

# The Influence of Customer-Specific Adaptations on the Performance of Third-Party-Logistics Relationships

Document Studies and  
Structural Modeling

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## Summary

The main purpose of this research was to acquire a better understanding of the performance of third-party logistics. Based on previous research, the demanded specificity, the intended performance evaluation, the expected adaptations by the provider and the willingness of the customer to adapt to the provider were identified as potential influences of third-party logistics relationship performance. Additionally, 22 requests for quote were analyzed. This document analysis demonstrates that the degree of partner-specific adaptations is influenced by the complexity of the service and the amount of existing assets of the customer. First, hypotheses were established to explain the relationships between the constructs. As a starting point for further research, a structural model was constructed based on SEM.

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## Keywords

Third-party-logistics, provider-customer-relationships, specific adaptations

# 1 Purpose and Research Objectives

The third-party logistics (3PL) business is developing due to increased outsourcing of all or part of a company's logistics function. An example is the recent total outsourcing of logistics by the German trading company, Karstadt, resulting in an additional annual turnover of 500 million euros for the third-party logistics provider DHL Solutions. In the USA, expenditures for third-party logistics have been growing since the early 1990s and have now reached more than \$45 billion (Knemeyer/Murphy, 2004, p. 35); in Germany annual expenditures for third-party logistics has been estimated at an approximate 15.6 billion euros (Klaus/Kille, 2006, p. 121).

Third-party logistics services consist of various types of logistics activities and include the co-ordination and control of these services. In comparison to traditional transport and warehousing services, third-party logistics (also called contract logistics) "are more complex, encompass a broader number of functions, and are characterized by longer-term, more mutually beneficial relationships" (Africk/Calkins, 1994, p. 49). Furthermore, a long term orientation and a more relational approach were emphasized (Knemeyer/Murphy, 2004, p. 35). At first sight, a third-party logistics relationship seems to be a kind of partnership between a provider and his customer (Mohr and Spekman, 1994, p. 135).

On the other hand, third-party logistics contracts can include detailed stipulations concerning a provider's responsibilities (van Hoek, 2000, p. 18, 21). Many third-party logistics providers complain about one-sided adaptation to customers' systems and procedures (Lieb/Bentz, 2005, pp. 602). Consequently, Hertz and Alfredsson (2003, p. 140) emphasized that the ability of customer adaptation is a crucial characteristic of third-party logistics providers. A fundamental point in understanding this situation is the fact that these arrangements are consequences of outsourcing decisions. Third-party logistics are customer-specific service packages which replace the previous systems and processes of the customer. The customer places specific demands on the service provider to ensure the continuation and sustainability of his business. Consequently, the customer strongly influences the characteristics of the new relationship. For example, the customer stipulates a specific location, demands specific procedures, expects the usage of his equipment or requires the use of a specific set of performance measures. The first objective of this research is to identify such customer requirements of third-party logistics relationships. The second objective is to give reason for the existence of one-sided adaptations of the provider.

This research strives to investigate the influences of these adaptations on the performance of third-party logistics relationships. For example, Knemeyer and Murphy (2004, p. 46) found that there is no influence of customer specific investments on customers' perceptions of the relationship performance. In contrast, based on the investigation of general buyer-seller relationships, Cannon and Perreault (1999, p. 454) found evidence of the influence of specific adaptations on

customer satisfaction. Generally, the scientific knowledge of the impact of customers' requirements on the satisfaction of customers and providers is limited. Previous research presents contradictory results and delivers no clear understanding of this kind of relationship. Furthermore, most studies have focused on outsourcing and have, therefore, taken customers' perspective on third-party logistics relationships (e.g. Large/Kovács, 2001; Lieb/Kendrick, 2002). Only a few studies have dealt with providers' strategic options (e.g. Hertz/Alfredsson, 2003, Lieb/Bentz, 2005). Therefore, the third objective of this paper is to examine the relationships between customer-specific adaptations and the satisfaction of both the customer and the provider.

