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LOGISTICS OUTSOURCING
FOR ECONOMIES IN
BUSINESS NETWORKS

FACULTY OF ECONOMICS AND BUSINESS ADMINISTRATION,
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UNIVERSITY OF OULU

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JOUNI JUNTUNEN

**LOGISTICS OUTSOURCING
FOR ECONOMIES IN BUSINESS
NETWORKS**

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Abstract

The fundamental choice among governance mechanism is whether to externally organize transactions outside the boundary of the firm in the market, or whether to internally organize transactions within the firm's boundaries. In other words, major decision which is made on the firm's organizational strategy culminates in the make-or-buy decisions. In business and especially in the context of logistics, the worldwide usage and importance of outsourcing has grown dramatically over the last decades and researchers have reported on the outsourcing of logistics functions from several perspectives and a growing interest towards outsourcing is indicated by the volume of writings on the subject in scholarly journals, trade publications and popular magazines.

The theoretical framework in outsourcing studies has commonly been the theory of the firm in microeconomics, transaction cost theory, agency theory, marketing or strategic management. However, according to recent studies it seems that several perspectives are needed when studying the development of relationships and the antecedents that underlie outsourcing decisions. Hence, in this study, concepts will be used from several theoretical backgrounds to get an eclectic view of outsourcing. The main research question is to study how the buyers' logistics outsourcing decisions contribute to the accomplishment of goals in business networks.

Empirical part of thesis contains two data sets. First data were collected in November 2005 and the target group in this data was northern Finnish companies. Totally 161 acceptable responses were received, corresponding to a 27.4 percent response rate. The second data were collected from industrial companies in Finland during spring 2008. In the second data, 235 acceptable responses were returned, representing a response rate of 22.5 percent.

As a result, a two dimensional model was created for describing outsourcing relationships in the logistics service markets. On the one hand, network economies can be gained through horizontal mode of outsourcing, where focus is in unit costs of services and the way to achieve lowest possible unit costs are short-term bidding games among service providers. On the other hand, network economies can be achieved through vertical mode of outsourcing with cooperation and strategic partnership where all participants concentrate on their core competences and thus create network economies through transactional value in long-term. In the middle are hybrid modes of outsourcing where focus is on both unit costs of services and transaction costs. These outsourcing modes are where the outsourcing strategies arise and in this way, the thesis contributes to theoretical development of outsourcing phenomenon and concepts behind logistics outsourcing decision making.

Keywords: external economies, modulation, network economies, outsourcing modes, structural equation modeling

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List of original publications

The thesis is based on the introductory chapter and the following essays:

- I Juga J & Juntunen J (2010) Trust, Control and Confidence in Logistics Outsourcing Decisions. *International Journal of Services Technology and Management*. In press.
- II Juntunen J, Juga J & Grant DB (2009) Services Quality and Performance: Trade-offs in Logistics Service Markets. In: *Proceedings of the 20th Annual Conference for Nordic Researchers in Logistics*. Jönköping, Sweden, June 11-12, 2009.
- III Juntunen J (2009) External economies and strategic cooperation: structural equation modelling with Finnish data. *World Review of Intermodal Transportation Research* 2(4): 364–375.
- IV Juntunen J & Juntunen M (2009) External economies and confidence, a way to decrease logistics costs. In: *Proceedings of the 14th Annual Logistics Research Network Conference*. Cardiff, UK, September 9-11, 2009.
- V Juntunen J (2010) Functional Spin-offs in logistics service markets. *International Journal of Logistics Research and Applications* 13(2): 121-132.

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1 Introduction

In his seminal research on corporate strategy, Ansoff (1965: 201) argues that a major decision which is made on the firm's organizational strategy culminates in the make or buy decisions. To be more precise, the fundamental choice among governance mechanism is whether to externally organize transactions outside the boundary of the firm in the market, or whether to internally organize transactions within the firm's boundaries (Bowen & Jones 1986). Also Fine (1998) suggests that supply chain design is the most important competency of the firm. Hence, it can be argued that one of the most important questions to the firm is what to make (vertical integration) and what to buy (outsource). Naturally, then, it is also important to understand the factors behind vertical integration and different types of outsourcing, such as partnerships and short-term contracts based on price competition.

In business and especially in the context of logistics, the worldwide usage and importance of outsourcing has grown dramatically over the last decades and outsourcing affects thousands of companies and employees every year (Logan 2000, Deepen 2007). Recent studies indicate that 85 percent of all companies outsource at least one function generating billions of dollars in outsourcing contracts annually. Common reasons for outsourcing are growing need to be more responsive to customer service and market demand, logistics activities also involve large commitment of capital and the logistics functions can be key facilitators in the cross-functional effort toward supply chain integration (Razzaque & Sheng 1998). Importance of outsourcing is noted also by academic scholars, who have recently given a great deal of attention to logistics outsourcing (Knemayer *et al.* 2003). Researchers have reported on the outsourcing of logistics functions from several perspectives and a growing interest towards outsourcing is indicated by the volume of writings on the subject in scholarly journals, trade publications and popular magazines (Razzaque & Sheng 1998, Bolumole 2001).

The basic concepts of this study, vertical integration and outsourcing, have been defined in various ways. Riordan (1990: 94) defines vertical integration as a situation where two, separate and consecutive processes are made by one firm. Holmstrom & Roberts (1998) argue that in vertical integration two different assets have the same owner. According to Kranton & Minehart (2000), vertically integrated firms make their own inputs while in networks manufacturers procure specialized inputs from suppliers. Outsourcing has been viewed as a form of pre-determined external provision with another firm for the delivery of goods and/or

services that would previously been offered in-house (Kakabadse & Kakabadse 2000).

Merriam Webster's (www.merriamwebster.com) online dictionary defines outsourcing as "to procure some goods or services needed by a business or organization under contract with an outside supplier". This definition is quite similar to Coase's (1937) classical make-or-buy thinking. From a logistics point of view, outsourcing, third-party logistics and contract logistics are generally considered to mean the same thing (Lieb *et al.* 1993). In third party logistics arrangements specifically tailored to each situation, the service providers and clients generally strive for long term relationships with win-win benefits for both parties (Virum 1993). Bolumole *et al.* (2007) definition for outsourcing in the context of logistics is the practice of charging external service providers with the task of performing in-house activities.

The theoretical framework in outsourcing studies has commonly been the theory of the firm in microeconomics, transaction cost theory, agency theory, marketing or strategic management. Arnold (2000) states that transaction cost theory and core competencies approach complement one another as recommendations for outsourcing design and management. Logan (2000) suggests that transportation user and provider can evaluate outsourcing relationships based on three strategic theories: transaction cost theory, agency theory and the resource based view. Further, Baker & Hubbard (2003) offer a good example of the importance of job design and control in the field of logistics. They argue that service intensive (for example short trips, specialized goods and hazardous cargo) trucking is more likely to be performed by private fleet and private fleets are more likely to adopt incentive improving technologies, while for-hire carries are more likely to adopt coordination improving technologies and are likely to be used in long trips and bulk goods. Thus, it seems that several perspectives are needed when studying the development of relationships and the antecedents that underlie outsourcing decisions. In this study, concepts will be used from several theoretical backgrounds to get an eclectic view of outsourcing. This kind of approach is supported by Joskow's (2005) argument that there is not and will never be a unified theory of vertical integration.

Buyers of logistics services want cheap price and good quality at the same time. To gain both of these aims, the buyers prefer reliable LSPs (logistics service provider) who they trust. However, simultaneously they seek lower costs through competitive markets. The buyers have a dilemma: there is a trade-off between service quality and the price of services, and generally also between long-term

partnership and competitive markets. Moreover, the buyers need to consider outsourcing also from a broader network perspective, and how to utilize the competences and resources of specialized service providers in the logistics service markets.

The purpose of this thesis is to create a model of outsourcing relationships in the logistics service markets. The main research question is to study how the buyers' logistics outsourcing decisions contribute to the accomplishment of goals in business networks. To answer this question, the research is divided into three sub-questions. First is to identify the antecedents of logistics outsourcing decisions and to test their impact on outsourcing propensity. Second is to establish the objectives and explain the consequences of the outsourcing of logistics for shippers. Third is to clarify different outsourcing options for the buyers of logistics services to achieve their goals in business networks.

The methodological approach of this study is positivistic, which implies that reality is considered to be objective, tangible and fragmentable (Mentzer & Kahn 1995). The general agreement in positivist tradition is that causal relationships can be discovered and, in addition, research findings are considered value-free, time-free and context independent. Moreover, the preferred research method in positivist tradition is quantitative and surveys are commonly used to gather research data (Mentzer & Kahn 1995). As in many logistics studies, the research question and the research method of this study represent the deductive positivistic approach. Actually, the deductive positivism is a predominant approach in business logistics research (Arlbjorn & Haldorsson 2002).

In the next chapter after introduction provides insight to the earlier studies concerning outsourcing from theoretical perspectives. After that in the same chapter, there will be short description concerning outsourcing in the context of the logistics. Next, the third chapter presents methodological approach of this thesis with description of the used method and data. In the fourth chapter is discussion, the key points of each paper included in this thesis is presented with results of this thesis. The last chapter is conclusion. In addition, the paper version of thesis has original publications after references (original papers are not included in the electronic version of the thesis).

2 Theoretical background

This thesis draws from several theoretical approaches. The main sources include organizational economics, marketing and relationship management, strategic management and economics of business strategy. In addition, the last subchapter is a review of earlier studies concerning outsourcing in the context of logistics.

2.1 Organizational economics

According to Barney & Ouchi (1986) organizational economics denotes the study of organizations and organizational phenomena using concepts from contemporary organization theory, organizational behavior, and theory of the firm in micro-economics. Organizational economics have many similarities with new institutional economics. For example, transaction cost economics is part of the revival of interest in new institutional economics. However, also concepts from classical economic theory, such as external economies through specialization, are relevant in outsourcing research.

2.1.1 *Transaction cost theory*

The traditional view regarding the determination of the optimal size of organization for a company is based on transaction cost economics presented in an article by Coase (1937). According to Bowen & Jones (1986), the analysis based on transaction cost theory focuses on the governance mechanism that emerges to mediate economic exchanges equitably and efficiently. In organizational economics, transaction cost theory is usually used to answering questions like what is it about these various tasks that leads one principal to maintain a spot market relationship with the different companies, another principal to maintain a long term contractual relationship and still others to use their own employees. Further, because these questions try to identify the kind of structure that a supply chain should have, they lead to even more fundamental questions like what are the boundaries of the firm and why firms exist in the first place.

It was Coase's (1937) fundamental insight in "The nature of the firm" that firms exist because it is costly to use the price system to coordinate economic activity. He argues that there is a trade-off between markets and the firm's internal hierarchy. According Coase, when a principal uses the market, the costs of negotiations and concluding separate contract for each exchange must also be taken

into account and the principal should do those functions where the transaction costs are greater than the firm's internal hierarchy costs. This can be seen also as a "market failure" situation, where market governance is replaced by hierarchical governance. Alchian & Demsetz (1972) consider the firm and the ordinary market to be competing types of markets. This means that there is a market inside of the firm which competes against the public markets. Further, Williamson (1975) studied the hierarchy and the inside contracting system as alternatives to the market. Also empirical evidence verifies the impact of different governance structures on efficiency (e.g. Armour & Teece 1978).

The concept of asset specificity has been shown to be an important criterion for defining the firm's boundaries and is now seen a central tenet in modern transaction cost theory (Williamson 1975, 1985, Heide & John 1988). Williamson argues that generic transactions are those for which markets are well suited and complex transactions should be managed by hierarchy; hybrid modes of governance are suited for those transactions that fall in between. According to Williamson (1981), transaction cost theory has three levels of analysis. The first is the overall structure of the enterprise. The second deals with the activities that should be performed within the firm or in markets. The third is how human assets are organized. Obviously, the second one is the most suitable level of analysis concerning outsourcing decision making. Transaction cost theory concludes that the boundaries of the firm are optimal, where marginal cost of using markets is equal to the marginal cost of firm's internal hierarchy. Further, also life cycle analysis is one important dimension that needs to be joined with transaction costs in order for observed patterns of vertical integration to be explained (Stigler 1951, Williamson 1985). According to Stigler (1951), firms should perform functions with increasing economies of scale and outsource functions with decreasing economies of scale, which leads to the hypothesis that firms in growing industries start to specialize.

In practice, it is extremely difficult to specify the real costs of market forms or hierarchical forms of governance in dynamic conditions and under uncertainty (Ghoshal & Insead 1996). In addition, unlike production costs, transaction costs are very difficult to measure because they represent the potential consequences of alternative decisions; and because "the world is not convex", transaction cost functions might even have several local optima (Stiglitz 1985, Radner 1986, Milgrom & Roberts 1990, Klein *et al.* 1990). This lack of adequate cost functions is the main reason why real life decisions cannot only be based on transaction cost theory, microeconomics and mathematics. In addition, according to Ghoshal &

Insead (1996), transaction cost theory is bad for practice because it embodies a “hidden ideology that distorts more than it illuminates”, lacks generality because of ethnocentric bias and even ignores the contextual grounding of human actions. Further, firms which have positive profits, not necessarily as great as possible, will survive regardless of the motivations behind the decisions leading to those profits (Alchian 1950). Hence it is not surprising that the same component continues to be outsourced by some firms and produced in-house by others in the same markets (Coase 1988).

According to Aertsen (1993), transaction cost analysis and some of its key concepts, particularly asset specificity and performance measurement, can be applied in the field of logistics. According to Rindfleisch & Heide (1997), asset specificity is commonly used as independent variable which explains outsourcing and vertical integration. Maltz (1994) argues that transaction cost analysis may be important to the outsourcing decisions, although not always as Williamson (1985) predicts. Dahlstrom *et al.* (1996) have studied procurement of logistical services and argue that transaction cost analysis outlines several factors that influence integration decisions. Further, Skjoett-Larsen (2000) has used transaction cost analysis to study the conditions under which third party agreements become preferable to the classical choice between markets and hierarchy. However, transaction cost analysis has been criticized for neglecting midrange relationships. Hence, also other theoretical approaches should be used and for example network theory can explain better the dynamics in third party cooperation (Maltz 1994, Dahlstrom *et al.* 1996, Skjoett-Larsen 2000).

2.1.2 Agency theory

During the 1960s and early 1970s, economists explored risk sharing among individuals or groups, which can be seen as an origin of agency theory (Eisenhardt 1989). According to Eisenhardt (1989), agency theory attempts to describe the ubiquitous agency relationship, in which one party (the principal) delegates work to another (the agent) who performs that work. The fundamental difference between transaction cost theory and agency theory is that while transaction cost theory concentrates on market failures, agency theory concentrates on relationships between markets and firms (Barney & Ouchi 1986: 205). Holmstrom & Milgrom (1987) argue that principal-agent models offer a good framework for studying relationships especially in situations with asymmetric information between the actors. Usually, in agency theory a principal owns the assets and

agent(s) are employee(s) or contractor(s) to the principal. According to Logan (2000), an agency problem arises when two parties involved have different goals and when it is difficult or expensive for the principal to measure what the agent is actually doing.

According to Hart (1995: 18-19), agency theory focuses on the relationship between risk and gain. A frequent way to shape the problem is how to make agents operate for the profit of the principal as the agents try to maximize their own utility which may be in contrast with the principal's benefit. The contractual dilemma (Williamson 1971) is a possible problem where the divergent interest between agent and principal will predictably lead to individually opportunistic behavior and joint losses. This is an old question and already Adam Smith (1776) argued that the incentives for agents are the dominant factor for efficiency. Similarly, Barnard (1938) wrote that the contributions of personal effort which constitute the energies of organizations are generated by individuals because of incentives.

Barney & Ouchi (1986: 206) argue that agency theory has also been developed for attempting to understand relationships between the firm and its capital market. According to Jensen & Mecklin (1976), separation of ownership and decision making causes agent costs and influences also the firm's capital structure because profit maximizing agent not always acts in the best interest of the principal. This is supported by Fama & Jensen (1983), who argue that the agency problem arises because contracts are not costless to write and enforce. Jensen & Mecklin (1976) define agency cost as the sum of the monitoring expenditures by the principal, the bonding expenditures by the agent and the residual loss.

Numerous contracts are vague or silent on a number of key issues and can give a room to opportunistic behavior (Tirole 1999). Incomplete contracts also cause residual control rights (Hart 1995: 30). The term "residual control rights" refers to the prerogative to decide how to use factors of production in circumstances which have not been determined by contracts. In practice, residual control rights may mean that an entrepreneur who owns only one van can rent the car to a short-term client, who may be moving house during a weekend, to give an example. This type of action might be more difficult for a big transport company; for example Baker *et al.* (2002) claim that if there are numerous or complicated non-contractible rights, a scheme that replaces contracts is needed to manage these rights. As a possible solution, they introduce the idea of employing a sufficiently large number of managers by the proprietor company to deal with non-contractible rights. This would naturally increase the hierarchy costs of the com-

pany and would lead to changes described by the transaction cost theory. Grossman & Hart (1986) assert that the optimal proprietorship is determined by the capacity of best taking advantage of residual control rights.

