and rotation methods, assessment of the final factor solution, validity and reliability tests, and labeling and interpretation of the factors. Section five estimates and interprets the regression model. The last section provides a short summary of the chapter.

4.2 Data Examination

Data examination is the first step in the analytic process of exploring the characteristics of the data. It is a time-consuming but necessary step that is sometimes overlooked by researchers. Multivariate data analysis includes a group of powerful statistical techniques allowing researchers to analyze many variables simultaneously to identify their patterns and relationships. These techniques demand the researchers to ensure that the statistical and theoretical underpinnings on which they are based are supported (Hair et al., 2009). Factor analysis and stepwise regression, the two multivariate techniques used in this study, require a number of assumptions to be met: sample size, outliers, normality, linearity, multicollinearity, homoscedasticity, and independence of residuals (Coakes and Steed, 2003).

4.2.1 Sample Size

The dataset in the present study contained 304 cases. Factor analysis requires a minimum of five subjects per variable. A sample of 100 cases is acceptable, but

sample sizes of 200 or more are preferable. For stepwise regression, the minimum requirement is to have at least five times, and ideally twenty times more cases than independent variables (Coakes and Steed, 2003). The final questionnaire included one dependent and ten independent variables. Therefore, a sample size of 220 or more was required. Having 304 cases, this dataset well met the requirements of the two techniques.

4.2.2 Outliers

Outliers are cases that have extreme values substantially different from other cases. Extreme cases have considerable impact on both factor analysis and stepwise regression and should be deleted or modified to reduce their influence (Coakes and Steed, 2003). There are four types of outliers. The first type arises from a procedural error, such as a data entry error or a coding mistake. The second type is the observation that occurs due to an exceptional event, which then is an explanation for the peculiarity of the observation. Researchers must decide whether the exceptional event should be included in the sample, and if so, the observation should be retained in the analysis; if not, it should be removed. The third type of outlier comprises exceptional observation for which the researcher has no explanation. These are the outliers most likely to be deleted. However, researchers may decide to retain them should they feel that these observations represent a valid segment of the population. The final type of outlier contains observations that fall within the normal range of values when a variable is analyzed individually, but become unique when the variable is analyzed in combination with other variables. In these instances, researchers should retain the outlier unless they have specific evidence indicating that it does not represent a valid segment of the population (Hair et al., 2009).

Table 4.1 provides the descriptive statistics for both the dependent and independent variables. All of the variables contained 304 cases, equal the number of sample; hence there were no missing data. All of the cases were within the expected range of 0 to 10, and thus no out-of-range values were present. The minimum and maximum values were also within three standard deviations, and the standardized values (z scores) were less than the threshold of ±3. Therefore, no univariate outliers were observed in this data set.

Table 4.1 Assessing Univariate Outliers Using Z Scores

	Variable	Min	Max	Mean	Std. Dev.	*Z* Scores	
						Min	Max
V5	Improved logistics operations	4	9	6.76	1.449	-1.903	1.549
V6	Specialized logistics expertise	5	9	6.93	1.155	-1.669	1.794
V7	Reduced logistics cost	2	7	4.41	1.407	-1.716	1.838
V8	Reduced owned assets	1	7	3.67	1.678	-1.594	1.982
V9	Reduced employee base	1	7	3.92	1.642	-1.777	1.877
V10	Customer discloses expectations	4	8	5.92	1.123	-1.711	1.851
V11	Customer measures LSP's performance	1	8	4.50	1.829	-1.913	1.913
V12	Access to LSP's quality information	2	8	4.98	1.589	-1.874	1.903
V13	LSP makes processes more effective	1	8	4.6	1.88	-1.914	1.809
V14	LSP modifies processes	1	8	4.52	1.897	-1.858	1.833
V15	LSP suggests improvement	1	8	4.63	1.843	-1.970	1.828
V16	LSP uses higher-quality equipment	4	9	6.83	1.412	-2.005	1.535
V17	LSP invests in quality management practices	4	9	6.83	1.366	-2.072	1.589
V18	LSP applies strict quality control procedures	4	10	7.16	1.572	-2.009	1.808
V19	Customer will continue using the current LSP	2	9	5.73	1.828	-2.039	1.791
V20	Customer will outsource more activities	1	9	5.58	2.070	-2.211	1.654
V21	Customer is willing to invest in the relationship	0	9	4.58	2.219	-2.062	1.994
V22	Customer is confident about LSP's qualifications	2	8	5.28	1.642	-1.997	1.657
V23	LSP stays within terms	2	8	5.03	1.615	-1.875	1.839
V24	LSP shares best judgment	2	8	5.34	1.596	-2.089	1.669
V25	LSP provides operational information	3	9	5.93	1.527	-1.921	2.007
V26	LSP provides summary reports	0	5	2.73	1.457	-1.876	1.555
V27	Customer provides operational information	2	7	4.30	1.392	-1.649	1.942
V28	Customer informs in advance	3	9	5.93	1.649	-1.775	1.863
V29	Each party provides useful information	5	9	7.13	1.170	-1.822	1.597
V30	LSP makes a large investment	0	9	4.19	2.282	-1.835	2.109
V31	LSP adapts its procedures	0	9	4.44	2.350	-1.891	1.939
V32	Small portion of LSP's investment can be transferred	0	6	3.14	1.667	-1.882	1.717
V33	LSP provides a dedicated team	2	8	5.08	1.594	-1.931	1.832
V34	LSP makes special efforts to handle unexpected problems	4	8	5.90	1.128	-1.682	1.863
V35	LSP is skilled in handling unexpected problems	4	10	7.25	1.598	-2.037	1.719

Table 4.1 (Continued)

Variable	Min	Max	Mean	Std. Dev.	*Z* Scores	
					Min	Max
V36 Together identify problems	3	9	6.46	1.550	-2.235	1.637
V37 Together solve problems	4	8	6.13	1.120	-1.900	1.671
V38 Organizational conflict	1	6	3.38	1.407	-1.695	1.859
V39 Operational conflict	3	6	4.44	.869	-1.654	1.798
V40 Conflict, on the whole	2	7	4.41	1.385	-1.738	1.871

Multivariate outliers have considerable impact on the regression solution and should be deleted or modified to reduce their influence. These were checked using three statistical methods, namely: studentized deleted residual, Mahalanobis distance, and Cook's distance. Studentized deleted residuals were checked for significance using *t* table with an alpha of .001 (df = *N* – number of predictors – 2 = 296; critical *t* value = 3.300); Mahalanobis distances were checked for significance using chi-square table with an alpha of .001 (df = number of predictors = 6; chi-square value = 22.46); and Cook's distances were checked for significance if they exceed a value of 1. Studentized deleted residuals revealed one outlier with a value of 3.415, while for the Mahalanobis and Cook's distances, this case was not found to be an outlier (values 2.703 and .019 respectively) (Table 4.2). The researcher, therefore, concluded that outliers were not a problem for this model.

Table 4.2 Testing for Influential Outliers: Residuals Statistics

Measure	Minimum	Maximum	Mean	Std. Deviation	N
Studentized Deleted Residual	-2.906	3.415	.000	1.006	304
Mahalanobis Distance	.421	19.662	5.980	3.170	304
Cook's Distance	.000	.037	.003	.006	304

4.2.3 Normality

Normality refers to the shape of the data distribution for an individual metric variable and its correspondence with the normal distribution. Normality is a prerequisite for many multivariate techniques (Hair et al., 2009). It is, however, the most frequently encountered assumption violation (Seer, 1986). In reality, data rarely conform to a classic normal distribution. More often, distributions are skewed and display varying degrees of kurtosis (Coakes and Steed, 2003). Table 4.3 shows that the calculated *z* values for skewness and kurtosis were all within ±2.58. This indicated that the distribution of this data set was normal at the .01 probability level (Hair et al., 2009).

Table 4.3 Assessing Normality Using Skewness and Kurtosis

Variable	Skewness			Kurtosis		
	Statistic	Std. Error	*z*	Statistic	Std. Error	*z*
V5 Improved logistics operations	-.041	.140	-.29	-.659	.279	-2.37
V6 Specialized logistics expertise	.103	.140	.74	-.605	.279	-2.17
V7 Reduced logistics cost	-.042	.140	-.30	-.700	.279	-2.51
V8 Reduced owned assets	.321	.140	2.30	-.675	.279	-2.42
V9 Reduced employee base	.340	.140	2.43	-.708	.279	-2.54
V10 Customer discloses expectations	-.153	.140	-1.10	-.716	.279	-2.57
V11 Customer measures LSP's performance	-.021	.140	-.15	-.595	.279	-2.14
V12 Access to LSP's quality information	.073	.140	.52	-.651	.279	-2.34
V13 LSP makes processes more effective	.003	.140	.02	-.657	.279	-2.36
V14 LSP modifies processes	-.049	.140	-.35	-.715	.279	-2.57
V15 LSP suggests improvement	-.005	.140	-.04	-.595	.279	-2.14
V17 LSP invests in quality management practices	-.322	.140	-2.30	-.585	.279	-2.10
V18 LSP applies strict quality control procedures	-.037	.140	-.27	-.673	.279	-2.42
V19 Customer will continue using the current LSP	-.051	.140	-.36	-.718	.279	-2.58
V20 Customer will outsource more activities	-.176	.140	-1.26	-.709	.279	-2.54

Table 4.3 (Continued)

Variable	Skewness			Kurtosis		
	Statistic	Std. Error	*z*	Statistic	Std. Error	*z*
V21 Customer is willing to invest in the relationship	-.199	.140	-1.42	-.327	.279	-1.17
V22 Customer is confident about LSP's qualifications	-.167	.140	-1.20	-.660	.279	-2.37
V23 LSP stays within terms	.023	.140	.16	-.691	.279	-2.48
V24 LSP shares best judgment	-.046	.140	-.33	-.672	.279	-2.41
V25 LSP provides operational information	-.213	.140	-1.52	-.710	.279	-2.55
V26 LSP provides summary reports	-.347	.140	-2.48	-.640	.279	-2.30
V27 Customer provides operational information	.109	.140	.78	-.702	.279	-2.52
V28 Customer informs in advance	-.075	.140	-.53	-.709	.279	-2.55
V29 Each party provides useful information	-.084	.140	-.60	-.676	.279	-2.43
V30 LSP makes a large investment	-.132	.140	-.95	-.713	.279	-2.56
V31 LSP adapts its procedures	-.088	.140	-.63	-.646	.279	-2.32
V32 Small portion of LSP's investment can be transferred	-.247	.140	-1.76	-.716	.279	-2.57
V33 LSP provides a dedicated team	-.027	.140	-.19	-.667	.279	-2.39
V34 LSP makes special efforts to handle unexpected problems	-.103	.140	-.74	-.716	.279	-2.57
V35 LSP is skilled in handling unexpected problems	-.234	.140	-1.68	-.492	.279	-1.76
V36 Together identify problems	-.152	.140	-1.08	-.586	.279	-2.10
V37 Together solve problems	-.340	.140	-2.43	-.639	.279	-2.29
V38 Organizational conflict	.037	.140	.26	-.693	.279	-2.49
V39 Operational conflict	-.095	.140	-.68	-.704	.279	-2.53
V40 Conflict, on the whole	.110	.140	.79	-.708	.279	-2.54

Earlier examination revealed that individually, the distribution of each variable was normal. However, two or more univariate normal variables, when combined, may not be normal in a multivariate sense. Multivariate normality, or the normality of the error term of the variate, was checked with a visual inspection of the normal P-P plot of the regression standardized residual for the dependent variable. As can be seen in Figure 4.1, all of the points were close to the diagonal, with no substantial or systematic departures. This indicated that the residuals did represent a normal distribution and that the model had not violated the assumption of normality.

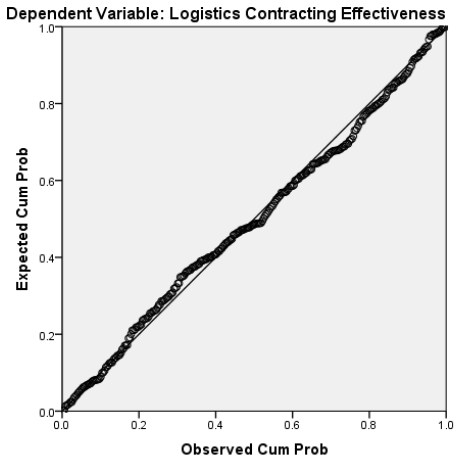

Figure 4.1 Normal P-P Plot of Regression Standardized Residual

4.2.4 Linearity

Linearity was assessed through an analysis of the residuals and partial regression plots. Figure 4.2 showed that there was no clear relationship between the residuals and the predicted values, which was consistent with the assumption of linearity.

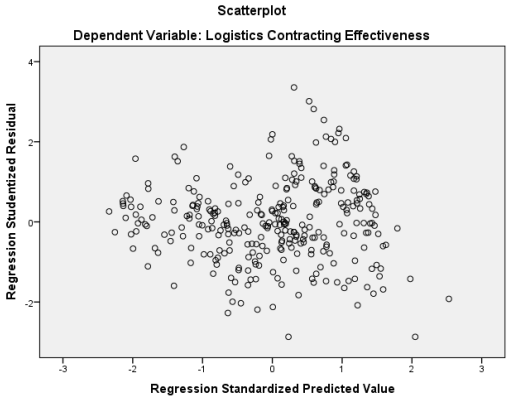

Figure 4.2 Analysis of Studentized Residuals

Hair et al. (2009), however, cautioned that when using more than one independent variable, each independent variable's relationship should also be linear to ensure its best representation in the equation. In Figure 4.3, it can be seen that the relationships for long-term orientation and information sharing were quite well defined

and thus had stronger effects in the regression estimation. The remaining variables were less well defined both in terms of slope and scatter of the points. This explains why they had less effect in the estimation (smaller coefficient, beta value and significance level). All six variables showed no nonlinear pattern, thus meeting the assumption of linearity for each independent variable.