In order to reach the first two research objectives, previous contributions in third-party logistics, relationship marketing and institutional economics were evaluated. This research was conducted to give reasons for the existence of customer-specific adaptations and to form hypotheses concerning the relationships between these adaptations and the satisfaction of both the customer and the provider. Secondly, more than 20 invitations to tender for third-party logistics agreements were analyzed. This analysis especially focused on customer-specific investments and adaptations. Finally, based on these hypotheses a structural model was suggested.

## **2 Literature Studies**

### **2.1 Performance and Satisfaction**

The main purpose of the research described in this paper is to acquire a better understanding of the factors that influence third-party logistics performance and satisfaction. Therefore, previous literature was analyzed to fathom whether or not the characteristics discovered by the document study exert an influence on the performance of third-party logistics. This literature research focused on third-party logistics, relationship marketing and institutional economics.

Before conducting this analysis, the meaning of the performance of third-party logistics relationships must be clear. First, performance could be understood as the degree of goal accomplishment. Most of the previous research focused on customers' perceptions of third-party logistics performance. Knemeyer and Murphy (2004, p. 39) defined third-party logistics performance as the "perceived performance improvements that the logistics outsourcing relationship has provided the user". Performance improvements include, for example, reduced logistics costs, reduced cycle times, more efficient handling of exceptions and improved system responsiveness (Knemeyer and Murphy, 2004, p. 39; Sinkovics and Roath, 2004, p. 53). Stank et al. (2003, p. 29) identified three distinct dimensions of logistics performance: operational performance, relational performance and cost performance.

A more general possibility to conceptualize the performance of services is the so-called SERVQUAL scale developed by Parasuraman, Zeithaml and Berry (1988). Parasuraman, Zeithaml and Berry (1988, p.16) emphasized the distinction between

service quality and satisfaction: „incidents of satisfaction over time result in perceptions of service quality“. On the other hand, customer satisfaction can be seen as the result of an ongoing evaluation of perceived service quality. In that respect, Stank et al. (2003, p. 30, 54) used customer satisfaction in third-party logistics to describe customer's contentedness with the overall relationship with the provider. Likewise, Cannon and Perreault (1999, p. 448) used 5 general items to measure customers' satisfaction with suppliers.

This research conceptualizes the outcomes of a third-party logistics relationship by concerning both the degree of goal accomplishment and the overall satisfaction with the business partner. Usually, customers and providers pursue distinct objectives. Therefore, separate measures of performance perceived by customers and providers, as well as, measures of customer satisfaction and provider satisfaction are necessary.

## **2.2 Relationship Marketing**

Generally, relationship marketing has emphasized the importance of adaptations by sellers to customers' systems and procedures. On the other hand, Morris, Brunyee and Page (1998, p. 366), found evidence of a low willingness of customers to change their behaviors and procedures in order to enhance cooperation with their suppliers.

Cannon and Perreault (1999, p. 442) derived a typology of customer-supplier relationships from a variety of characteristics which can be regarded as "relationship connectors" (Figure 1). These relationship connectors are: information exchange, operational linkages, legal bonds, cooperative norms, adaptations by sellers, adaptations by buyers. Two types of relationships with extensive adaptations were derived (Cannon and Perreault, 1999, p. 442). The first of these types is "customer is king" which involves extensive adaptations only by the seller. The second type of relationship is "mutually adaptive" which requires adaptations by both the seller and the supplier. Surprisingly, there seems to be limited influence of sellers' adaptations on customer satisfaction (Cannon and Perreault, 1999, p. 454). Customer satisfaction with adapted relationships such as "customer is king" is almost as low as customer satisfaction with basic buying relationships. Furthermore, when a business relationship requires considerable adaptations by the customer, satisfaction is low.