The influence of asymmetrical information is a central issue in agency theory (Laffont 2003). What the term means in agency theory is that the supplier (agent) knows more about his product or service than the potential buyer (principal). Once the agent has been paid, s/he might not necessarily want to provide the first-class service s/he had promised (moral hazard). This could also be seen as a problem when people ask more services than they need if they are free. For example, Arrow (1963) argues that in medical care widespread medical insurances increase the demand for medical care. On the other hand, if the choice of the agent is made only based on low price, this will lead to adverse selection. Stiglitz's (1977) example of adverse selection concerns taxation; if taxes are too high agents would not work and earn so much that the Pareto optimum would be met. Adverse selection could naturally also happen in the reverse direction when agents are negotiating deals with the principal. To reduce moral hazard and adverse selection, one way is to reduce incentives for opportunistic behavior.

Holmstrom & Milgrom (1991) suggest job design to be one important tool for adjusting incentives. In their example, if employees get incentive pay based on one specialized measure only, they probably would not sacrifice time to anything else. Hence, if the firm has different functions, it should also have employees with specialized job designs as well. From an outsourcing perspective in the road freight context, for instance, the carriers' capability to monitor their drivers affects strongly make-or-buy decisions (Baker & Hubbart 2000, 2003).

According to Eisenhardt (1985), when the behavior of the agent is observable, in the simple case of complete information, a behavior based contract is optimal. She argues that in the case of incomplete information the principal has two options. The principal can purchase information about the agent's behavior and reward appropriate behavior, or alternatively, the principal can reward the agent based on outcomes (Eisenhardt 1989). Zsidisin & Ellram (2003) have used agency theory in their study of supply chain risk management. They conclude that when supply chain risk sources become more prevalent, purchasing organizations are increasingly likely to implement behavior-based techniques that reduce information asymmetries, align organizational objectives, and program suppliers' activities.

Eisenhardt (1985, 1989) points out that agency theory has similarities with transaction cost theory and that the organizational and agency approaches are

complementary. Further, Eisenhardt (1988) argues that, in the context of retail compensation policy, efficiency and institutional perspectives can be complementary and hence multiple perspectives can enhance our understanding. Eisenhardt's (1989) recommendation is to use agency theory with complementary theories. Logan (2000) concludes that the resource-based view, transaction cost economics, and agency theory can be used to guide the transportation user and provider in evaluating outsourcing relationships.

2.1.3 External economies

An external economy through specialization is not a new concept, although it has not been commonly used in recent decades. Already Marshall (1898) described external economies as those which depend on the general organization of the trade, the growth of the knowledge and appliances common to the trade and the development of subsidiary industries. Chipman (1970) used Adam Smith's classic pin factory example to illustrate the beneficial relationship between specialization and external economies. Even as an old concept, Scitovsky (1954) argued that external economies have been one of the most elusive concepts in economic theory and its definitions are few and unsatisfactory. According to Meade (1952), external economies exist whenever the output of a firm depends not only on the factors of production utilized by this firm, but also on the output and factor utilization of another firm or group of firms. It is agreed that external economies mean services (and disservices) that are rendered free (without compensation) by one producer to another, but there is no agreement on the nature and form of these services or on the reasons for their being free and it seems that external economies are invoked whenever the profits of one producer are affected by the actions of other producers (Scitovsky 1954). Adams & Wheeler (1953) found that when a circular interdependence exists inside an industry, the industry supply curve may be either more or less steep than the supply curve of a typical firm in the industry, depending upon whether external diseconomies or external economies exist.

External economies have usually been seen as a result of comparative advantage and specialization between different nations (e.g. Marshall 1898, Chipman 1970). Exploiting comparative advantages requires international trade and thus also efficient logistics. External economies also exist on the microeconomic level, for example Caballero & Lyons (1990) found substantial evidence of external

economies in manufacturing, but they called for further exploration on the source of these external economies.

External economies can be contrasted with transaction costs which reflect the contracting problems incurred by relationship-specific investments, asymmetric information and potentially opportunistic behavior between organizations. However, investments in relationship-specific assets lower transaction costs in the long run (Dyer 1997). In addition, a positive association between relationship management efforts and outsourcing has been observed by Knemayer *et al.* (2003), especially when specific investments exist in the relationship. Finally, there is a strategic aspect to external economies as firms are increasingly treating logistics strategically to gain competitive advantage but often lack the competence to run efficient logistics operations themselves (Sohail 2006). This final point can be well summarized by the observation that focus should shift from the outsourcing of activities to the insourcing of resources, as aptly pointed by (Gadde *et al.* 2002).

2.2 Marketing and relationship management

In marketing literature, vertical integration and outsourcing have been studied in the institutional school and later in organizational dynamics school (Sheth *et al.* 1988: 74). While the institutional school deals mainly with different kind of structures, the organizational dynamics school studies behavioral factors and relationship-specific facilitators for outsourcing. Another stream of marketing literature relevant for outsourcing studies deals with resource dependency (Pfeffer & Salancik 1978). The third approach that can be associated with outsourcing research is relationship management and networks (Håkansson 1982, Thorelli 1986, Jarillo 1988, Dyer & Singh 1998, Möller & Halinen 1999, Gadde & Håkansson 1993: 78-79, Ritter *et al.* 2004).

2.2.1 From institutional school to organization dynamics school

The institutional school emerged in the 1910s largely because of a perception among consumers that the prices they were paying at retail stores for agricultural products were unjustifiably high (Sheth *et al.* 1988: 74). One important point was raised already by Weld (1915), who argued that middlemen can decrease the total costs of a distribution channel. According to Bucklin (1973), where middlemen are used in the channel, it also includes the design of control procedures. One

theoretical view to the sourcing decision-making problem is hence from the vertical marketing system theory, which is defined to be a set of forces, conditions, and institutions associated with the sequential passage of a product or a service through two or more markets (Bucklin & Stasch 1970: 5).

The growth of the vertical marketing systems offers the foundation to deal with increasingly complex and turbulent environment, and when the volume of the product line increases, the probability of using a highly integrated channel increases in contrast to the probability of using the market (Stern *et al.* 1989, Klein *et al.* 1990). Further, the need for control in distribution systems emerges because coordination left to market forces alone often results in less than optimal decision patterns for both the operators of the system and for the consumers it serves (Bucklin 1973). Obviously, the characteristics of goods form another important factor to the principal's decision to select the most suitable distribution channel and channel structure (Aspinwall 1958, Anderson & Coughlan 1987).

Mallen (1973) argues that a marketing channel institution will delegate those activities that other firms can perform more cheaply and will undertake only those tasks for which it has a cost advantage. Undertaking tasks can be seen as vertical integration and delegating tasks can be seen as using external economies, i.e. outsourcing. Further, the concept of functional spin-off could be used to evaluate and predict changes in distribution structure (Stigler 1951, Mallen 1973, Sheth *et al.* 1988: 81). Unfortunately, since the early 1970s, there has been little work done in the institutional school of thought (Sheth *et al.* 1988: 81).

The primary reason for this decline is the emergence of the organizational dynamics school, which is direct descendant of the institutional school. According to the organizational dynamics school, the concepts of dependency and commitment play a major role to an understanding of power relationships in the marketing channel (Baier & Stern 1969: 112, Sheth *et al.* 1988: 152). A social relation commonly entails ties of mutual dependency between the parties and power is a property of the social relations, not an attribute of the actor (Emerson 1962). In short, power resides implicitly in the other's dependency (Emerson 1962). According to Bolumole (2001), the most commonly cited reason for the limitations of outsourcing is the increased dependence on service providers.

2.2.2 Resource dependency

Resource dependency (Pfeffer & Salancik 1978), which is related to all cost saving possibilities by using external economies, provides power to resource owner

over the firm which needs those resources. According to Pfeffer (2003: xiii-xxv), the resource dependency view was originally developed to provide an alternative perspective in inter-organizational relations, and it maintained that some organizations had more power than others because of the particularities of their interdependence and their location in social space. Glasberg & Schwartz (1983) argue that corporate survival depends, on one hand, upon successful structural adaptation to the constraints imposed by the uncertainty of access to needed resources and, on the other hand, upon partially controlling the environment to ensure a steady flow of needed resources.

Heide & John (1988) argue that specific assets create inter-organizational dependency. They distinguish four means by which dependency is increased: First, when the outcomes obtained from a relationship are important or highly valued; second, dependency is also increased when the outcomes from relationship are comparatively higher or better than the outcomes available from alternative relationships; third, dependency increased when fewer alternative sources of exchange are available; fourth dependency is increased when fewer potential alternative sources of exchange are available. According to Scott (2003), companies aim to increase a company's tolerance of external resource shortage over a limited period of time by improving classification of inputs, increasing stock levels, adjusting workflow to minimize variation in the input and output requirements, forecasting resource needs and adjusting the scale of production.

When organizations are interdependent, because of resource exchange, and when one of them is less dependent than the other on the particular exchange relationship, conditions exist which can lead to inter-organizational influence (Pfeffer 1972). Salancik (1979) gives an example of the government, which was a substantial provider of resources to a number of industries, but itself was less dependent on its suppliers because there were often multiple suppliers of desired goods and services. He argues that organizations that relied heavily on government contracts were typically, although not always, more dependent on the government than it was on them. To give another example, small suppliers of General Motors are more dependent on General Motors than it is on them, and consequently General Motors can use this asymmetric interdependency to influence the small suppliers to sell to them at a relatively lower price (Pfeffer 1972).

According to Gadde *et al.* (2003), the greater the dependency of one organization on the other, the more power the latter has over the former. When a power advantage is used, usually the more dependent firm adapts the wishes of the more powerful firm (Emerson 1962, Ritter *et al.* 2004). In industry it is commonly seen

as discounts, or reducing the cost of production, from weaker actor in relation to the stronger. The alternative to the weaker actor is to seek new business relationships. In the first case, when more dependent firm adapts to the wishes of the more powerful one, the weaker member has sidestepped one painful demand but it still vulnerable to new demands. By contrast, the second solution alters the power relation itself. The second operation takes place through alterations in power networks, defined as two or more connected power-dependency relations (Emerson 1962). Relationships are important also according to Scott (2003), who states that companies use bargaining and contracts, mergers of suppliers, joint ventures, trade associations and the government connections to ensure the availability of supplies.

Traditionally in resource dependency, companies seek to build alliances with companies that are in a social position to be trusted to manage resource dependency (Pfeffer 2003: xvii-xviii). Gadde *et al.* (2002) present a complementary perspective by looking at third party logistics rather as insourcing resources. They state that establishing well functioning measuring systems for evaluating the efficiency of outsourcing and alliances is difficult. Hence, the first and most logical extension to resource dependency is using relationship management and network measures and methods.

2.2.3 Relationship management and networks

Probably the most salient part of the environment of any firm is other firms that can influence the firm also indirectly through third firms (Thorelli 1986, Gadde & Håkansson 1993: 78-79) and a firm's critical resources may extend beyond its boundaries (Dyer & Singh 1998). Thus, focusing on any one single firm cannot provide an adequate understanding of the business processes and a firm's ability to develop and manage successfully its relationships with other firms may be viewed as a core competence (Ritter *et al.* 2004). According to the industrial marketing and purchasing group, buying and selling in industrial markets should not be understood as a series of serially independent transactions, but transactions could only be examined as episodes in often long-standing and complex relationships between the buying and selling organization. From the network perspective, it is necessary to examine the interaction between individual buying and selling firms where either firm may be taking the more active part in the transaction (Håkansson 1982). This means that social exchange episodes may be important in themselves in avoiding short term difficulties between the parties and in maintain-

ing a relationship in the periods between transactions and gradually interlock the two firms with each other.

According to Jarillo (1988), firms act in a complex environment, where no firm can be understood without a reference to its relationships with many others. In Thorelli's (1986) article, networks are said to exist due to economies of scale and specialization, and ability to reduce transaction costs. For Thorelli (1986), power is the central concept in network analysis and for understanding any particular network, the flows of power and information may actually be more important than those of money and utilities. Further, Thorelli (1986) argues vertical integration to be one instance of what may be termed "network failure", perhaps as commonplace as market failure, and thus a network may be viewed as an alternative to vertical integration. This can be compared to the market failure concept in transaction cost theory where asset specificity (Williamson 1985) is one of the most important factors for vertical integration. According to Dyer & Singh (1998), productivity in the value chain is possible when trading partners are willing to make relation-specific investments and combine resources in unique way.

According to Jarillo (1988), establishing an efficient network implies the ability to lower transaction costs, for it is precisely those costs that lead firms to also to integrate. Hence, the strategic network can take advantage of economies in scale with low transaction costs (Stigler 1951, Mallen 1973, Thorelli 1986, Jarillo 1988). In practice, networks are ubiquitous and perhaps the most obvious example is the distribution channel system (Thorelli 1986). For example, if faster delivery of goods adds value to the customer, then the network will look for firms that have superior logistical capabilities (Kathandaraman & Wilson 2001).

Kathandaraman & Wilson (2001) argue that firms must create better value than their competitors. To do this, managers must fully integrate the resources for delivering a product that fully satisfies the needs at competitive price. Jarillo (1988) argues that strategic networks increase trust in relationships and thus lower transaction cost and decrease the total cost of the value chain. In addition, when shifting from the firm level to network level, the firms realize that their value to the network is the extent they bring in diverse core capabilities that are valued by the network; therefore the core capabilities constrain the quality of relationship between the firms in the network (Kathandaraman & Wilson 2001). If trust is one dimension in the quality of relationships, then good quality decreases transaction costs and improves the strategic network.

Product branding is seen as an assurance of quality and consistency. Therefore it is suggested that branding may act as a substitute for personal relationships

in situation where direct relationships with product providers are difficult to achieve (Palmer 1997). According to Davis *et al.* (2008) brand image - the attributes and benefits held by the customers associated with a brand - is important in the purchasing of logistics services. However, it is recognised that branding for services is different than product branding (e.g. Balmer 2001) and in services branding it usually is the company which is the primary brand (Berry & Parasuraman 1991), branding is seen in this study from corporate branding perspective.

2.3 Strategic management

Strategic management offers two different perspectives on outsourcing decision making: the industry organization view (Dyer & Singh 1998, Porter 1980) and the resource-based view which can be seen as a logical extension of traditional strategy implementation research (Barney 1991, Barney & Zajac 1994, Dyer & Singh 1998, Rumelt 1991, Wernerfelt 1984). According to Dyer & Singh (1998) these two perspectives have contributed greatly to our understanding of how firms achieve above-normal returns. On the other hand, they argue that with these two perspectives it is also important to understand the network of relationships in which the firm is embedded. Further, according Mahoney & Pandian (1992), the resource-based view fits comfortably within the conversation of organizational economics and it is complementary to industrial organization analysis.

2.3.1 Industry organization view

According to Chandler (1962), strategy is the determination of the basic long term goals and objectives of the enterprise, and the adoption of courses of action and the allocation of resources necessary for carrying out these goals. He defines structure as the design of the organization through which the enterprise is administered. A structure of the organization follows strategy (Chandler 1962, Jones & Hill 1988), and a major structural decision that is made on the firm's strategy culminates in the make or buy decisions (Ansoff 1965). Chandler (1962) argues that changes in operations, for example growth, without structural adjustments can lead to economic inefficiency. Following Stigler's (1951) idea, firms in growing industries start to specialize and solve the inefficiency problems by outsourcing some of its functions.

Jones & Hill (1988) argue that structure follows strategy and superior performance is a product of the correct “fit” between strategy and structure. Further, the industry structure view suggests that supernormal returns are primarily a function of a firm’s membership in an industry with favorable structural characteristics (Porter 1980, Dyer & Singh 1998). Even if it seems easy to modulate structure, Chandler (1962) argues that even basic reorganizations in structure come only after sharp crisis. He defines this problem as delay. New strategy creates new administrative needs, but executives could still continue to administer both the old and new activities with same personnel, using same channels of communication, and authority and same types of information. According to Chandler (1962), such administration must become increasingly inefficient. Unproductive administration cause high hierarchy costs and thus, following transaction cost theory (Coase 1937), firms may seek to rebalance hierarchy and transaction costs by outsourcing.

