
RELATIONSHIP BETWEEN SUPPLY CHAIN STRATEGIES AND TRANSPORT OUTSOURCING GOALS - THE RISK PERSPECTIVE

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***Abstract:** In the literature, the relationship between demand uncertainty and supply chain strategy is well explained. However, although the outsourcing can be the one of the riskiest decision for a firm, this kind of risk is not much explored. Further, the relationship between transport outsourcing and supply chain strategy is still underresearched. The objective of this research is to partly bridge the literature gap and explore the relationship between the reasons for transport outsourcing, and consequently, transport outsourcing risks, and supply chain strategy. The decision about supply chain strategy is strongly related with transport outsourcing decision. We identified and explained two kinds of transport outsourcing risks - external, e.g. supply chain demand risk and internal, e.g. outsourcing contract risk. The result of revealed nature of transport outsourcing risks is a conceptual model which connects supply chain strategies and transport outsourcing goals.*

***Keywords:** Supply chain strategy, Transport outsourcing, Uncertainty, Risk.*

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1. INTRODUCTION

Demand uncertainty strongly impacts on supply chain strategy. It should also impacts on transport outsourcing decision. Namely, according to the literature, demand variability impacts on transport fleet size, structure, and utilisation. To improve the transport performances in an uncertain environment, firms usually externalize their transport operations. The main reasons for logistics and, consequently, for transport outsourcing are costs, quality of service and operational flexibility.

In the literature, the relationship between demand uncertainty and supply chain strategy is well explained. However, although the outsourcing can be the one of the riskiest decision for a firm, this kind of risk is not much explored. Further, the relationship between transport outsourcing and supply chain strategy is still underresearched. The objective of this research is to partly bridge the literature gap and explore the relationship between the supply chain strategy and reasons for transport outsourcing, related with risks. Due to a lack of knowledge about given relationship, and, consequently, related lack of empirical research, an exploratory research is used as a suitable research

method to start to explore more in-depth this relationship.

The paper is organized as follows. In the second Section, the main characteristics of modern supply chains and related strategies are briefly overviewed. In the third Section, the impact of time demand risks on the choice of supply chain strategy is explained. In the fourth Section, transport outsourcing and related risks are shown and classified. In the fifth Section, the linkage between supply chain strategies and transport outsourcing goals is shown and explained, while the last Section contains main conclusions and recommendations.

2. THE MODERN SUPPLY CHAINS AND RELATED STRATEGIES

Supply chain management (SCM) encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities [1]. It also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers, and customers. Logistics management is that part of supply chain management that plans, implements, and controls the efficient, effective forward and reverses flow and

storage of goods, services and related information between the point of origin and the point of consumption in order to meet customers' requirements. It is an integrating function, which coordinates and optimizes all logistics activities, as well as integrates logistics activities with other functions including marketing, sales manufacturing, finance, and information technology.

Some important characteristics of modern supply chains are emphasized in [2]:

- There is no more competition between companies within the supply chain, but between different supply chains;
- The biggest opportunity for costs reduction and/or value increasing lies in partners connection in supply chains;
- The competitiveness of the supply chain is based on the added value achieved by information exchange;
- Competitiveness of supply chains requires joint determination of management strategies
- etc.

Appropriate strategy of supply chain management relies on several key factors [3]:

- Strategy should be adapted to specific requirements of customers;
- Products flow management with stable requirements and reliable supply sources should not be the same as the flows management where the demand is uncertain and source of supply is unreliable;
- The Internet can be a powerful tool for enabling, or supporting the development of specific strategies for supply chain management;
- Management strategies based on the reasoning "the same rule for all" will fail.

A key objective in supply chain management is to shape a chain to meet customer needs and create added value according to given constraints, and among the main constraints is supply chain uncertainty. For these reasons, academics have begun to identify the characteristics of supply chains, to get the better insight into their nature. Two main groups of characteristics determine the nature of supply chain [3] - characteristics of supply and characteristics of demand. Regarding to both of them, stable and evolving, functional and innovative supply chains are identified.

Regarding to the new approach to the supply chain and supply chain management, a literature

began to identify and analyze the various supply chain strategies, mostly during the nineties. The two basic types of strategies are: effective and responsive chains; and the lean and agile chains. Even in the most recent literature, one can notice a little confusion regarding the usage of these terms, and the fact that some authors do not clearly distinguish these two classifications (see also [4]).