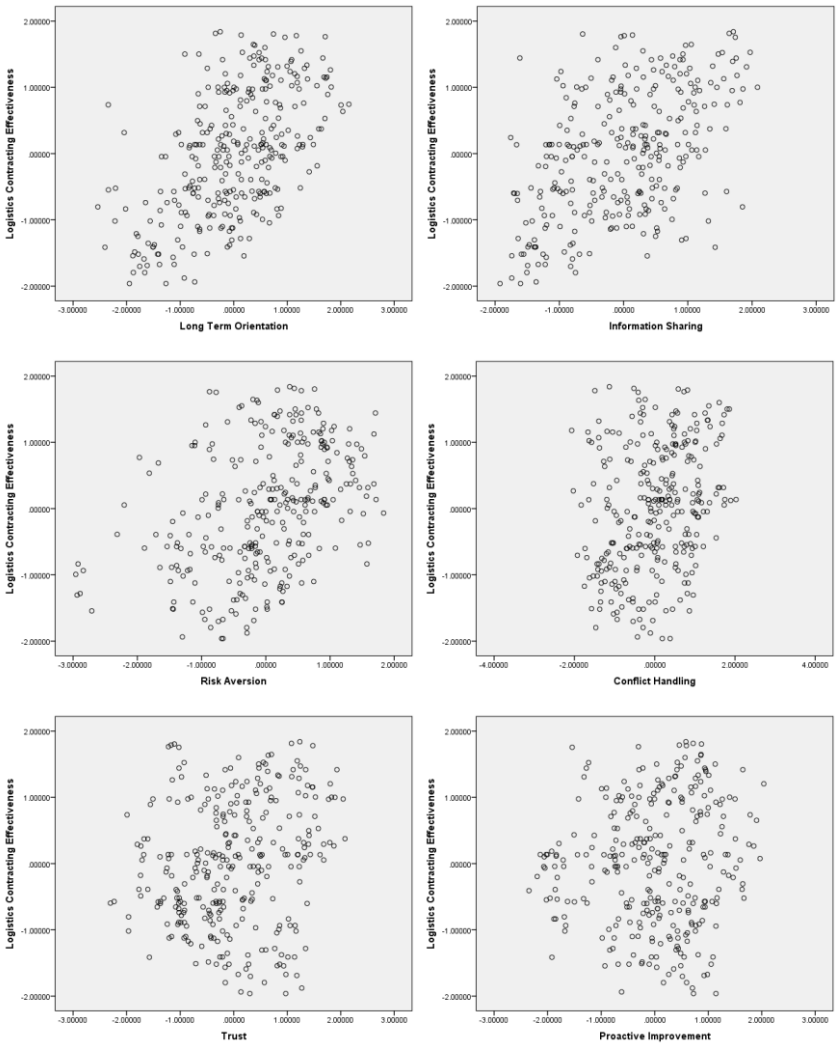

Figure 4.3 Standardized Partial Regression Plots

4.2.5 Homocedasticity

Homoscedasticity means that the variability in one variable is the same across all values of the other variables. The assessment was made, again, using the standardized

partial regression plots. Examination of Figure 4.2 found that the residuals varied randomly around zero and that the spread of the residuals was about the same throughout the plot, which indicated homoscedasticity in the multivariate case.

4.2.6 Multicollinearity

In any interpretation of the regression model, researchers must be aware of the impact of multicollinearity. When two or more variables are highly correlated, they tend to distort the results or make them unstable, which limit the generalizability of the results (Hair et al., 2009). For this model, multicollinearity was tested by the tolerance and variance inflation factor (VIF) values. The tolerance value was one minus the proportion of the variable's variance explained by the other independent variables. A high tolerance value indicated little collinearity, and a tolerance value approaching zero indicated that the variable was almost totally accounted for by the other variables. The VIF is the inverse of the tolerance value, thus a small VIF values indicate low intercorrelation among variables. Table 4.4 shows that the tolerance values all exceeded .99 and the VIF values were all close to 1. These results indicated that collinearity was not a problem for this model.

Table 4.4 Testing for Multicollinearity: Tolerance and VIF Values

Model	Collinearity Statistics	
	Tolerance	**VIF**
(Constant)		
Long-Term Orientation	.994	1.006
Information Sharing	.996	1.004
Risk Aversion	.996	1.004
Conflict Handling	.995	1.005
Trust	.997	1.003
Proactive Improvement	.998	1.002

4.3.7 Independence of the Residuals

The independence of the residuals makes sure that the residuals are not correlated serially from one observation to the next. This assumption is tested using the Durbin-Watson statistic. The Durbin-Watson statistic ranges in value from 0 to 4. A value near 2 indicates non-autocorrelation; a value towards 0 indicates positive autocorrelation; and a value toward 4 indicates negative autocorrelation. For this model, the Durbin-Watson statistic was 1.886 (Table 4.5), suggesting that the assumption of independence of the residuals was not violated.

Table 4.5 Testing for Autocorrelation: Durbin-Watson Statistic

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
6	.874	.763	0.758	0.460443	1.886

4.3 Descriptive Statistics

The sampled respondents consisted of 42 small firms, 143 medium-sized firms, and 119 large firms. All of the small firms and the majority of the medium-sized firms used logistics services on a transactional basis, while the large firms were all on a contractual basis. Small firms were either first-time logistics users or switched to a new LSP. Most of the medium and large firms renewed their contracts with the previous LSP, while some switched to a new LSP (Table 4.6). Years of experience in logistics operations ranged from five and a half years to fourteen years and four months (Table 4.7). These figures indicated that the respondents were a credible source of information about logistics outsourcing.

Table 4.6 Demographic Profile: Firm Size, Usage Mode, and Contract Type

Firm Size	Mode		Contract Type		
	Transact	Contract	First Time	Switched	Renewed
Small (<200 employees)	42	0	15	26	1
Medium (200 - 999 employees)	100	43	8	41	94
Large (1,000 or more employees)	0	119	0	11	108
Total	142	162	23	78	203

Table 4.7 Demographic Profile: Respondents' Experience with Logistics

Variable	N	Minimum (Month)	Maximum (Month)	Mean (Month)
Experience	304	66	172	97.14

As was explained in the questionnaire development section, the respondents were asked to indicate their level of agreement on an 11-point scale where 0 = disagree and 10 = highly agree. Table 4.8 presents the results where the variables are classified into three levels of agreement: somewhat agreed, agreed, and highly agreed using hierarchical cluster analysis (between-groups linkage cluster method with squared Euclidean distance interval measure). Contractual customers indicated higher agreement on outcome items except "reduced logistics cost." For the items affecting logistics contracting effectiveness, again, contractual customers gave higher scores on most items. The items for which the transactional customers had higher agreement were those pertaining to trust, proactive improvement, and conflict. All of these differences were statistically significant.

Table 4.8 Mean Scores of the Variables

Variable	Mean Scores			Sig. (2-tailed)
	Overall N = 304	Contract N = 162	Transact N = 142	
Dependent Variable				
Highly Agreed				
V5 Improved logistics operations	6.76	7.61	5.78	0.000
V6 Specialized logistics expertise	6.93	7.45	6.33	0.000
Agreed				
V7 Reduced logistics cost	4.41	4.08	4.80	0.000
Somewhat Agreed				
V8 Reduced owned assets	3.67	4.85	2.33	0.000
V9 Reduced employee base	3.92	5.08	2.59	0.000
Independent Variable				
Highly Agreed				
V35 LSP is skilled in handling unexpected problems	7.25	7.70	6.74	0.000
V18 LSP applies strict quality control procedures	7.16	7.60	6.65	0.000
V29 Each party provides useful information	7.13	7.45	6.77	0.000
V16 LSP uses higher-quality equipment	6.83	7.54	6.02	0.000
V17 LSP invests in quality management practices	6.83	7.47	6.10	0.000
V36 Together identify problems	6.46	7.02	5.82	0.000
V37 Together solve problems	6.13	6.60	5.59	0.000
V25 LSP provides operational information	5.93	6.92	4.81	0.000
V28 Customer informs in advance	5.93	6.41	5.38	0.000
V10 Customer discloses expectations	5.92	6.41	5.37	0.000
V34 LSP makes special efforts to handle unexpected problems	5.90	6.36	5.37	0.000
V19 Customer will continue using the current LSP	5.73	6.34	5.03	0.000
V20 Customer will outsource more activities	5.58	6.76	4.23	0.000
Agreed				
V24 LSP shares best judgment	5.34	5.08	5.63	0.003
V22 Customer is confident about LSP's qualifications	5.28	4.38	6.30	0.000
V33 LSP provides a dedicated team	5.08	4.49	5.75	0.000
V23 LSP stays within terms	5.03	4.33	5.82	0.000
V12 Access to LSP's quality information	4.98	4.34	5.70	0.000
V15 LSP suggests improvement	4.63	4.15	5.18	0.000
V13 LSP makes processes more effective	4.60	4.10	5.16	0.000
V21 Customer is willing to invest in the relationship	4.58	5.59	3.42	0.000
V14 LSP modifies processes	4.52	3.82	5.32	0.000
V11 Customer measures LSP's performance	4.50	5.68	3.15	0.000
V31 LSP adapts its procedures	4.44	5.90	2.78	0.000

Table 4.8 (Continued)

Variable	Mean Scores			Sig. (2-tailed)
	Overall N = 304	Contract N = 162	Transact N = 142	
V39 Operational conflict	4.44	4.30	4.59	0.004
V40 Conflict, on the whole	4.41	4.00	4.87	0.000
V27 Customer provides operational information	4.30	4.86	3.65	0.000
V30 LSP makes a large investment	4.19	5.14	3.11	0.000
Somewhat Agreed				
V38 Organizational conflict	3.38	2.88	3.96	0.000
V32 Small portion of LSP's investment can be transferred	3.14	3.84	2.34	0.000
V26 LSP provides summary reports	2.73	3.44	1.92	0.000

4.4 Factor Analysis

4.4.1 Factor Extraction and Rotation Methods

Although the multivariate techniques have been developed to accommodate multiple variables, it is advisable that researchers always look for the most parsimonious set of variables to include in the analysis (Hair et al., 2009). In chapter two, the researcher identified thirteen factors that might influence logistics contracting effectiveness namely, top management championship, contract specificity, performance monitoring incentives and penalties, proactive improvement, contract-specific investment, continuity, trust, information sharing, joint problem solving, risk aversion, conflict, and means for resolving contract disputes. While pretesting the initial questionnaire, the respondents suggested dropping four factors namely, top management championship, contract specificity, incentives and penalties, and means for resolving contract disputes, and adding a new factor "service recovery." To see if the data might suggest a different conceptualization of logistics contracting effectiveness, e.g., how many factors really exist and which items belong with which factor, an exploratory factor analysis was performed.

There are two extraction methods for obtaining factor solutions: component analysis and common factor analysis. Component analysis is appropriate when the researchers want to extract the minimum number of the factors that account for the

maximum portion of the variance represented in the original set of variables, and when prior knowledge suggests that there is a very small amount of specific and error variance represented in the total variance. On the other hand, should the researchers want to identify the latent dimensions or constructs represented in the original set of variables, and they have little knowledge about the amount of specific and error variance and wish to eliminate it from the total variance, common factor analysis is most appropriate (Hair et al., 2009).

Despite much debate as to which method is the most appropriate (Coakes and Steed, 2003), empirical research has demonstrated similar results in many instances (Velicer and Jackson, 1990). In most applications, both component and common factor analyses produce essentially identical results if the number of variables exceeds 30 (Gorsuch, 1983), or the communalities exceed .60 for most variables (Hair et al., 2009).

Another issue that needs to be considered in performing factor analysis is the rotation of factors. The initial factor matrix usually contains complex variable—variables that have high loadings on two or more factors—and they make interpretation of the output difficult (Coakes and Steed, 2003). Rotation may therefore be necessary to reduce the number of complex variables and to enhance the interpretation. There are two rotation methods: orthogonal and oblique. If the objective of the analysis is to reduce a larger number of variables to a smaller set of uncorrelated variables for subsequent use in regression or other prediction techniques, orthogonal rotation is the best. On the other hand, if the objective is to obtain several factors that are expected to be highly correlated, an oblique rotation would be a more appropriate choice (Hair et al., 2009).

Considering the above, the researcher performed four analyses: principal components (PC) with varimax rotation (Table 4.9), PC with direct oblimin rotation (Table 4.10), principal axis factoring (PAF) with varimin rotation (Table 4.11), and PAF with direct oblimin rotation (Table 4.12). All four methods produced identical factor structures—six factors consisted of the same items. PC extraction had higher cumulative variance explained (69.40%) compared to PAF (62.61%). However, the factor scores derived from PAF/varimax, when used in the stepwise regression analysis, yielded a higher overall predictive fit (R^2) 76.3% (adjusted R^2 = 75.8%) as

compared to the PAF/direct oblimin R^2 = 76.2% (adjusted R^2 = 75.8%); and both PC/varimax and Pc/direct oblimin R^2 = 74.5% (adjusted R^2 = 74.0%). Since the main purpose of this study was to develop a regression model that best explained logistics contracting effectiveness, the researcher thus decided to adopt the PAF/varimax method. This decision was consistent with Hair et al.'s (2009) suggestion discussed earlier.

In Tables 4.9 – 4.12, it can be seen that variable 32—a "small portion of LSP's investment can be transferred"—loaded ambiguously on two or more factors with low communality (.315 in PAF and .382 in PC), indicating that it was an outlier among the variables; thus the researcher removed this item from the final analysis. For the final PAF/varimax factor solution, the initial statistics indicated that six factors should be extracted, and the final statistics outlined that these six factors accounted for 63.66 percent of the variance (Table 4.13).

Table 4.9 Initial Principal Components with Varimax Rotation

Variable	Component					
	1	2	3	4	5	6
V40 Conflict, on the whole	-.795					
V39 Operational conflict	-.745					
V38 Organizational conflict	-.729					
V10 Customer discloses expectations	.729					
V37 Together solve problems	.704					
V34 LSP makes special efforts to handle unexpected problems	.660					
V30 LSP makes a large investment		.854				
V21 Customer is willing to invest in the relationship		.840				
V20 Customer will outsource more activities		.835				
V31 LSP adapts its procedures		.685				
V19 Customer will continue using the current LSP		.642				
V23 LSP stays within terms			.888			
V12 Access to LSP's quality information			.859			
V22 Customer is confident about LSP's qualifications			.830			
V33 LSP provides a dedicated team			.824			
V11 Customer measures LSP's performance			-.676			
V28 Customer informs in advance				.821		
V29 Each party provides useful information				.805		
V27 Customer provides operational information				.804		
V36 Together identify problems				.771		
V25 LSP provides operational information				.535		
V26 LSP provides summary reports				.496		
V32 Small portion of LSP's investment canbe transferred		.379		.394		
V13 LSP makes processes more effective					.866	
V14 LSP modifies processes					.840	
V24 LSP shares best judgment					.838	
V15 LSP suggests improvement					.835	
V17 LSP invests in quality management practices						.814
V18 LSP applies strict quality control procedures						.812
V16 LSP uses higher-quality equipment						.782
V35 LSP is skilled in handling unexpected problems						.752
Eigenvalues (after varimax rotation)	3.947	3.848	3.83	3.728	3.265	2.895
% of Variance	12.731	12.413	12.355	12.027	10.532	9.339
Cumulative %	12.731	25.144	37.499	49.526	60.058	69.397