Outsourcing decreases the share of fixed costs of a company, which makes it easier to control profitability during recession (Pajarinen 2001: 17). Furthermore, adjusting the production volume becomes more flexible if the rate of outsourcing is high. In such a situation a required quantity of production inputs can be acquired through a subcontractor without the necessity to hire more employees. Bengtsson & Berggren (2002) assert that the main reasons for the increase in outsourcing by Nokia and Ericsson are flexibility and enhanced reaction time to changes in demand for their products. Through outsourcing Ericsson minimizes the risk of overcapacity when demand decreases during times of receding trade. Also in Nokia’s modus operandi there is a tendency to outsource tasks during periods of boom and to let subcontractors compete against each other during recession. On the one hand, production costs and market prices are easier to measure than transaction costs, and thus it is also easier for firms to concentrate on production costs and market prices. On the other hand, Jarillo (1988) argues that tight competition of suppliers weakens strategic networks and hence increases transaction costs.

2.3.2 Resource based view

The resource based view of the firm is an eclectic approach encouraging a dialogue between researchers from a variety of perspectives (Penrose 1959, Wernerfelt 1984). First, the resource-based view integrates concepts from mainstream strategy research (Mahoney & Pandian 1992). Second, the resource-based view is suit-

able within the conversation of organizational economics (Barney & Ouchi 1986, Mahoney & Pandian 1992). Third, the resource based view is complementary to industrial organization analysis (Porter 1980, Mahoney & Pandian 1992).

According Barney (1991), the resource-based view offers two assumptions in analyzing sources of competitive advantage; firms within an industry may be heterogeneous with respect to the strategic resources they control and these resources may not be perfectly mobile across firms, and thus heterogeneity can be long lasting. While market failure explains the existence of the firm, the resource-based view posits heterogeneous firms as the outcome of certain types of market failure and thus helps management on the choice of governance structure (Coase 1937, Mahoney & Pandian 1992).

Productive activity requires the cooperation and coordination of teams of resources and routines are to the organization what skills are to the individual and organizational routines involve a large component of tacit knowledge (Grant 1991). Distinctive competence and superior organizational routines in one or more of the firm's value-chain functions may enable the firm to generate rents from a resource advantage (Mahoney & Pandian 1992). Idiosyncratic bilateral synenergy is defined as the enhanced value that is idiosyncratic to the combined resources of the acquiring and target firm (Mahoney & Pandian 1992). Hence, the resource-based view of the firm simply pushes the value chain logic further, by examining the attributes that resources must possess in order to be sources of sustained competitive advantage (Porter 1985, Barney 1991).

Trust, in economic exchanges, can be a source of competitive advantage, but it is not always (Barney & Hansen 1994). A deeper level of trust enables greater competitive advantages, but to be a source of competitive advantage, trust must be available to only few firms in their exchange relations (Peteraf 1993, Barney & Hansen 1994). Invisible assets as a tacit organizational knowledge or trust cannot be traded or easily replicated by competitors since they are deeply rooted in the organization's history (Amit & Schoemaker 1993).

Socially complex and imperfectly imitable resources can generate a firm's sustainable advantage (Dierickx & Cool 1989, Barney 1991). For example, positive firm reputation can be thought of as informal social relations between firms and such informal relations are likely to be socially complex and imperfectly imitable (Klein & Leffler 1981, Barney 1991). Further, loyalty of one's dealers or the trust of one's customers cannot be bought, but those must be earned through history of honest dealings (Dierickx & Cool 1989). Socially complex resources can be difficult to manage systematically and can be based on such complex so-

cial phenomena that the ability of other firms to imitate these resources is significantly constrained (Barney 1991).

The capability to manage a supply chain efficiently can be one source of sustained competitive advantage, as for example Wal-Mart has shown (e.g. Stalk *et al.* 1992). On the other hand, a firm's resources and capabilities are valuable only if they reduce a firm's costs or increase its revenues compared to the situation if the firm did not possess those resources (Barney 1997: 147). According to Barney (1999), the firm's capabilities do not play a significant role in traditional transaction analysis of firm boundaries, even though in many situations capabilities do influence the boundary decisions. Similarly, Mahoney & Pandian (1992) argue that simultaneous attention of resource-based view, organizational economics and the industrial organization paradigm is precisely the approach that warrants future research.

Outsourcing makes it possible to invest capital in core activities, or core competence, and may therefore increase production volume. Core competence is communication, involvement and a deep commitment to working across organizational boundaries. It does not diminish with use, and it should be difficult for competitors to imitate (Prahalad & Hamel 1990). Managers, when building core competencies, decide whether to make or buy needed inputs. They start with end products and look upstream to the efficiencies of the supply chain and downstream toward distribution and customers (Prahalad & Hamel 1990). Outsourcing can provide a shortcut to a more competitive product, but it typically contributes little to building the people's skills that are needed to sustain product leadership (Prahalad & Hamel 1990). On the other hand, according to Greaver (1998), outsourcing is a way to solve problems that result from incompetence, lack of capacity, financial pressures or technical failure.

2.4 Concluding remarks on theoretical underpinnings

A summary of previous theories toward understanding of outsourcing decision making is presented in table 1 with some key development steps.

Table 1. Key theories and some publications.

Theory/Author(s)	Key findings
Transaction cost theory	
Coase (1937)	Firms exist because it is costly to use price system to coordinate economic activity.
Williamson (1975)	Hierarchy and inside contracting systems are alternatives to the markets.
Williamson (1985)	Transaction costs are an important factor to the outsourcing decision.
Aertsen (1993)	TCA and some of its key concepts can be applied in the field of logistics.
Agency theory	
Smith (1776)	Incentives for agents are the dominant factor for efficiency.
Barnard (1938)	Energies of organizations are generated by individuals because of incentives.
Arrow (1963)	Once agent has been paid, s/he might not provide the service level s/he had promised (Moral hazard)
Akerlof (1970)	Trust encourages markets to work properly without adverse selection.
Jensen & Mecklin (1976)	Separation of ownership and decision making causes agent costs and influences also the firm's capital structure because profit maximizing agent does not always act in the best interest of the principal.
Barney & Ouchi (1986)	Asymmetric information could be such an important factor that motivations of the decision makers are irrelevant because they do not know the outcomes of different strategies.
Zsidisin & Ellram (2003)	When supply chain risk sources become more prevalent, purchasing organies are increasingly likely to implement behavior-based techniques that reduce information asymmetries, align organizational objectives, and program suppliers' activities.
External economies	
Marshall (1898)	External economies depend on the general organization of the trade, the growth of the knowledge and appliances common to the trade and the development of subsidiary industries.
Stigler (1951)	Growing industries start to specialize.
Meade (1952)	External economies exist whenever the output of a firm depends not only on the factors of production utilized by this firm, but also on the output and factor utilization of another firm or group of firms.
Caballero & Lyons (1990)	External economies also exist on the microeconomic level, but there is demand for further exploration on the source of these external economies.
Knemayer <i>et al.</i> (2003)	When specific investments exist in the relationship, a positive association between relationship management efforts and outsourcing is observed.

Theory/Author(s)	Key findings
Marketing and relationship management	
Weld (1915)	Middlemen can decrease the total costs of a distribution channel.
Emerson (1962)	Power resides implicitly in the other's dependency.
Bucklin (1970)	Where middlemen are used in the channel, it also includes the design of control procedures.
Mallen (1973)	The concept of functional spin-off could be used to evaluate and predict changes in distribution structure.
Bolumole (2001)	The most commonly cited reason for the limitations of outsourcing is the increased dependence on service providers.
Resource dependency	
Pfeffer & Salancik (1978)	Resource dependency provides power to resource owner over the firm which needs those resources.
Glasberg & Schwartz (1983)	Corporate survival depends on successful structural adaption and controlling the environment to ensure a steady flow of needed resources.
Heide & John (1988)	Specific assets create inter-organizational dependency.
Scott (2003)	Companies use bargaining and contracts, mergers of suppliers, joint ventures, trade associations and government connections to ensure the availability of supplies
Relationship management and networks	
Thorelli (1986)	Networks exist due to economies of scale and specialization, and ability to reduce transaction costs. Network failure can be seen as a market failure in transaction cost theory that leads to vertical integration when relationship-specific investments fail.
Jarillo (1988)	Strategic networks increase trust in relationships and thus lower transaction cost and decrease the total cost of the value chain.
Palmer (1997)	Branding may act as a substitute for personal relationships in situation where direct relationships with product providers are difficult to achieve.
Kathandaraman & Wilson (2001)	Networks will look for firms that have superior logistical capabilities if, for example, faster delivery of goods adds value to the customer.
Strategic management	
Chandler (1962)	Changes in operations, for example growth, without structural adjustments can lead to economic inefficiency.
Ansoff (1965)	Major structural decision that is made on the firm's strategy culminates in the make or buy decision.
Porter (1980)	Supernormal returns are primarily a function of a firm's membership in an industry with favorable structural characteristic.
Jones & Hill (1988)	Superior performance is a product of the correct "fit" between strategy and structure.

Theory/Author(s)	Key findings
Resource-based view	
Penrose (1959), Wernerfelt (1984)	Resource-based view of the firm is an eclectic approach encouraging a dialogue between researchers from a variety of perspectives.
Dierickx & Cool (1989)	Socially complex and imperfectly imitable resources can generate a firm's sustainable advantage.
Prahalad & Hamel (1990)	Outsourcing makes it possible to concentrate on core competence. Core competence does not diminish with use and it should be difficult for competitors to imitate.
Barney (1991)	Firms within industry may be heterogeneous with respect to the strategic resources they control and these resources may not be perfectly mobile across firms, thus heterogeneity can be long lasting.
Mahoney & Pandian (1992)	Distinctive competence and superior organizational routines in one or more of the firm's value-chain functions may enable the firm generate rents from a resource advantage.
Greaver (1998)	Outsourcing is a way to solve problems that result from incompetence, lack of capacity, financial pressures or technical failure.

To conclude, it can be seen that there are many similarities between the different approaches to analyzing outsourcing decision making. From a strategic perspective, the resource based and industrial organizational views are strongly connected to relationship management and also to organizational economics. When striving for a holistic understanding of outsourcing decision making, it is useful to embrace concepts and factors from complementary approaches. Unlike in strictly confined theoretical models, the empirical research of industry practice requires a broader view that integrates strategic, economic and behavioral aspects of outsourcing decision making.

2.5 Outsourcing in logistics

2.5.1 Definition and scope

Merriam Webster's online dictionary (www.merriamwebster.com) defines outsourcing as "to procure as some goods or services needed by a business or organization under contract with an outside supplier". This definition is quite similar to classical make-or-buy thinking, which is fundamentally rooted in transaction cost theory (Coase 1937). According to Maltz & Ellram (1997), the outsourcing decisions are a variant of classical make or buy decision. Companies can either use the make option, which means that they have to invest and build their own logis-

tics organization, or they can contract these functions out (Razzaque & Sheng 1998).

Domberger (1998), however, separates contracting – as a design and implementation of contractual relationship between purchaser and supplier – and outsourcing – as a process whereby activities traditionally carried out internally are contracted out to external providers. Bolumole *et al.* (2007) define outsourcing in the context of logistics as the practice of charging external service providers with the task of performing in-house activities. It is economically beneficial to spin off to specialists those functions which have a decreasing cost curve as volume increase and this is also how the middlemen have generated the basic *raison d'être* for their own existence by providing external economies to the buyer of these functions (Mallen 1973).

Lieb *et al.* (1993) argue that outsourcing, third-party logistics (TPL) and contract logistics generally mean the same thing. According to Virum (1993), the term TPL is well known, but there is not one specific definition of TPL and it is not very commonly used by the service providers. However, there are several important aspects connected to TPL. The number of services being outsourced is higher than for a provider of transport or warehousing only and services that TPL providers offer are adjusted to each particular shipper. In addition, TPL service providers want the relationship to develop into strategic partnership with win-win situation for both parties.

Razzaque & Sheng (1998) differentiate outsourcing and strategic partnership as follows. On the one hand, as mentioned earlier, outsourcing is a specifically defined contractual relationship that is dependent on the supplier meeting the buyer's defined performance goals. Deepen *et al.* (2008) additionally distinguish two dimensions of outsourcing performance, goal achievement and goal exceedance. These form the starting point how buyers evaluate their service providers. On the other hand, in a strategic partnership both parties have needs that the other can fulfill, and both firms share values, goals and corporate strategies for mutual benefits. In strategic partnership, parties share the risks and rewards of the relationship. Further, buyers and suppliers in strategic partnership utilize joint problem solving efforts to develop mutual responses to changes in the market place. Bolumole (2001) sees outsourcing in logistics services as a strategy in which organizations employ the services of external providers. Increased competition, globalization and the need for reduced order cycle times and inventory levels have created a need for more responsive processes based on effective supply chain alliances. Thus, traditional methods of developing logistics strategy and

structuring the supply chain are no longer valid for ensuring organizations' survival. As a result, logistics activities are being outsourced to achieve seamless supply chain operations.

According to Andersson & Normann (2002), traditional logistics services, like transportation modes, are not difficult to specify. For the purchase of advanced logistics services, for example in the form of third-party logistics, the definition is much more difficult because the service is new for both shipper and provider and is rather complex. The list of outsourced activities ranges from warehousing, packaging, transportation and distribution to import and export. Third-party logistics providers are also increasingly offering value-added activities such as assembly and quality control. As the forms of outsourcing have developed, also the forms of cooperation have changed. For example Razzaque & Sheng (1998) list four types of contract logistics vendor based on outsourced activities. First type is asset-based vendors, who offer mainly physical logistics services through the use of their own assets. Second are management-based vendors, who offer logistics management services through systems databases and consulting services. Third are integrated vendors, who mainly use their own assets, like trucks and warehouses, but contract also with other vendors on an as-needed basis. Fourth are administrative-based vendors, which mainly provide administrative management services such as freight payment.

The worldwide usage and importance of logistics outsourcing has grown dramatically over the last decades and outsourcing affects thousands of companies and employees every year (Logan 2000, Deepen 2007). Studies already in 2000 indicate that 85 percent of all companies outsource at least one function generating billions of dollars in outsourcing contracts annually. According to Jaafar & Rafiq (2005), logistics and transportations were the most popular areas of outsourcing as they dominated the business activity of the 1980s and 1990s. Recent studies report that globally 85 percent of domestic transportation and 81 percent of international transportation have been outsourced while 72 percent of warehousing has been outsourced globally. Highest outsourcing level in logistics services in 2008 was in domestic transportation in Europe (92 percent) and lowest in customer service in North-America (9 percent), see table 2.

Table 2. Outsourced logistics functions, Capgemini 2008.

Outsourced Logistics Service	All	North	Europe	Asia	Latin
	Regions	America		Pacific	America
	%	%	%	%	%
Domestic transportation	85	78	92	91	70
International transportation	81	69	89	89	70
Warehousing	72	70	73	75	62
Customs clearance and brokerage	65	66	57	81	56
Forwarding	52	48	44	70	45
Shipment consolidation	46	46	43	55	38
Reverse logistics (defective, repair, return)	38	31	42	41	34
Cross-docking	38	37	43	35	25
Transportation management (shipment planning and execution with one or more carriers)	37	39	38	36	25
Product labeling, packaging, assembly, kitting	36	29	42	37	35
Freight bill auditing and payment	30	54	20	21	14
Supply chain consultancy provided by 3PLs	17	21	15	14	14
Order entry, processing and fulfillment	15	12	14	21	17
Fleet management	13	9	15	14	15
LLP/4PL services	13	11	13	14	12
Customer service	12	11	10	12	22

Many academic scholars have recently given a great deal of attention to logistics outsourcing (Knemayer *et al.* 2003). The researchers have reported on the outsourcing of logistics functions from several perspectives including overviews of the industry, keys to successful logistics outsourcing relationships, selection of logistics outsourcing providers, and international perspectives on logistics outsourcing. A growing interest towards outsourcing is indicated by the volume of writings on the subject in scholarly journals, trade publications and popular magazines (Razzaque & Sheng 1998, Bolumole 2001). Some of the commonly cited logistics outsourcing related studies since year 2000 and their key findings are summarized in table 3.

Table 3. Selected logistics outsourcing studies since 2000.