3. THE RELATIONSHIP BETWEEN TIME DEMAND RISKS AND SUPPLY CHAIN STRATEGIES

The uncertainty and risks can occur at any point and in any relationship in global supply chains [5]. Therefore, the size and complexity of the supply chains certainly affect the risk increase. The production and/or logistics in global supply chains are often outsourced, which brings many opportunities; it reduces the influence of the demand uncertainty and fixed capital, and supports expansion into new markets. However, outsourcing increases the complexity of the supply chain, because outsourced processes and new participants can be difficult to control, especially in the unknown markets.

Interorganizational networking and, particularly, partnerships with small and medium-sized enterprises (SMEs), increase exposure to risk in large companies [6]. In contrast, SMEs also have their own business risks because of the stronger links with partners in the supply chain (*ibid.*).

The literature body about logistics risks in supply chain is scarce, compared with the one about other supply chain risks [7]. Some authors divide logistic risks, associated with the dynamic characteristics of the supply chain demands, on the risks related with the supply uncertainty and risks related with the demand uncertainty [3]. Consequently, four different types of supply chains were identified: efficient, risk-hedging, responsive and agile supply chains (Table 1).

Efficient supply chains use strategies and concepts to minimize activities that do not add value to the product, while using economies of scale and optimization techniques and methods in order to maximize capacity utilization in production and distribution. Developed database and information flows are also used for the same purpose, while the Internet can be a convenient way to achieve integration of information flows. Optimization of production and distribution in this case is performed on the basis of transparent data for demands, capacities and inventories along the supply chain.

Table 1. Supply chain management strategies classified according to the degree of uncertainty of the processes and customers demand [3]

		Demand uncertainty (customers)	
		Low (Functional products)	High (Innovative products)
Supply uncertainty (processes)	Low (Stable processes)	Efficient supply chains	Responsive supply chains
	High (Evolving processes)	Risk-hedging supply chains	Agile supply chains

Risk-hedging supply chains use strategies and concepts in order to reduce risk to the individual actors. These strategies tend to pull and share resources in chains so that the risks are also shared in case of disruption. Individual participants in the chain can be sensitive to a disruption in supply, but in cases with more than one source of supply, or when there are alternative suppliers, the risk of the disturbance can be reduced. Increasing the level of minimum inventory and sharing the related holding inventory costs with other participants who are also interested to prevent delays in delivery, are the ways to deal with a variety of companies risk management in supply chain. Information technologies, especially the Internet, have a crucial role in ensuring data transparency between companies that share this type of risk. Information on real-time inventory allows the goods movement from one point to another with minimum costs.

Responsive supply chains use strategies that increase the reaction time and flexibility of variable and specific needs of customers. The Internet primarily enables defining the exact individual wishes of customers and meeting their requirements in the shortest possible time. One way to achieve this is online ordering, which provides access to the customers and allows 24 hours service seven days a week, as well as the rapid transfer of informations between all stakeholders in the supply chain involved in making product (eg. assembling of ordered computer configuration).

Agile supply chains use strategies that aim to be responsive and flexible to the needs of customers, while sharing the risk among all subjects. They actually combine the positive characteristics of responsive supply chains and risk-hedging supply chains. This type is known as agile because they have the ability to respond quickly to changes, diversification and unforeseen customer

requirements, while minimizing the risk associated with fluctuations in various demands, incurred by individual actors in the supply chain.

The interest for risks related with particular supply chains are rapidly rising among researchers (see, for example [8]).

4. MAIN RISKS IN TRANSPORT OUTSOURCING

Although outsourcing may represent the one of the riskiest decision for the company, the literature rarely discusses this type of risk and its reducing potentials [9, 10]. Therefore, modern supply chains are becoming more risky, due to a higher number and complexity of relationships between participants, which may be disrupted or interrupted for a variety of reasons. Along with several other dominant trends in business, the trend of outsourcing, including logistics outsourcing, resulted in gradual development of increasingly complex networks and supply chains [11]. Supply chains grow in length and/or width and a large number of companies are involved in more than one supply chain, thus connecting the supply chains in larger and more complex network structures.

Transport is a function that moves goods from one point to another and so temporally and spatially connecting the different entities in the supply chain. Transport costs can be very significant in the overall cost of the product. For example, the cost of freight transport is equivalent to 6% of gross domestic product in the United States [12]. The importance of transport function is also shown as average transport cost per unit of product. Transport costs account for about 3% of the product price on average [13]. The development of electronic commerce, associated reduction in the average size of shipments and an increase in average number of door to door deliveries, increases the importance of transport costs.