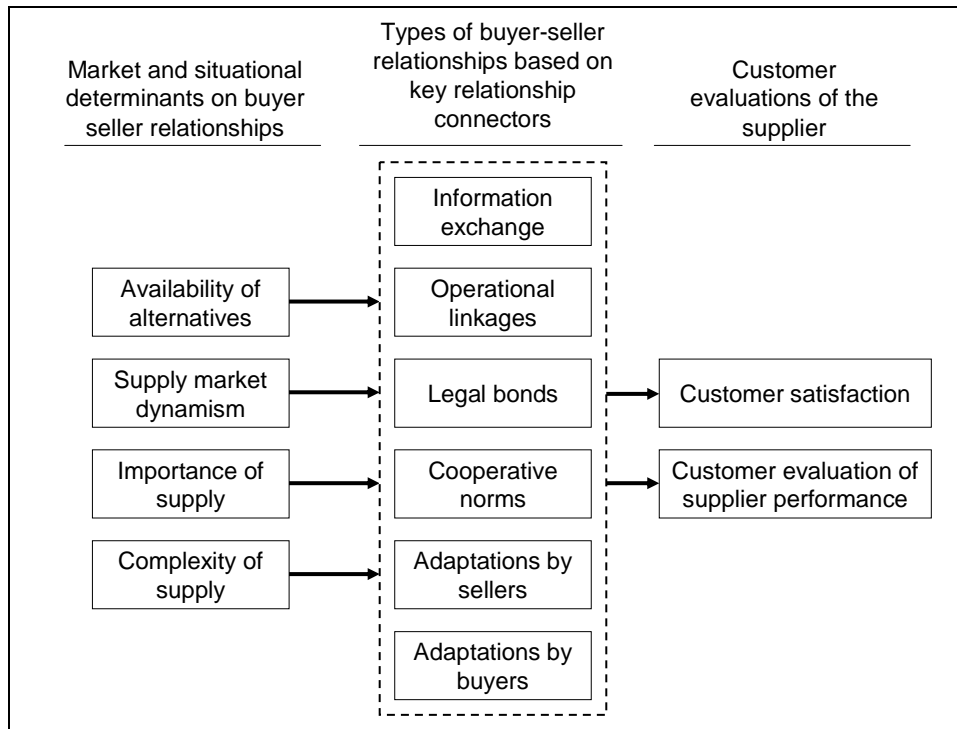


Figure 1: Relationship connectors (Cannon and Perreault, 1999, p. 442).

## 2.3 Transaction Cost Economics

As shown in the first section, third-party logistics consist of recurrent, complex services based on a long-term contract between a provider and a customer. For such settings, the transaction cost theory predicts the existence of specific investments by the providers (Williamson, 1979, pp. 246-247). Asset specificity is a precondition to meet the specific requirements of the customer and to efficiently support the recurrent transactions (Williamson, 1984, p. 202). Following Williamson (1979, p. 247), Figure 2 displays the relationship between frequency, asset specificity and logistics contract characteristics. Detailed and long-term agreements are necessary to safeguard these specific investments. Van Hoek (2000, p. 21) proved that customer-specific third-party logistics services such as final assembly, display building or warehousing are positively related to the existence of detailed contracts.

Initially, Williamson distinguished between four types of asset specificity: site specificity, physical asset specificity, human asset specificity and dedicated assets specificity (Williamson, 1984, pp. 214-215). Two further types were later added: brand name capital and temporal specificity (Williamson 1991, p. 281). In the context of third-party logistics, the first four types are most important.

In the case of site specificity, the location of the third-party logistics facility is stipulated by the customer. For example, the customer demands that a warehouse is located in the proximity of a existing assembling plant. For this reason, the provider is not able to use an existing facility located in a different area. Consequently, there is a

need for new customer-specific investments in a warehouse at this demanded location.

