

# Logistics Sourcing Strategies in Supply Chain Design

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## Abstract

A company's logistics sourcing strategy determines whether it structures and organizes logistics within the company or company group or integrates logistics upstream and downstream in the supply chain. First, three different types of logistics sourcing strategies in supply chain design are described and the theoretical background for the development of these strategies, including both transaction cost theory and network theory, is analyzed. Two special cases about logistics sourcing strategy decision-making in China's electric household appliance (EHA) industry are discussed, based on the above theoretical analysis. Then, the factors that drive the selection of a company's logistics sourcing strategy are analyzed. These factors include market factors, external logistics service provision factors and a company's internal factors. Chinese features in logistics sourcing strategies are summarized based on the above case studies. Finally, some management insights are discussed.

**Key Words:** logistics sourcing strategy, supply chain design, outsourcing, driving factor

## 1. Introduction

Today, supply chain management has become a hot topic for companies in various industries. Logistics sourcing strategy is just one of the important issues for supply chain management that determines how to structure and organize logistics within a company or company group or integrate logistics upstream and downstream in the supply chain. The reasons why logistics sourcing strategy is becoming more and more important can be seen from three perspectives. First, in a dynamic business environment, more and more companies recognize that high frequency between new strategic moves and actions is required in order to get higher operational effectiveness. Second, higher and higher pressure on profit margins from competition has put logistics at the leading edge. A lot of companies have begun to take logistics as the new profit source. Thus, the demand for strategic sourcing flexibility has increased greatly, especially for such companies whose products are heavy, huge in volume, and require long transportation distances. In such cases, logistics costs will be huge, and cost reductions have to be focused on logistics-related activities. This paper focuses on logistics sourcing strategy for such kinds of companies.

Traditional logistics organizational strategies tended to take logistics as a function within the company, whereas today more and more companies are outsourcing their logistics to third party logisticians (3PL). However, different companies with different products and distribu-

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tion channels need different logistical platforms. Different companies with different resource bases and business policies also need different logistics organizational strategies. In today's China, a lot of companies actually take a middle road between the above two models. In this paper, these three different types of logistics sourcing strategies in supply chain design are described, the theoretical background for the development of these strategies is analyzed, and then conclusions are made about what factors drive companies to select different logistics sourcing strategies. The focus is on China's electric household appliance (EHA) industry. The reason for selecting the EHA industry is that logistics issues are becoming the key competitive factor for the companies in this industry. In China, the EHA industry is facing the most competition ever because the supply is in surplus compared to demand. The "price wars" force companies in this industry to reduce costs. It is perceived that there is no more opportunity to reduce materials and labor costs, so therefore logistics costs are becoming the last profit source for these companies. Recently, many companies have tried to reposition their logistics sourcing strategies. We will explore the key factors that companies consider when they select logistical strategies by analyzing two cases in this industry. Finally, some management insights are discussed.

## 2. Literature Review

The earliest related literature appeared during the 1960's and 1970's. The focus at that time was how to integrate logistics-related activities within a company since it is a common practice at that time to take the logistics function as one affiliated with production or marketing and sales functions in manufacturing companies. Logistics-related activities such as purchasing, transportation, inventory and distribution were controlled separately in different departments<sup>[6,11]</sup>. From 1980s, large companies began to re-engineer their logistics processes, and corresponding academic research also began to appear<sup>[4,7]</sup>. On the other hand, thinking on logistics sourcing strategy began to bud, and related theory and practices were explored<sup>[5,16]</sup>. At the beginning of the 1990s, companies were inspired by new management concepts such as business process re-engineering, supply chain management, time-based competition, and so on. As a result, logistics management became an important part of company business strategies, logistics outsourcing became the choice of more and more companies, and third party logistics (3PL) also became a popular concept<sup>[3,14]</sup>. From the end of the 1990s, many researchers studied logistics sourcing strategy issues theoretically or empirically. F. Aertsen<sup>[2]</sup> applied transaction cost economics to explore the conditions under which logistics functions are separated. Mats Abrahamsson, et al.<sup>[1]</sup> summarized three types of logistics operations models: decentralized logistics affiliated to production and marketing, centralized logistics, and direct distribution and logistics platforms as a resource base for market development. Some papers have studied both the internal and external factors that drive companies to change their logistics sourcing strategies<sup>[8,13]</sup>. Other papers have explored how 3PLs change their strategies to cope with customer requirements in a dynamic business environment. However, there have been few papers that have studied company logistics sourcing strategies from the aspect of supply chain design. There has also been little research discussing the decision-making characteristics of Chinese companies in logistics sourcing strategies.