Table 4.10 Initial Principal Components with Direct Oblimin Rotation

Variable	Component					
	1	2	3	4	5	6
V29 Each party provides useful information	.858					
V28 Customer informs in advance	.849					
V27 Customer provides operational information	.810					
V36 Together identify problems	.796					
V25 LSP provides operational information	.450					
V26 LSP provides summary reports	.444					
V32 Small portion of LSP's investment canbe transferred	.345					.313
V13 LSP makes processes more effective		.887				
V24 LSP shares best judgment		.863				
V14 LSP modifies processes		.838				
V15 LSP suggests improvement		.838				
V23 LSP stays within terms			.919			
V12 Access to LSP's quality information			.891			
V33 LSP provides a dedicated team			.869			
V22 Customer is confident about LSP's qualifications			.831			
V11 Customer measures LSP's performance			-.648			
V18 LSP applies strict quality control procedures				-.833		
V17 LSP invests in quality management practices				-.817		
V35 LSP is skilled in handling unexpected problems				-.786		
V16 LSP uses higher-quality equipment				-.774		
V40 Conflict, on the whole					.825	
V39 Operational conflict					.800	
V38 Organizational conflict					.728	
V10 Customer discloses expectations					-.715	
V37 Together solve problems					-.681	
V34 LSP makes special efforts to handle unexpected problems					-.630	
V30 LSP makes a large investment						.902
V21 Customer is willing to invest in the relationship						.888
V20 Customer will outsource more activities						.862
V19 Customer will continue using the current LSP						.651
V31 LSP adapts its procedures						.630
Eigenvalues (after direct oblimin rotation)	5.434	3.924	5.360	3.951	5.267	5.907
% of Variance	30.251	10.594	9.358	7.509	6.729	4.957
Cumulative %	30.251	40.844	50.202	57.712	64.441	69.397

Table 4.11 Initial Principal Axis Factoring with Varimax Rotation

Variable	Factor					
	1	**2**	**3**	**4**	**5**	**6**
V23 LSP stays within terms	.884					
V12 Access to LSP's quality information	.831					
V22 Customer is confident about LSP's qualifications	.807					
V33 LSP provides a dedicated team	.752					
V11 Customer measures LSP's performance	-.631					
V40 Conflict, on the whole		-.739				
V10 Customer discloses expectations		.692				
V38 Organizational conflict		-.676				
V37 Together solve problems		.662				
V39 Operational conflict		-.649				
V34 LSP makes special efforts to handle unexpected problems		.616				
V30 LSP makes a large investment			.824			
V20 Customer will outsource more activities			.824			
V21 Customer is willing to invest in the relationship			.793			
V31 LSP adapts its procedures			.660			
V19 Customer will continue using the current LSP			.538			
V27 Customer provides operational information				.793		
V28 Customer informs in advance				.789		
V29 Each party provides useful information				.716		
V36 Together identify problems				.702		
V25 LSP provides operational information				.507		
V26 LSP provides summary reports				.447		
V32 Small portion of LSP's investment canbe transferred			.333	.344	-.206	
V14 LSP modifies processes					.832	
V13 LSP makes processes more effective					.821	
V15 LSP suggests improvement					.785	
V24 LSP shares best judgment					.771	
V17 LSP invests in quality management practices						.801
V16 LSP uses higher-quality equipment						.765
V18 LSP applies strict quality control procedures						.724
V35 LSP is skilled in handling unexpected problems						.612
Eigenvalues (after varimax rotation)	3.547	3.531	3.47	3.332	2.992	2.538
% of Variance	11.441	11.39	11.192	10.747	9.653	8.186
Cumulative %	11.441	22.831	34.024	44.771	54.424	62.610

Table 4.12 Initial Principal Axis Factoring with Direct Oblimin Rotation

Variable	Factor					
	1	2	3	4	5	6
V28 Customer informs in advance	.828					
V27 Customer provides operational information	.811					
V29 Each party provides useful information	.768					
V36 Together identify problems	.727					
V25 LSP provides operational information	.422					
V26 LSP provides summary reports	.391					
V32 Small portion of LSP's investment can be transferred	.293					.267
V13 LSP makes processes more effective		.844				
V14 LSP modifies processes		.836				
V24 LSP shares best judgment		.795				
V15 LSP suggests improvement		.787				
V23 LSP stays within terms			.922			
V12 Access to LSP's quality information			.865			
V22 Customer is confident about LSP's qualifications			.809			
V33 LSP provides a dedicated team			.793			
V11 Customer measures LSP's performance			-.599			
V17 LSP invests in quality management practices				-.808		
V16 LSP uses higher-quality equipment				-.760		
V18 LSP applies strict quality control procedures				-.746		
V35 LSP is skilled in handling unexpected problems				-.640		
V40 Conflict, on the whole					.772	
V39 Operational conflict					.700	
V10 Customer discloses expectations					-.682	
V38 Organizational conflict					.675	
V37 Together solve problems					-.640	
V34 LSP makes special efforts to handle unexpected problems					-.588	
V30 LSP makes a large investment						.884
V20 Customer will outsource more activities						.868
V21 Customer is willing to invest in the relationship						.851
V31 LSP adapts its procedures						.608
V19 Customer will continue using the current LSP						.536
Eigenvalues (after direct oblimin rotation)	5.264	3.701	5.159	3.739	5.025	5.791
% of Variance	29.125	9.531	8.276	6.289	5.489	3.900
Cumulative %	29.125	38.655	46.932	53.221	58.710	62.610

Table 4.13 Final Principal Axis Factoring with Varimax Factor Solution

Variable	Factor					
	1	2	3	4	5	6
V23 LSP stays within terms	.886					
V12 Access to LSP's quality information	.832					
V22 Customer is confident about LSP's qualifications	.809					
V33 LSP provides a dedicated team	.752					
V11 Customer measures LSP's performance	-.634					
V40 Conflict, on the whole		-.737				
V10 Customer discloses expectations		.696				
V38 Organizational conflict		-.674				
V37 Together solve problems		.663				
V39 Operational conflict		-.648				
V34 LSP makes special efforts to handle unexpected problems		.620				
V30 LSP makes a large investment			.826			
V20 Customer will outsource more activities			.821			
V21 Customer is willing to invest in the relationship			.797			
V31 LSP adapts its procedures			.651			
V19 Customer will continue using the current LSP			.539			
V28 Customer informs in advance				.795		
V27 Customer provides operational information				.786		
V29 Each party provides useful information				.718		
V36 Together identify problems				.702		
V25 LSP provides operational information				.499		
V26 LSP provides summary reports				.436		
V14 LSP modifies processes					.832	
V13 LSP makes processes more effective					.820	
V15 LSP suggests improvement					.785	
V24 LSP shares best judgment					.775	
V17 LSP invests in quality management practices						.802
V16 LSP uses higher-quality equipment						.766
V18 LSP applies strict quality control procedures						.723
V35 LSP is skilled in handling unexpected problems						.612
Eigenvalues (after varimax rotation)	3.552	3.544	3.327	3.175	2.962	2.537
% of Variance	11.839	11.813	11.091	10.583	9.875	8.457
Cumulative	11.839	23.652	34.744	45.327	55.202	63.659

4.4.2 Assessment of the Final PAF/Varimax Factor Solution

4.4.2.1 Number of Factors, Sampling Adequacy, and Factorability

The KMO MSA of .88 indicates a meritorious sampling adequacy. Bartlett's test of sphericity was significant (<.05), indicating the presence of correlations among the variables (Table 4.14). These results were indicative of a data matrix suitable for factor analysis. An inspection of the anti-image correlation matrix (Table 4.15) found that all measures of sampling adequacy were well above the acceptable level of .5 (bold on the diagonal). This provided further evidence of the factorability of the variables.

Table 4.14 Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test of the Independent Variables

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.875
Bartlett's Test of Sphericity	Approx. Chi-Square	6284.668
	df	435
	Sig.	.000

Table 4.15 Anti-Image Correlation

Factor	V10	V11	V12	V13	V14	V15	V16	V17	V18	V19
V10	**.899**									
V11	-.031	**.938**								
V12	-.100	.021	**.830**							
V13	-.003	.078	.009	**.873**						
V14	.139	-.110	-.098	-.335	**.879**					
V15	-.060	.035	-.113	-.266	-.256	**.877**				
V16	.032	-.192	.029	.011	-.029	-.029	**.829**			
V17	.040	.065	-.019	.055	.076	.063	-.653	**.781**		
V18	.023	-.019	.021	.005	-.076	-.060	.027	-.366	**.714**	
V19	.083	-.068	-.055	.102	.042	.032	.087	-.022	.027	**.927**

Table 4.15 (Continued)

Factor	V20	V21	V22	V23	V24	V25	V26	V27	V28	V29
V20	**.855**									
V21	-.349	**.860**								
V22	-.132	.167	**.905**							
V23	.027	-.063	-.212	**.827**						
V24	-.028	.058	-.062	-.052	**.836**					
V25	-.070	-.019	.012	.160	-.073	**.961**				
V26	.035	.030	-.076	-.057	-.002	-.083	**.944**			
V27	-.074	.009	-.002	-.107	.034	-.147	-.078	**.883**		
V28	.233	-.058	.059	.099	-.006	-.101	-.049	-.556	**.850**	
V29	-.006	.052	.001	-.031	-.033	-.091	-.041	-.127	-.151	**.889**
Factor	**V30**	**V31**	**V33**	**V34**	**V35**	**V36**	**V37**	**V38**	**V39**	**V40**
V30	**.894**									
V31	-.067	**.923**								
V33	-.046	-.159	**.842**							
V34	.046	-.049	-.095	**.892**						
V35	-.028	.030	-.214	.062	**.675**					
V36	.011	-.075	.068	.065	.021	**.914**				
V37	-.095	.074	.050	-.230	-.037	-.067	**.912**			
V38	-.044	.047	.060	.052	-.237	.022	.091	**.894**		
V39	.006	.008	-.064	.079	.108	-.023	.068	-.210	**.846**	
V40	-.033	-.018	-.038	-.093	-.012	-.132	.110	-.359	-.353	**.861**

4.4.2.2 Validity Test

It is essential that the results of any factor analysis be validated, particularly when the objective of the analysis is to identify the underlying structure of a set of variables (Hair et al., 2009). In this study, a split sample analysis was performed to validate the factor analysis results. The researcher split the sample (304 respondents) into two equal samples (152 respondents) and re-estimated the factor models to test for comparability. According to Table 4.16, it can be seen that all three solutions produced identical factor structures with comparable loadings. Having these results, the researcher could be more assured that the results were stable within the sample and that the factor structure was valid.

Table 4.16 Split-Sample Validation of Principal Axis Factoring Analysis

Variable	Factor					
	1			2		
	Total Sample	**Split-Sample 1**	**Split-Sample 2**	**Total Sample**	**Split-Sample 1**	**Split-Sample 2**
V23 LSP stays within terms	.886	.892	.882			
V12 Access to LSP's quality information	.832	.833	.833			
V22 Customer is confident about LSP's qualifications	.809	.789	.828			
V33 LSP provides a dedicated team	.752	.745	.756			
V11 Customer measures LSP's performance	-.634	-.583	-.713			
V40 Conflict, on the whole				-.737	-.736	-.735
V10 Customer discloses expectations				.696	.783	.585
V38 Organizational conflict				-.674	-.654	-.699
V37 Together solve problems				.663	.746	.578
V39 Operational conflict				-.648	-.668	-.628
V34 LSP makes special efforts to handle unexpected problems				.620	.628	.601

Variable	3			4		
	Total Sample	**Split-Sample 1**	**Split-Sample 2**	**Total Sample**	**Split-Sample 1**	**Split-Sample 2**
V30 LSP makes a large investment	.826	.818	.825			
V20 Customer will outsource more activities	.821	.828	.811			
V21 Customer is willing to invest in the relationship	.797	.770	.829			
V31 LSP adapts its procedures	.651	.667	.629			
V19 Customer will continue using the current LSP	.539	.529	.570			
V28 Customer informs in advance				.795	.782	.806
V27 Customer provides operational information				.786	.784	.786
V29 Each party provides useful information				.718	.785	.666
V36 Together identify problems				.702	.686	.716
V25 LSP provides operational information				.499	.498	.502
V26 LSP provides summary reports				.436	.420	.448

Table 4.16 (Continued)

Variable	Factor					
	5			6		
	Total Sample	**Split-Sample 1**	**Split-Sample 2**	**Total Sample**	**Split-Sample 1**	**Split-Sample 2**
V14 LSP modifies processes	.832	.830	.834			
V13 LSP makes processes more effective	.820	.858	.781			
V15 LSP suggests improvement	.785	.812	.771			
V24 LSP shares best judgment	.775	.781	.767			
V17 LSP invests in quality management practices				.802	.777	.830
V16 LSP uses higher-quality equipment				.766	.750	.784
V18 LSP applies strict quality control procedures				.723	.760	.677
V35 LSP is skilled in handling unexpected problems				.612	.634	.596

4.4.2.3 Reliability Test

To make sure that the items comprising each factor produced a reliable scale, Cronbach's alpha coefficient for internal consistency was calculated. Items that moved in the opposite direction from other items were recoded prior to analysis in order to avoid negative average covariance among items—a fatal violation to reliability model. In Table 4.17, it can be seen that all coefficients were above the generally agreed-upon lower limit of .70 (Hair et al., 2009), indicating the presence of internal consistency, meaning that the items all consistently represented the same latent construct.

Table 4.17 Reliability Analysis of the Independent Variables

Factor	Information Sharing	Conflict Handling	Long-Term Orientation	Proactive	Trust	Risk Aversion
Cronbach's alpha	.895	.853	.901	.889	.890	.832

4.4.3 Labeling and Interpreting the Factors

Factor 1 consists of five items measuring the information provision between the customer and the LSP, and one item measuring joint problem solving. This factor was assigned the label "information sharing." Factor 2 is made up of three items designed to measure conflict, one joint problem solving item, one service recovery item, and one information sharing item. The latter three items moved in the opposite direction of the conflict items. This factor was labeled "conflict handling." Factor 3 reaffirmed the pretest findings—three continuity items and two contract-specific investment items formed a new factor which the researcher earlier suggested to be labeled as "long-term orientation." Note that another contract-specific investment item, "a small portion of the investments can be easily transferred to another job/contract," was removed from the analysis during the scale purification process.

Factor 4 has four items—three measure proactive improvement and one measures trust. This factor was thus named "proactive improvement." Factor 5 also has five items—two measure trust, one measures continuity, and two measure performance monitoring. The performance monitoring item moved in the opposite direction of the trust items. This factor was labeled "trust." The final factor consists of three risk aversion items and one service recovery item and was labeled "risk aversion." An examination of the content of the items making up each of the six factors suggested the following labels and interpretations (Table 4.18):

Table 4.18 Factor Labeling and Interpretation

Label	Interpretation
Information Sharing	Logistics is an information-driven activity. In a logistics outsourcing relationship, it is expected that any useful information which might help the other party will be provided in a timely manner. From the LSP's side, these include operational information, summary service, and usage reports. The customer is to provide operational information and keep its LSP informed of any impending changes, allowing it to make appropriate adjustment to meet the customer's changing service requirement. The sharing of information will enable both parties to work together to identify problems.
Conflict Handling	Conflict exists in many business relationships, particularly logistics outsourcing, in which the LSP and the customer may have differing (and many times, conflicting) goals. Conflict can occur at the operational or organizational level. Conflict can stress the relationship and need to be handled appropriately. As a service provider, the LSP should be prepared to make a special effort to handle the conflict. While the customer should disclose its expectations and adopt a "we are partners" rather than "the customer is king" attitude, and work together with its LSP to solve the conflict.
Long-Term Orientation	Logistics outsourcing has become more complex, where the customer outsources several logistics activities or even the entire logistics process to the LSP. This might require the LSP to make a large investment in assets and adapt its operating procedures to meet the customer's specific requirements. The larger the amount the LSP invests in contract-specific assets, the higher is the degree to which the LSP is locked into the relationship. It, in turn, expects that the customer will continue using it after the initial contract expires and/or outsource more activities to it. The customer could assure its LSP by demonstrating the willingness to invest in the relationship with the LSP.