Author(s)	Key findings
Arnold (2000)	Transaction cost economies and the core competence approach complement each other as recommendations for outsourcing design and outsourcing management.
Mclvor (2000)	Problems frequently occur because complex issues such as adequate cost analysis and sufficient definition of own core business have not been done.
Van Laarhoven <i>et al.</i> (2000)	Well defined requirements, procedures, systems and close relationships are factors of successful outsourcing relationships.
Skjoett-Larsen (2000)	Transaction cost analysis explains the conditions under which third party agreements become preferable to the classical choice between market and hierarchy.
Bolumole (2001)	Traditional methods of developing logistics strategy and structuring the supply chain are no longer valid for ensuring organization's survival.
Knemayer <i>et al.</i> (2003)	A closer relationship between shipper and 3PL increases costs but also promises benefits.
Baker & Hubbard (2003)	Better controlling capabilities and improvements in information systems can affect the size of the trucking companies.
Wilding & Juriado (2004)	Soft issues, such as cultural incompatibility and poor communication, may lead to the failure of the 3 PL partnership.
Jaafar & Rafiq (2005)	Poor service might increase customer willingness to multiple sourcing (two to five TPL providers) and thus improvements in customer's satisfaction could yield higher returns.
Halldorsson & Skjoett-Larsen (2006)	To ensure further prosperity of the relationships, also in dyadic third-party logistics arrangements, the two companies must direct their effort towards the logic of the network approach.
Kremic <i>et al.</i> (2006)	Offering tools and guidelines in terms of decision support, the literature is lacking and needs additional work.
Bolumole <i>et al.</i> (2007)	Multiple social science theoretical perspectives can be combined to develop a framework within which logistics outsourcing decisions can be examined and evaluated.
Deepen (2007)	Logistics performance is a main driver of the firm's performance. However, most firms do not rise to their its full potential.
Wallenburg (2009)	Cost improvements are the main driver of customer loyalty when the outsourced services are simple and their contracting period rather short. When services increase in complexity and the contracting period lengthens, customer loyalty is primarily driven by proactive performance improvement, while cost improvement only plays a subordinate role.

Although this list is by no means exhaustive, it serves to illustrate that many dimensions and approaches in outsourcing decisions need to be considered. There are multiple benefits and risks related to logistics outsourcing and many challenging issues related to outsourcing relationships. For example, which part of logistics should be outsourced is a very fundamental question that involves a strategic decision, and who should provide the service calls for identification of the adequate requirements in order to select the appropriate LSP (Deepen 2007). Hall-dorsson & Skjoett-Larsen (2006) argue that third-party logistics dyads are subject to both controllable and non-controllable forces of change, which may not always have a positive effect on the logistics performance or the relationship itself. Hence, to ensure further prosperity of relationships, the companies must direct their effort towards the logic of the network approach. In addition, those who rely on single sourcing have feelings of insecurity due to poor service that might be provided by their current third-party logistics provider and thus need to turn to multiple sourcing (Jaafar & Rafiq 2005). This means that to gain an eclectic view on outsourcing, researchers need multiple approaches simultaneously.

2.5.2 Drivers, benefits and risks

Before deciding on the scope of activities to outsource, firms should evaluate the benefits and risks associated with the particular outsourcing arrangements. Although those benefits and risks are inherently different in each case there are some common advantages and disadvantages in logistics outsourcing. According to Razzaque & Sheng (1998), in modern organizations management of logistics functions involves decision making for the complete distribution of goods and services with a view to maximize value and minimize cost. There are three main reasons why logistics has been upgraded from its traditional back-room position to a strategic boardroom function. First, there is a growing need to be more responsive to customer service and market demand, and logistics can deliver better customer service as an integrative concept that cut across the traditional functions of business. Second, logistics involves a large commitment of capital. Third, logistics can be the key facilitator towards supply chain integration. Razzaque & Sheng (1998) propose producing logistics in-house, using logistics subsidiaries or outsourcing as alternative ways of handling logistics activities effectively and efficiently.

Because a company's logistics performance has an influence on overall firm performance and outsourcing performance is an important driver of logistics per-

formance, clearly understanding the drivers of logistics outsourcing performance is critical knowledge for managers in today's competitive business environment (Deepen 2007). According to Razzaque & Sheng (1998), outsourcing offers multiple advantages to those who are using it. It reduces capital investments in facilities, equipment, information technology and manpower. Firms only need to contract for necessary level of service to meet current demand and when demand surge they can call more resources from third-party. Therefore, usage of third-party logistics convert fixed cost to variable cost and it also enables better adaption to changes through flexibility and agility. Logistics being their core business, third-party logistics can also lower cost by being more efficient. Thus outsourcing reduces inventories and improves inventory turnover rate. The most frequently mentioned benefit of outsourcing is the reduction of the firm's logistics costs, LSPs can be more efficient because logistics is their core business, there can be scale and scope advantages and reduced capital need (Deepen 2007).

Razzaque & Sheng (1998) list factors that may act as driving forces behind outsourcing. First come globalization of business and continued growth in global markets. In addition, foreign sourcing has placed increasing demands on the logistics function and it has led to more complex supply chains. Also lack of knowledge of destination country's infrastructure and customs forces firms to purchase the expertise. Another major factor promoting outsourcing is the increasing use of just-in-time (JIT) principles (Trunick 1989, Goldberg 1990, Sheffi 1990). Using JIT delivery, inventory and logistics control have become more and more important part of manufacturing and distribution. This may also increase the demand for expertise of professional logistics service providers. Emerging technology and versatility of third parties are two other important drivers of outsourcing, because it would be expensive and time consuming to develop and implement new technologies in-house (Trunick 1989). By using contract logistics, firms can spend more time and resources to pursue strategic planning and management issues. Thus, with contract logistics, firms can focus on their core competency rather than logistics (Razzaque & Sheng 1998, Deepen 2007). According to Bolumole (2001), in certain situations, a combination of the cost, experience and competence leave the organization with no other option but to outsource. A comprehensive list of literature regarding the potential benefits of outsourcing is presented in table 4 (Kremic *et al.* 2006¹).

¹References in table 4 are not included in the reference list of this thesis. The full references can be found in the Kremic *et al.* (2006) paper.

Table 4. Expected benefits sought from outsourcing.

Expected benefit	References
Cost savings	Adler (2000), Antonucci <i>et al.</i> (1998), Champy (1996), Crone (1992), Drtina (1994), Dubbs (1992), Fan (2000), Gordon & Walsh (1997), Hendry (1995), Hubbard (1993), Jennings (2002), Kakabadse & Kakabadse (2000a), Kriss (1996), Krizner (2000), Laabs (1993a, b), Laarhoven <i>et al.</i> (2000), Lankford & Parsa (1999), Large (1999), LaRock (1993), Lawes (1994), Lee (1994), McCray & Clark (1999), Mehling (1998), Quinn & Hilmer (1994), Razzaque & Sheng (1998), Roberts, V. (2001), Tefft (1998), Tully (1993), Vining & Globerman (1999), Willcocks & Currie (1997), Willcocks <i>et al.</i> (1995)
Reduced capital expenditures	Hubbard (1993), Kakabadse & Kakabadse (2000a), Lawes (1994), McEachern (1996), Muscato (1998), Razzaque & Sheng (1998), Tully (1993)
Transfer fixed costs to variable	Blumberg (1998), Gordon & Walsh (1997), McEachern (1996)
Quality improvement	Blumberg (1998), Campbell (1995), Champy (1996), Hubbard (1993), Jennings (1997), Jennings (2002), Kakabadse & Kakabadse (2000a), Kriss (1996), Laabs (1993a, b), Lee (1994), McEachern (1996), Mehling (1998), Roberts, V. (2001), Tefft (1998), Willcocks <i>et al.</i> (1995)
Increased speed	Drew (1995), Dubbs (1992), Jennings (1997), Kakabadse & Kakabadse (2000a), Kriss (1996), Krizner (2000), Quinn & Hilmer (1994), Razzaque & Sheng (1998)
Greater flexibility	Antonucci <i>et al.</i> (1998), Campbell (1995), Drtina (1994), Gordon & Walsh (1997), Jennings (1997), Jennings (2002), Kakabadse & Kakabadse (2000a, b), Muscato (1998), Quinn & Hilmer (1994), Quinn (1999), Muscato (1998), Razzaque & Sheng (1998), Roberts, V. (2001), Tully (1993), Willcocks <i>et al.</i> (1995)
Access to latest technology/infrastructure	Antonucci <i>et al.</i> (1998), Campbell (1995), Champy (1996), Crone (1992), Drtina (1994), Gordon & Walsh (1997), Kakabadse & Kakabadse (2000a), Lankford & Parsa (1999), McEachern (1996), Mehling (1998), Muscato (1998), Roberts, V. (2001), Wright (2001)
Access to skills and talent	Blumberg (1998), Campbell (1995), Gordon & Walsh (1997), Hill (1994), Hines & Rich (1998), Jennings (1997), Lankford & Parsa (1999), Large (1999), Lawes (1994), Mans (1998), McEachern (1996), Moran (1997), Muscato (1998), Razzaque & Sheng (1998), Richardson (1997), Willcocks <i>et al.</i> (1995), Wright (2001), Augment staff Burzawa (1994), Gibson (1993), Gilbert (1999), Jennings (1997), Kakabadse & Kakabadse (2000a, b), Large (1999), Lawes (1994), Razzaque & Sheng (1998), Richardson (1997), Tefft (1998), Willcocks <i>et al.</i> (1995), Wright (2001)

Expected benefit	References
Increase focus on core functions	Adler (2000), Antonucci (1998), Blumberg (1998), Champy (1996), Crone (1992), Hubbard (1993), Jennings (2002), Kakabadse & Kakabadse (2000a, b), Laabs (1993a, b), Lankford & Parsa (1999), Large (1999), Lawes (1994), Leavy (1996), Mclvor & McHugh (2000), Mehling (1998), Moran (1997), Quinn & Hilmer (1994), Roberts, V. (2001), Willcocks <i>et al.</i> (1995), Wolosky (1997), Wright (2001)
Get rid of problem functions	Mclvor (2000a), Willcocks & Currie (1997), Willcocks (1995)
Copy competitors	Willcocks & Currie (1997), Willcocks <i>et al.</i> (1995)
Reduce politic pressures or scrutiny	Gordon & Walsh (1997), Hendry (1995), Kakabadse & Kakabadse (2000a), Willcocks & Currie (1997), Willcocks <i>et al.</i> (1995)
Legal compliance	Gordon & Walsh (1997), Kakabadse & Kakabadse (2000a)
Better accountability/management	Domberger & Fernandez (1999), Hubbard (1993), Mehling (1998), Willcocks <i>et al.</i> (1995)

Deepen (2007) argues that after the initial outsourcing debate had rather euphoric notion, realization came over the years that outsourcing is accompanied by some disadvantages and risks and there are also many reasons that discourage the use of third-party logistics. Losing control to third-party appears to be the most commonly cited reservation that inhibits firms from using contract logistics (Razzaque & Sheng 1998, Deepen 2007). Other serious problems could be losing touch with important information, problems with selecting and managing service providers properly, providers' unreliable promises and inability to respond to changing customer demands, and providers' lack of understanding customers' business goals. Also strategic dimension of outsourcing projects is often neglected, leading to sub-optimal results based on short term reasons of cost reduction and capacity issues (McIvor 2000). Problems frequently occur because complex issues such as adequate cost analysis and sufficient definition of own core business have not been done. In addition, Bolumole (2001) reminds that outsourcing is just a tool, not a panacea. Thus, the firm must rely on the LSP to fulfill the service as agreed upon in the contract, but then it has demand for the data it needs for judging whether the levels of quality, service and cost reduction have been achieved or not (Deepen 2007). A comprehensive list of literature regarding the potential risks of outsourcing is presented in table 5 (Kremic *et al.* 2006²).

² References in table 5 are not included in the reference list of this thesis. The full references can be found in the Kremic *et al.* (2006) paper.

Table 5. Potential risks of outsourcing.

Potential risk	References
Unrealized savings or hidden costs	Alexander & Young (1996), (<i>Journal of Accountancy</i> 1996), (<i>Works Management</i> 1999), Antonucci <i>et al.</i> (1998), Brown (1997), Dubbs (1992), Earl (1996), Elliot (1995), Hendry (1995), Jennings (1997), Jones (1993), Kakabadse & Kakabadse (2000a, b), Lonsdale (1999), McEachern (1996), Prahalad & Hamel (1990), Quinn & Hilmer (1994), Willcocks <i>et al.</i> (1995)
Less flexibility	Management Accounting (1998), Antonucci <i>et al.</i> (1998), Bryce & Useem (1998), Gordon & Walsh (1997), McCray & Clark (1999), Roberts, V. (2001), Tefft (1998), Willcocks & Currie (1997)
Poor contract or poor selection of partner	Management Accounting (1997, 1998), Crone (1992), Domberger & Fernandez (1999), Gordon & Walsh (1997), Hill (1994), Jorgensen (1996), Klopack (2000), Krizner (2000), Lee & Kim (1999), Mullin (1996), Willcocks <i>et al.</i> (1995)
Loss of knowledge/skills and/or corporate memory and the difficulty in reacquiring a function	Campbell (1995), Earl (1996), Gilbert (1999), Jennings (1997), Kakabadse & Kakabadse (2000a, b), Kelleher (1990), Leavy (1996), McEachern (1996), Mclvor (2000a), Paoli & Prencipe (1999), Prahalad & Hamel (1990), Quinn & Hilmer (1994), Quinn (1999), Roberts, V. (2001), Willcocks & Currie (1997), Willcocks <i>et al.</i> (1995)
Loss of control/core competence	Anthes (1991), Antonucci <i>et al.</i> (1998), Elliot (1995), Jennings (1997), Kakabadse & Kakabadse (2000a, b), Katz (1995), Klopack (2000), Leavy (1996), Lonsdale (1999), McEachern (1996), Ngwenyama & Bryson (1999), Quinn & Hilmer (1994), Razzaque & Chen (1998), Roberts, V. (2001)
Power shift to supplier	Antonucci <i>et al.</i> (1998), Campbell (1995), Kakabadse & Kakabadse (2000a), Katz (1995), Lonsdale (1999), Quinn (1999), Quinn (1999), Roberts, V. (2001), Willcocks & Currie (1997)
Supplier problems (poor performance or bad relations, opportunistic behavior, not giving access to best talent or technology)	Avery (2000), Baden-Fuller <i>et al.</i> (2000), Brown (1997), Bryce & Useem (1998), Earl (1996), Elliot (1995), Iyer & Kusnierz (1996), Kakabadse & Kakabadse (2000a), Katz (1995), Laabs (1998), Lawes (1994), Lonsdale (1999), Mans (1998), Quinn & Hilmer (1994), Razzaque & Sheng (1998), Roberts, V. (2001), Vining & Globberman (1999), Willcocks & Currie (1997), Willcocks <i>et al.</i> (1995), Willis (1996)

Potential risk	References
Losing customers, opportunities, or reputation	Blumberg (1998), Brown (1997), Kakabadse & Kakabadse (2000a), Quinn & Hilmer (1994), Roberts, V. (2001)
Uncertainty/changing environment	Earl (1996), Gordon & Walsh (1997), Lawes (1994), Lonsdale (1999), Willcocks & Currie (1997)
Poor morale/employee issues	Blumberg (1998), Gordon & Walsh (1997), Kakabadse & Kakabadse (2000a), Quinn (1999), Razzaque & Sheng (1998), Story (2000)
Other	
Loss of synergy	Campbell (1995), Willcocks & Currie (1997)
Create competitor	Klopach (2000)
Conflict of interest	Avery (2000), Gordon & Walsh (1997)
Security issues	Graham (1996), Peltier (1996)
False sense of	Roberts, P. (2001), Sherter (1997), Widger (1996)
Legal obstacles	Gordon & Walsh (1997), Graham (1996)
Skill erosion	Lafferty & Roan (2000)

In the literature, there are some critical factors to ensure successful outsourcing. According to Razzaque & Sheng (1998), the most important factor is that the decision to outsource must come from the top of the organization and managers need to view outsourcing as a strategic activity. Other important factors are that communication between logistics users and providers works fluently, and firms have specified the service providers' role, expectations, requirements and responsibilities clearly. Wilding & Juriado (2004) found that a considerable number of consumer goods companies admitting that soft issues, such as cultural incompatibility and poor communication, may lead to failure of the third-party partnership. Razzaque & Sheng (1998) highlight the meaning of trust and control for successful outsourcing. In addition, also Das & Teng (1998) have studied trust and control, arguing that those are the critical dimensions of confidence enabling strategic cooperation. Mutual commitment on a continuing long-term basis, not just on a contractual short-term basis, is important when making outsourcing decisions, because through long-term relationship contract logistics draws its strength as a powerful and effective source of strategic advantages (Maltz & Ellram 1997, Razzaque & Sheng 1998).

2.6 Positioning this thesis

As seen in theoretical chapter above, there are several theoretical approaches to outsourcing as well to outsourcing logistics. Researchers have also presented comprehensive lists of benefits and risks of outsourcing. However, literature concerning different strategies, logistics outsourcing decisions and outcomes of logistics outsourcing is relatively scarce. Hence, this thesis attempts to combine several theoretical approaches into one framework illustrating outsourcing strategies, outsourcing decision dimensions and outcomes in the context of logistics services.