### 3. Three Types of Logistics Sourcing Strategies and their Theoretical Analysis

One of the preferred logistics sourcing strategies is to take logistics as a function within a company; this is referred to as an insourcing strategy. However, today more and more companies, especially those in western countries, are outsourcing their logistics to third party logistics (3PL), and this is referred to as an outsourcing strategy. There is also a hybrid model between the above two models; that is, a company owns a logistics subsidiary by setting up or buying a logistics company. This is referred to as a middle strategy.

The focus is different in each of these strategies. The first type, an insourcing strategy, focuses on how to integrate logistics-related activities within a company. Traditionally, logistics-related activities such as purchasing, transportation, inventory, and distribution were controlled separately in different departments within a company, such as the production department, sales department, purchasing department, and so on. Today, an insourcing strategy integrates separate logistics resources into one within a company. Usually, a special logistics department will be established and will take charge of all of the company's logistics-related operations, including both inbound and outbound logistics. The purpose of this strategy is to enhance both internal and external operational efficiency.

The second type, an outsourcing strategy, makes use of external resources as much as possible. One of the purposes of this strategy is for a company to focus its own resources on the company's core competence. Another purpose is for the company to make its logistics processes flexible enough so as to cope with environmental uncertainty. Thus, building cooperative external relationships in the supply chain becomes the critical issue in implementing this strategy.

However, if a company wants to balance the advantages of both outsourcing and logistics control capability, the third type, a "middle strategy" becomes the choice. In this strategy, the focus is on both cost reduction and process control.

The reasons why a company chooses whether or not to outsource their logistics operations can be analyzed by using transaction cost theory<sup>[16]</sup> and network theory. Transaction cost theory analyzes whether specific activities are internalized or secured from the market. A transaction is defined as an exchange across a technological interface. When a transaction is carried out, a number of costs arise as a result of frictions in the economic system. These costs include information costs (the costs related to seeking information about the potential partner), bargaining costs (costs related to negotiating and drawing up of contracts in which all possible situations in future transactions are considered), and enforcement costs (costs to enforce performance, resolve conflicts and renegotiate contracts)<sup>[16]</sup>. If transaction costs are low, it suggests that the activity should be purchased in the market. When the transaction costs are high, the activity should be internalized. According to transaction cost theory<sup>[16]</sup>, transactions can be characterized by three critical dimensions: frequency, uncertainty, and asset specificity. Among these three dimensions, asset specificity is the main feature of the transaction. It is defined as investments related to a specific transaction and having a limited value when used in alternative applications. Investments in transaction-specific assets often result in mutual dependency. For example, the supplier investing in a special machine that can only produce components for a special customer is bound to the customer to some degree. On the other hand, the customer is also bound to some degree to the supplier, unless alternative suppliers have the same production equipment. These transaction characteristics will

determine which logistics sourcing strategy is most suitable for a company. In other words, the decision-making involved in a company taking a special logistics sourcing strategy can be explained by transaction cost theory.