Table 4.18 (continued)

Label	Interpretation
Proactive Improvement	As an expert in the field, the LSP should share its best judgment about the customer's logistics operations, even those outside its direct responsibility. Considering that the environment is constantly changing, should a process change is deemed beneficial, the LSP, at its own initiative, approaches the customer with suggestion for such change. Within the LSP's own internal operations, it should continuously modify its processes, making them more effective.
Trust	The customer believes that the LSP has integrity (e.g., stays within the terms of the contract) and competence (e.g., technical, operational, human and financial abilities) in handling the customer's logistics activities. The LSP can earn both competence trust and trust in integrity by allowing the customer convenient access to its internal process quality data, quality control procedures, and quality improvement programs and the results of these programs, and provide the customer with a dedicated staff with the knowledge, skills and experience, or trained specifically to meet the customer's requirement. This team, through their constant interaction with the customer, shows its consistency and loyalty to the customer, which will help foster the customer's trust in integrity. Lack of trust will cause the customer to monitor the LSP's performance more intensely.
Risk Aversion	Electronics manufacturers require their LSPs to avert risk and to be quality conscious, making sure that their high-priced products are well taken care of. The LSPs are expected to invest in higher-quality equipment, quality management practices, apply strict quality control procedures, and train their staff to ensure that they can deliver high-quality services.

4.4.4 Dependent Variable: Logistics Contracting Effectiveness

Logistics contracting effectiveness, the dependent variable of this study, is defined as "an LSP's performance on a contract and the various outcomes customer managers use to measure it." This construct was measured with five items borrowed from Knemeyer and Murphy (2004). These five items reflect the four most frequently mentioned reasons for logistics outsourcing: operations improvement (Lynch, 2004), access to expertise and cost reduction (Wilding and Juriado, 2004), asset reduction (Razzaque and Sheng, 1998), and headcount reduction (Bardi and Tracey, 1991). Principal axis factoring was conducted to derive a factor made up of these five items.

Table 4.19 presents the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity. The KMO MSA .63 indicates a mediocre sampling adequacy. Bartlett's test of sphericity was significant (<.05), indicating the presence of correlations among the variables. Therefore, it was appropriate to proceed with the factor analysis. Table 4.20 shows the factor loadings and communality of the five items. It can be seen that the item "reduced logistics cost" had a low loading and communality, both below .5. This made it a candidate to be removed from the analysis. The researcher tried removing this item and derived a four-item factor. However, in the subsequent stepwise regression analysis, it appeared that the five-item dependent variable produced a more interpretable result. Thus, it was decided to maintain the five-item factor. Cronbach's alpha for this factor was greater than the generally-agreed-upon lower limit of .70 (Hair et al., 2009), indicating that the scale was consistent and reliable.

Table 4.19 Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test of the Dependent Variable

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.633
Bartlett's Test of Sphericity	Approx. Chi-Square	923.129
	df	10
	Sig.	.000

Table 4.20 Factor Loading, Communality, and Reliability of the Dependent Variable

Variable	Factor Loading	Communality
V5 Improved logistics operations	.860	0.739
V9 Reduced employee base	.762	0.581
V8 Reduced owned assets	.716	0.512
V6 Specialized logistics expertise	.685	0.469
V7 Reduced logistics cost	-.282	0.079
Cronbach's alpha	.784	

Having developed valid and reliable factor structures for the independent variables and the dependent variable, the next step was to determine the contributions of these variables in explaining the overall logistics contracting effectiveness. This was done through a stepwise regression analysis.

4.5 Stepwise Regression Analysis

In order to apply the regression procedure, the researcher selected "logistics contracting effectiveness" as the dependent variable to be predicted by six independent variables namely, trust, conflict handling, long-term orientation, information sharing, proactive improvement, and risk aversion. The relationship among the six independent variables and the dependent variable was assumed to be statistical, not functional, because it involved perceptions of performance and may have had levels of measurement error.

4.5.1 Estimating and Interpreting the Regression Model

Table 4.21 displays the correlations among the six independent variables and their correlations with the dependent variable.

Table 4.21 Correlation Matrix - Logistics Contracting Effectiveness Data

Variable	X_1	X_2	X_3	X_4	X_5	X_6
Predictors						
X_1 Trust	1.000					
X_2 Conflict Handling	.010	1.000				
X_3 Long-Term Orientation	.010	.055	1.000			
X_4 Information Sharing	.020	.030	.039	1.000		
X_5 Proactive Improvement	.019	.003	.033	.014	1.000	
X_6 Risk Aversion	.043	.040	.000	.027	.008	1.000
Dependent						
Logistics Contracting Effectiveness	.188**	.277**	.552**	.496**	.085	.402**

Note: ** correlation was significant at the .01 level (2-tailed)

The correlations among the six independent variables were low and not significant. Except for proactive improvement, all other variables were significantly correlated with the dependent variable. Based upon Guilford and Fruchter's (1973) guidelines for interpreting strengths of statistically-significant correlation coefficients (Table 4.22), three independent variables namely, long-term orientation, information sharing, and risk aversion, were considered to have a moderate correlation and a substantial relationship with the dependent variable (.552, .496 and .402 respectively). Conflict handling had a low correlation, and a definite but small relationship (.277). Trust and proactive improvement had a very low correlation, with a slight, almost negligible, relationship (.188 and .085 respectively).

Table 4.22 Guidelines for Interpreting the Strengths of Correlation Coefficients

Strength	Interpretation
<.20	Very low correlation, slight, almost negligible relationship
.20 - .40	Low correlation, definite but small relationship
.40 - .70	Moderate correlation, substantial relationship
.70 - .90	High correlation, marked relationship
>.90	Very high correlation, very dependable relationship

Source: Guilford and Fruchter, 1973.

The stepwise regression analysis revealed that the six independent variables together explained 76.30 percent of the variance in the dependent variable, which was highly significant, as indicated by the *F*-value. An examination of the *t*-values indicated that all six independent variables significantly contributed to the dependent variable (Table 4.23). The unstandardized coefficients column yielded a constant term (.008) and unstandardized coefficients (.521, .458, .382, .223, .152, and .096) for the six independent variables.

Table 4.23 Logistics Contracting Effectiveness Stepwise Regression Analysis

Variable	Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.
	B	Std. Error			
(Constant)	.008	.026		.000	1.000
Long-Term Orientation	.521	.028	.525	18.520	.000
Information Sharing	.458	.029	.454	16.049	.000
Risk Aversion	.382	.029	.376	13.269	.000
Conflict Handling	.223	.029	.218	7.686	.000
Trust	.152	.028	.153	5.403	.000
Proactive Improvement	.096	.028	.097	3.432	.001

R^2 = .763; SEE = .460; F = 159.445; Sig. F = .000

With the results obtained, the proposed explanatory model was revised as follows:

$$\begin{aligned} \text{LogContEff} = .008 &+ .521\text{LongTerm} + .458\text{InfoShare} + .382\text{RiskAve} \\ &\quad (18.520^*) \qquad (16.049^*) \qquad (13.269^*) \\ &+ .223\text{ConfHand} + .152\text{Trust} + .096\text{ProactImp} \\ &\quad (7.686^*) \qquad (5.403^*) \qquad (3.432^*) \quad \ldots\ldots\ldots\ldots\ldots (2) \end{aligned}$$

where

LogContEff = logistics contracting effectiveness
LongTerm = long-term orientation
RiskAve = risk aversion
ConfHand = conflict handling
Trust = trust
ProactImp = proactive Improvement

In terms of explanation, the estimated model indicated two strong influences (long-term orientation and information sharing), three somewhat lesser influences (risk aversion, conflict handling, and trust) and the least influence (proactive improvement). Increases in any of these six variables will result in corresponding increases in logistics contracting effectiveness. For example, given that all other variables are fixed, an increase of one point in the customer's perception of long-term orientation will result in an average increase of about .5 percent in logistics contracting effectiveness.

Apart from explaining logistics contracting effectiveness, the regression coefficients can also be used to assess the relative importance of the individual variables. In such a case, the regression coefficients need to be standardized to allow direction comparison to be made (Hair et al., 2009). From the "standardized coefficients" column, it can be seen that long-term orientation (.525) and information sharing (.454) were the two most important variables, followed by risk aversion (.376) conflict handling (.218), and trust (.153). Proactive improvement, although a significant variable, was notably lower in importance (.097). This was not surprising given its very low univariate correlation with the dependent variable (.085) (Table 4.21). This model can be presented graphically as seen in Figure 4.4.

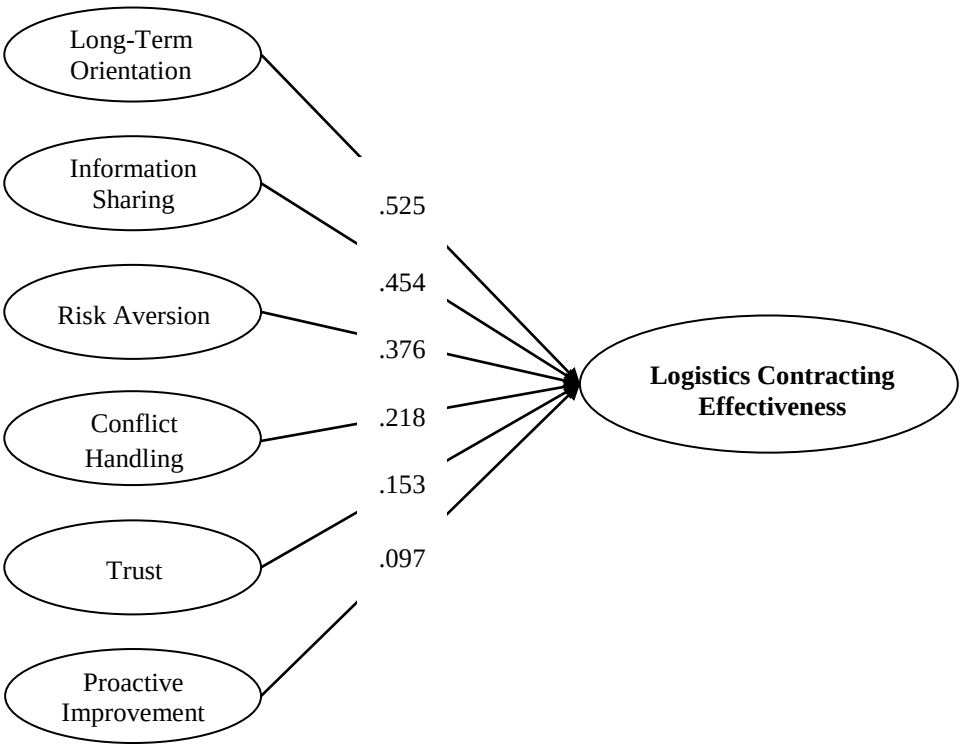

Figure 4.4 Logistics Contracting Effectiveness Explanatory Model

4.5.4 Contrasting the Views of Contractual and Transactional Customers

The overall model discussed above included data on both contractual and transactional customers. Earlier descriptive statistics indicated that there were statistically-significant differences in the level of agreement toward each group of variables between the two types of customer (e.g., contractual customers rated higher on outcome (except cost), long-term orientation and risk aversion items, whereas transactional customers rated higher on trust and proactive improvement items). The researcher was curious how these differences would affect the regression estimations. Hence, a stepwise regression was run for each customer group.

As can be seen in Table 4.24, the stepwise regression model for contractual customers, proactive improvement, the least important variable in the overall model, had the highest positive regression weight in this model (.273), closely followed by information sharing (.271), long-term orientation (.257), and trust with the lowest

weight (.101). Together, these four variables accounted for 50 percent of the variance explained and were significant, as indicated by the *F*-value. Conflict handling and risk aversion did not contribute to the model.

Table 4.24 Stepwise Regression Analysis - Contractual Customers

Variable	Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.
	B	Std. Error			
(Constant)	.602	.046		13.184	.000
Proactive Improvement	.273	.039	.439	7.048	.000
Information Sharing	.271	.041	.411	6.565	.000
Long-Term Orientation	.257	.044	.353	5.890	.000
Trust	.101	.041	.148	2.444	.016
Excluded Variables					
Conflict Handling				.849	.397
Risk Aversion				1.910	.058

R^2 = .501; SEE = .428; F = 39.449; Sig. = .000

The transactional customers model was very different from the contractual customers model (Table 4.25). It included five significant variables, which together accounted for 72 percent of the variance explained. Long-term orientation had the highest regression weight (.371), followed by risk aversion (.310) and information sharing (.295). Proactive improvement and conflict handling had low weights at .150 and .135 respectively. Trust was found to be not significant and was removed from the analysis.

Table 4.25 Stepwise Regression Analysis - Transactional Customers

Variable	Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.
	B	Std. Error			
(Constant)	-.397	.037		-10.628	.000
Long-Term Orientation	.371	.032	.547	11.739	.000
Risk Aversion	.310	.031	.492	9.932	.000
Information Sharing	.295	.032	.449	9.240	.000
Proactive Improvement	.150	.031	.233	0.476	.000
Conflict Handling	.135	.035	.187	3.878	.000
Excluded Variables					
Trust				-0.948	.345
R^2 = .772; SEE = .307; F = 70.647; Sig. = .000					

4.6 Summary

This study had 304 samples classified into 42 small firms, 143 medium-sized firms, and 119 large firms. All of the small firms and the majority of the medium-sized firms used logistics services on a transactional basis, while the large firms were all on a contractual basis. The initial data examination indicated that this sample size was adequate and that the data set was normal. At the multivariate level, the data set also met all of the assumptions required by the two techniques used in this study: factor analysis and stepwise regression analysis.

The factor structure obtained from the principal axis factoring with varimax rotation produced a higher predictive fit (R^2) when used in the subsequent stepwise regression analysis. Stepwise regression analysis revealed that long-term orientation and information sharing had a stronger bearing on logistics contracting effectiveness, followed by risk aversion, conflict handing, and trust. Proactive improvement, although a significant variable, had remarkably very low influence. The stepwise regression run for each group of customer produced different results: for contractual customers, there were four significant variables: proactive improvement, information sharing, long-term orientation, and trust. Conflict handling and risk aversion were not

significant, whereas for transactional customers, risk aversion became the second most important variable, while trust was not significant.

CHAPTER 5

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

The final chapter is divided into seven sections, including this brief introduction. Section two discusses the key results in relation to the literature reviewed in chapter two and the in-depth interviews with six logistics executives (five customers and one LSP). This combination of literature and interviews helped to enrich the interpretation of the results obtained. Based upon the discussion, section three draws conclusions and section four provides recommendations. Section five discusses theoretical and practical contributions of the study. Section six acknowledges the limitations of the study with suggestions for future research. The final section summarizes the chapter.

5.2 Discussion of the Key Results

The current study attempted to answer two research questions, namely:

Q1: What measures logistics contracting effectiveness?

Q2: What factors can logistics managers use to enhance contracting effectiveness?