		Asset specificity		
		No	Medium	High
Frequency	occasional	contract of carriage	forwarding contract	forwarding contract / contract of employment
	Recurrent	contract of carriage / warehousing contract	forwarding contract / cooperation agreement	third-party logistics contract / contract of employment

**Figure 2: Asset specificity and logistics contract characteristics.**

If the customer expects adaptations to his own systems and procedures, the provider is forced to invest in customer-specific equipment to meet these requirements. Thus, physical asset specificity is created. Examples of such investments include specific warehouse capacity and dedicated electronic link-ups for inventory control (Knemeyer and Murphy, 2004, p. 42). Usually, such customer-specific equipment is not suitable for alternative usage. "Inasmuch as the value of this capital in other uses is, by definition, much smaller than the specialized use for which it has been intended, the supplier is effectively "locked into" the transaction to a significant degree" (Williamson, 1979, p. 240). Therefore, the third-party logistics provider not only hesitates to behave in an opportunistic way, but also hesitates to terminate the relationship earlier than planned. Likewise, the customer is not able to turn to alternative providers due to the necessity of new specific investments. (Williamson, 1979, p. 240). Therefore, (the) transaction cost theory expects a mutual commitment to the third-party logistics relationship.

Human asset specificity refers to specific investments in human resources. For example, if the customer places special demands on the knowledge and skills of a provider's staff, specific training is necessary. The effects of human asset specificity on third-party logistics relationships are the same as in the case of physical asset specificity. The term "dedicated assets" indicates non-specific equipment of the provider such as general warehouses or means of transportation. These capacities are intended for the exclusive use of one particular customer. Furthermore, dedicated assets involve the expansion of an existing warehouse on a special customer's request.

One common reason for asset specificity in third-party logistics is the need for customer-specific performance measurement (Large and Kovács, 2001, p. 49). Usually, the customer places specific demands on the service provider concerning



performance measurement and reporting. For example, the third-party logistics company is required to provide specific key performance indicators and detailed management reports, which enable the customer to monitor the performed service. In order to meet these requirements, the provider is forced to invest in specific data processing procedures or to adapt to the existing monitoring systems. Likewise, specialized personnel is necessary in order to fulfill these special demands.

In conclusion, (the) transaction cost theory predicts extensive investments by third-party logistics providers. In other words, (the) transaction cost theory expects one-sided adaptations by the provider rather than mutual adaptations by both parties. Furthermore, (the) transaction cost theory suggests positive impacts of asset specificity on the performance of third-party logistics. As shown above, asset specificity contributes to the commitment of both parties, resulting in a trustful relationship between the partners. Surprisingly, Knemeyer and Murphy (2004, p. 46) found that a buyer's perception of specific investments by a third-party logistics provider is not related to the level of trust toward this provider. In contrast, Kwon and Suh (2004, p.6) proved that supply chain partners' investments increase the level of trust between partners. On the other hand, own investments exert a negative influence on the level of trust of the other party (Kwon and Suh, 2004, p.6). Artz (1999, p. 122) found evidence of a negative relationship between the level of specific investments by the customer and the performance of a supplier-customer relationship, although, reciprocal investments by the supplier can increase customer's satisfaction. One possible explanation is the mutual dependence of both parties (Artz, 1999, p. 122). Likewise, Heide and Stump (1995, p. 62) found evidence for a negative impact of buyers' investments in supplier-specific assets on the perception of relationship performance.

## **2.4 Third-Party Logistics**

In the first part of this paper, the ability of customer adaptation was introduced as a key characteristic of third-party logistics providers. Hertz and Alfredsson (2003, p. 141) emphasized the importance of the general ability to solve problems and of the ability to undergo customer adaptations. Both characteristics were used to differentiate between third-party logistics providers and traditional logistics firms (Figure 3). Furthermore, Hertz and Alfredsson developed a typology of third-party logistics providers based on these characteristics. So-called "customer adapters" (providers with a relatively high ability to solve general problems and high ability to carry out customer adaptations) usually take over existing activities of several customers and try to improve the performance of these processes. The second type of provider, consisting of companies with both a high ability carrying out customer adaptations and a high ability of solving general problems, is described as a "customer developer". This type develops advanced customer solutions for each customer.