Another perspective used to analyze a company's decision-making behavior regarding logistics sourcing strategy is network theory<sup>[12]</sup>. The basic assumption in the network model is that the individual company is dependent on resources controlled by other companies. Utilization of these resources is achieved through interactions with other companies. These interacting companies compose a network. While this network is just one of the large number of possible structures, the existence of this special network is not accidental; it is one established by management design. The purpose for a company to participate in or build such a network is to create a competitive position by establishing new relationships, finding new partners, and making new investments. Successful complementary investments and access to the competences of other companies through the network may become an important asset. A company's relations to other companies often constitute its most valuable resource. A company's persistent interaction with other companies in the network is an important factor in the development of new resources and skills. Thus, the most critical competency in designing supply chain networks is the ability of assembling chains of capabilities, both within the company itself and with those organizations allied with the company.

Both transaction cost theory and network theory support the decision-making process involved with a company's logistics outsourcing strategy. The cases shown below also can be explained on the basis of these theories.

## 4. Case Studies

### 4.1 Methodology

Following the methodology of Eisenhardt<sup>[10]</sup>, Ellram<sup>[9]</sup> and Yin<sup>[17]</sup>, a case study method is employed to further analyze a company's decision-making behavior regarding logistics sourcing strategy and the factors that drive companies to select different types of logistics sourcing strategies. Two cases have been examined, and both of them are Chinese companies in the EHA industry who have experienced logistics changes and have taken different logistics sourcing strategies in this decade. The triangulation method recommended by Yin<sup>[17]</sup> was used. Data was collected using multiple methods from multiple sources, including interviews in each company, the examination of company documents, and the examination of relevant information from public media. All the persons interviewed are senior managers in charge of logistics in the companies. The companies provided documents when the researchers visited them. Public information from business journals, newspapers and the Internet was also collected.

### 4.2 Case 1: HiCo

HiCo<sup>1</sup> was incorporated in 1984. Their only product at that time was a refrigerator. Over the past 20 years, the company has witnessed significant prosperity. HiCo currently manufactures a wide range of electric household appliances, and they have more than 15,000 kinds of items in about 100 product lines. HiCo's products are exported to more than 100 countries. In 2004, HiCo's global sales hit about RMB 101.6 billion (about USD 12.5 billion). Figure 1 shows its sales growth within a 20 year period.

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1 A pseudonym was used for the company's name.

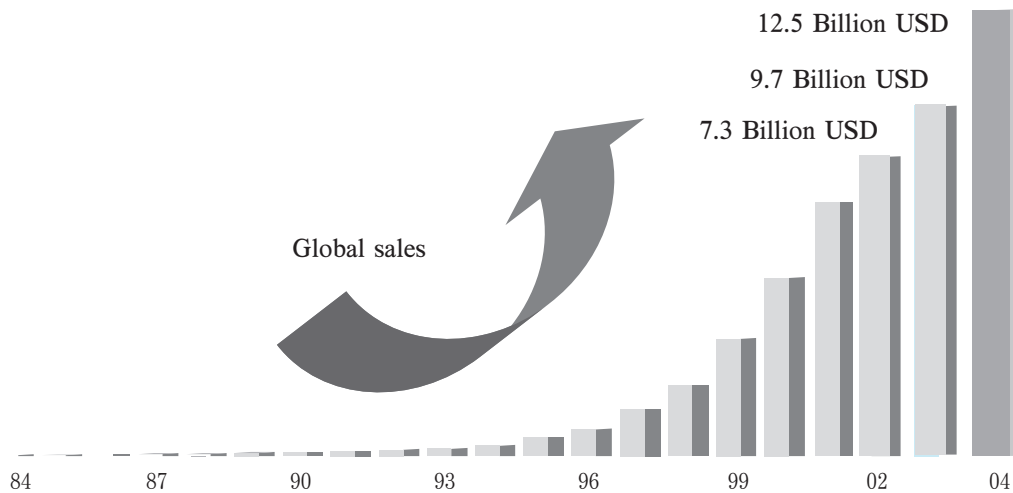


Figure 1 HiCo's sales growth within a 20 year period

The logistics sourcing strategy of HiCo has changed greatly within this past decade. Before 1999, the logistics activities of HiCo were separated from the production, purchasing, and marketing departments within the company. Facing increasing competition in the consumer market, especially time-based competition, HiCo wanted to improve logistics operations so as to shorten materials flow time and market response time. Of course, they also wanted to reduce logistics costs.