The first question dealt with the dependent variable. Defined as "an LSP's performance on a contract and the various outcomes customer managers use to measure it," logistics contracting effectiveness was measured with five items drawn from Knemeyer and Murphy's (2004) scale, which reflect the four most frequently mentioned reasons for logistics contracting out: operations improvement (Lynch, 2004), cost reduction realized from LSP expertise and economies of scales (Wilding amd Juriado, 2004), asset reduction (Razzaque and Sheng, 1998), and headcount reduction (Bardi and Tracey, 1991). These five items are:

1) This contract has improved our logistics operations performance.
2) This contract has provided us with more specialized logistics expertise.
3) This contract has reduced our logistics costs.
4) This contract has reduced our level of owned assets.
5) This contract has reduced our employee base.

Table 4.3 presented in the preceding chapter and partially reproduced here as Table 5.1 shows the mean scores of the above five items.

Table 5.1 Mean Scores of the Dependent Variable Items

Variable	Mean Scores			Sig. (2-tailed)
	Overall N = 304	**Contract N = 162**	**Transact N = 142**	
Highly Agreed				
V5 Improved logistics operations	6.76	7.61	5.78	.000
V6 Specialized logistics expertise	6.93	7.45	6.33	.000
Agreed				
V7 Reduced logistics cost	4.41	4.08	4.80	.000
Somewhat Agreed				
V8 Reduced owned assets	3.67	4.85	2.33	.000
V9 Reduced employee base	3.92	5.08	2.59	.000

Overall, the customers appeared to be satisfied with their logistics service experience. They agreed highly that the logistics contract provided them with more specialized logistics expertise and improved their logistics operations performance. While they agreed that the contract helped lower their logistics cost, they did not seem to be able to reduce much owned assets or headcounts. The experience of Company L1's logistics director helped explain the above:

> We thought about outsourcing fifteen years ago when we were hard hit by the Tom Yum Kung crisis. At that time our senior management talked much about "downsizing" and "core competency." By contracting out some noncore activities, the company thought they should be able to

> reduce the number of employees on the payroll. We worked out a few projects, say production warehousing, finished goods warehousing, and featuring [the last stage of the product assembly process before shipping the item to the customer], and decided to go ahead with the production warehousing as a trial project. Cost, staff and asset reductions were the three main objectives.
>
> However, it turned out using an LSP was more expensive. This is because we used a dedicated facility and the contract was on a cost-plus basis – the provider detailed out all their cost items such as warehouse rent, moving equipment, office equipment, insurance, etc. plus their management fee and billed these to us on a monthly basis. And because the project was not that big we were able to reduce only about 30 staff. Comparing to the total 5,000 staff we had, I would say 30 was really negligible.
>
> But the provider has a more sophisticated warehouse management system. This system allows us to view and manage our inventory on a real-time basis. This not only helps eliminate excess stock problem, but also enables us to follow FIFO (first-in, first-out) in issuing parts and materials to the production line. Our quality assurance is very fond of this system.

Another case, that of Company M1, reaffirmed the above. The logistics manager disclosed his experience:

> We produce a range of electronic products from three factories. Although each factory produces different products, there are a number of common parts and materials that can be used by all factories. Prior to using this LSP's warehouse, each factory had its own warehouse and inventory control system. Common parts or materials at one factory could not be used by the others due to inventory invisibility. Realizing this situation, our management decided to house all three factories' parts and materials at an LSP's warehouse.

> By using the LSP's [multi-client] warehouse managed by a single warehouse management system (WMS), inventory became visible to all three factories, so called "single window." We now have a more coordinated, integrated inventory control, and, of course, efficiency in both operations and cost. The purchasing department is now able to issue a single order to cover the requirements of all three factories. Suppliers can send in larger quantity per order to one location, instead of previously three separate smaller shipments to three locations.

Transactional customers are small- and medium-sized manufacturers. Because their logistics activities are less complex, coupled with limited resources, they seek standard services from LSPs from the beginning of their operations. These were the reasons why they reported significantly lower agreement on all outcome items, except cost, as one sales manager at Company S1 explained:

> We used [company name]'s transportation service since the beginning. It was a simple operation – the LSP's [four] boxed pick-up vans come to pick up our products and deliver them to our customers once a day. This does not require high expertise. Should we want to do this ourselves, we would need to purchase may be two boxed pick-up van and hire two or three drivers, and these will become our fixed cost. Comparing to using an LSP, I will say it is cheaper. Let me add that because our industry is very volatile, our customers from time to time require urgent orders. Using an LSP is very helpful because they can provide extra vans at short notice.

The second research question dealt with the independent variables. Through the literature reviewed, thirteen factors that might influence the level of logistics contracting effectiveness were identified. These included two *ex-ante* factors, namely: top management championship and contract specificity; and eleven *ex-post* factors: performance monitoring, incentives and penalties, proactive improvement, contract-specific investment, continuity, trust, information sharing, joint problem solving, risk aversion, conflict, and means for resolving contract disputes. Based upon the pretest

results, the two *ex-ante* factors and two *ex-post* factors (incentives and penalties, and means for resolving contract disputes) were removed and one new factor, "service recovery," was added. As a result, a total of ten factors (31 measurement items) were tested in the final questionnaire.

Factor analysis regrouped the items to form a new six-factor structure and subsequent stepwise regression analysis revealed that these factors were significant contributors to logistics contracting effectiveness: long term orientation (regression coefficient = .525), information sharing (.454), risk aversion (.346), conflict handling (.218), trust (.153), and proactive improvement (.097). However, when analyzed separately by type of customer, for the contractual model, only four factors were found to be significant: proactive improvement (.273), information sharing (.271), long term orientation (.257) and trust (.101); on the other hand, for the transactional model, there were five significant contributing factors: long-term orientation (.371), risk aversion (.310), information sharing (.295), proactive improvement (.150), and conflict handling (.135). These are presented in tabular form in Table 5.2.

Table 5.2 Significant Contributing Factors to Logistics Contracting Effectiveness

Factor	Standardized Coefficient		
	Overall	**Contractual**	**Transactional**
Long-term orientation	.525	.257	.371
Information sharing	.454	.271	.295
Risk aversion	.376		.310
Conflict handling	.218		.135
Trust	.153	.153	
Proactive improvement	.097	.273	.150

5.2.1 Long-Term Orientation as a Contributor to Logistics Contracting Effectiveness

Long-term orientation was the strongest predictor of logistics contracting effectiveness in both the overall and transactional models, and the third strongest in the contractual model. Long-term orientation refers to the degree to which the parties are willing to continue their relationship into the future. Overall, it was the strongest factor influencing logistics contracting effectiveness. Table 5.3 shows that contractual customers had higher mean scores on all five long-term orientation items than transactional customers.

Table 5.3 Mean Scores Comparison – Long-Term Orientation

Long-Term Orientation Items	Mean Scores	
	Contractual	**Transactional**
Customer will outsource more activities	6.76	4.23
Customer will continue using the current LSP	6.34	5.03
The LSP adapts its procedures.	5.90	2.78
The customer is willing to invest in the relationship	5.59	3.42
The LSP makes a large investment	5.14	3.11

Contract logistics usually requires high contract-specific investment in physical, human (Williamson, 2008) or intangible assets such as procedures and systems (Large et al., 2011) to meet the specific requirements of the customer. According to transaction cost theory (Williamson, 1979), this creates considerable switching costs for both the LSP and the customer. To woo the LSP to invest in idiosyncratic assets, the customer has to assure its LSP that the relationship will be continued. This actually benefits both—the LSP has "more years" to depreciate the assets, and accordingly charges lower fees to the customer, as the logistics director at Company L1 described:

> At first, the contract was valid for three years. So the LSP depreciated all the assets based on three years and their prices came out to be shockingly high. We argued with them that for some types of assets, depreciation period should be at least five years. They needed some sort of assurance

> that these assets will be used for longer than three years. So we changed the contract to be three years, renewable for up to one year; and made a gentleman's agreement that we will renew the contract twice.

Investments in contract-specific assets can result in interdependency (Skjoett-Larsen, 2000). Higher asset specificity leads to higher interdependence between the customers and the LSPs. For both parties in such a situation, transaction cost theory suggests the practice of joint investment as a way to sustain an effective working relationship (Williamson, 1985). Company L2 provided a good example for this:

> The initial contract was for three years on a build-operate-transfer basis. We provided [onsite] warehouse space and utilities. The LSP acquired the necessary warehouse equipment such as rack, forklift, and computer hardware. The LSP charged back all these costs on an amortization basis plus their management fee on a monthly basis. When the initial contract expired, they transferred all the equipment to us. And in the subsequent contract, they charged only the warehouse management fee.

Transactional customers handle most of their internal logistics activities (e.g., warehousing) by themselves and purchase external logistics services (e.g., freight forwarding) from LSPs. This was clearly reflected by the significantly lower mean scores of all five long-term orientation items as compared to the contract mode. However, the highest coefficient magnitude suggested that transactional customers viewed long-term orientation as the most important factor influencing the level of logistics contracting effectiveness. This result is consistent with social exchange theory and resource-dependence theory (RDT). Social exchange theory posits that in a successful relationship, exchanging parties realize the need to reciprocate the benefits they receive from the other party to ensure that they continue receiving them. Through these repeating reciprocating actions, they demonstrate their commitment to the relationship (Moore and Cunningham, 1999). According to the perspective of RDT, in an unstable factor market, firms will connect with important production factors to form a cooperative relationship (Pfeffer and Gerald, 1978). In the logistics service industry,

supply and demand can be seasonal and sometimes change in the opposite direction. For example, air cargo payload can be very limited during winter due to head winds while customers demand more capacity to meet the pre-Christmas sales rush. To ensure that they can get the needed air cargo space during the peak season, transactional customers adopt a relational approach, seeking to establish a longer-term relationship with one or a few LSPs to lock in their capacity. A sales manager at Company S1 disclosed:

> Forwarders like and will commit valuable capacity only to high [freight] volume shippers. This becomes a problem for smaller companies that have limited amounts of freight. To cope with this problem, we move all our freight via only one forwarder so that we can generate enough and consistent volume during the lean period and use this to leverage with the forwarder for the needed [air cargo] space during the upcoming peak period and lower rates for the next lean period.

This single-sourcing strategy seems to be consistent with RDT, which argues that the dependent organization may secure the flow of needed resources (which in this case is air cargo space) through the exchange of other valuable goods (consistent volume of cargo). However, RDT also warns that an organization should also cultivate alternative sources of supply (Casciaro and Piskorski, 2005). By putting "all their eggs in just one basket" is not Company S1 putting itself in a vulnerable position? The sales manager there explained:

> We thought about that. But freight forwarding is basically a very much standard service. Of course we would not switch to a new LSP during the peak period – they all have to take care of their regular customers first. Even in the case they have some leftover capacity, they will charge you premium price. Comparing overdependence [on a single forwarder] and space guarantee, we will say the latter is more important.

5.2.2 Information Sharing as a Contributor to Logistics Contracting Effectiveness

For the current study, information sharing had the second strongest bearing on logistics contracting effectiveness overall and for the contractual models, and the third strongest for the transactional model (see Table 5.2, page 118). Table 5.4 shows that the contractual customers had higher mean scores on all six information sharing items than the transactional customers.

Table 5.4 Mean Scores Comparison – Information Sharing

Information Sharing Items	Mean Scores	
	Contractual	**Transactional**
Each party provides useful information	7.45	6.77
Together identify problems	7.02	5.82
The LSP provides operational information	6.92	4.81
The customer informs in advance	6.41	5.38
The customer provides operational information	4.86	3.65
The LSP provides summary reports	3.44	1.92

Information sharing is one of the important factors influencing trust between firms (Ross et al., 2007) and the effective and efficient management of any interorganizational relationship (Tian et al., 2008). Relational exchange theory posits that information sharing is one key determinant in efficient contract governance (Artz and Brush, 2000), and principal-agent theory further argues that information sharing reduces information asymmetry (Arrow, 1985), which in turn develops trust (Dyer and Chu, 2000). The results of this study clearly showed that both contractual and transactional customers realized the importance of open communication and cooperation between the customer and its LSP, as evidenced by the highest mean scores of items "each party provides useful information" and "together identify problems." This goes beyond the routine exchange of operational information, e.g., daily stock balance report, as reflected by the lowest rating on the item "LSP provides summary reports."

However, Doney and Cannon (1997) pointed out that sharing sensitive information, although necessary for both strategic and operational coordination among logistics partners, can put a company in a vulnerable position. This explains why the item "customer provides operational information" had the second lowest rating on the part of both contractual and transactional customers. Li (2002) indicated that the greatest concern is information leakage. This is particularly the case of an LSP serving several competing customers, as the logistics director at Company L1 affirmed:

> Our LSP also operates a production warehouse for one of our main competitors. Although the two warehouses are quite far apart and operated by two different teams of staff, we were very much concerned about the possibility that our proprietary information may be leaked to the competitor. That is why we have a confidentiality clause in the service contract.

Although sharing sensitive information is risky, it is nevertheless necessary for both the strategic and operational coordination between the customers and their LSPs. Mohr and Spekman (1996) suggested that both parties jointly set information sharing objectives, and determine the quality of the information and the extent of the sharing of information.

5.2.3 Risk Aversion as a Contributor to Logistics Contracting Effectiveness

Considering the role and the complex linkages that logistics functions have with other functions within and between firms, outsourcing them to LSPs raises many concerns. One of the most frequently cited concerns is service quality (Aghazadeh, 2003). In logistics services, the LSP's level of risk aversion is related to its attitudes toward risk, which may cause quality related problems with the services provided to customers. Risk-averse LSPs are more likely to invest in quality management practices and related preventive activities to reduce the risk of quality problems and

failure, and to improve their capability of providing better quality to customers (Starbird, 1994).

Due to their size and complex logistics operations, contractual logistics customers seek dedicated, customized logistics services from large international, usually asset-based, LSPs with a long-term agreement. International LSPs, operating and competing globally, realize the importance of quality management and are more likely to apply strict quality control procedures, hiring quality control personnel and investing in more expensive, higher-quality equipment. In other words, they are willing to pay more to avoid risks. Transactional customers seek standard services mostly from local LSPs for a shorter period of time. Local LSPs, due to their smaller size, limited scope of operations and resources, are less likely to be able to invest in quality management practices. These differences explain why contractual customers rated statistically significantly higher than transactional customers on all four risk aversion items (Table 5.5).

Table 5.5 Mean Scores Comparison – Risk Aversion

Risk Aversion Items	Mean Scores	
	Contractual	**Transactional**
LSP invests in quality management practices	7.47	6.10
LSP uses higher-quality equipment	7.54	6.02
LSP applies strict quality control procedures	7.60	6.65
LSP is skilled to handle unexpected problems	7.70	6.74

Risk aversion deals with the LSP's operational performance, which is considered only as an "order qualifier" (Stank et al., 2003), meaning that it does not distinguish a particular LSP from its competitors. Contractual customers themselves, having enormous resources, also invest in quality management practices and use higher-quality equipment. Thus, when other factors were taken into the equation, risk aversion lost its insignificance for contractual customers. The logistics director at Company L1 shared the following:

> The brands of the equipment our LSP uses are well recognized in the market. We used the same brands when we were insourced. I know other [large] LSPs are using equivalent specification.