Knemeyer, Corsi and Murphy (2003, p. 102) used three indicators to measure the level of adaptations by third-party logistics providers:

- “The third party has gone out of its way to link us with its business.
- This third party has tailored its services and procedures to meet the specific needs of our company
- This third party would find it difficult to recoup its investment in us if our relationship were to end.”

Furthermore, the amount of specific training and qualification is important to evaluate the level of customer adaptations (Kwon/Suh, 2004, p. 14). Such extensive adaptations by third-party logistics providers require a considerable amount of asset specificity. In contrast to the transaction cost theory, Knemeyer and Murphy (2004, p. 46) found that the level of specific investments by a provider is not related to a buyer’s perception of third-party logistics performance such as asset reduction.

		Ability of customer adaptation	
		Low	High
General ability of problem solving	High	Integrators DHL, Fedex, TNT	Third Party Logistics firms
	Low	Standard Transportation firms	Traditional house brokers or warehousing firms

Figure 3: Third-party logistics provider position (Hertz/Alfredsson, 2003, p. 141).

### 3 Analysis of third-party logistics invitations to tender

Literature emphasizes the importance of asset specificity and adaptations by the third-party logistics provider. Therefore, document studies were conducted to evaluate whether or not the customers place certain demands on the provider. Based on the results of the literature research, this analysis focused on the demanded specificity (site specificity, physical asset specificity, and human asset specificity), the intended procedure of performance evaluation, the expected adaptation by the

provider and the willingness of the customer to adapt to the provider. Furthermore, the characteristics of the third-party logistics projects were examined in order to identify potential influences of asset specificity and adaptation.

Altogether 22 requests for invitations to tender were analyzed, two major European third-party logistics companies made these documents available to the author. The subject of 8 documents was customer-specific distribution and warehousing. Seven additional documents were invitations to tender for physical supply and operations, for example, sequencing activities and materials handling. The remaining documents dealt with the outsourcing of (international) transport and forwarding. The main emphasis was on the first 15 cases. Most of these customers belong to the automotive industry.

Analyzing the documents, a considerable amount of site specificity is conspicuous. Most of the customers demand a specific location or at least stipulate that the warehouse must be located in the proximity of their own manufacturing facilities. Most of the customers expect specific investments by the provider such as warehouses, warehousing equipment or computer systems. Therefore, physical asset specificity is a frequent characteristic of third-party logistics. In the case of outsourcing, the provider is requested to use existing assets of the customer. Likewise, human asset specificity exists on a regular basis. Typically, there is a need for additional personnel at the demanded location or at least a need for training in order to fulfill the requirements of specific customers.

As expected, most of the customers place specific demands on the service provider concerning performance measurement and reporting. With a few exceptions, there is limited willingness of the customers to accept providers' performance measures. Generally, the willingness of the customer to adapt to the provider seems to be low. The vast majority of the cases show one-sided adaptations by the third-party logistics provider.

In addition, there seems to be a relationship between the complexity and specificity of the third-party logistics service and the level of specific investments expected by the provider. If the complexity and specificity of the requested service is low, there is usually no need for physical asset or human asset specificity, because the provider is able to use standard procedures and existing equipment to meet customer's requirements.

Especially in the case of outsourcing, the volume of customers' existing assets could have an influence on the degree of specific investments both by the providers and the customers. If the customer is not able to reuse existing facilities and equipment, these assets cause sunk costs. Therefore, the document study suggests that the level of required specific investments by the provider is positively influenced by the amount of a customer's existing assets. In this case, the customer refuses to adapt to the provider.

## 4 Hypotheses and Structural modeling

This section presents hypotheses advanced by a synthesis of the existing body of research examined earlier in this paper and by the results of the document study. The nature of the following hypotheses is a proposition for further research due to the fact that no hypothesis testing is presented in this paper. Nevertheless, the formulation of hypotheses can be regarded as an important stage in a ongoing research process.