At first, they considered outsourcing logistics to a 3PL completely, but they found it was not easy to get a logistics provider who had enough ability and a reasonable price to satisfy HiCo's requirements. HiCo also had some apprehensions about business information disclosure. Finally, HiCo became determined to re-engineer their logistics process within the company. In 1999, HiCo established a "Logistics Headquarters" responsible for all of the logistics-related operations in the company, including both inbound and outbound logistics activities such as materials and parts purchasing, inventory control, materials flow between different plants, and product distribution (Figure 2).

HiCo succeeded greatly with this logistics model. By 2004, the average inventory time in HiCO was reduced from 30 days to 10 days, and the average inventory volume was also reduced greatly.

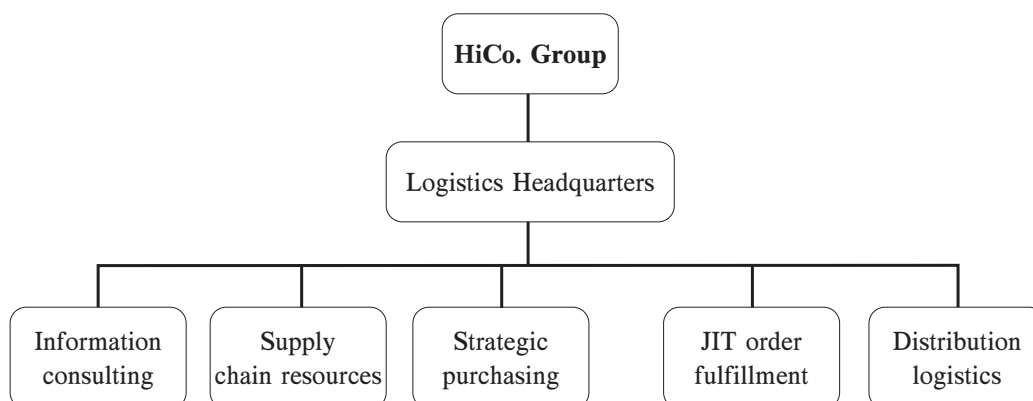


Figure 2 Integrated logistics organization in HiCo

### 4.3 Case 2: XiCo

XiCo<sup>2</sup> is the largest producer of washing machines in China. There are also wide product lines in this company, including washing machines, air conditioners, refrigerators, dishwashers, clothes dryers, freezers, dry cleaning machines, and so on. Similar with HiCo, XiCo is also one of China's 100 biggest enterprises, with total assets of approximately RMB 8 billion and annual sales of over RMB 10 billion. XiCo has 168 city offices, 3,400 distribution centers, and over 1,500 after-service centers located all over the country.

XiCo's logistics sourcing strategy evolution has taken a different path from that of HiCo. From 2000, XiCo and KeCo (another EHA manufacturing company) together established an e-business platform to purchase materials and parts jointly. This was the first step for XiCo to change its logistics sourcing strategy.

Joint purchasing made two companies enjoy the benefit of cost reduction because of the economic scale. The two companies wanted to further reduce their logistics costs by putting more of their logistics activities into this platform, and they even transferred all of their logistics operations to this platform. In other words, they wanted to separate logistics operations from their respective companies. However, similar to the situation faced by HiCo, they also found there were no professional logistics companies in operation that could completely take on the logistics operations of these two companies. Still, they hoped to have one, especially one that could take on their logistics requirements as its main business. As a result of this, they could get better service.

Finally, in 2002, XiCo and KeCo reached an agreement with Cosco, which is the largest logistics company in China, to establish a new logistics company jointly. This company, NlogisticsCo, is in charge of the logistics operations of these two companies. In this new logistics company, 60% of its stock is held by Cosco, and XiCo and KeCo each hold 20% of the remaining stock (Figure 3).

