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# An examination of risk and resource sharing behavior between LTL trucking companies and warehouse providers

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# AN EXAMINATION OF RISK AND RESOURCE SHARING BEHAVIOR BETWEEN LTL TRUCKING COMPANIES AND WAREHOUSE PROVIDERS

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Increased demand for third-party logistics providers who can offer multiple services to their customers has encouraged many entities to explore innovative ways to expand service offerings. The current research examines Class I LTL motor carriers who have expanded their services to include warehousing. While there are several ways to achieve a service expansion into warehousing, the current research focuses on firms who have elected to expand by creating a strategic alliance type relationship with an external warehouse provider. The research examines carriers attitudes about risk and resource sharing in the alliance relationship. The results indicate that carriers are moderately receptive to sharing resources with their warehouse partner and relatively less interested in sharing risks with the warehouse partner.

## INTRODUCTION

Over the last fifteen years the use of third-party logistics services in a supply chain has experienced many changes. Logistics outsourcing, also known as using third-party providers, is:

> ...the decision to use independent, external organizations as the means of accomplishing some, or all of the logistics related functions within the firm (Sheffi 1990).

Several changes including rising customer service expectations, deregulation of the transportation industry and new trends in the supply of logistics services have helped to bring about continual innovation and growth in the market for external logistics providers (Cooke 1988, Anderson 1988, and Scribbins 1988). Many current third-party logistics providers began operating as providers of one logistics function (i.e., transportation) and subsequently started expanding service offerings in response to customer demands (McGinnis 1990). Some of these providers are now beginning to realize they cannot provide their customers with the vast array of specialized services desired. Therefore, they have started building relationships or strategic alliances with other logistics providers to offer a more attractive and all-inclusive package to potential customers.

A popular view of strategic alliance type relationships is the establishment of, and commitment to, an interactive relationship where both parties benefit by sharing risks and resources (Ellram 1991, Landeros and Monczka 1989). What is still somewhat unclear about alliance behavior is: 1) to what extent an entity involved in a strategic alliance type relationship is willing to share the risks and resources necessary for a successful relationship,

and 2) what types of risks and resources a partner is more (or less) likely to share. The current research hopes to provide insight into both issues by examining Class I LTL motor carriers who have elected to expand service offerings to include warehousing. The research also hopes to ascertain if the carriers in the sample are pleased with the risk and resource sharing behavior of their warehouse partner. Therefore, the results of the research will focus specifically on motor carriers' perceptions of risk and resource sharing. The sample used for this research consists of Class I LTL carriers who approached warehouse providers with the idea of establishing a strategic alliance.

## BACKGROUND

By entering into strategic alliances, many external logistics providers are practicing a form of relationship marketing. The goal of these relationships is to establish, develop, and maintain exchanges by the use of long-term relationship building (Morgan and Hunt 1994). Practicing relationship marketing can be done by establishing long-term strategic alliances (Morgan and Hunt 1994) or partnerships (Anderson and Narus 1990) with other logistics providers. This type of relationship involves moving away from treating businesses as adversaries and moving toward a relationship where both entities benefit. The popularity of implementing strategic alliance type relationships with other practitioners appears to be rising as firms realize the high level of achievement available by pooling resources with other companies and employing networking techniques (Morgan and Hunt 1994).

Building relationships and pooling resources with other logistics providers not only provides companies with a better resource base but also allows for risk reduction through diversification. Furthermore, building an alliance with other logistics practitioners allows the provider of each logistics function to concentrate on their core competency while still allowing customers to purchase multiple logistics functions through a cohesive entity. However, for the relationship to work all entities must be willing to dedicate resources to, and share the risk of the relationship.

Recently many motor carriers have begun to expand service offerings, making logistics outsourcing more attractive to potential customers (Crum and Allen 1991). In some cases customers can receive not only a large number of logistics services from one cohesive entity but they can actually obtain multiple services integrated together. While there are many service expansion opportunities available to carriers including logistics information systems, fleet management, and order fulfillment, the current research has elected to examine two logistics services (transportation and warehousing) consistently identified as frequently outsourced (Lieb 1992).

Transportation is consistently outsourced by many firms not wishing to invest capital resources on private carriage. Many firms using external transportation providers also require warehousing services but are reluctant to invest in warehousing assets because they do not directly generate profit for the company. In today's market, customers outsourcing both transportation and warehousing services look to their external provider to create a seamless logistics system. In order to satisfy most customers, the third-party provider must integrate the two logistics services together while providing the customer one contact person within the organization who can handle all logistics concerns. The new emphasis on integrated offerings and one-stop shopping (Lieb and Randall 1996) plus the desire to remain competitive has encouraged many Class I LTL motor carriers to expand service offerings to customers.