> Our quality assurance department developed the warehouse quality control procedures together with the LSP and conduct uninformed quality checks every now and then making sure that they strictly adhere to the procedures.

On the other hand, transactional customers, being small-sized local firms, lack the knowledge and resources to acquire higher-quality warehouse equipment. This explains why risk aversion is strongly significant for them. The logistics manager at Company M1 provided a view from a medium-sized firm:

> Our warehouses were very small and conventional. Each had a few rows of two-level rack and only one stacker. When the stacker was out or order, our warehouse men had to climb the rack to retrieve the goods. It definitely cannot be compared to the LSP's warehouse. Their system [WMS] and movement equipment are impressive.

5.2.4 Conflict Handling as a Contributor to Logistics Contracting Effectiveness

Very few logistics relationships work smoothly without any conflict between the contracting parties. At some point during the life of a contract, a conflict is likely to arise. This usually occurs due to poor performance by the LSP (Fernandez, 2005). As an industrial, business-to-business (B2B) service, logistics services are somewhat intangible and subjectively experienced processes, and in many cases, production and consumption activities take place simultaneously. The literature suggests that intangibility causes performance ambiguity, which in turn makes it difficult to judge how well an LSP performs (Bowen and Jones, 1986; Hill, Baer and Kosenko, 1992).

Table 5.6 Mean Scores Comparison – Conflict Handling

Conflict Handling Items	Mean Scores	
	Contractual	**Transactional**
Conflict, on the whole (reverse-scored)	4.00	4.87
Organizational conflict (reverse-scored)	2.88	3.96
Interpersonal conflict (reverse-scored)	4.30	4.59
Customer discloses expectations	6.41	5.37
LSP makes special efforts to handle unexpected problems	6.36	5.37
Together solve problems	6.60	5.59

The results in Table 5.6 indicate that contractual customers had statistically significantly lower mean scores on the three conflict level items, and higher mean scores on the three conflict-solving items. The logistics director at Company L1 believed that this was due to the long-term nature of contract logistics. She shared her experience as follows:

> We outsourced our warehousing operations to this provider fifteen years ago. It was difficult and had a lot of problems at the beginning, but we were able to sort them out one by one along the way.
>
> As part of the staff transfer agreement, the LSP recruited some of our warehouse operators. The new LSP warehouse used WMS (warehouse management system) which automatically assigns location to put-away a new receipt or pick up an order. Although they trained our staff but you know old habits die hard. These operators still put-away or pick-up materials to or from the locations that are convenient to them, not the locations indicated in the tally sheet or pick ticket. Say, an operator was supposed to pick a material from location A10 according to the pick ticket, yet walking down the aisle he saw the same part in location A3, so he picked up the part from A3 so to save him a few steps to location A10. Some of the operators did this even if they realized that it could cause

> storage inaccuracy (physical locations of the goods do not match with those in the system) and, worst of all, FIFO violation. And because of storage inaccuracy the provider could not find the part where it was supposed to be but walked around the warehouse looking for it. This really did not look professional and it caused delay in delivering the parts to the production line.
>
> Line switching or line down is costly. We hit the provider really hard. They boasted about how sophisticated their WMS was. We thought it did not live up to their claim. The provider deployed a number of auditors to the warehouse and caught the operators in the act [laugh]. After we found out that the real root cause was the staff, not the system, the LSP manager and our logistics manager held a meeting with all operators, they were still loyal to their ex-boss rather than the LSP manager, reinstructing them to strictly follow the instruction given in the pick ticket. It took almost a month to reconcile the stock, but the situation greatly improved.
>
> Rumor had it that our logistics manager had incited the operators to be 'insubordinate' to their new manager. I talked to him and he admitted that he felt threatened when he learned about the company's decision to outsource the production warehouse to an LSP. I told him that the project was critical to the company. Sabotaging it would harm everybody, including him and me, not just the provider. The only thing we could do is to make it work.

As Sophocles, one of the great tragedians of ancient Greece, said: "Time eases all things." The incidents described above reaffirm Bradley's (1994) notion, that a long-term relationship provides the required transition time to improve the business; and the idea of Sclar (2000), that when the parties to a contract realize that they have no viable alternative to working together cooperatively, they begin to adjust flexibly to one another.

Given the substantial negative impact that conflict has on overall logistics contracting effectiveness, it needs to be managed effectively. Mohr and Spekman (1994) argued that when conflicts arise, the manner in which the parties solve them is important. It is essential that the parties not blame each other but rather try to discover a solution to the problem and to take preventive action ensuring that the problem will not come up again. The highest mean score in both the contractual and transactional models certainly support the above argument. When parties engage in joint problem solving, a mutually-satisfactory solution can be reached, thereby enhancing the perceived success of the relationship. The highest mean scores of the item "together solve problem" in both the contractual and transactional models in this study certainly supported the above argument. The logistics director at Company L1 provided a real life example:

> During those few weeks line-down because of parts delay problem. We asked the production lines to release some of our ex-warehouse operators and sent them to the LSP warehouse to help them searching for the parts, even though at that time we thought it was due to the failure of the LSP's system. The LSP themselves also mobilize operators from other warehouses. It took us almost a month to reconcile the inventory.

The literature suggests that a high level of conflict combined with a good relationship can translate into functional conflict (Pondy, 1967), which can serve as an interactive tool for improvement (Gadde and Hakansson, 1993). The logistics director at Company L1 provided the following comment:

> We positioned two of our staff, the logistics manager and his assistant, at the LSP's warehouse to coordinate with and monitor the LSP. After that incident, the rumor that I mentioned, we were quite worried that they would not be able to get along well. The LSP manager proved to be very professional and his let-bygones-be-bygones attitude was 'constructive.' And you know what, after a few months there, our manager realized that

> this contract actually provided him with a chance to learn new logistics technology and practices.

The literature also suggests customers to fully disclose their expectations and to work together with the provider to solve a problem, and that LSPs should be prepared to make special efforts to handle unexpected problems. The logistics director at Company L1 added the following:

> It was our first outsourcing project. We did not know exactly how to evaluate third-party warehouse operations, so we asked every department concerned (e.g., material planning, Board of Investment liaison, production, etc.) to submit the indicators they would like to use to evaluate the LSP. Everybody was enthusiastic and we had a very large set of KPIs. The LSP grouped the KPIs, prioritized them, and came back to us asking us to remove those not really useful indicators and they should be measured only what they are responsible for. I will say through these rounds and rounds of discussion, we learned what is expected of each other.

Conflict handling remained a significant contributing factor in the transactional model, although it had the lowest strength. Because of their limited knowledge of logistics management practices, they might not have been able to realize and express fully their requirement to the LSP. This causes ambiguity, and in turn raises the likelihood of conflict and hinders the ability to coordinate activities (Luo, 2002). This was evidenced by the significant lower ratings on the three conflict-solving items and higher ratings on the three conflict-level items.

5.2.5 Trust as a Contributor to Logistics Contracting Effectiveness

Trust is the willingness to rely on an exchange partner in whom one has confidence (Moorman et al., 1992). Prior studies have suggested that the confidence on the part of the trusting party results from the firm's belief that the trustworthy party is reliable and has high integrity, which are both associated with such qualities as

consistency, competence, responsibility, honesty, fairness, helpfulness and benevolence (So and Sculli, 2002). Compared to contractual customers, transactional customers reported significantly higher agreement on all four positive items and significantly-lower agreement on the reverse-scored item (Table 5.7).

Table 5.7 Mean Scores Comparison - Trust

Trust Items	Mean Scores	
	Contractual	**Transactional**
LSP stays within terms	4.33	5.82
Access to LSP's quality information	4.34	5.79
Customer is confident in LSP's qualifications	4.38	6.30
LSP provides a dedicated team	4.49	5.75
Customer measures LSP's performance (reverse-scored)	5.68	3.15

Customers choose their LSP based on a number of criteria, one of which is the professionalism and skills of the LSP. The results indicated that transactional customers had high competence trust in their LSPs. They realized that their LSPs had the knowledge, skills and experience to handle their logistics activities. Compared to larger international LSPs, small local LSPs are better able to personalize their interactions with their customers. This makes the customers feel as if they are provided with a dedicated staff that is prepared to make special efforts to solve their problems in a professional way. Principal-agent theory posits that access to information helps reduce information asymmetry and improve transparency. When information asymmetries are low, high levels of trust are believed to develop (Dyer and Chu, 2000). The transactional customers reported they had convenient access to their LSP's quality information, and this in turn fostered their trust in the integrity of their LSPs. Having high levels of both competence trust and trust in integrity, transactional customers find it less necessary to monitor their LSP's operational performance.

The literature reports that the customers' trust in their LSPs has a significant and positive influence on their commitment to the outsourcing relationship (Tian et al., 2008). This surely was the case here, as more than 50 percent of transactional customers renewed their contracts with their previous LSPs. The literature also reports that the length of the outsourcing relationship between the customers and LSPs has a significant and positive influence on customers' trust in the LSPs (Tian et al., 2008). Thus these two factors, trust and the long-term relationship, have a reciprocal influence on each other. Transactional customers seek services from LSPs on an *ad-hoc* basis or a short-term contract, usually one year or less. For this study, about ten percent of them were first-time users, and 36 percent switched to a new LSP after the previous contract expired. Because of this short-term relationship, trust between both parties may have not been fully established. This could be the reason why trust was not a significant contributing factor as perceived by transactional customers. On the contrary, the contractual customers outsource part or all of their logistics activities to LSPs on a long-term basis, usually one to three years. For this study, 90 percent of the contractual customer renewed their contracts, demonstrating their continuance commitment to their LSPs. Such commitment can cause increased coordination between the customer and the LSP, enabling them to experience increased closer integration (Brown et al., 1995). This explains why for the contractual customers, even though they reported significant lower agreement on the four positive items and higher on the reverse-scored item, trust remained a significant contributing factor.

5.2.6 Proactive Improvement as a Contributor to Logistics Contracting Effectiveness

Proactive improvement was the strongest factor influencing logistics contracting effectiveness in the contractual model, but lost much of its strength in the overall and the transactional models. This factor has long been recognized in the service industry as potentially a very effective strategy to satisfy customers and to increase loyalty (Beverland et al., 2007). Regrettably, most LSPs have traditionally taken a rather reactive approach. Changes in the service delivered to customers are primarily made in response to the customers' requests and are not proactively initiated by the LSPs (Wallenburg et al., 2010). Prior studies have found that customers expect their LSPs

to drive service innovation continuously and thereby increase the value provided to their customers (the end-customers) (Flint et al., 2005). For the current study, both contractual and transactional customers agreed that their LSPs were proactive (Table 5.8).

Table 5.8 Mean Scores Comparison – Proactive Improvement

Proactive Improvement Items	Mean Scores	
	Contractual	**Transactional**
LSP shares its best judgment	5.08	5.63
LSP suggests improvement	4.15	5.18
LSP makes processes more effective	4.10	5.16
LSP modifies its processes	3.82	5.32

The item "LSP shares its best judgment" had the highest mean score. This item was originally designed to measure "trust in integrity" (Komiak and Benbasat, 2004). The inclusion of this item in the proactive improvement factor (as suggested by PAF/Varimx analysis) suggested that trust and proactive improvement are interrelated—a certain level of trust is required for the customer to believe that the LSP's proposed change is the best alternative and is useful and necessary. Furthermore, for proactive improvement to foster trust, the proposed change should also be in the best interest of the customer, not the LSPs themselves. The logistics manager at Company M2 shared his experience:

> We used an LSP's six-wheeler truck to transport our products from our Rojana factory to our customer's factory in Prachinburi and pick up recycling empty trays from that factory back to us. They charged us six-wheeler round trip. Later the LSP came to us proposing using a smaller pick-up van for the return trip citing the much smaller volume of the empty trays. They gave us a small discount. How thoughtful they were to help us reducing our costs. But later we came to know that the actual motive was that they wanted to use the six-wheeler truck to pick up shipment from

> another customer in the same industrial park. So it really was more for their own benefit, not ours.

The incident described above can certainly result in distrust. According to Lewicki and Bunker (1995), distrust can be viewed as confident negative expectations toward other partners. It needs to be stressed here that distrust is not analogous to low levels of trust (McKnight and Chervany, 2001). This is mainly because trust and distrust are typically separate and appear to have somewhat different determinants and consequences. Having low trust in an LSP may indicate that the customer may not want to do any business with this LSP, whereas to have the disposition to distrust an LSP means that the customer is suspicious of the LSP's intention.

Proactive improvement seems to be based on both the willingness of the LSPs and the empowerment of the customers (Wallenburg et al., 2010). Due to the customers' high involvement in their LSPs' service delivery processes, contract logistics can be considered a high contact service (e.g., onsite warehousing) where customer managers and employees participate in the production processes at least to some extent. Also, due to the complex linkages that the logistics function has with other functions within and between firms, changing a logistics process will necessitate changes in other functions accordingly. Thus, LSPs rarely modify the processes by themselves, unless it is really useful and necessary. Even if this is the case, they still have to obtain their customers' consent before implementing such change. The key account manager at Company LSP1 provided an example:

> We operated an FGI (finished goods inventory) warehouse for a customer for a few years and later they awarded us also some of their airfreight shipments. We thought of automating the export documentation processes by linking the FGI warehouse management system to the cargo management system (CMS). This could help save us a huge amount of time. However, the customer disagreed. Because they used the same KPIs to evaluate all their airfreight forwarders and they thought such linkage would be unfair to other forwarders who had to manually key in shipment details into their system.

For the transactional customers, first, being less sophisticated in logistics operations, they thus rely more on their LSPs' expert advice and suggestions. Secondly, most if not all of their outsourced logistics activities are performed outside their premises (e.g., using the LSP's multi-client warehouse); thus they are less involved in intermediate activities and focus more on outcomes (e.g., on-time delivery) in evaluating their LSPs. This could be the reason why they perceived their LSPs to be more proactive.

5.3 Conclusions

The current trend of changes in global business has highlighted the importance of logistics in the wider economy of Thailand, and the challenges faced by LSPs. There are four stages of logistics development: (1) Physical distribution—where firms focus only on the outbound flow of finished products from the end of the production line to the consumers; (2) internal integration—in which physical distribution functions are integrated with pre-production activities such as material sourcing and work-in-process inventory to form end-to-end material flow management; (3) external integration—extends the concept beyond one firm to all firms involved in the whole supply chain; and (4) global logistics—firms source parts and components in different countries for assembly in another country into products destined for markets in several others (Ojala et al., 2006). According to Kamonchanok Suthiwartnarueput (2007), Thailand is still at the lowest level of logistics development—physical distribution. This is largely due to the lack of advanced technologies and sophisticated logistics practices (Liu, 2012). The Thai government has taken an integrative approach, encouraging Thai companies, particularly the small- and medium-sized enterprises, to invest in more advanced logistics management, i.e., internally-integrated or externally-integrated logistics.