Previous research, concerning the influence of specific investments and adaptations on the performance of close business relations, has presented contradictory results. For example, Knemeyer and Murphy (2004, p. 46) found that the level of specific investments by a provider is not related to a buyer's perception of third-party logistics performance. Furthermore, relationship marketing suggests limited influence of sellers' adaptations on customer satisfaction (Cannon and Perreault, 1999, p. 454). In contrast, the transaction cost theory expects a positive impact of asset specificity on the performance of third-party logistics. Following the transaction cost theory, there is a positive relationship between a customer's perception of the third-party logistics performance and the specific investments made by the provider:

H1a: The customer's perception of the performance is positively influenced by the level of specific investments by the provider.

Most of the previous research is based on customers' perceptions of relationship performance. In contrast, this research strives to investigate both the customer's and the provider's evaluation of the relationship. In a provider's point of view, extensive specific investments cause additional costs and increased dependence. Therefore, the following hypothesis is formed:

H1b: The provider's perception of the performance is negatively influenced by the level of specific investments by the provider.

Most of the previous research expects a negative influence of specific investments by the customer on the customer's perception of third-party logistics performance. For example, Artz (1999, p. 122) found evidence of a negative relationship between the level of specific investments by the customer and the performance of a supplier-customer relationship. From a provider's point of view, adaptations by the customer could have a positive influence on the performance. These ideas lead to the following two research hypotheses:

H2a: The customer's perception of the performance is negatively influenced by the level of specific investments by the customer.

H2b: The provider's perception of the performance is positively influenced by the level of specific investments by the customer.

As shown above, customer satisfaction should be understood as the result of an ongoing evaluation of perceived service quality. Therefore, a positive relationship between performance and satisfaction can be expected.

H3a: The customer's satisfaction is positively influenced by the customer's perception of the performance of the relationship.

H3b: The provider's satisfaction is positively influenced by the provider's perception of the performance of the relationship.

The document research suggests a relationship between the complexity of the third-party logistics service and the level of specific investments by the provider. A broad number of functions and existence of specific activities such as order processing or final assembly implies a certain degree of customer adaptation and specific investments by the provider.

H4: The level of specific investments by the provider is positively influenced by the complexity of the offered third-party logistics service.

Likewise, the document research suggests the consideration of the customer's existing assets. In the case of outsourcing, the customer possesses extended physical assets such as warehouses, computer systems or special vehicles. If this holds true, the customer usually demands adaptations by the provider. Furthermore, the customer may expect the takeover of these assets by the provider. In both cases, the customer's existing assets result in specific investments by the provider.

H5: The level of specific investments by the provider is positively influenced by the amount of the customer's existing assets.

In contrast, increasing levels of the customer's existing assets lead to a decreased willingness of the customer to invest in additional provider-specific assets. Therefore, a negative relationship between specific investments by the customer and the amount of the customer's existing assets can be expected.

H6: The level of specific investments by the customer is negatively influenced by the amount of the customer's existing assets.

As shown in the literature section, the customer's requirements, concerning the use of specific key performance indicators, could lead to physical and human asset specificity. The document analysis indicates that most of the invitations to tender contain detailed stipulations regarding performance measurement and reporting. Therefore, the following hypothesis is formed:

H7: The level of specific investments by the provider is positively influenced by the desired level of monitoring.