Once a carrier discovers they have a customer interested in obtaining warehouse space, they can expand their services to accommodate the customer in a variety of ways. For example, a carrier can elect to purchase necessary warehousing services on the open market from a firm dedicated to providing warehouse services. This type of arrangement is typically identified by some form of short-term documentation that reads like an "arms-length" agreement between the buyer (LTL carrier) and the seller (warehouse provider). Documentation of an agreement between the carrier and warehouse provider can take a variety of forms including a contract or similar formal business agreement.

Conversely, other carriers will choose to form strategic alliances with firms supplying necessary services like warehousing facilities and experience (Gentry 1996). The carrier still purchases warehousing services in this type of relationship. However, a collaborative effort between the carrier and warehouse provider is usually evident. An alliance type arrangement is typically identified by some form of long-term documentation. The document is often a contract, structured such that

the provisions show a teamwork type approach to offering services. With many traditional "arms-length" agreements the contract specifies "penalties" and attempts to "assess blame" for errors that might occur. With the long-term collaborative alliance type relationship the contract identifies ways in which the two entities can work together to prevent past errors from reoccurring. While most would agree the long-term collaborative relationship created by alliances is different from short-term "arms-length" agreements to purchase a service, several issues remain unclear about alliance behavior. These issues are detailed in the following research questions.

**Research Question #1**

Do LTL carriers and warehousers who elect to participate in an alliance share risks and resources more than LTL carriers and warehousers who are engaged in traditional "arms-length" business relationships?

**Research Question #2**

Once an alliance type relationship is formed, are there certain types of risk and resources that LTL carriers and warehousers are more or less likely to share?

## STUDY

The current research focuses on the potential relationship between Class I LTL motor carriers and the external warehouse provider. This examination will focus specifically on the carrier side of the relationship. The current study attempts to differentiate between firms achieving a service expansion by participating in a strategic alliance and those electing to expand by purchasing the additional service. Furthermore, the researchers will attempt to determine if these two categories of firms (strategic alliance vs. purchase) differ in their risk and resource sharing behavior. The research will also attempt to gain insight into the types of risk and resources business partners are more (or less) likely to share. Specifically the current research will focus on the following:

> Class I LTL (general commodity) motor carrier based logistics service providers in business at the end of 1994 who offer both motor carriage and warehousing services.

For purposes of this study third-party warehousing will include both contract and public warehousing and will be defined as:

> A business entity with space and services available to serve customers in the receiving, storage and shipping of the customer's goods (Speh and Blomquist 1988).

## DATA COLLECTION

Success of the research project required contacting an individual within the trucking company who had sufficient knowledge about the relationship between the company they represent and the external warehouse provider. As a result a telephone survey was employed. This method was chosen for three primary reasons: 1) to increase the chances of talking with the proper contact person within the firm, 2) to increase the response rate, and 3) to obtain better narrative information from each respondent. There is no assurance that the "best" contact person was reached. Use of a phone survey gave the interviewer the opportunity to briefly discuss the carrier-warehouser relationship with the trucking company representative. In cases where the initial contact person was qualified, the survey instrument was administered. If the initial contact person could identify a more qualified individual, the more qualified representative was contacted and the survey administered.

The initial list used to derive the sample consisted of 78 carriers. Of the seventy-eight carriers two refused to participate and fifteen others had subsequently been combined with other carriers through a merger, acquisition or takeover arrangement. Therefore a total of 61 carriers participated in the actual survey administration. Of the sixty-one firms contacted, 19 indicated they had not expanded service offerings to include warehousing. Therefore, the final sample for this research consisted of forty-two (42) subjects (Class I LTL carriers) who indicated they did participate in some form of a relationship or agreement with another entity to expand service offerings to provide their customers warehousing services.

Since the focus of the research was to examine behaviors of the carrier-warehouser relationship, the nineteen carriers not expanding service offerings to include warehousing were dropped from further analysis. Each of the remaining 42 subjects were contacted and asked the following specific survey

question in an attempt to determine the type of carrier-warehouser relationship: "When your company expands services to include warehousing, how is the expansion usually achieved, through a partnership or alliance with a warehouse provider or through an "arms-length" purchase of services on the open market?" In cases where the answer was ambiguous (e.g., it depends on different variables like the $ amount, volume, and length of the agreement) additional survey questions were asked to help obtain a better understanding for the actual carrier-warehouser interface.