Accordingly, Thailand's logistics development strategy (2007 – 2011) set out five strategic agenda: (1) business logistics improvement; (2) transport and logistics network optimization; (3) logistics service internationalization; (4) trade facilitation enhancement; and (5) capacity building. The first agendum encourages firms to

contract out logistics activities to LSPs (NESDB, 2007). Logistics outsourcing is still not very common in Thailand. Multinational companies, having exposure to more advanced logistics practices (e.g., externally-integrated or global logistics), better understand the strategic benefits of contract logistics. On the other hand, large local companies are somewhat skeptical and are willing to contract out only some external logistics activities—those performed outside their premises such as transportation and freight forwarding—and keep the internal or onsite functions (e.g., production warehousing, logistics administration) in-house. For small- to medium-sized local firms, the understanding is even less because the scale of operations is limited, making benefits less discernible (Logistics Bureau, 2002). Although logistics services have expanded to cover newer, higher value-added activities such as final assembly, transportation and warehousing remain the two most frequently outsourced logistics functions (Coyle et al., 2013).

Drawing from the literature, thirteen factors that might influence the level of logistics contracting effectiveness were identified. They include two *ex-ante* factors, namely, top management championship and contract specificity; and eleven *ex-post* factors: performance monitoring, incentives and penalties, proactive improvement, contract-specific investment, continuity, trust, information sharing, joint problem solving, risk aversion, conflict, and the means for resolving contract disputes. The pretest respondents suggested that the two *ex-ante* factors and two *ex-post* factors (incentives and penalties, and means for resolving contract disputes) were to be removed and one new factor, "service recovery," was added. Consequently, a total of ten factors consisting of 31 items were tested in the final questionnaire. The factor analysis reclassified some of the items and reduced the number of factor to six: long-term orientation, information sharing, risk aversion, conflict handling, trust, and proactive improvement. The subsequent stepwise regression analysis indicated that these six factors were significant contributors to logistics contracting effectiveness.

The conventional approach, particularly the principal-agent theory, emphasizes the importance of discrete, arms-length transactions between a principal and an agent. The relational approach, however, has a different set of propositions about what influences success in contracting for services. According to this newer perspective, the determinants of a successful contractual relationships include trust, frequent

communication between the parties, and efforts by the parties to work together to solve problems and address disturbances in the relationship (Fernandez, 2005). Examining the content of the six factors, this study very much supported the relational approach—successful logistics contractual relationships are generally not discrete, arms-length transactions, but tend to be based on trust and managed in a collaborative manner.

Overall, long-term orientation had the strongest contribution to logistics contracting effectiveness. It indicated the degree to which the customers and LSPs were willing to continue their relationship into the future. Situations involving large specialized investments have a "lock in" effect (Williamson, 1985). The idiosyncratic nature of the investments makes it difficult for the LSP to transfer the assets created from these investments to another contract without incurring significant costs. On the other hand, switching LSPs can also be an expensive proposition for the customer, since the current LSP has already invested in and developed specialized physical, human, and technological assets and therefore can provide the service for less than a new provider that would have to incur the cost of these assets for the first time. For both parties in this situation, therefore, preserving the relationship over a long period serves as a means of economizing on transaction costs. A long-term relationship also nurtures a climate of trust and commitment (Dwyer et al., 1987; Holcomb and Hitt, 2007). Principal-agent theory explains that when principals and agents engage in long-term relationships, the principals will learn more about the agents and thus be able to assess the agent's behavior more readily.

Information sharing was the second strongest contributor to logistics contracting effectiveness. Information sharing is the expectation that the parties will freely and actively provide useful information to each other. Information sharing is a key determinant of efficient contract governance (Artz and Brush, 2000). It helps to reduce information asymmetry (Arrow, 1985), which in turn develops trust (Dyer and Chu, 2000). Sharing information can serve as a signal of the honesty and openness of LSPs, improve the LSPs' transparency, and reduce relationship risks. With respect to logistics service quality, LSPs can better plan their operations if they can gain more visibility of the business operations of their customers. This should result in better service and possibly lower costs—a savings that could then be passed on to the

customers. However, customers can be reluctant to share critical information with their LSPs. This is particularly the case when an LSP serves two or more competing customers. It is suggested that the customer and its LSP should jointly set the information sharing objectives, and determine the quality of the information and the extent of the sharing of information (Mohr and Spekman, 1996).

The third contributor to logistics contracting effectiveness was risk aversion. In logistics services, the LSPs' level of risk aversion is related to their attitudes toward risk, which may cause quality-related problems with the services provided to customers. Because risk-averse LSPs dislike risk, they are more likely to invest in quality management practices and related preventive activities to reduce the risk of quality problems and failure, and to improve their capacity of providing better quality to customers (Starbird, 1994). Interestingly, risk aversion was the second strongest significant predictor in the transactional model, but was not at all significant in the contractual model. Examining the mean scores of the items constituting this factor revealed that contractual customers had significantly higher ratings on all items. This indicated that contractual customers perceived their LSPs to be performing much better in this area than transactional customers. One plausible explanation is that although their LSPs use higher prices, better-quality equipment, the contractual customers themselves, being large corporation, also have the capacity and actually had invested in high-priced equipment before when they were insourced. Consequently, they perceived high-quality equipment as just a necessary "order qualifier," but not a sufficient "order winner." On the other hand, transactional customers lack the resources to acquire higher-quality equipment themselves, and thus have higher expectations for their LSPs to provide it for them.

Conflict handling was the fourth contributor to logistics contracting effectiveness. Conflict is a situation in which one party perceives that its interests are being opposed or negatively affected by the other party (Wall and Callister, 1995). Conflict exists in many business relationships. In the context of logistics outsourcing, conflict not only can stress the relationship between LSPs and customers, but also threatens the level of service the customers (user-customers) subsequently offer to their customers (end-customers). Customers can no longer take a passive role and let their LSPs tackle problems by themselves. It is the work of both parties to reduce the

likelihood of conflict or its consequences. Customers should fully disclose their expectations for quality and service levels, and the standards for measuring performance. This will help avoid poor performance by the LSPs due to task ambiguity. Whenever something goes wrong, LSPs should be prepared to make special efforts and customers should be involved in working together with their LSPs to solve the problem. Such collaboration can help turn a dysfunctional conflict into a functional one. Functional conflict provides many positive results including: awareness of both sides of problems, and improvement of overall morale and working relationships by solving problems together.

The fifth contributor to logistics contracting effectiveness was trust. This study characterized trust as a construct involving two components, namely, competence and integrity. Competence trust refers to the ability of an LSP to perform a task that it says it can perform (Heffernon, 2004). Trust in integrity is the belief that an LSP makes good faith agreements, tells the truth, and fulfills promises (Komiak and Benbasat, 2004). Trust was a significant factor in the overall and contractual models, but lost its significance in the transactional model. One plausible explanation is that in logistics service, trust between customers and LSPs seems to be especially important when there is much at stake for the customers, i.e., high dependence on the LSP due to asset specificity. To safeguard their position, contractual customers tend to be more cautious toward their LSPs and monitor their LSPs' performance more intensely. On the other hand, for transactional customers, although they have a certain level of initial trust in the competence of the chosen LSPs, the short-term nature of their relationships does not allow them enough time to interact with their LSPs and evaluate their behaviors. This might hinder the creation of trust in integrity.

Last is proactive improvement. This factor actually had the strongest bearing on the contractual model. This finding was consistent with prior research, suggesting that the proactive improvement of an LSP has a strong, positive causal effect on the goals of outsourcing arrangements, on both operational and cost performance (Krizman, 2009). While proactive improvement can be a very effective strategy to satisfy customers and increase loyalty, most LSPs still somehow adopt a rather reactive stance (Wallenburg et al., 2010). This study suggests that LSPs should put strong effort into continuously making the logistics processes more effective to meet the ever-changing

environment. Furthermore, LSPs should show initiative by approaching the customers with suggestions based on their best judgment for improvement of the customers' logistics activities, even those outside the LSPs' direct responsibility.

Thirteen hypotheses were proposed in chapter 2, and the 14th was added in chapter 3. The conclusions discussed above supported four hypotheses: H5, H8, H9 and H10. Table 5.9 summarizes the results of the hypothesis tests.

Table 5.9 Hypothesis Tests Results

Hypothesis		Result
H1:	The level of top management championship has a positive impact on logistics contracting effectiveness.	Not tested. Items were removed from the final questionnaire due to respondents' inability to answer.
H2:	The level of contract specificity has a positive impact on logistics contracting effectiveness.	Not tested. Items were removed from the final questionnaire due to respondents' inability to answer.
H3:	The intensity of performance monitoring has a positive impact on logistics contracting effectiveness.	The factor "performance monitoring" was not identified. Originally, there were three measurement items designed to test this factor. However, factor analysis loaded one item onto factor "conflict handling," and the remaining two items onto "trust."
H4:	The use of incentives and penalties has a positive impact on logistics contracting effectiveness.	Not tested. Items were removed from the final questionnaire due to respondents' inability to answer.
H5:	The level of the LSP's proactive improvement has a positive impact on logistics contracting effectiveness.	Supported. One measurement item from "trust" loaded onto this factor.

Table 5.9 (Continued)

Hypothesis	Result
H6: The level of contract-specific investment has a positive impact on logistics contracting effectiveness.	Not identified. Factor analysis merged this factor with "continuity" to form a new factor, "long-term orientation." See H7 and Table 4.8 for an interpretation of the new factor.
H7: The level of continuity expressed by the customer has a positive impact on logistics contracting effectiveness.	Not identified. Items merged with "Contract-specific investment". See H6 above.
H8: The level of trust between the customer and LSP has a positive impact on logistics contracting effectiveness.	Supported. Two items from "performance monitoring" loaded onto this factor.
H9: The level of information sharing between the customer and LSP has a positive impact on logistics contracting effectiveness.	Supported. One item from "joint problem solving" loaded onto this factor.
H10: The level of LSP's risk aversion has a positive impact on logistics contracting effectiveness.	Supported. One item from "service recovery" loaded onto this factor.
H11: The use of alternative dispute resolution has a positive impact on logistics contacting effectiveness.	Not tested. Items were removed from the final questionnaire due to respondents' inability to answer.
H12: The extent of joint problem solving has a positive impact on logistics contracting effectiveness.	Not identified. Originally this factor consisted of two items. One item loaded onto "information sharing" and one item onto "conflict handling."
H13: The frequency of conflict between the customer and LSP has a negative impact on logistics contracting effectiveness.	Not identified. One item each from "performance monitoring," "joint problem solving," and "service recovery" loaded onto this factor to form a new factor, "conflict handling." See Table 4.8 for an interpretation of this new factor.

Table 5.9 (Continued)

Hypothesis	Result
H14: The level of service recovery effort has a positive impact on logistics contracting effectiveness.	Not identified. There were two measurement items for this factor. One item loaded onto "conflict handling" and one item onto "risk aversion."

5.4 Recommendations

5.4.1 Practical Recommendations

The current study identified six factors that need to be considered to improve the level of logistics contracting effectiveness: long-term orientation, information sharing, risk aversion, conflict handling, trust, and proactive improvement. Below are specific practical recommendations based upon these six factors:

1) Customer managers should realize that the use of LSPs should not be interpreted as turning over all logistics activities to an LSP and "that is it." An effective logistics outsourcing requires the work of both the customers and LSPs. Both customer managers and LSP managers should emphasize:

(1) Long-term orientation—this represents the degree to which the contracting parties anticipate that their relationship will continue into the future (Gardner et al., 1994; Heide and Miner, 1992). A long-term relationship not only can persuade the LSPs to invest more in contract-specific assets, but also provides the required transition time to improve the outsourced operations. To strengthen the relationship, each party should develop one-on-one relationships with key members of the other party's staff, including the single point of contact for each firm. This one-on-one relationship should later be upgraded to well-integrated links between the two firms. A healthy logistics contractual relationship needs to include a number of individuals at various levels within the customer and LSP firms. Such increased complexity in a relationship will strengthen bonds and mitigate the potential risk of

turnover. If an inter-firm relationship is based on only two individuals, changing just one player can jeopardize the continuity of the relationship. This means that LSPs need to identify key individuals within the customer firm and foster relationships between peers at the two firms. Such a linkage between various individuals at various levels provides a foundation for stability and longevity in the relationship.

(2) Sharing appropriate information—customers sharing operational information with their LSPs will help the LSPs better plan their operations, resulting in better service and possibly lower costs—a savings that could then be passed on to the customers. Frequent communications and information sharing between the contracting parties are crucial for effective management of logistics outsourcing relationships. The customers and the LSPs should jointly: (1) set information sharing objectives; and determine (2) the quality of the information and (3) the extent of the sharing of information (Mohr and Spekman, 1996). It is also suggested that communication channels in multiple organizational levels be established in order to cover strategic as well as operational information needs.

(3) Managing conflict effectively—conflict can stress the relationship between LSPs and customers, and threaten the level of service that the customers subsequently offer to their customers, the end-customers (Murphy and Poist, 2000). In view of this, to avoid or lessen the impact of conflict, customers should fully disclose their expectations and work together with their LSPs to solve problems; and LSPs should be prepared to make special efforts to handle any unexpected problems.

2) LSP managers should also emphasize:

(1) Enhancing competence trust—this trust covers LSPs' technical, operational, human, and financial abilities. Apart from having knowledge, skills, and expertise in handling the customers' logistics activities, LSPs should be risk averse, and be willing to invest in quality management practices and related preventive activities to reduce the risk of quality problems and failure, and to improve their capacity in providing better quality to customers. LSPs should also be proactive, and consistently improve the services provided to their customers with their own initiative.

(2) Enhancing trust in integrity—integrity is based on experience from the interpersonal relationships between the LSP and the customer and more

especially on their perceptions of each other's past behavior (Komiak and Benbasat, 2004). LSPs can enhance the trust of their customers by being open and effective communicators. Sharing information with their customers helps reduce information asymmetry and improves the LSPs' decision transparency, which in turn develops trust.

5.4.2 Policy Recommendations

The major problems facing Thailand's logistics development are more about the "soft" components of the infrastructure. Specifically, due to the lack of advanced technologies and sophisticated logistics practices, Thailand is still stuck at the lowest level of logistics development—physical distribution. To upgrade Thailand's logistics to a higher level, that is, internally integrated, the Thai government has encouraged Thai companies to contract out their logistics activities to LSPs. These providers have greater expertise and technologies, which enable increased flexibility of logistics operations to cover wider geographical areas, with lower operating costs and better quality service.

As stated, there are six significant factors affecting the level of logistics contracting effectiveness, one of which is "trust." There are two components of trust: competence and integrity. Competence trust develops during the early interaction phase. It covers technical, operational, human, and financial abilities (Heffernon, 2004). It is this trust that woos customers to externalize their noncore logistics activities to LSPs. While the use of LSPs is expected to increase, this industry has encountered one major problem pertaining to labor involved in logistics, that is, shortage of knowledgeable and capable personnel at both operational and tactical levels. In fact, LSP managers find that new graduates lack practical knowledge and skills in logistics management and communication skills (both oral and written, in Thai and especially in English). The only area in which new graduates perform well is computer usage.