Theoretically this means that one starting point is transaction cost theory (Coase 1937, Williamson 1975, Williamson 1985) which has been complemented with network theory (Thorelli 1986, Jarillo 1988). In newer service research, a parallel concept to asset specificity is complexity (e.g. Langlois 2002), which can be reduced by using modularity. Another approach comes from resource dependency. According to Heide & John (1988), specific assets create inter-organizational dependency. When this is linked with Dyer's (1997) argument that relationship-specific assets can lower transaction costs, the approach shifts from safeguarding of assets to the strategic partnership.

This thesis is positioned in the intersection of several theoretical approaches. Most importantly, the thesis draws from transaction cost theory and network theory, emphasizing efficient governance structures and relationships between organizations. Further inputs to the theoretical discussion of this thesis come from the resource-based view in strategy literature. These complementary approaches offer a prolific base for building up the theoretical framework concerning decision making in outsourcing relationships.

3 Methodology and research method

This chapter contains methodological background of the thesis as well as description of the research method.

3.1 Methodology

According to Kovacs & Spens (2005), logistics research is interdisciplinary by definition. It stems from many different scientific traditions and has been influenced by economic and behavioral approaches. However, the questions are asked, as in research generally, both ontologically and epistemologically. Ontology can be defined as the most general lesson about the nature of being, its fundamental features and principles, epistemology deals with the question of how we understand reality and communicate this to other people (Solem 2003). In other words, ontology concerns fundamental assumptions what is reality and epistemology is process of learning about it.

Burrell & Morgan (1979) suggest two approaches for analyzing assumptions in social sciences, subjective and objective approach. Further, when classified by subjective and objective approaches, ontology can be divided into nominalism and realism, and epistemology into positivism and anti-positivism. In addition, Burrell & Morgan (1979) divide also human nature and methodology based on subjectivist and objectivist approaches. Human nature is divided into voluntarist and determinist, and methodology into ideographic and nomothetic. Gammelgaard (2004) argues that logistics research will benefit – and has benefited – from various methodological approaches. The research approach of this thesis is positivist. The study represents the objectivist tradition and nomothetic methodology. Ideally, the aim in this type of research is to find causal relationships and establish law-like generalizations (Neilimo & Näsi 1980).

The positivist approach, which is predominant in logistics research, implies that reality is considered to be objective, tangible and fragmentable (Mentzer & Kahn 1995). A general agreement in positivist tradition is that causal relationships can be discovered and, in addition, research findings are considered value-free, time-free and context independent. In other words, according to Solem (2003), in the positivist tradition knowledge is hard, real and capable of being transmitted in a tangible form. Research, for example, formulates hypotheses and then tests them. Preferred methods include operationalizing concepts so they can be measured and taking large samples. The preferred research method in the positivist

approach is quantitative and surveys are commonly used to gather research data (Mentzer & Kahn 1995). Quantitative methods are also used in this study for empirical data collection and analysis.

Research strategy is usually divided into inductive and deductive. In addition, Kovacs & Spens (2005) recommend also abductive reasoning for logistics research. Deductive positivism is predominant strategy in business logistics and it is the most suitable approach for testing existing theories (Arlbjorn & Haldorsson 2002). In this thesis, the strategy is deductive. In all papers the starting point is conceptual framework which leads to theoretical models with hypotheses. The models are followed by empirical testing and final conclusions.

3.2 Method

The research method in this thesis is structural equation modeling. To understand this method, the following sub chapters describe latent variables, exploratory factor analyses, measurement models, confirmatory factor analyses and finally structural equation modeling itself.

3.2.1 Latent variables

Latent - also called hidden, hypothetical, or underlying - variables are unobservable and have no definite scales (Joreskog 2007, Shah & Meyer Goldstein 2006). In other words, latent variables are variables that are not directly observed but are produced, using mathematical model, from other variables that are observed and directly measured. Because both the origin and the unit of measurement in each latent variable are arbitrary, to define the model properly, the origin and the unit of measurement of each latent variable must be defined. There are two typical ways in which this is done. First, the most useful and convenient way of assigning the units of measurement of the latent variables is to assume that they are standardized so that they have zero means and unit variances in the population. Second, another way to assign a unit of measurement for a latent variable is to fix a non-zero coefficient (usually one) in the relationship for one of its observed indicators. This defines the unit for each latent variable in relation to one of the observed variables, a so-called reference variable. In practice, one chooses as reference variable the observed variable which, in some sense, best represents the latent variable (Joreskog 2007). Usually this means for example choosing the reference variable by comparing loadings of the measures and choosing the highest. In ad-

dition, there are two cases when further considerations are necessary. First, when the observed variables in the model are ordinal, because then, even the observed variables do not have any units of measurement. Second, further considerations are also necessary in longitudinal and multiple group studies in order to put the variables on the same scale at different occasions and in different groups. In such studies one can also relax the assumption of zero means for the latent variables (Joreskog 2007).

There are two basic problems concerning latent variables. The first problem is concerned with the measurement properties, validities and reliabilities, of the measurement instruments. The second problem concerns the causal relationships among the variables and their relative explanatory power. The validity of a measure indicates how well the measure measures what it is supposed to measure and the reliability of a measure indicates how well the measure measures whatever it measures. In addition, most measurements used in the behavioral and social sciences include measurement errors, which, if not taken into account, can cause severe bias in results. Adequate modeling should take measurement errors into account whenever possible. Measurement errors occur because of imperfections in measurement instruments (questionnaires, interviews, tests, etc.) and measuring procedures (recording, coding, scaling, grouping, aggregation, etc.). (Joreskog 2007.)

3.2.2 Exploratory factor analysis

EFA (exploratory factor analysis) is a complex, multi-step process technique, which is often used to detect and assess latent sources of variation and covariation in observed measurements (Costello & Osborne 2005, Joreskog 2007). According to Koufteros (1999), EFA helps to determine how many latent variables underlie the complete set of items and also provide a means of explaining variation among relatively large number of original variables using relatively few newly created latent variables. It is widely utilized and broadly applied statistical technique especially in social sciences and behavioral studies.

It is widely recognized that EFA can be quite useful in the early stages of experimentation or test development. Usually, the results of an EFA have heuristic and suggestive value and may generate hypotheses which are capable of more objective testing by other methods. As more knowledge is gained about the nature of for example social and psychological measurements, however, EFA may not be a useful tool and may even become a hindrance in those sciences. Further, most

studies are to some extent both exploratory and confirmatory since they involve some variables of known and other variables of unknown composition (Joreskog 2007). Because the nature and design of EFA is exploratory, it is highly desirable that a hypothesis which has been suggested by EFA should subsequently be confirmed, or disproved, by obtaining new data and subjecting these to more rigorous statistical techniques (Osborne & Costello 2005, Joreskog 2007).

The basic idea of factor analysis in mathematical form is the following. For a given set of observed variables x_1, \dots, x_p one wants to find a set of underlying latent factors ζ_1, \dots, ζ_k , fewer in number than the observed variables. These latent factors are supposed to account for the correlations of the observed variables in the sense that when the factors are determined from the observed variables, there should no longer remain any correlations between them. If both the observed response variables and the latent factors are measured in deviations from the mean, this leads to the model:

$$x_i = \lambda_{i1}\zeta_1 + \lambda_{i2}\zeta_2 + \dots + \lambda_{ik}\zeta_k + \delta_i,$$

where δ_i , the unique part of x_i , is assumed to be uncorrelated with $\zeta_1, \zeta_2, \dots, \zeta_k$ and with δ_j for $j \neq i$.

The unique part δ_i consists of two components: a specific factor s_i and a pure random measurement error e_i . These are indistinguishable, unless the measurements x_i are designed in such a way that they can be separately identified. The term δ_i is often called the measurement error in x_i even though it is widely recognized that this term may also contain a specific factor (Joreskog 2007.)

3.2.3 Confirmatory factor analysis

In a CFA (confirmatory factor analysis), the investigator has such knowledge about the factorial nature of the variables, based on the earlier studies, that he/she is able to specify that each measure x_i depends only on a few of the factors ζ_j (Joreskog 2007). According to Koufteros (1999), CFA involves the specification and estimation of one or more hypothesized models of factor structure, each of which proposes a set of latent variables to account for covariance among a set of observed variables.

Equation can be written in matrix form as

$$\mathbf{x} = \mathbf{\Lambda}\boldsymbol{\zeta} + \boldsymbol{\delta},$$

where $\mathbf{x}' = (x_1, x_2, \dots, x_p)$, $\boldsymbol{\zeta}' = (\zeta_1, \zeta_2, \dots, \zeta_k)$, and $\boldsymbol{\delta}' = (\delta_1, \delta_2, \dots, \delta_p)$.

The matrix Λ of order $p \times k$ is called the factor matrix or the factor loadings matrix.

To compare EFA and CFA, EFA is usually performed in two steps: First one estimates an arbitrary matrix Λ and then this is transformed according to external criteria for simple structure to facilitate interpretation of the data. In CFA the factor loadings are usually uniquely determined by the number and positions of the specified zero factor loadings (Joreskog 2007).

3.2.4 Measurement models

According to Joreskog (2007), most theories and models in the social and behavioral sciences are formulated in terms of theoretical or hypothetical concepts, or constructs, or latent variables, which are not directly measurable or observable. The measurement of a hypothetical construct is accomplished indirectly through one or more observable indicators, such as responses to questionnaire items that are assumed to represent the construct adequately, usually based on previous qualitative or quantitative studies.

The purpose of a measurement model is to describe how well the observed indicators serve as a measurement instrument for the latent variables and concept “construct validity” examines the degree to which a scale measures what it intends to measure (Garver & Mentzer 1999, Joreskog 2007). Measurement models are important when one tries to measure for example such abstractions as people’s behavior, attitudes, feelings and motivations. Unfortunately, most measures employed for such purposes contain sizable measurement errors, but the measurement models allow us to take these errors into account (Joreskog 2007).

In confirmatory factor analysis, factors require at least three measures to be identified. In large models, using at least four measures per factor also gives the benefit that each construct’s fit can be evaluated separately without full model. According to Hair *et al.* (2010: 701), four indicators should be used whenever possible, three indicators per construct is acceptable and constructs with fewer than three indicators should be avoided. Similarly, Kenny (1979) argues that two indicators might be fine, three is better, four is best, and anything more is gravy. However, some concepts in psychological constructs and some behavioral outcomes in marketing are very simple and thus can be represented with a single item (Hair *et al.* 2010: 701). Hence, the review of the literature should primarily drive the model specification and identification for both, measurement and structural models (Schumacher & Lomax 1996: 140).

3.2.5 Structural equation modeling

SEM (Structural equation modeling) has been a popular research method since it was founded by Sewall Wright in 1916 (Bollen 1989, Shah & Meyer Goldstein 2006, Joreskog 2007). The development has been huge, and there are thousands of journal articles, hundreds of dissertations and numerous books where SEM has been the topic or used research method. Factors behind this development are that computer technology has become efficient enough for SEM and the method itself has simple command language. One key factor is also that there have been several SEM courses at many universities. In addition, with SEM it is possible to test complex models and path diagrams offer a visual way to present results. There are five main virtues of SEM methodology (Joreskog 2007). First, SEM has the power to test complex hypotheses involving causal relationships among constructs or latent variables. Second, SEM unifies several multivariate methods into one analytic framework. Third, SEM specifically expresses the effects of latent variables on each other and the effect of latent variables on observed variables. Fourth, SEM can be used to test alternative hypotheses. And fifth, SEM gives, for example to a social scientist, powerful tools for stating theories more exactly, testing theories more precisely and generating more understanding through observed data.

According to Wallenburg & Weber (2005), SEM can offer a rigorous empirical approach for theory development and testing, which is still an area to be developed in logistics and supply chain management research. Similarly, Garver & Mentzer (1999) suggest that logistics research needs to more fully utilize SEM, especially for testing of concept validity in empirical research, because researchers are calling for future logistics research to have a stronger theoretical foundation and to focus on theory testing. Also in OM (operations management) research the use of SEM has increased. Shah & Meyer Goldstein (2006) state that SEM has recently become one of the preferred data analysis methods among empirical OM researchers and articles that employ SEM as the primary data analytic tool now routinely appear in major OM journals. Shook *et al.* (2004) offer one example: only five studies using SEM were published in Strategic Management Journal prior to 1995, while 27 such studies appeared between 1998 and 2002.

Shah & Meyer Goldstein (2006) argue SEM to be a technique to specify, estimate, and evaluate models of linear relationships among a set of observed variables in terms of a generally smaller number of unobserved variables. According to Joreskog (2007), from a statistical point of view SEM process goes as follows.

The first step is specification of the model, which is followed by identification of models and parameters, fitting and testing models, and assessment of fit. Based on the assessment of fit the last step is testing structural hypotheses. SEM models consist of observed variables and unobserved variables that can be independent or dependent in nature. Unobserved, or latent, variables are hypothetical construct that cannot be directly measured and in SEM are typically represented by multiple measures that serve as indicators of the underlying constructs (Shah & Meyer Goldstein 2006). SEM has several aspects; object of the study could be concepts, construct or model formalization. Basic issues for studies are causality between concepts, model building (theory vs. data driven – exploratory vs. confirmatory), units of measurement and standardization, and scale types. In its most usual form, SEM consists of a set of linear equations that simultaneously test two or more relationships among directly observable and/or unmeasured latent variables (Shook *et al.* 2004).

The indicator variables can be ordinal, continuous (normal or non-normal), censored, mixtures, nominal and fixed or covariates. Data itself can be cross-sectional, longitudinal, single sample, multiple samples or case-weighted. In cases, where data is assumed to follow normal distribution, it must be studied because non-normality affects standard errors and fit measures. In other words, normal theory methods give incorrect standard errors and chi-squares under non-normality. Further, there are multiple solutions to deal with incomplete data: list-wise deletion, pairwise deletion, imputation by matching, multiple imputations, completing by EM (expectation maximization) etc. In addition, data transformations are not prohibited from modeling point of view. Therefore SEM is a suitable method for many different types of data. Because modeling is based on correlation or covariance matrixes, thus if such a matrix is possible to create, also modeling is possible (Joreskog 2007.)

While measurement model specifies how latent variables or hypothetical constructs depend upon or are indicated by the observed variables, SEM specifies the causal relationships among the latent variables (Joreskog *et al.* 2000). In other words, SEM is regression analysis with latent variables. In mathematical form SEM notation is as follows:

The formulas of CFA are

$$\mathbf{x} = \Lambda\mathbf{x}\xi + \delta, \text{ for } \mathbf{x}, \text{ and}$$

$$\mathbf{y} = \Lambda\mathbf{y}\eta + \epsilon, \text{ for } \mathbf{y},$$

and the formula of SEM is the regression model of the CFA

$$\boldsymbol{\eta} = \mathbf{B} \boldsymbol{\eta} + \boldsymbol{\Gamma} \boldsymbol{\xi} + \boldsymbol{\zeta}.$$

The terms in these formulas are defined as follows:

\mathbf{Y}	is a $p \times 1$ vector of observed response or outcome variables.
\mathbf{x}	is a $q \times 1$ vector of predictors, covariates, or input variables.
$\boldsymbol{\eta}$	is an $m \times 1$ random vector of latent dependent, or endogenous, variables.
$\boldsymbol{\xi}$	is an $n \times 1$ random vector of latent independent, or exogenous, variables.
$\boldsymbol{\varepsilon}$	is a $p \times 1$ vector of measurement errors in \mathbf{y} .
$\boldsymbol{\delta}$	is a $q \times 1$ vector of measurement errors in \mathbf{x} .
$\boldsymbol{\Lambda}_y$	is a $p \times m$ matrix of coefficients of the regression of \mathbf{y} on $\boldsymbol{\eta}$.
$\boldsymbol{\Lambda}_x$	is a $q \times n$ matrix of coefficients of the regression of \mathbf{x} on $\boldsymbol{\xi}$.
$\boldsymbol{\Gamma}$	is an $m \times n$ matrix of coefficients of the $\boldsymbol{\xi}$ -variables in the structural relationships.
\mathbf{B}	is an $m \times m$ matrix of coefficients of the $\boldsymbol{\eta}$ -variables in the structural relationships. \mathbf{B} has zeros in the diagonal, and $\mathbf{I} - \mathbf{B}$ is required to be non-singular.
$\boldsymbol{\zeta}$	is an $m \times 1$ vector of equation errors (random disturbances) in the structural relationship between $\boldsymbol{\eta}$ and $\boldsymbol{\xi}$.