In cases where responses to the above question did not allow the researchers to clearly conclude the type of carrier-warehouser relationship, additional questions were asked to better understand the relationship. Additional questions included: 1) "Does your trucking company have a co-affiliate company that you work with to provide warehousing services?" 2) "Would you characterize the way your company provides warehousing services to be most similar to a public, private, or contract warehousing situation?" 3) "Do you bill separately for each service?" and, 4) "Are your truck and warehouse facilities in the same terminal or on the same property?"

In most cases the determination of how a carrier expanded services was fairly clear. In rare cases the researchers had to use responses to the above questions plus narrative information to make a well-informed judgement about how the company was actually expanding service offerings. Specifically the researchers classified seventeen of the forty-two subjects as providing warehousing to their customers by an "arms-length" agreement with an external provider. The other twenty-five firms were classified by the researchers as participating in a strategic alliance type relationship with an external warehouse provider.

## RESULTS

The survey instrument used to collect data for the research used multiple measures to collect data on two attributes: risk sharing and resource sharing. The survey instrument was developed by the researchers with the assistance of a thorough literature review examining previously used risk and resource sharing attributes. A survey pretest was used in the development process to refine the instrument. Multiple measures were used to assess both the risk and resource attributes because of the many varieties of risk and resources that can be shared between business partners. For instance, a carrier and warehouser may decide to share information technology resources but elect not to share labor resources.

The researchers started with seven items measuring resource sharing and six items measuring risk sharing. The reliability of the multi-item measure was appropriately assessed by following accepted research procedures. The researchers examined a Cronbach Alpha measure which helps to determine the reliability of the overall survey instrument (Peter 1979). In addition, the researchers used principal component factor analysis to determine if each item measuring a risk or resource sharing attribute belonged in the survey. Initial analysis determined two of the items measuring risk sharing and one of the items measuring resource sharing were not reliable. These items were subsequently dropped from the multi-item measurement instrument.

The Cronbach Alpha value for the six items measuring resource sharing and the four items measuring risk sharing were above .65 (See Tables 1 and 2) which is considered acceptable for exploratory research (DeVellis 1991). Once a determination was made that the Cronbach Alpha measure was sufficient, principal component factor analysis was again used and the results of the analysis were satisfactory. Therefore, the results presented here are based on using six (6) questions to measure the resource sharing attribute (Table 1) and four (4) questions to measure the risk sharing attribute (Table 2). The three questions excluded from the multi-item measure produced some interesting questions about the types of risk and resources carriers and warehousers are more (or less) likely to share. The issues raised by each of the three questions will be specifically examined later in the results section.

Satisfied with the reliability of the multi-item measurement instrument the researchers proceeded with the analysis of the results. The researchers tried to determine if significant differences in the levels of resource sharing and risk sharing existed between firms participating in strategic alliances and those using "arms-length" agreements to obtain warehousing services.

**TABLE 1**
**TYPES OF RESOURCES USED TO MEASURE THE *RESOURCE* SHARING ATTRIBUTE**

| **Carrier willingness to share the following resource** Cronbach Alpha measure= .8600 | **Examples used in survey to illustrate types of sharing** *How willing would you be to sharing any of the following examples with a partner?* |
|---|---|
| Q1: Asset acquisition | * Share cost of acquiring new receiving and shipping equipment<br>* Share cost of acquiring new communication and information equipment |
| Q2: Personnel | * Share cost of hiring a specialist<br>* Share internal personnel (e.g., dock workers) |
| Q3: Information | * Share financial information<br>* Share customer information |
| Q4: Commitment | * Share costs of entering into a long-term agreement<br>* Share initial costs of obtaining a customer |
| Q5: Communication | * Share information about daily schedules/route changes<br>* Share daily operating information with partners |
| Q6: Price reductions | * Share consequences of price reductions<br>* Share profit margin decreases with partner |

**TABLE 2**
**TYPES OF RISK USED TO MEASURE THE *RISK* SHARING ATTRIBUTE**

| **Carrier willingness to share the following risk** Cronbach Alpha = .6674 | **Examples used in survey to illustrate types of sharing** *How willing would you be to sharing any of the following examples with a partner?* |
|---|---|
| Q7: Contract termination | * Share the financial risk of a lost contract<br>* Share the risk of negative publicity from a lost contract |
| Q8: Lost personnel | * Share the risk of an employee leaving your firm for the partner<br>* Share the risk of an employee leaving your firm for the customer |
| Q9: Poor performance | * Share the risks associated with a late shipment<br>* Share the risks associated with a damaged shipment |
| Q10: Inability to handle the volume | * Share the risk for lack of ability to handle peak demand<br>* Share the risk of penalty for failure to transport and store the volume required by the customer |

In the sample of firms contacted in the current research there was a significant difference in the level of risk and resource sharing between firms participating in strategic alliances and firms using traditional "arms-length" agreements to obtain warehousing services (Table 3). Based on a 7-point Likert scale, firms participating in strategic alliances appear to show moderate interest in sharing resources (mean score = 4.526) and less interest in sharing risk (mean score= 2.588). Firms using "arms-length" agreements to achieve a service expansion are also relatively more likely to share resources (mean score= 2.709) than risk (mean score= 1.907). When examining all of the firms in the current sample they are more likely to share resources then they are to share risk.