These hypotheses indicate a complex and closely connected set of relationships between the theoretical constructs involved in this research. The constructs used (for example perception of the performance or complexity of the offered third-party logistics service) are not directly observable or measurable. With other words, it is necessary to define a set of items to account for each theoretical construct involved. To meet these requirements, the model was constructed using structural equation modeling (SEM). The usefulness of SEM lies on its ability to test a set of hypotheses simultaneously (Giménez/Large/Ventura, 2005, p. 156). Furthermore, SEM is a

statistical technique that combines the structural model (theoretical model) and the measurement model into one total model (Hair et al., 2005, p. 711-712). The first step of using SEM as a research method is the development of the structural model specifying the constructs and the causal relationships among them. Therefore, the hypotheses need to be expressed in the form of a set of linear equations. Figure 4 displays a graphical depiction of the structural model. This structural model can be used as a starting point for the testing of the hypotheses presented in this section.

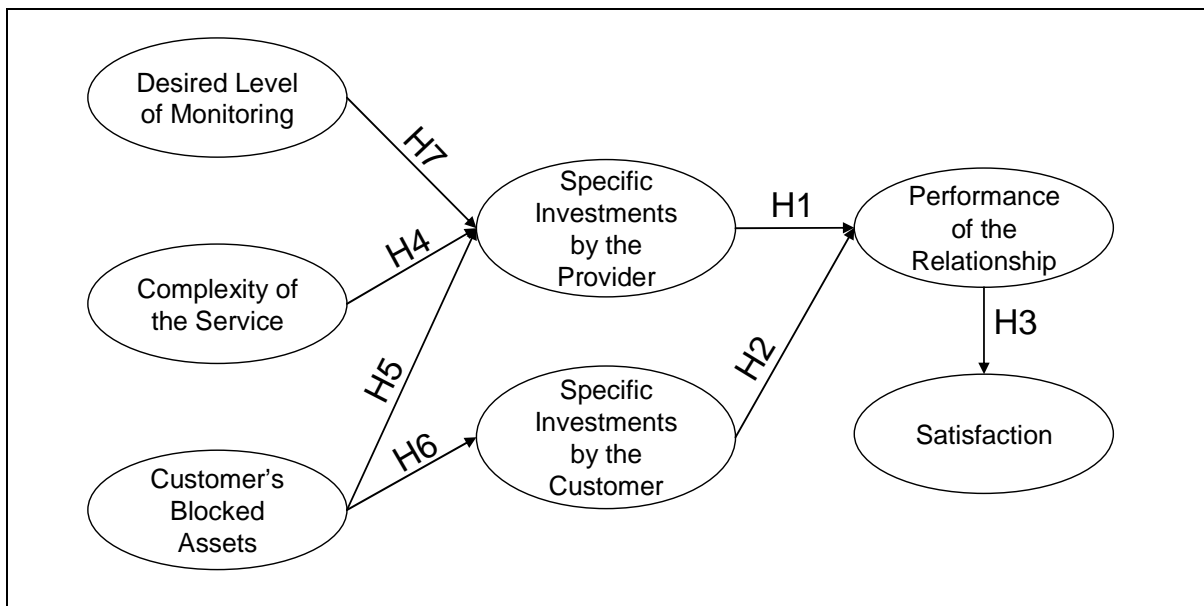


Figure 4: Graph of the proposed model.

## 5 Conclusions and Further Research

The main purpose of the research described in this paper was to acquire a better understanding of the performance of third-party logistics. In doing so, previous literature on relationship marketing and transaction cost theory was analyzed. As a first result, the demanded specificity (site specificity, physical asset specificity, and human asset specificity), the intended procedure of performance evaluation, the expected adaptations by the provider and the willingness of the customer to adapt to the provider were identified as potential influences of third-party logistics relationship performance. In addition, the document analysis demonstrates that the degree of partner-specific investments is influenced by the complexity of the service and the amount of existing assets of the customer. The conclusions of the literature and the cases were used to establish hypotheses explaining the relationships between the complexity of the service, the degree of adaptations by the customer, the degree of adaptations by the provider, the amount of existing assets of the customer, the intensity of performance measurement, the performance of the third-party logistics relationship and the satisfaction with the business partner. Further research is intended to verify this model by using relationship data collected from both customers and providers of third-party logistics services.

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