3.3 Data acquisition

Larson (2005) argues that it is important that logistics researchers use best practices in conducting mail surveys, because while interest in collecting data with mail surveys is increasing among logistics researchers, response rates are declining. The research papers included in this thesis contain two data. Both data were collected in two steps to maximize response rate. First, the target groups received an email where they were asked to fill the questionnaires through Internet using Webropol (www.webropol.com) software. Second, the respondents received a phone call where they were reminded of the questionnaire. According to Lambert & Harrington (1990), the best protection against non-response bias is to attempt to increase the response rate. In practice, response rates cannot reach the level that non-response bias would not be a potential problem. Lambert & Harrington (1990) argue that a non-response bias can be studied by comparing different re-

response waves. With both data, the first wave included companies that responded after the original e-mail request and the second wave consisted of companies that responded after the telephone reminder. A randomized one-way analysis of variance (ANOVA) was used to test whether any differences existed between the response waves.

First data were collected in November 2005 in connection with a regional logistics strategy project (Juntunen 2006). The survey was administered in the Internet using the Webropol online survey package. The questionnaire included various sections intended for mapping the business conditions for logistics in Northern Finland, with one section devoted to outsourcing-related questions. The target group in this data consisted of northern Finnish companies that consume logistics services (e.g. mining, manufacturing, maintenance and construction). Measured by turn-over, 600 largest companies in the region were selected to the sample and all companies with less than five employees were excluded. The questionnaire was pilot tested by the steering group of the Northern Finnish logistics strategy project. Due to nature of the project, the empirical study was carried out in a relatively short timeframe.

An e-mail was sent to the companies with a link to the Internet questionnaire as well as background information about the project and the researcher's contact details. After a week's response time, the companies were contacted by telephone to remind about the survey and ask for responses. Totally 161 acceptable responses were received, corresponding to a 27.4 percent response rate. The first wave included companies that responded after the original e-mail request (6.0 percent). The second wave consisted of companies that responded after the telephone reminder (21.4 percent). ANOVA was used to test whether any differences existed between the waves. There were no statistically significant differences (using the criterion of $p > 0.05$) between the two waves for any of the variables used in this study, so it may be assumed that non-response bias is not a problem with first data.

The second data were collected from industrial companies in Finland during spring 2008. Based on experiences from the previous survey, the second questionnaire was refined and new constructs and measures were included. Hence, the survey was extended to give a better coverage of constructs such as experienced service level, satisfaction, branding issues etc. In addition, there were also some differences with target group selection criteria in relation to the first survey because the former data were collected among northern Finnish companies whereas this data were collected among all Finnish companies. The first criterion for the

second target group was that their line of business consumes a lot of logistics services (e.g. mining, manufacturing, infrastructure maintenance and construction). The next criterion was that the companies in the target group must have at least 50 employees and they must have a turnover of over 400 000 Euros a year.

In the second data, 235 acceptable responses were returned, representing a response rate of 22.5 percent. Also with this data, a randomized one-way analysis of variance (ANOVA) was used to study non-response bias by comparing different response waves. The first wave included the companies that responded after the original e-mail request (37.4 percent) and the second wave consisted of companies that responded after the telephone reminder (62.6 percent). There were no statistically significant differences in the second data (using the criterion of $p > 0.05$) between the two waves. Therefore, it may be assumed that non-response bias is not a problem in the second data either.

Koufteros (199) argues that expert evaluation, pretesting, and pilot studies are necessary evils with survey studies. In this study the first questionnaire was tested with the steering group of the project and the second questionnaire consists mainly of similar questions as the first one. Together with the preceding literature analysis of relevant research, the pilot testing of the questionnaire helped to secure adequate validity of the intended research questions.

3.4 Reliability, validity and generalizability

According to Mentzer & Flint (1997), reliability is defined as how consistently the measures yield the same results through multiple applications. Reliability is easy to measure and thus receives relatively more emphasis than other, maybe even more important concepts, like validity and generalizability (Aaker & Day 1990). However, reliability is a precondition for validity (Grant 2004). The underlying theme in all reliability tests is to correlate scores from a scale with scores from a replication of that scale, as for example, in the split-half method and coefficient alpha (Aaker & Day 1990, Garver & Mentzer 1999). In SEM, approaches to estimating scale and item reliability are designed to overcome limitations associated with traditional coefficient alpha (Garver & Mentzer 1999). The squared multiple correlations are usually interpreted as the reliability of the observed measure and scale reliability is usually studied with construct reliability and variance extracted values.

Mentzer & Flint (1997) divide validity in logistics research into statistical conclusion validity, internal validity, construct validity and external validity. Sta-

tistical conclusion validity indicates if there is a relationship among the constructs. Internal validity indicates if there are plausible causal relationships. Construct validity studies if there are given causal probabilities, what exactly are the constructs in the relationship. In structural equation modeling and confirmatory factor analysis, factor loadings and validity have strong correlation (Bollen 1989). Aaker & Day (1990) define convergent validity as the ability of measurement instrument to correlate or converge with other supposed measures of the same variable or construct. According to Steenkamp and van Trijp (1991), a weak condition for convergent validity is that the factor regression coefficient on a particular item is statistically significant and a stronger condition is that factor regression coefficient is substantial. External validity is concerned with the causal probability between specific constructs, and how generalizable results are across persons, settings and times (Mentzer & Flint 1997).

According to Mentzer & Flint (1997), statistical generalizability is concerned with whether other business people would have the same reactions as those who responded to the sample, and this is strongly related to the concept of the non-response bias. Aaker & Day (1990) define non-response bias as an error due to the inability to elicit information from some respondents in a sample, often due to refusals. The non-response problem depends on whether the non-respondents hold opposing views from the respondents particularly upon the key questions of interest. There are three approaches for dealing with non-response bias: first is to improve the research design, second is to repeat the contacts and increase the amount of respondents, and the third is to estimate non-response bias and take it into account when reporting the results of the study (Aaker & Day 1990).

Non-response bias can be studied for example by comparing different response waves (see e.g. Lambert & Harrington 1990). In the papers of this thesis, different response waves were studied using a randomized one-way analysis of variance (ANOVA). This is consistent also with Mentzer & Flint (1997), who argue that the only way to establish evidence of generalizability is to repeat the study with new samples from the population. Different response waves obviously can be seen as new samples from the total population.

There is one limitation to generalizability, because all respondents come from Finland. Thus, the results require validation in international contexts with similar data from different cultures. The measures of the latent variables require further studies, because there is little previous research where similar theoretical constructs have been used as in this study. Therefore, in this study some of the concepts require additional measures which would improve the validity of the sug-

gested theoretical models. The data have been collected with surveys, and there may be a bias in responses towards positive attitudinal statements, which often is the case in for example customer satisfaction surveys (e.g. Peterson & Wilson 1992).

According to Doty & Glick (1998), in any given study, common methods bias may inflate some observed relationships and deflate others relative to the true relationships among constructs. However, using multiple even minimally dissimilar methods can improve the accuracy of population parameter estimates. The important differences among methods can be characterized in terms of at least three dimensions: differences in measurement techniques, differences in data sources, and time lags (Doty & Glick 1998). This thesis contains two data sets collected from different target groups with three years' time interval. Even though the results from the different data sets mainly support each other, it is not possible to fully exclude the existence of common method bias in the models of the study.

Based on a careful review of extant literature, the relevant concepts and their suggested relationships were determined for the theoretical models of the study. Despite the lack of empirically validated measures for many of the latent variables in this study, the theoretical overview generally supports the internal and constructs validity of the study. When it comes to external validity and generalizability, the response rates of the two surveys conducted for this research were good in comparison to usual response rates of surveys nowadays (Larson 2005). In addition, the non-response bias was studied with ANOVA for different response waves, and no statistically significant differences were observed between the different response waves. All measures used in the papers of this thesis are statistically significant and hence support at least weak convergent validity. All factors are theoretically justifiable and/or have good construct reliability and average variance extracted values, and can therefore be considered acceptable. Multiple fit indices have been used in the models as Hair *et al.* (2010: 678) suggest and all fit indices are acceptable, hence the models can also be considered acceptable. Thus, it seems justifiable to argue that reliability and validity of this thesis are on acceptable level.

4 Discussion and conclusion

In this chapter, there will be a short description of the findings of each paper included in this thesis. Then will be a discussion, where the results of the papers are pulled together to answer the research questions and to present additional perspectives on the findings of this thesis, and finally research limitations and ideas for further studies will be discussed.

4.1 Main findings of the papers

4.1.1 *Antecedents of the logistics outsourcing decision*

Juga J & Juntunen J (2010) Trust, Confidence and Control in Logistics Outsourcing Decisions. *Int J Services Technology and Management*. In press.

The purpose of the first paper is to identify the antecedents of logistics outsourcing decisions. To do so, a model is developed for explaining the propensity to outsource logistics activities. The model is based on two main streams of outsourcing-related research. On the one hand, there is a well-established tradition of organizational economics – especially transaction cost analysis – that has shown the vital role of relationship specific-investments in the outsourcing decisions. On the other hand, there are inter-organizational theories that serve to identify the behavioral factors and conditions affecting the outsourcing decisions. In the paper, the model is tested with structural equation modeling (SEM) using empirical survey data from Finnish industrial companies.

Outsourcing is described in the paper as an arrangement of cooperative relationships between partnering organizations for improving the performance of inter-firm transactions and it is based on a long-term orientation and confidence in compatible interests between the organizations. Confidence, which comes from two distinct sources, trust and control, involves a perceived certainty about satisfactory partner cooperation (Das & Teng 1998), essentially mitigating the adversity between market-based business organizations. Firms may want to use control mechanisms to either routinise activities or to promote non-routine activities, such as learning (Sitkin *et al.* 1994, Das & Teng 1998). Trust is commonly described as an expectation that another party will not act in an opportunistic manner (Bradach & Eccles 1989, Gainey & Klaas 2005).

Relationship-specific investments (or asset specificity) refer to the transferability of the assets that support a given transaction (Williamson 1985). These investments can involve both physical and human assets that are dedicated to a particular business partner and whose redeployment entails considerable switching costs (Heide 1994). When the relationship is supported by bilateral credible commitments, the threat of opportunism by either party is mitigated for the other (Joshi & Stump 1999). In fact, it can be argued that an effective partnership requires a relational equity based on balanced investments between the parties to the current relationship (see e.g. Bensaou 1999, Buvik & Reve 2001, Sawhney & Zabin 2002).

Based on the conceptual overview, a tentative model is developed for describing logistics outsourcing decisions, where confidence is seen as a central behavioural facilitator affecting the propensity for outsourcing logistics activities. Confidence is based on the level of trust and control that the organization has in the relationship (Das & Teng 1998). Further, trust can be explained by the quality of relationship between the organizations (Anderson & Weitz 1989, Ring & Van de Ven 1994). The propensity for outsourcing is negatively associated with the need for relationship-specific investments between the organizations (Williamson 1985). However, the negative impact of asset specificity can be attenuated by the safeguards that the partners implement to protect the relationship specific investments (Williamson 1985, Joshi & Stump 1999).

The data for this study were collected from northern Finnish industrial companies during November 2005. The target group consisted of 587 companies and there were 161 acceptable responses (response rate 27.4 percent). The estimation was made with the Lisrel software (Jöreskog & Sörbom 1993, Du Toit & Du Toit 2001, Jöreskog *et al.* 2000). The empirical analysis shows that confidence as a mediating variable has a positive association with outsourcing in the presence of relationship specific investments. From a managerial point of view, this means that companies also need to consider investments in developing trust and control, not just tangible safeguards for protecting the specific investments in an outsourcing relationship. In this study, the confidence to outsource is linked with the principal's growth expectations, which also increases the business opportunities for the logistics service provider. Good relationships were found in the analysis as an important criterion for trust.

Being an important aspect of outsourcing, confidence needs to be examined in further studies where the buyer's motives to outsource logistics are investigated. Besides relational and control-related aspects, there are other elements that

should be included as the antecedents influencing the shipper's confidence in logistics outsourcing, such as the service provider's image and the external economies attainable to the service buyer in the outsourcing relationship. The relationship between service and cost performance also needs to be investigated.

4.1.2 The shippers' outsourcing dilemma

Juntunen J, Juga J & Grant DB (2009) Services Quality and Performance: Trade-offs in Logistics Service Markets. In: Proceedings of the 20th Annual Conference for Nordic Researchers in Logistics. Jönköping, Sweden, June 11-12, 2009.

The paper reports on a study of how service satisfaction and logistics cost reductions affect a shipper's loyalty and propensity to switch logistics service providers (LSPs). Shippers have a dilemma as customers: they want both lower costs and good service levels which forces them to a trade-off between using a good quality LSP and seeking cost reductions from competitors. In the paper, a conceptual model is developed from theoretical literature concerning LSPs and services marketing where the dependent variable of propensity to switch an LSP is affected by independent variables of logistics cost reductions and satisfaction-driven loyalty. Satisfaction in turn is based on operational and personal service elements.

The theoretical background of the paper builds on traditional concept of value created by logistics, cost efficiency versus competitive service levels (Langley & Holcomb 1992). These two value dimensions also relate to logistics outsourcing decisions (Maltz 1994, Boyson *et al.* 1999). The service dimension can be related with the Stank *et al.* (2003) model showing the hypothesized relationships between service performance elements and customer satisfaction, loyalty and market share. The other dimension, cost savings, is an important motive for outsourcing decisions in logistics. For example, surveys report that some firms have routinely achieved 30 to 40 percent reductions in logistics costs and have been able to greatly streamline global logistics processes as a consequence of outsourcing (Boyson *et al.* 1999). Thus, it is considered that service level and logistics costs form important criteria for decisions on initiating and continuing logistics outsourcing relationships.

The data for the empirical study were collected from Finnish industrial companies during spring 2008. The target group consisted of 1043 companies and there were 235 acceptable responses (response rate 22.5 percent). The structural

equation model provides a good statistical fit and all relationships in the model are statistically significant and their directions are similar to the proposed theoretical model. Standardized estimations show that personal service explains operational service and these together explain overall satisfaction. In addition, overall satisfaction explains the customer's loyalty as expected and a negative association can be found between the customer's loyalty and switching propensity. Further, the impact of cost reduction on switching propensity is positive, as expected. An interesting detail is that the modification indexes indicate a high error correlation between the customer's service experiences related to keeping schedules and the evaluation of overall satisfaction with the main logistics service provider. This obviously highlights the importance of reliable schedules in an increasingly time-oriented logistics environment.

This paper shows that quality is more important to the customer than the possibilities for cost reductions, so LSPs should maybe focus on developing their partnerships to improve service quality and thereby increase the customers' overall satisfaction. In addition, tight price competition does not guarantee continuity of the relationship; however it might sometimes be necessary to compete on price. The paper emphasizes the idea of two underlying dimensions of the outsourcing decisions. There are both economical and quality dimensions, which probably require different types of relationships to achieve optimal result in outsourcing situations.

4.1.3 External economies and strategic cooperation

Juntunen J (2009) External economies and strategic cooperation: structural equation modelling with Finnish data. *World Review of Intermodal Transportation Research* 2(4): 364–375.

External economies have usually been seen as a result of comparative advantage and specialization between different nations (e.g. Marshall 1898, Chipman 1970). However, Caballero & Lyons (1990) found evidence of external economies in manufacturing, while also demanding further exploration of the source of these economies on microeconomics level. The purpose of this paper is to identify how relationship-specific investments affect partnership and to test their impact on the external economies with SEM (structural equation modeling) using empirical survey data from Finnish industrial companies. External economies are an important issue especially in transportation and logistics. According to Sohail (2006),

firms are increasingly seeking to treat logistics operations strategically to gain competitive advantage but often lack the competency to run efficient logistics operations themselves. This pinpoints how strategic cooperation and specialization benefits all parties involved. In this study, external economies are defined as an external possibility to improve the firm's performance through cooperation with other firms.

Based on Stigler's (1951), Alchian & Demsetz' (1972) and Mallen's (1973) arguments, it is reasonable to say that economies of scale have positive correlation with specialization, and thus with outsourcing. If an increase in output is seen as always giving rise to a reduction in unit costs, it becomes necessary to ask why specialization is not everywhere pushed to its limits so that the economy is made up of highly specialized monopolies rather than competitive industries with large numbers of identical firms (Prendergast 1993). An answer to this question might be transaction costs, because increases in asset specificity requires more complex governance structures (i.e. more complex contracts) and thus transaction costs are presumed to increase with increase in asset specificity (Williamson 1985). However, Dyer (1997) argues that relationship-specific assets can actually reduce transaction costs, especially in long-term relationships. For instance, Japanese automakers have been shown to incur lower transaction costs than U.S. automakers even though their suppliers are more specialized to them.