**TABLE 3**
**ANALYSIS OF MULTI-ITEM MEASURES FOR THE *RISK* AND *RESOURCE* SHARING ATTRIBUTES**

| Sharing Possibilities: | N | Strategic Alliance[1] | Arms Length[1] | Significance |
|---|---|---|---|---|
| Resource sharing | 42 | 4.526 | 2.588 | Yes (.05 level) |
| Risk sharing | 42 | 2.709 | 1.907 | Yes (.05 level) |

[1]1 = low willingness to share and 7 = high willingness to share

When compared to firms participating in strategic alliances, firms expanding service offerings by negotiating an "arms-length" agreement with a warehouse provider are much less likely to share resources (mean score = 4.526 vs. 2.588) or risk (mean score = 2.709 vs. 1.907). Both risk and resource sharing behavior are significantly different (.05 level) when comparing strategic alliance participants to providers using an "arms-length" agreement to expand service offerings (Table 3).

Additionally, it is interesting to note that, regardless of how the carrier achieved the expansion into warehousing, the mean score for risk sharing is below 3 on a 7-point scale. This indicates that, while carriers engaged in a partnership are more likely to share risk than their "arms-length" counterparts, there seems to be a general lack of willingness to share business risk. The willingness of a carrier to share resources with a partner who provides warehousing is probably best described as moderate since the mean score is slightly above 4.5 on a 7-point scale. The mean resource sharing score for carriers using "arms-length" agreements to share resources is relatively low (below 3 on a 7-point scale). Overall their appears to be a general lack of desire to share risks or resources with warehouse providers.

As previously mentioned one of the seven items measuring resource sharing was dropped from the analysis. The item addressed the likelihood of a carrier to share profits with their warehouse provider. While motor carriers participating in alliances appear to be somewhat receptive to sharing many resources (i.e., asset acquisition, personnel, information, commitment, communication, and price reductions), the results indicate they may not be interested in sharing profits with their warehouse provider. This item was identified during the principal component factor analysis phase of the research as the only item not measuring the same attribute (*resource*) as the other items. Further investigation revealed that the responses to sharing profits were consistently low regardless of how the motor carrier expanded service offerings. This indicates a general reluctance on the part of the motor carriers in the current sample to share any profits regardless of the relationship with the warehouse provider.

Two risk sharing items were also dropped from the multi-item measure. Carriers appear to be willing to share certain types of risk (i.e., contract termination, lost personnel, poor performance, and inability to handle the volume) with their warehouse partner. However, carriers appear reluctant to sharing the risk of poor customer service and the risk of future lost business with their partner. Further investigation of the results of these two items indicates the responses for these questions are low regardless of how the motor carrier expanded their service offerings. While further investigation is needed, it appears that carriers are more reluctant to share these specific types of risk with their warehouse provider. The researchers can not conclude that these types of risk (poor customer service and future lost business) and/or resources (profits) are never shared by motor carriers and warehouse providers. However, it appears these types of risks and resources are potential problem areas when attempting to structure a collaborative alliance type agreement with a warehouse provider.

## MANAGERIAL IMPLICATIONS

Outsourcing has managerial implications for both the buyer (customer) and supplier (third-party provider) of logistics services. In the past a large portion of the research into the third-party logistics

market has been from the perspective of the customer or buyer. In contrast, the current research examines the logistics outsourcing decision process from the providers' point of view. Therefore the managerial implications will focus specifically on implications for the suppliers of logistics services.

Sharing risks and resources tends to be an indication of the commitment to the relationship (Morgan and Hunt 1994).
The narrative comments received from several representatives of carriers included in the current research also indicates the importance of risk and resource sharing behavior on relationships between third-party providers. If one partner is willing to share but the other firm is handling the relationship like an "arms-length" agreement, the relationship is likely to have difficulty. As a result, corporate attitudes towards risk and resource sharing should be specifically examined during the preliminary negotiation stage of the contract process.