For the purpose of this research, from the viewpoint of transport managers – decision-makers, all transport risks in supply chains are classified as internal and external risks. The internal, or inner risks include all risks related to transport outsourcing decision making: owning own-account fleet, choosing the number of carriers, outsourcing of particular or full management activities, etc. Therefore, internal risks are connected with the relationship carrier-customer of transport services, whereby it sometimes could be the same business entity. The transport service customer usually bears the main risk pressure and responsibility for miscalculations, since he pays for a service, has a

high influence on the usage of available transport resources and directly benefit from the the high quality of transport services.

The external, or outer risks associated with the decision on transport outsourcing include risks related to the dynamic characteristics of the requirements described in the previous section. They may be implied by changing end-user demands, expanding markets or changing the distribution network, by changing the number of participants in the supply chain, the types of relationships between entities, etc.

The risk related to the dynamic characteristics of the supply chain can be reduced by transferring the risk to the logistics/transport provider, or outsourcing. This increases companies flexibility, i.e. reaction time to changing market demands. However, the experiences of the outsourcing decision-making indicate that outsourcing of costs and risks often outsource a competencies and process manageability. Increased risk on opportunity is possible if the company does not manage the outsourcing processes and has not developed mechanisms for decision making on such an important issue [10].

5. THE LINKAGE BETWEEN SUPPLY CHAIN STRATEGIES AND TRANSPORT OUTSOURCING GOALS

According to their discussed characteristics, the supply chain strategies can be now interrelated with the main goals of transport outsourcing, in accordance with the related risk classification. Again, the main objectives of transport outsourcing in the literature are costs minimization, increase of transport services quality and adaptation of the company's business strategy. However, there is no available literature that clarify what it means to "adjust the business strategy of the company." Also, there is no available literature that clearly link concepts and management strategies with the outsourcing decisions, and there is no technique, or method of decision making where a particular management strategies are clearly linked to the appropriate outsourcing concepts.

The lack of literature dealing with analysed problem is also identified in [14], where it is emphasized that connection between the strategy of supply chain management and logistics outsourcing is not sufficiently researched.

The main reasons/goals for transport outsourcing are identified in Table 2 and assigned to specific supply chain management strategies. They are in accordance with the goals identified in [10].

The proposed model deals with the combination of uncertainty and, consequently risks related to the outsourcing of transport operations and risks in products supply and demand (Table 1). The degree of uncertainty can be related to the complexity of the process, the state of the transport market and the ability to manage and control outsourced processes.

Table 2: Linking SCM strategies with the primary goals of transport outsourcing (TO) by using the risk perspective

		(Transport) demand risks	
		Low (functional products)	High (innovative products)
Transport outsourcing risks	Low	efficiency 1. goal: minimization of logistics (transport) costs	responsiveness 3. goal: minimization of delivery times
	High	risk-hedging 2. goal: minimization of internal TO risks	agility 4. goal: Flexibility, minimization of total external and internal TO risks

The presented results could be inspirational for further research about the impact of supply chain strategy on transport outsourcing decision-making. They open the room for both, exploratory and explanatory research in the future and contribute to the normative body of literature on transport outsourcing, which is, actually, scarce.

The proposed model also has a practical value. It could help transport managers in decision-making to identify the best transport insourcing/outsourcing concept for particular supply chain strategy. For that purpose, the proposed model should be used in the very first steps of outsourcing decision-making procedure.

6. CONCLUSION

Supply chains are dynamic in their nature, and processes are managed with a smaller or larger degree of uncertainty and risks, which affects the variability and uncertainty of a need for transport services.

Transport outsourcing does not reduce the risks associated with the negative impact of dynamic characteristics of supply chains on transport performance (here: external outsourcing risks), but it can transfer them from transport service customer to the carrier. Moreover, one of the major reasons for popularity of transport outsourcing may be pushing a part of supply chain risks from transport service customer to transport service provider. Actually, a need to minimize risk in such way is often in behind

the term “flexibility”, one of the most cited reasons for outsourcing. Virtually, outsourcing reduces risk and increases flexibility of the company expressed in the response time to unknown conditions. However, the introduction of new entities and relationships always brings new risks in the supply chain. It is proposed a conceptual model, that consider both types of risks and they are connected with transport outsourcing goals. The important implication of this research is that a decision on transport outsourcing, from the risk perspective, should be made by taking into account both types of risks. The proposed model contributes to the normative research on outsourcing decision-making procedure, because it connects the supply chain management strategy with the transport outsourcing goals from the supply chain and outsourcing risk perspective.

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