Meade (1952) argues that external economies exist whenever the output of a firm depends not only on the factors of production utilized by this firm, but also on the output of another firm. In other words, the productivity of the individual producer possibly will depend not only on its input of productive resources, but also on the activities of supplementary firms (Scitovsky 1954). This might be called "direct interdependence among producers" but it is better known under the name of external economies. Additionally, as Alchian & Demsetz (1972) argue, better competitiveness is possible through cooperative specialization. Therefore, cooperation in a supply chain may increase investments and profits of all firms in the supply chain. Thus it is not a surprise that Gudmundsson's (2006) study of global market places points directly to need for a win-win cooperative mentality between large buyers and logistics service providers. Furthermore, Dyer (1997) argues that high asset specificity and low transaction costs are possible if safeguards can be employed to control opportunism.

If, in the long run, relationship-specific investments lower transaction costs, both unit costs and transaction costs go down and external economies exist. To test this statement, empirical data were collected from northern Finnish industrial

companies during November 2005. It is observed in this study that relationship-specific investments explain external economies as predicted. From a managerial point of view, the results indicate that LSPs' relationship-specific investments and trust are important measures of partnership. This means that LSPs should consider relationship-specific investments alongside with trust to gain external economies and strengthen their partnership with the shipper. Also different types of logistics companies could gain external economies through network benefits, for example an airport hub and other transportation modes could earn more destinations and higher shipping frequency with strategic cooperation (Givoni 2007). As a theoretical conclusion, a model of how relationship-specific investments may produce external economies is offered. The study combines transaction cost theory and external economies. In addition, the empirical study confirms that relationship-specific investments explain external economies.

4.1.4 External economies, confidence and logistics costs

Juntunen J & Juntunen M (2009) External economies and confidence, a way to decrease logistics costs. In: Proceedings of the 14th Annual Logistics Research Network Conference. Cardiff, UK, September 9-11, 2009.

A well-established tradition in organizational economics has shown the vital role of asset specificity to transaction costs (Dyer 1997). In addition, there are inter-organizational theories that serve to identify the behavioral factors, and more precisely, how the relationship-specific investments affect trust and hence external economies in logistics services (e.g. Dyer 1997, Juntunen 2009). Also relationships (Juga & Juntunen 2007) and corporate brand (e.g. Davis *et al.* 2008) between customers and logistics service providers are important factors for creating confidence. Like most other B-to-B relationships, also B-to-B relationships in logistics services are characterised by not only economical but also social exchange (Deepen 2007). Therefore, combining external economies and confidence as factors to decrease logistics costs is justified. This paper examines on one hand how relationship-specific investments (Dyer 1997) explain external economies in logistics services (Juntunen 2009), and on the other how relationships and corporate brand image (Davis *et al.* 2008) explain confidence. Additionally, the study examines how external economies and confidence decrease logistics costs.

Juga & Juntunen (2007) observe that relationships create trust, which is an important facilitator for outsourcing when specific investments are required in a

logistics outsourcing situation. Palmer (1997) suggests that product branding, by offering assurances of quality and consistency, acts as a substitute for personal relationships in situation where direct relationships with product providers are difficult to achieve. Additionally, Davis *et al.* (2008) find evidence of the importance of brand image - the attributes and benefits held by the customers associated with a brand - in the purchasing of logistics services. Furthermore, Welling & Kamann (2001) argue that the foundation of cooperation is the durability of a relationship. These relationship-related issues increase confidence, which is important when developing partner cooperation (Das & Teng 1998). According to Dyer (1997), investments in relationship-specific assets lower the transaction costs in the long run. Hence relationship-specific assets lower also total cost in the long run. Similarly, a positive association between relationship management efforts and outsourcing is observed by Knemeyer *et al.* (2003), especially when specific investments exist in the relationship. In this study external economies refer to the external possibilities to improve the company's performance through cooperation with other companies (Juntunen 2009).

Based on the conceptual overview, a tentative model was developed to describe associations between relationships, corporate brand image, confidence, relation-specific investments, external economies and decreasing logistics costs. The data were collected from industrial companies in Finland during spring 2008 and 235 acceptable responses were returned, representing a response rate of 22.5 percent. The empirical test suggests that relationship-specific investments explain external economies. Additionally, relationships and brand image explain confidence. And finally, confidence and external economies explain decreasing logistics costs as predicted.

As a theoretical conclusion, a model how relationship-specific investments may produce external economies is suggested. Also, an influence between relationships and corporate brand image with confidence is found. Additionally, the model shows that confidence and external economies could decrease logistics costs. Thus, this study combines external economies to behaviourally oriented theories. Even though both confidence and external economies are commonly known concepts, no previous research was found where the two concepts have been incorporated in the same study. As managerial implication the results of the empirical survey indicate that in addition to relationships and corporate brand image, also relationship-specific investments are important aspects when logistics service providers want to create more value to their customer through lower costs.

4.1.5 Functional spin-offs and network economics

Juntunen J (2010) Functional Spin-offs in logistics service markets. *International Journal of Logistics: Research and Applications* 13(2): 121–132.

The theoretical background of this paper comes mainly from Thorelli's (1986) and Jarillo's (1988) work, they split external costs into two different categories: the price of input and transaction costs. On the one hand, competition in the market can lower the input price, but using multiple suppliers increases search, contract and controlling costs. On the other hand, one can lower transaction costs by long-term contracts, but the price can become higher than under tight competition. According to Jarillo (1988), establishing an efficient network implies the ability to lower transaction costs, for it is precisely those costs that also lead firms to integrate. Hence, the strategic network can take advantage of economies in scale with low transaction costs.

Following the strategic network concept by Thorelli (1986) and Jarillo (1988), it may be reasonable to consider two alternative dimensions of outsourcing. On the one hand, the vertical mode of outsourcing means concentrating on transaction costs. In this mode, the principal and the agent have deep and long-term cooperation, which lowers transaction costs between the partners. However, the vertical outsourcing mode may involve higher short-term costs. On the other hand, the horizontal mode means concentrating on input prices. In this horizontal mode, by contrast to vertical mode, tight bidding games may enable short-term cost savings, but do not encourage agents to invest in long term relationship development, such as research and development, quality, information systems etc. In both cases the principal influences and controls the outsourced functions and there are no true markets. When multiple firms outsource their functions, network economies start to develop and the principal's influence on individual agents is reduced. Using a well-known concept from economic literature (Stigler 1951, Mallen 1973), this special mode of outsourcing could be named as functional spin-offs.

Based on the empirical findings of this study, it seems that the path to network economies in logistics starts from horizontal outsourcing and advances through increasing vertical modulation to functional spin-offs (Figure 1). In practice, this could mean that the principal first learns how to buy logistics service from markets and then moves on to partnerships to reduce transaction costs. A functional spin-off occurs as a combination of the vertical and horizontal modes

when the principal has enough competence to set out total logistics solutions for the competition and when the markets are fully developed to offer such solutions.

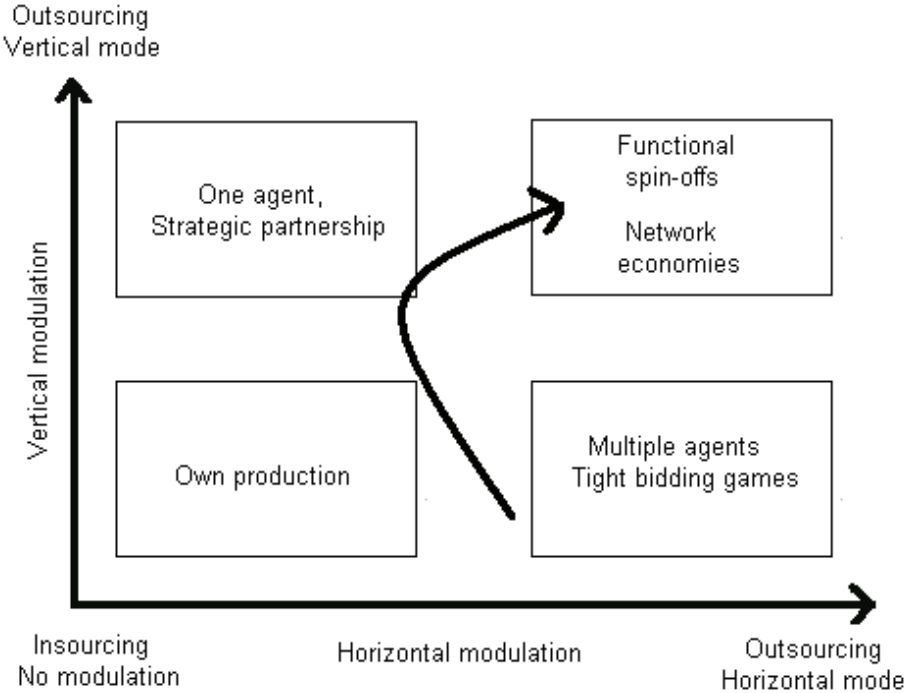


Fig. 1. Different modes of outsourcing underlying functional spin-offs

In this paper, an essentially eclectic approach is chosen to study the antecedents of outsourcing decisions and their outcomes in a network context because logistics outsourcing is a complex phenomenon involving concepts and models from multiple theoretical backgrounds. The analysis shows that both transactional and relational orientations are relevant for outsourcing decisions in business networks. However, the findings also indicate a need for looking at different modes of outsourcing that may increase the understanding of outsourcing strategies in logistics and the dynamics of outsourcing relationships. On the one hand, a horizontal mode of outsourcing can be distinguished, involving multiple service providers that compete for contracts on spot markets. On the other hand, a vertical mode of outsourcing involves close partnerships with selected service providers on a long-term basis. The extent to which these modes are present in an outsourcing relationship might be called horizontal and vertical modulation, respectively. A fully

developed outsourcing relationship, with a high level of horizontal and vertical modulation, entails a functional spin-off that can serve as a source of substantial network economies to the partners.

As conclusion, it seems from the results of this study that the development of outsourcing relationships goes from the horizontal mode to the vertical mode and finally to functional spin-offs. Theoretically, the distinction of different outsourcing modes can shed new light on the definition and circumstances in which these outsourcing arrangements are likely to be found.

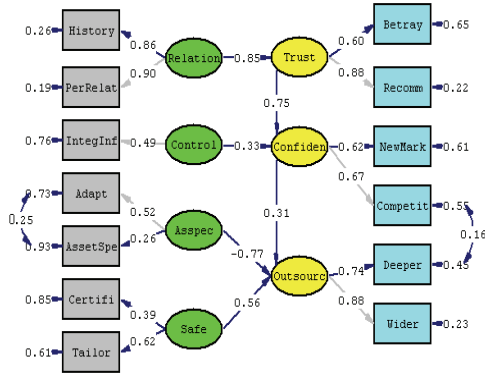
4.2 Papers in a nutshell

In this chapter, the models and findings of the papers are presented shortly as a table. The intention is to present how research builds up from the papers and how the papers relate to each other.

Table 6. Models tested in the papers.

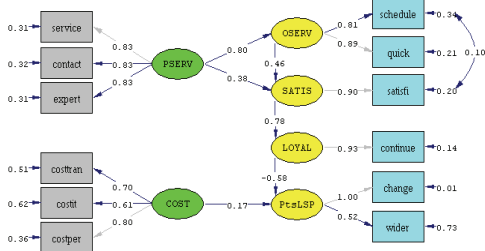
Purpose and empirical models	Description of the paper
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The purpose of this paper is to identify the antecedents of logistics outsourcing decisions.



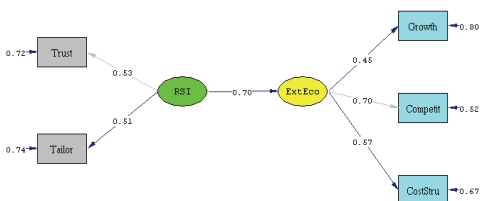
In the empirical analysis, it is shown that confidence as a mediating variable has a positive association with outsourcing in the presence of relationship specific investments. In this study, the confidence to outsource is linked with the principal's growth expectations, which also increases the business opportunities for the logistics service provider. Good relationships are found in the analysis as an important criterion for trust. Because relationship-specific assets and relationships are important antecedents of outsourcing, they require further research.

The paper reports on a study of shippers' dilemma as customers: they want both lower costs and good service levels which can lead to a trade-off situation between staying loyal to existing service providers and seeking cost reductions from competing providers.



The results mean, indeed, that customers have a dilemma. They want good service but they also want to reduce costs by using market competition. Based on the results of the study, it may be argued that the service satisfaction-loyalty paradigm is also highly relevant in the logistics outsourcing business context, with or without countervailing factors that simultaneously push towards changes in the relationship. Based on the results, both quality and costs are important aspects of outsourcing and hence also they require further studies.

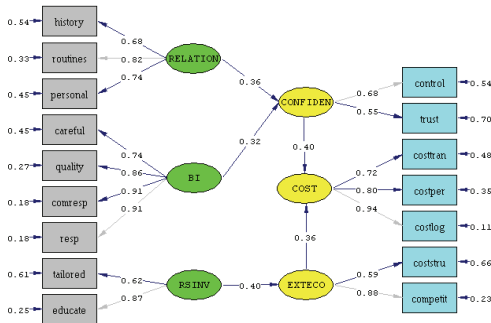
The purpose of this paper is to identify how the relationship-specific investments affect partnership and to test their impact on the external economies.



This study unites transaction cost theory and external economies. It is observed in the empirical study that relationship-specific investments explain external economies as the theoretical underpinnings and the tentative model predicted. This also means that the role of external economies needs to be further investigated in the following sections of the study.

Purpose and empirical models

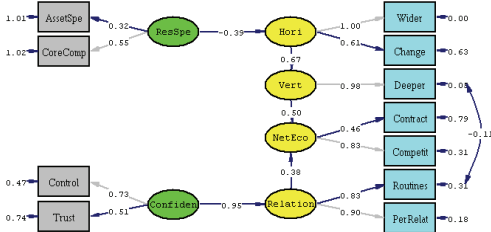
This paper examines on one hand how relationship-specific investments explain external economies in logistics services, and on the other how relationships and corporate brand image explain confidence. Additionally, the study examines how external economies and confidence decrease logistics costs.



Description of the paper

As a theoretical conclusion, a model how relationship-specific investments may produce external economies is suggested. Also, an influence between relationships and corporate brand image with confidence is found. Additionally, the model shows that confidence and external economies could decrease logistics costs. Thus, this study combines the concept of external economies to behaviorally oriented theories. In addition, because both external economies and confidence lower costs, it indicates that the approach to outsourcing decisions should be multidimensional and there might be different modes how to make outsourcing decisions.

The aim of this study is to increase understanding of logistics outsourcing decisions in a network context.



In this paper, an essentially eclectic approach is chosen to study the antecedents of outsourcing decisions and their outcomes in a network context. The analysis shows that both transactional and relational orientations are relevant for outsourcing decisions in business networks. In addition, the findings also indicate a need for looking at different modes of outsourcing that may increase the understanding of outsourcing strategies in logistics and the dynamics of outsourcing relationships.

As seen in the table, the publications lead from antecedents of logistics outsourcing towards network economies with different modes of outsourcing. Important concepts which influence outsourcing decisions are relationships, relationship-specific investments, external economies, quality and modes of outsourcing.

4.3 Discussion

Received theory in outsourcing research has been dominated by transaction cost theory emphasizing a trade-off approach between markets and hierarchy since

Coase's (1937) article "The Nature of the Firm". From a transaction cost perspectives, different kinds of organization structure compete against markets and especially asset specificity is an important factor for outsourcing decisions (Rindfleisch & Heide 1997, Williamson 1975, 1985). However, Simon (1991) argues that this approach has not drawn from empirical work but is more like acts of faith, or perhaps of piety. In addition, according to Zajac & Olsen (1993), transaction cost theory seems to be suited for the study of individual firm's make or buy decisions. Thus, transaction cost theory is more appropriate for investigating one firm which minimizes its costs than analyzing relationships and networks. In reality, however, relationship-specific investments can be a very important source of competitiveness, especially in long-term business relationships (Dyer 1997).

In addition to the trade-off between hierarchy and transaction costs, another important issue in the outsourcing problem derives from classical micro economic trade-off between cost and quality. This trade-off may influence loyalty and thus also the buyer's decision to choose between short-run opportunistic purchasing and long-run strategic partnership with co-creation of value. In recent literature more emphasis has been given to the opportunities for cooperation and partnerships. In fact, Ghoshal & Insead (1996) criticize transaction cost theory for concentrating too much on opportunistic behavior rather than cooperation possibilities. According to Zajac & Olsen (1993) too, instead of transaction costs, it would be more beneficial to study transactional value.