Proactive managerial attention to a potential partner's risk and resource sharing behavior may help to alleviate possible future difficulties in the relationship. Attitudes about sharing risks and resources can be assessed in a variety of ways. First, significant amounts of knowledge can be gained by participating in discussions during the negotiation phase of the relationship. Second, key members of the potential partner firm can be asked to fill out a survey designed to measure attitudes towards sharing. Third, the carrier can seek information from other entities who are currently dealing with the warehouse provider. This approach can help to identify various tendencies of the potential business partner. This step should be completed before the relationship is finalized.

As competition levels throughout the industry have increased, firms do appear to have reacted by adjusting service offerings. Many logistics practitioners interviewed during the current study indicated they feel some pressure to offer multiple logistics services. Some respondents indicated they have expanded service offerings to remain competitive, maintain acceptable customer service levels, and/or maintain or increase market share.

Several respondents indicated that management in their company is highly cognizant of customer demands. If management is truly customer driven, they need to have a strategic plan in place for how to successfully expand service offerings to meet the unique needs of each customer in a manner which is acceptable to the customer and the motor carrier. If the chosen method of expansion is through a strategic alliance, then the researchers suggest establishing a preferred partner list. A preferred partner list should include many of the standard items you might find on a preferred supplier or carrier list (e.g., financial stability, handling of loss and damage claims, customer service levels, etc.). However, a preferred partner list must be more in-depth than a conventional preferred supplier or carrier list.

Entering into a long-term collaborative relationship with one warehouse provider can increase a carrier's risk exposure if the supplier fails to perform as expected. In order for the carrier to reduce risk of performance failure, the potential partner must convince the carrier of their commitment to the success of the relationship. Several approaches can be utilized to help assess the commitment of a partner to long-term success. First, a trial period can be implemented where the carrier uses the warehouse provider on a test basis. If the warehouse provider satisfies all of the carrier's pre-established criteria for a successful partnership, they are granted partner status and placed on a preferred partner list. In cases where trial opportunities are not possible (e.g., if the initial expense of implementing a trial partnership is too large) the carrier and potential partner can enter into a short-term partnership agreement. If the results of the short-term agreement are acceptable then a long-term partnership agreement can be constructed and the warehouser can be placed on the preferred partner list. Regardless of the method used to examine the potential partner, they should be able to demonstrate a commitment to the relationship and a willingness to share an acceptable level of risks and resources. The specific determination of an acceptable level of sharing depends on the individual goals and objectives of each potential partner.

## CONCLUSIONS

Class I LTL motor carriers appear to be responding to current market conditions and expanding service offerings to include additional services like warehousing. The sensitivity to current market trends may be an indication that third-parties are focusing on providing integrated logistics services to their customers. If third-parties remain sensitive to customers' demands in the future, perhaps external logistics providers will not only be able to provide

multiple, integrated services but provide services throughout the entire supply chain.

While many providers of logistics services appear to be responding to customer demands for multiple services, the manner in which they achieve the expansion differs between entities. The idea of sharing risks and resources with former competitors to offer multiple services requires a change in managerial attitudes and practices. In some cases firms who recently competed against each other for business are now teaming up to provide a more attractive package of logistics services to potential customers. While improvements in sharing may still be warranted, firms participating in strategic alliances to expand service offerings appear to be sharing some risks and resources with their partners.

## LIMITATIONS

As with any research several limitations are associated with this study. The focus of the study is very narrow which limits the usefulness and generalizability of the information obtained. The use of one specific expanded service offering (transportation and warehousing) also limits the generalizability of the results. There are numerous logistics functions which can be offered and it is doubtful risk and resource sharing behavior is identical when different functions and entities are involved.

Focusing entirely on the carrier side of the relationship is a potential limitation because it only allows the researchers to capture one side of the carrier-warehouser relationship. It is very possible that warehouse providers feel differently about risk and resource sharing behavior in the relationship.

Furthermore, asking the carrier to focus on one specific relationship with a particular warehouse provider may not yield results representative of the way the carrier handles other external relationships. Limitations to the current research reduces the ability of the researcher to draw inferences from the results. Nonetheless, the researchers believe the results help provide insight into current levels of risk and resource sharing between Class I LTL motor carriers and warehousing companies.

## RECOMMENDATIONS FOR FUTURE RESEARCH

There are many possible extensions to the current research. The scope of research could be expanded in the future to include a larger and more diverse sample of logistics providers. For instance, third-party providers offering different expanded services (e.g., inventory control, information support) could be examined. External logistics providers who did not begin as carriers but entered the third-party market through another logistics function (e.g., warehouser expanding to also offer transportation) could also be examined. A more international approach examining third-party providers operating outside the United States could make a potentially large contribution to understanding risk and resource sharing behavior between logistics providers.

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