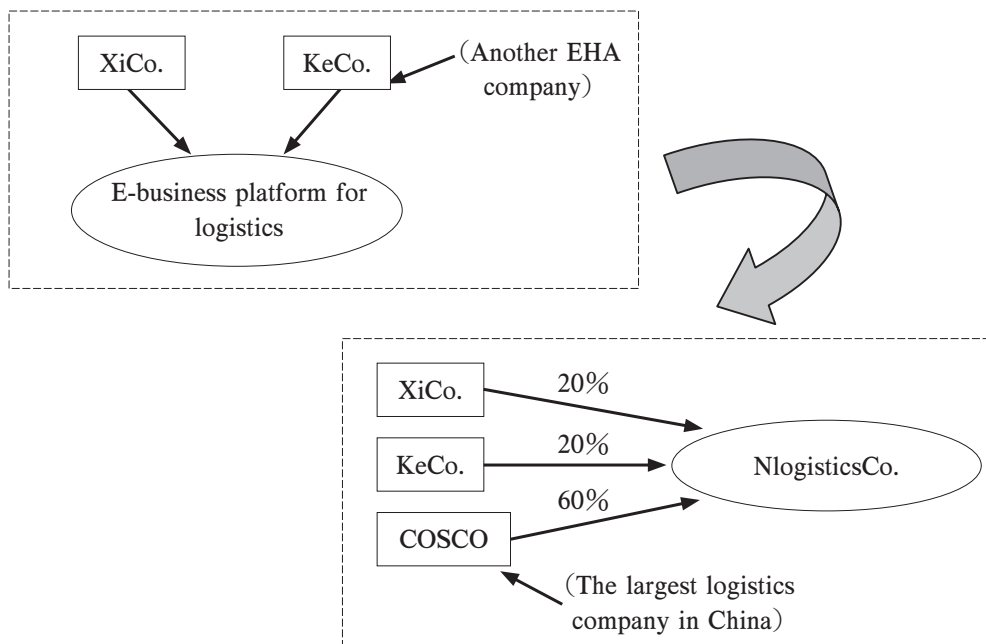


Figure 3 The logistics sourcing strategy evolution of XiCo

<sup>2</sup> A pseudonym was used for the company's name.

Four years has passed since NlogisticsCo was established, and the performance of XiCo's logistics has greatly improved. For example, the cost of transporting one washing machine from Wuxi City (which is located near Shanghai) to Beijing was RMB 40 before, and now it is only about RMB 20. The total logistics cost of XiCo has been reduced by 38%. As XiCo's vice-president says, this kind of logistics outsourcing has reduced not only the visible logistics operation costs, but also the underlying costs.

## 5. Driving Factors and Chinese Features Analysis

The above two cases reflect different logistics sourcing strategies taken by different companies, and they also reflect some Chinese features in logistics sourcing decision-making. We can see from these cases that for today's companies, the logistics focus has changed from one of internal efficiency to one of external relationships in the supply chain. Traditionally, logistics is regarded by most companies as a function tightly connected to production and/or marketing. In manufacturing-oriented companies, logistics is often practically a part of the production system, while in market-oriented companies logistics is more or less a part of marketing and sales. During that past time, logistics focus was just about internal efficiency and the optimization of activities. However, during the past decade, more and more companies have recognized that in order to be flexible enough to cope with environmental uncertainty, they have to redesign their supply chain, creating the need for companies to find more reasonable ways to organize their logistics activities. Therefore, logistics focus has begun to change from internal to external aspects, specifically the supply chain aspect.

More specifically, the factors that drive companies to decide whether or not to outsource their logistics operations are both external and internal. These factors can be divided into three categories: market factors, external logistics service provision factors, and company internal factors.