In view of the above, this study recommends that policymakers should emphasize:

1) Raising the awareness of Thai manufacturers, particularly the small- and medium-sized companies, about the benefits of internally-integrated logistics.

Apart from regularly conducting awareness-raising campaigns or seminars, a logistics diagnostic center should be established to offer consultation on logistics management, especially for SMEs.

2) Encouraging manufacturers to contract out their logistics activities to LSPs. This will enable them to gain almost instant access to sophisticated logistics expertise and technologies without incurring a large upfront investment, easing the transition moving from physical distribution to internally-integrated logistics. The case of Company M1 discussed in the discussion of the key findings section serves as a good example. A venue should also be available for prospective customers and LSPs to meet and discuss their logistics requirements and appropriate solutions. The Thailand International Logistics Fair (TILOG), organized annually by the Department of International Trade Promotion, Ministry of Commerce, is one good starting place.

3) Producing knowledgeable logistics personnel for both the manufacturing (as in-house administrator) and logistics service industry. Educational institutions should involve these two industries in the design and development of courses/programs in order to meet their specific needs. For vocational educational institutions preparing students for jobs that are based on manual or practical activities, two models of vocational training should be considered: internship and dual vocational training (DVT) systems. The difference between internships and the DVT system is that internships emphasize full-time study and undergoing training at a company for one month (240 hours) or one semester, while the DVT emphasizes both work and study—students study part time at school and work part time in the company throughout the whole program (Duangnapa Mokkaranurak, 2009). To encourage the industry to participate in training (as a trainer accepting an internship or DVT, or sending their employees for further training), tax incentives should be considered. All these require a unified approach from the Ministry of Education, the Ministry of Labor, and the Ministry of Finance, as well as the NESDB, to develop well-coordinated policies to reduce duplication and inconsistencies.

5.5 Theoretical and Practical Contributions

Logistics service, as an area of academic study, has not received the attention it deserves. This study, the researcher believes, is timely and makes a very useful contribution to the discipline. First, this study disagrees with the conventional perspective, led by the principal-agent theory, which stresses the importance of discrete, arms-length transactions between a principal and an agent. The findings in this study support the newer relational perspective, that successful logistics contractual relationships are generally not discrete, arms-length transactions but tend to be based on trust and managed in a collaborative manner.

Secondly, many of the prior works either were descriptive studies of a focal organization (e.g., "Insight from a Logistics Partnership" by House and Stank (2001) and "Logistics Service Quality as a Segment-Customized Process" by Mentzer et al. (2001)), or focused on a single factor (e.g., "The Role of Trust in Supply Chain Governance" by Ghosh and Fedorowicz (2008) and "Developing a Scale for Proactive Improvement within Logistics Outsourcing Relationships" by Wallenburg et al. (2010)). The current study casts the net wider in search of more predictors of logistics-contracting effectiveness. Drawing from the literature and on the insights from customers—the ultimate judge of LSP's performance—the current study empirically developed and tested a 31-item, ten-factor model and was able to reclassify the items into six factors, making the model a desirable parsimonious one.

In addition to the theoretical contributions discussed above, the current study also offers substantial value for policymakers and practitioners. A good understanding of logistics service and the factors contributing to contracting effectiveness should enable policymakers to formulate appropriate strategies to improve the capacity of Thai LSPs and to encourage the use of LSPs to strengthen the logistics capability of Thai companies, particularly the small- and medium-sized firms. Practitioners—both customers and LSPs—can use the six factors to produce better results in the area of logistics contracting.

5.6 Limitations and Future Research

As in all research, the current study has limitations. First, it has a narrow scope, focusing on only the two most outsourced logistics activities—transportation and warehousing—and collected data from only one industry—electronics manufacturing. Each industry has its own unique requirements beyond basic logistics capabilities, so there was a possibility that the results might have varied across industries as well as product categories. It could be argued that the analysis could be better achieved through a much broader scope and industry base. Future research may include other newer services (e.g., parts and service support or final assembly) and expand the industry base to cover other segments (e.g., retail or automotive).

Secondly, the current study was conducted in Thailand, which is considered to be still at the lowest level of logistics development—physical distribution—where firms focus only on the outbound flow of finished products. The generalizability of this study across other levels of logistics development may be limited. It is suggested that future research replicating the current study be conducted regarding the internally-integrated logistics, (e.g., Malaysia) or externally-integrated logistics (e.g., Hong Kong or Singapore) context to see if a different level of logistics development may have any influence on the perception and evaluation of LSP performance.

Thirdly, this study had to exclude two *ex-ante* factors (top management championship and contract specificity) and two *ex-post* factors (incentives and penalties, and means for resolving contract disputes) due to the respondents' inability to answer these questions. The literature argues that *ex-ante* factors are important in setting the groundwork for the relationship. They have as much of a bearing on the outcomes of a contractual relationship as *ex-post* factors. It would be beneficial if future research can identify an adequate number of customer-managers that are knowledgeable about the *ex-ante* factors and employ qualitative methods in order to obtain a thorough understanding of the importance and contribution of the *ex-ante* factors.

Fourthly, this study employed stepwise regression analysis. This technique yields coefficients indicating the average impact of an independent variable on contracting effectiveness in a hypothetical average case. In other words, it describes

typical cases or typical behaviors and practices. This approach is suitable for developing an explanatory model and testing theoretical propositions. However, as Meier and Gill (2000) argued, in order to identify those factors that managers can use to produce better results in the area of contracting, one should examine not the typical cases but the high-performing ones in order to see how they manage differently. The researcher attempted to separate the sample, using cluster analysis and the summated scores of the five outcome items, into the high-performance group and typical-performance group. Out of 304 cases, there were only 77 high performers (and it could be interpreted that there is still much room for improving logistics contracting effectiveness) not meeting the required 20:1 case per variable ratio (Coakes and Steed, 2003). The researcher suspected that this low number of cases severely affected the explanatory strength of the model (R^2 = .24). Future research may target a larger sample size from which an adequate number of high-performing cases may be derived.

Finally, this study defined the dependent variable—logistics contracting effectiveness—as an LSP's performance on a contract and the various outcomes customer managers use to measure it. Future research may redefine this variable as customer satisfaction and intention to renew the contract and use Söderland's (2003) intentions-as-expectations (IE) or intentions-as-plans (IP) scale to measure this construct. Then the findings can be compared with the current study to see if a different definition of the dependent variable will yield different results.

5.7 Summary

The current study sought to answer two research questions:

Q1: What measures logistics contracting effectiveness?

Q2: What factors can logistics managers use to enhance contracting effectiveness?

The first question dealt with the dependent variable. Defined as "an LSP's performance on a contract and the various outcomes customer managers use to measure it," the dependent variable was measured with five items borrowed from Knemeyer and Murphy's (2004) third-party logistics performance scale: (1) this contract has improved our logistics operations performance; (2) this contract has

provided us with more specialized logistics expertise; (3) this contract has reduced our logistics cost; (4) this contract has reduced our level of owned assets; and (5) this contract has reduced our employee base. Overall, the customers appeared to be satisfied with their logistics service experience. Contractual customers, however, reported significantly higher agreement than the transactional customers on all items except cost. Both types of customers agreed highly that the logistics contract provided them with more specialized logistics expertise and improved their logistics operations performance. While they agreed that the contract helped lower their logistics costs, they did not seem to be able to reduce much owned assets or headcounts.

The second research question dealt with the independent variables. The final questionnaire contained 31 items measuring ten variables. Factor analysis regrouped these items into new six variables labeled as: long-term orientation, information sharing, risk aversion, conflict handling, trust, and proactive improvement. Subsequent stepwise regression analysis indicated that these six variables were significant contributors to logistics contracting effectiveness.

Based upon the results, the current study suggests that in order to enhance logistics contracting effectiveness, both customers and LSPs should emphasize developing a long-term relationship, sharing appropriate information, and managing conflict effectively. Apart from these, LSP managers should also emphasize building competence trust and trust in integrity. For policymakers, this study suggests that they should emphasize raising the awareness of Thai manufactures, particularly the SMEs, about the benefits of internally-integrated logistics. They should be encouraged to contract out their logistics activities to LSPs that will provide them with almost instant access to sophisticated logistics expertise and technologies without incurring a large upfront investment.

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APPENDIX

Survey Questionnaire

This is a survey of Thai electronics manufacturers regarding their experiences with logistics outsourcing. Please think of a current logistics contract (transportation and/or warehousing) in which you are involved and answer the following questions to the best of your knowledge. However, should you need to consult someone that is more knowledgeable about any of the items on the questionnaire, please feel free to do so. If there is more than one logistics service provider for the same service, please provide answers in reference to the provider that has the highest billing.

SECTION A: About Yourself

Please tell us something about your organization and yourself. Please tick ✓ or fill in the appropriate boxes.

Item 1 The number of employees in your organization:
- [ ] Less than 200
- [ ] 200 - 999
- [ ] 1,000 or more

Item 2 The current logistics service is on a:
- [ ] Contractual basis (contract term ≥ 3 years)
- [ ] Transactional basis (no formal contract or contract term ≤ one year)

Item 3 Experience in logistics operations:
[ ][ ] years [ ][ ] months

Item 4 Is your current LSP different from your previous contract?
- [ ] We are a first-time logistics user.
- [ ] Yes, we switched to a new LSP.
- [ ] No, it is a renewed contract with the previous LSP.

SECTION B: Outcomes of Logistics Contract

The following statements relate to your evaluation of the ultimate performance of the logistics contract in which you are involved. Using the scale provided, please circle the number that indicates the level of your agreement with each statement.

Item	Measure	Disagree										Strongly Agree
5	This contract has improved our logistics operations performance.	0	1	2	3	4	5	6	7	8	9	10
6	This contract has provided us with more specialized logistics expertise.	0	1	2	3	4	5	6	7	8	9	10
7	This contract has reduced our logistics costs.	0	1	2	3	4	5	6	7	8	9	10
8	This contract has reduced our level of owned assets.	0	1	2	3	4	5	6	7	8	9	10
9	This contract has reduced our employee base.	0	1	2	3	4	5	6	7	8	9	10

SECTION C: Factors Affecting Logistics Contracting Effectiveness

Please indicate the level of your agreement with the following statements:

Item	Measure	Disagree										Strongly Agree
10	We fully disclose our expectations for quality and service levels, and the standards for measuring performance.	0	1	2	3	4	5	6	7	8	9	10
11	We regularly measure our LSP's performance using the agreed-upon performance standards.	0	1	2	3	4	5	6	7	8	9	10

12	We have convenient access to information about our LSP's internal process quality data, quality control procedures, and quality improvement programs and the results of these programs.	0	1	2	3	4	5	6	7	8	9	10
13	Our LSP puts strong effort into continuously making the logistics processes more effective.	0	1	2	3	4	5	6	7	8	9	10
14	When the situation changes, our LSP by itself modifies the processes, if this is useful and necessary.	0	1	2	3	4	5	6	7	8	9	10
15	Our LSP shows initiative by approaching us with suggestions for improvement of our logistics activities, even those outside its direct responsibility.	0	1	2	3	4	5	6	7	8	9	10
16	Our LSP uses higher-quality equipment even it is more expensive.	0	1	2	3	4	5	6	7	8	9	10
17	Our LSP invests in quality management practices to improve its process and service quality.	0	1	2	3	4	5	6	7	8	9	10
18	Our LSP applies strict quality control procedures to ensure that it can deliver better-quality services.	0	1	2	3	4	5	6	7	8	9	10
19	Our LSP knows that we will continue using them after the existing contract expires.	0	1	2	3	4	5	6	7	8	9	10
20	Our LSP knows that we will outsource more activities to them.	0	1	2	3	4	5	6	7	8	9	10
21	Our LSP knows that we are willing to invest in our relationship with them.	0	1	2	3	4	5	6	7	8	9	10
22	We feel confident about our LSP's knowledge, skills and expertise in handling our logistics activities.	0	1	2	3	4	5	6	7	8	9	10

23	We generally trust our LSP to stay within the terms of the contract.	0	1	2	3	4	5	6	7	8	9	10
24	Whenever the LSP gives us advice on our logistics operations, we know that it is sharing its best judgment.	0	1	2	3	4	5	6	7	8	9	10
25	Our LSP provides us with their operational information on a regular basis.	0	1	2	3	4	5	6	7	8	9	10
26	Our LSP provides us with summary service and usage reports on a monthly or quarterly basis.	0	1	2	3	4	5	6	7	8	9	10
27	We regularly provide our LSP with our operational information to help them plan for our needs.	0	1	2	3	4	5	6	7	8	9	10
28	We keep our LSP informed in advance of impending changes in our service requirements.	0	1	2	3	4	5	6	7	8	9	10
29	In this relationship, it is expected that any information which might help the other party will be provided.	0	1	2	3	4	5	6	7	8	9	10
30	This contract requires the LSP to make large specialized investments in order to perform the work.	0	1	2	3	4	5	6	7	8	9	10
31	This contract requires the LSP to adapt its procedures and/or systems to meet our specific requirements.	0	1	2	3	4	5	6	7	8	9	10
32	Only a small portion of the investment made by the LSP for this contract can be transferred to another contract.	0	1	2	3	4	5	6	7	8	9	10
33	This contract requires the LSP to provide a dedicated team of staff with unique knowledge, skills, and experience, or trained specifically to meet our requirements.	0	1	2	3	4	5	6	7	8	9	10

34	If anything goes wrong, or something unexpected happens, the LSP contact employees are prepared to make a special effort to handle the problems.	0	1	2	3	4	5	6	7	8	9	10
35	The LSP contact employees are skilled to handle unexpected problems.	0	1	2	3	4	5	6	7	8	9	10
36	We always work together with our LSP to identify problems.	0	1	2	3	4	5	6	7	8	9	10
37	Whenever something goes wrong, we always work together with our LSP to solve the problem.	0	1	2	3	4	5	6	7	8	9	10
38	In our relationship with this LSP, we frequently run into conflicts on the organizational level.	0	1	2	3	4	5	6	7	8	9	10
39	On the operational level, conflicts between our employees and those of the LSP frequently occur.	0	1	2	3	4	5	6	7	8	9	10
40	On the whole, our relationship with this LSP is characterized by frequent conflicts	0	1	2	3	4	5	6	7	8	9	10

If there is additional information about this contract you wish to offer, please write your comments in the space below or on a separate sheet of paper.

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I greatly appreciate the time and effort you have taken to participate in this survey. Thank you very much.

BIOGRAPHY

NAME	Santi Visuddhisat
ACADEMIC BACKGROUND	Bachelor's Degree in Business Administration with a major in marketing, Faculty of Business Administration, Assumption University, Bangkok, Thailand, 1992. Master's Degree in Marketing, Faculty of Commerce and Accountancy, Thammasat University, Bangkok, Thailand, 1994. Master's Degree in Information Technology with a major in information technology management, Faculty of Information Technology, King Mongkut's Institute of Technology Ladkrabang, Bangkok, Thailand, 2003. Master's Degree in Political Economy and Administration, Faculty of Economics, Ramkhamhaeng University, Bangkok, Thailand, 2009.
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