In the first paper, which identifies the antecedents of logistics outsourcing decisions, it is shown that asset specificity decreases the propensity for outsourcing. However, this negative impact on outsourcing can be mitigated by safeguarding of assets with mutual commitment to specific investments. In addition, the propensity to outsource is increased by confidence which comes from trust and controlling capability in the inter-firm relationship. Thus, by combining safeguarding of relationship-specific investments and long-term cooperation, it is possible to increase competitiveness of both parties in outsourcing relationship.

Another important trade-off, that between service quality and cost performance, is studied in the second paper. In contrast to the model suggested by Stank *et al.* (2003), it is shown in the paper that the shipper has a dilemma in having to choose between quality and costs. Nevertheless, of these two criteria, service quality seems to be more important which further highlights the role of long-term relationships. To conclude, therefore, it could be argued that trade-offs exist, but

the concepts are not unambiguous and it is possible to influence the factors that underlie these trade-offs.

On a macroeconomic level, external economies serve as facilitator for competitiveness to nations who have international trade (e.g. Marshall 1898). Similarly, Caballero & Lyons (1990) found evidence of external economies in manufacturing, which means that the same concept can be found in microeconomics. In the third paper of this thesis, it is observed empirically that relationship-specific investments explain external economies. In this sense, external economies can be compared with the concept of network economies by Thorelli (1986) and Jarillo (1988). In network economies, two types of cost can be distinguished: the price of input and transaction costs. According to Jarillo (1988), establishing an efficient network implies the ability to lower transaction costs. Hence, the strategic network can take advantage of economies in scale with low transaction costs.

The fourth paper combines external economies with behaviorally oriented factors as instruments for lowering logistics costs. Confidence, which builds on relationships (as also shown in the first paper) and corporate brand image, can be seen to affect logistics costs. At the same time, these costs are also influenced by relationship-specific investments through external economies. Reducing logistics costs can be seen as an element of transactional value in addition to good quality. Hence, even if a trade-off exists between quality and costs in logistics outsourcing decisions (the buyer's dilemma, as discussed in paper two), a focus on transactional value may serve to explain the rise of network economies beyond purely cost-oriented approaches.

The analysis of the fifth paper shows that both transactional and relational orientations are relevant for outsourcing decisions and looking at different modes of outsourcing may increase the understanding of outsourcing strategies. A horizontal mode of outsourcing involves multiple service providers that compete for contracts on spot markets and a vertical mode of outsourcing involves close partnerships with selected service providers on a long-term basis. These different modes explain how external economies transform into different types of network economies in the context of logistics outsourcing.

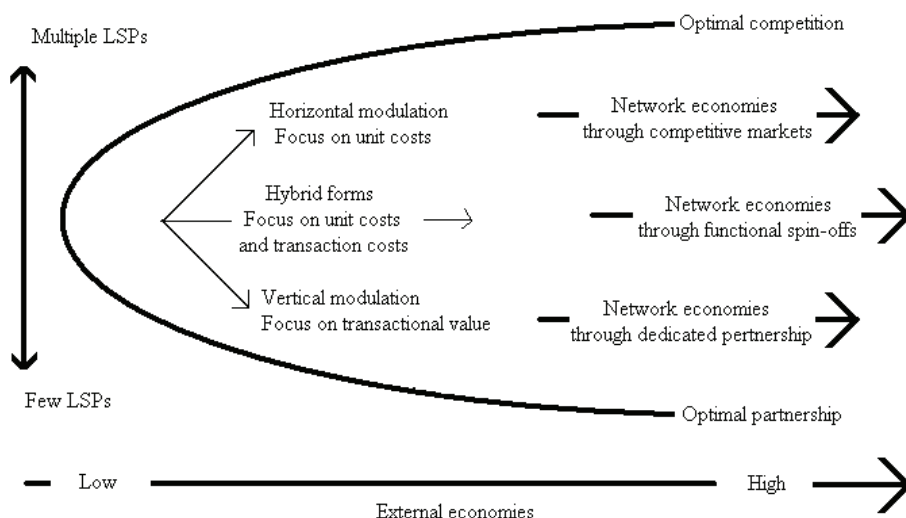


Fig. 2. Outsourcing relationships in the logistics service markets

Figure 2 presents the outsourcing relationships alternatives and shows how outsourcing can be linked to external economies. External economies include different types of network economies – whereas external economies is a general economic concept, network economies are related to focal business networks. In Thorelli's (1986) article, networks are said to exist due to economies of scale and specialization, and ability to reduce transaction costs. In addition, Zajac & Olsen (1993) argue that maximizing joint transactional value may require governance structure which is not optimal from transaction cost perspective. On the one hand, network economies can be gained through horizontal mode of outsourcing, where focus is in unit costs of services and the way to achieve lowest possible unit costs are short-term bidding games among service providers. On the other hand, network economies can be achieved through vertical mode of outsourcing with cooperation and strategic partnership where all participants concentrate on their core competences and thus create network economies through transactional value in long-term basis for all parties involved. In the middle are hybrid modes of outsourcing where focus on both unit costs of services and transaction costs.

In figure 2, the semi-circle describes marginal utility curves related to optimal competition and optimal partnership, reflecting the microeconomic assumption of lowering marginal utility. Savings in the price of services do not increase linearly with an increasing number of service providers in bidding games. Similarly, transaction costs do not decrease linearly with a reduction in the number of part-

ners. Also transactional value is not a linear function of the deepness of the strategic partnership. An optimal solution for buyers of logistics services is thus somewhere inside these limits depending on the situation where the decisions concerning outsourcing are made. This is where the three outsourcing strategies arise: using competitive markets, dedicated partnerships, or hybrid forms of these (functional spin-offs).

A common way to approach outsourcing in transaction cost theory is to describe transaction costs and hierarchy costs as a trade-off. The prices of the inputs are not included, even though specialization affects the unit costs through economies of scale. Thus, the way to formulate the optimal level of outsourcing is to minimize total costs as a function of using own organization and using market option. When using modulation concepts, formula for optimal outsourcing changes. In modulation concepts, transactional value, transaction costs and price of services in markets are functions of modulation. There is thus a trade-off between different modes of outsourcing, where the buyer can favor either low price of services through bidding games or high transactional value through strategic partnership as the extreme options.

As a conclusion, a two dimensional understanding to outsourcing is developed. The degree of outsourcing determines the possibilities for external economies and different modes of outsourcing determine how these external economies are accomplished. In his recent work, Williamson (2008) actually does not just divide outsourcing into three contractual interfaces, simple market exchange, hybrid transactions and hierarchy, but he also divides hybrid transactions into three leading styles, muscular style, benign style and credible style. This can be seen as demand for multiple dimensions in outsourcing studies. In comparison to modulation concepts, horizontal mode has similarities with “muscular style”, hybrid forms have similarities with “credible style” and vertical mode has similarities with “benign style”. However, Williamson does not distinguish between unit costs, transaction costs and transactional value as is done here with modulation concepts.

In newer service research, a parallel concept to asset specificity is complexity. Both give rise to contractual difficulties and thus cause increasing hierarchy and transaction costs. Complexity, an unmanageable spaghetti tangle of systemic interconnections (Langlois 2002), can be eliminated by using modularity. In other words, different types of modules reduce complexity; there can be quite specific modules and then totally interchangeable modules. Starr’s (1965) description of interchangeable modules is that they can be easily replaced, for example with

other manufacturers' similar modules. While not developed further in this study, the concepts of modularity and modulation obviously have similar elements. Different modes of outsourcing could be suitable for different types of modularity. Whereas modularity can reduce complexity of production, modulation can reduce complexity of organization.

4.4 Managerial implications

Some suggestions to managers are reported in each research paper included in this thesis. To highlight the main issues, there are three main points to consider. The first is that in addition to relationships and corporate brand image, also relationship-specific investments are an important aspect when logistics service providers want to create more value to their customer at lower costs. This means that LSPs should consider relationship-specific investments to gain external economies and strategic partnerships with shippers. Besides tangible safeguards for protecting the specific investments in an outsourcing relationship, but the companies also need to consider investments in developing trust and control.

The second key point follows from the finding that quality is more important for the customers than possibilities to cost reductions. So, LSPs should maybe focus on developing their partnerships to improve service quality together with their customers to increase customers' overall satisfaction. In addition, achieved cost reductions do not seem to guarantee continuity of the relationship, although it might sometimes be necessary to compete only with price. This might in fact be related to the question of service modularity. On the service provider's side, it is important to understand that when offering one service in multiple modules, the customer can also move some modules to other service providers and hence modularity actually decreases cooperation. For example Juga *et al.* (2009) found evidence that customers' loyalty does not necessarily mean that they are willing to purchase more services from current service providers even if they are satisfied with ongoing cooperation.

The third main implication is that while long-term outsourcing partnerships can be beneficial, there may be additional network benefits to gain for the partners if the contracts were reframed on the basis of vertical as well as horizontal modes of outsourcing. However, this does not mean that all outsourcing relationships are destined to move towards the option of functional spin-offs. Instead, the organizational and environmental circumstances should be carefully evaluated and the outsourcing relationships designed accordingly.

A final managerial implication of this thesis is that outsourcing is a two dimensional concept and thus supply chain managers should understand - in addition to the optimal degree of outsourcing - if they are in a situation where horizontal or vertical mode is more suitable option. Further, there are limits to the number of participants in bidding games as well as partners in strategic cooperation. Moreover, there are hybrid forms of modulation that include elements of both horizontal as well as vertical modes of outsourcing. Based on modularity research, also modularity reduces complexity of supply chains and managers must understand if they are dealing with supply chain specific modules or interchangeable modules so they can build optimal supply network by using suitable outsourcing mode.

4.5 Research limitations and ideas for further studies

As mentioned in the theoretical background chapter, organizational economics, and especially transaction cost analysis, is an old concept and widely used in outsourcing research. However, there seem to be few links to the concepts of external economies, functional spin-offs and network economies. These concepts need both theoretical clarification and further empirical validation. One interesting continuing research opportunity would be to study these concepts also from the service providers' perspective. Additional constructs, such as service quality dimensions and corporate branding can also offer new interesting avenues to model development and testing. Finally, also modulation concepts involve a new interesting approach to understanding business networks. The extension of the modulation concepts toward modularity research offers another possible direction for future studies.

In this thesis, structural equation modeling was not used in a strictly confirmatory theory testing manner. Instead, the research process aimed more at discovering models with two properties, they make theoretical sense and their statistical correspondence to data is reasonable (e.g. Kline 2005: 11). In many applications, theory can provide only a starting point for a theoretically justified model that can be empirically supported and hence researcher must employ structural equation modeling not just to test the model empirically but also to provide insight into its re-specification (Hair *et al.* 2010: 647). To some extent, this study can be considered to be exploratory, and thus structures and relationships between latent variables throughout the thesis are not totally coherent. In addition, the

constructs lack previously validated measures, which leaves opportunities for further development of the operational constructs.

The data may cause biases because it was collected from one country. The first data set of this study was limited to Northern Finland and the second was limited to Finland, and therefore broader international empirical data would be needed for further model validation and comparing the results between different populations. In Nordic countries, relationships may be a dominant factor based on cultural background; hence additional data should be collected outside Scandinavia to get a broader view on the logistics service markets. Further, different economic cycles might also influence the propensity to switch the LSP and increase the usage of market competition to lower costs. Because the second data were collected in spring 2008 and circumstances in Finland were totally different already at fall 2008. Additional data from economic downturn would be one possibility to find new interesting aspects to outsourcing.

In this thesis, both data sets concerned industrial companies. One interesting empirical research opportunity could include public sector organizations in comparative studies. For example, comparison outsourcing patterns in military or healthcare organizations could increase understanding of outsourcing decisions in different contexts. Continuing theoretical and empirical research is also needed to further develop and test the models in other contexts besides logistics.

In this study, structural equation modeling proved to be a strong tool for studying the latent variables related to external economies. Despite some weaknesses in some of the operational measures of the concepts, the models as a whole seem to offer a sound basis for evaluating latent variables and their relationships. However, also qualitative research could help to develop better measures to the concepts and thereby improve the validity of the research. Qualitative research would also offer a useful complement for studying the proposed concepts and their relationships in greater depth. Moreover, triangulation between qualitative and quantitative methods could help to increase understanding of the phenomena and thus improve business relevance of the research topic.

5 Summary

The purpose of this thesis was to create a model of outsourcing relationships in the logistics service markets. The main research question was to study how the buyers' logistics outsourcing decisions contribute to the accomplishment of goals in business networks. To answer this question, the research was divided into three sub-questions. First was to identify the antecedents of logistics outsourcing decisions and to test their impact on outsourcing propensity. Second was to establish the objectives and explain the consequences of logistics outsourcing for shippers. Third was to clarify different outsourcing options for the buyers of logistics services to achieve their goals in business networks.

The methodological approach of this study was positivistic, which implies that reality is considered to be objective, tangible and fragmentable. A general agreement in positivist tradition is that causal relationships can be discovered and in addition, research findings are considered value-free, time-free and context independent. In addition, the preferred research method in positivist tradition is quantitative and surveys are commonly used to gather research data. Also in this study, a deductive positivistic approach was employed and quantitative survey data was used for model testing.

Outsourcing can be studied from several perspectives, and to gain an eclectic view, several theoretical backgrounds are also needed. Thus, in this study, the theoretical framework draws from organizational economics, marketing and relationship management, as well as strategic management literature. These different theoretical approaches are reflected on the three sub-questions that are studied in the five papers and are synthesized in the discussion chapters of the thesis.

The first sub-question was to identify the antecedents of logistics outsourcing decisions and to test their impact on outsourcing propensity. The first paper shows that asset specificity decreases the propensity for outsourcing, but this negative impact on outsourcing can be mitigated by safeguarding of assets and mutual commitment to the relationship. In addition, the propensity to outsource is increased by confidence which comes from trust and controlling capability in the inter-firm relationship. A trade-off between service quality and cost performance is studied in the second paper. It is shown that the shipper has a dilemma in having to choose between quality and costs. Nevertheless, of these two criteria, service quality seems to be more important which further highlights the role of long-term relationships.

The second sub-question was to establish the objectives and explain the consequences of the logistics outsourcing for shippers. In the third paper it is observed that relationship-specific investments explain external economies – or the network economies in focal business networks. The fourth paper combines external economies with behaviorally oriented factors as instruments for lowering logistics costs. Confidence, which builds on relationships and corporate brand image, can be seen to affect logistics costs. At the same time, these costs are also influenced by relationship-specific investments through external economies. Reducing logistics costs can be seen as an element of transactional value in addition to good quality. Hence, even if a trade-off exists between quality and costs in logistics outsourcing decisions, a focus on transactional value may serve to explain the rise of network economies beyond purely cost-oriented approaches.

The third sub-question was to clarify different outsourcing options for the buyers of logistics services to achieve their goals in business networks. The fifth paper shows that both transactional and relational orientations are relevant for outsourcing decisions and looking at different modes of outsourcing may increase the understanding of outsourcing strategies. A horizontal mode of outsourcing involves multiple service providers that compete for contracts on spot markets and a vertical mode of outsourcing involves close partnerships with selected service providers on a long-term basis. These different modes explain how external economies transform into different types of network economies in the context of logistics outsourcing. As a conclusion, a two dimensional understanding to outsourcing is developed where the degree of outsourcing determines the possibilities for external economies and different modes of outsourcing determine how these external economies are accomplished.

The first managerial conclusion is that in addition to relationships and corporate brand image, also relationship-specific investments are an important aspect when logistics service providers want to create more value to their customer at lower costs. The second key point follows from the finding that quality is more important for the customers than possibilities to cost reductions. So, LSPs should maybe focus on developing their partnerships to improve service quality together with their customers to increase customers' overall satisfaction. The third main implication is that while long-term outsourcing partnerships can be beneficial, there may be additional network benefits to gain for the partners if the contracts were reframed on the basis of vertical as well as horizontal modes of outsourcing.

In the extant outsourcing research, there seem to be few links between the concepts of external economies, functional spin-offs and network economies.

These concepts need both theoretical clarification and further empirical validation. One interesting continuing research opportunity would be to study these concepts also from the service providers' perspective. Additional constructs, such as service quality dimensions and corporate branding can also offer new interesting avenues to model development and testing. The extension of the modulation concepts toward modularity research offers another possible direction for future studies.

As an answer to the main research question of the thesis, a model was created for describing outsourcing relationships in the logistics service markets. The model shows how the different outsourcing options contribute to the accomplishment of goals in business networks. In this way, the thesis contributes to theoretical development of outsourcing phenomenon and concepts behind logistics outsourcing decision making. All in all, it is hoped that this thesis increases understanding and opens new research opportunities concerning logistics outsourcing and network economies.

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