The first set of factors that drive companies when they create their logistics sourcing strategies are market factors. The markets faced by companies in various industries have changed greatly compared to twenty years ago. Product life cycles are shortening, product lines are expanding, and time-based competition has become a new source of competitive advantage. These changes in the market have led companies to reposition their logistics sourcing strategies.

Another consideration is the availability of external logistics service provision. Although many companies today are considering outsourcing their logistics activities in order to devote themselves to their core business, they often find that it is not easy to find suitable logistics service providers. There are several reasons for that. First, logistics outsourcing means that these activities now controlled within the organization become transactions with external organizations. Thus, there will be transaction costs, including information costs, bargaining costs, and enforcement costs like those in the analysis in Section 3. Such kinds of transaction costs may not be lower. Second, service ability is another important factor in choosing a logistics service provider. Companies often find that the external logistics service providers cannot meet their requirements of time and quality. Third, outsourcing logistics means that companies have to disclosure some business information to the logistics service providers, so relationship of trust is needed. However, it is not easy to find a trusted partner. The HiCo case is one such case.

The third consideration is a company's internal factors which include cost pressure, timeliness, and the company's resources integration strategies. The driving force of cost and

time factors is clear; however, it is also necessary to discuss a company's resource integration strategy. The resource integration strategy of a company determines its degree of vertical integration; a low integration strategy often leads to outsourcing logistics, while a high integration strategy will lead to insourcing logistics. Since more and more companies are devoted to a core business strategy, reducing the vertical integration degree becomes the frequent choice of many companies. It is clear from network theory that a company's resource integration strategy greatly influences its logistics sourcing strategy.

Although all of these broad factors affect a company's decision-making regarding logistics sourcing strategies, the specific factors that each company emphasizes are different. These different factors have been identified for HiCo and XiCo, and Table 1 shows the main factors associated with each company's logistics sourcing strategy.

**Table 1 Factors affecting the companies' logistics sourcing strategies**

	Case 1: HiCo	Case2: XiCo
Quick response	<input type="radio"/>	<input type="radio"/>
Price/cost	<input type="radio"/>	<input type="radio"/>
After service	<input type="radio"/>	
Transaction cost		<input type="radio"/>
Service ability	<input type="radio"/>	
Partnership		<input type="radio"/>

Furthermore, we can see from the above case studies and driving factor analysis that one of the important drivers pushing companies in China's EHA industry to change their logistics sourcing strategies is the severe "price war". In China, the EHA industry is facing the fiercest competition ever because total supply is in excess of total demand. The severe "price war" puts companies under high pressure to reduce costs further. Because it seems that there is almost no more opportunity for companies in this industry to reduce materials cost and labor costs, logistics costs are becoming the last profit source for them. Another feature of the logistics sourcing strategies in China's EHA industry is that Chinese companies prefer to give a high priority to logistics control ability compared with companies in other countries. This is why both of the companies discussed in the two case studies do not use outsourcing strategies exclusively.

## 6. Conclusions

The following conclusions and management insights are drawn from the above analysis and discussions.

First, a company's core competency does not preclude the involvement of external suppliers, as long as supplier involvement continues to create unique and competitive value. For example, a company that outsources its transportation and warehousing/distribution activities may not have a core competence in that area, but it may be able to manage relationships with suppliers who provide transportation and warehousing service.

Secondly, the cooperative relationships between a company and its suppliers often constitute a company's most valuable resource. From the second case above, it is clear that if a company can make successful use of the investments and competences of other companies



(including invisible assets such as their tacit knowledge), it will sustain the company's competitiveness since this is hard to copy.

Thirdly, one of the most critical issues in designing supply chains is how to assemble a supply chain's capabilities. In other words, the ability of assembling a chain's capabilities will become the most critical competence in supply chain management.

Finally, it should be noted that no attempt is made to rate any of the logistics sourcing strategies identified in this research as "better" or "more advanced" than the others. Rather, it is assumed that each of them may be appropriate in certain situations. The above case studies have shown that although HiCo and XiCo took different strategies, both of them succeeded.

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