

Long-term Business Relationships between Consignor and Trucking Carrier in Japan

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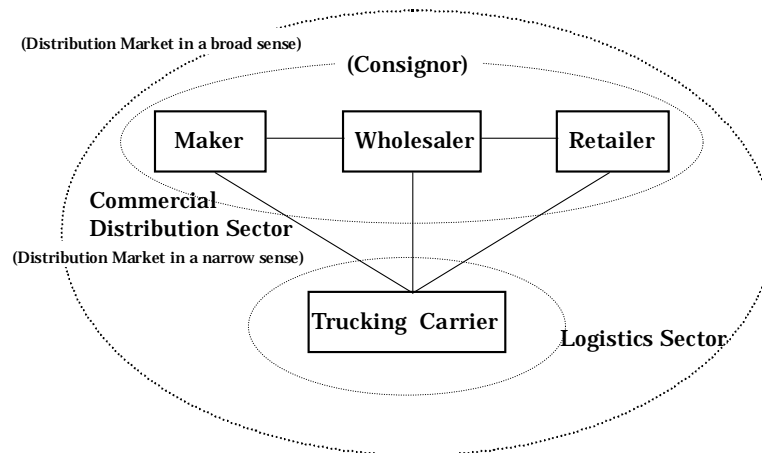
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1. INTRODUCTION

One of the outstanding features of relationships between companies in the Japanese market is that companies' vertical relationships are maintained as long-term business relationships. In recent years, there have been numerous economic analyses, theoretical as well as empirical, of these sorts of vertical corporate relationships. These analyses can be roughly divided into two categories: those that analyze the production relationship between the parts suppliers and the manufacturers in the assembly industry and those that analyze the distribution relationship from the manufacturing industry to the point of sale of the products to consumers. Among the former is the research series by Asanuma (1997) and Fujimoto, Nishiguchi and Itoh eds. (1998), while Miwa and Nishimura eds. (1991), Maruyama (1992) and Nariu (1994) deal with the latter. The latter has focused solely on analyses of the commercial distribution market, with manufacturers, wholesalers, and retailers as the main target, defining the distribution market in the narrow sense.

When "distribution market" or "distribution activities" are mentioned, often the focus is on commercial distribution only. However, it must not be forgotten that we cannot grasp the distribution channels without analyzing logistics. Commercial distribution is important, but it is not the only form of distribution. The actual movement of goods, including transport, storage, and loading/unloading of merchandise is another important constituent of distribution (fig. 1).

Figure 1: Distribution Market



Especially in Japan, many kinds of peculiar business customs in the commercial distribution market have attracted researchers in the fields of economics of information, games, incomplete contracts, and transactions cost. Indeed, we observe various quasi-organizational forms of vertical restraints, such as resale price maintenance, the closed territory system, and the exclusive dealing system. Why these vertical restraints exist particularly in Japan is an intriguing question that researchers have attempted to explain in economic terms.

It is only recently that the importance of logistics has become recognized, due to increasing interest in promoting overall efficiency and reducing total costs in distribution channels. Particularly in the trucking business, which is the main player in overland transportation, many new companies have entered since the deregulation implemented by the legislation of the two logistics laws in 1989 (i.e., Freight Forwarding Business Law and Trucking Business Law). Intensified competition compels trucking carriers to seek to offer transportation services at rates lower than those of competitors. At the same time, they attempt to differentiate themselves from their competitors by providing customers more organized and advanced logistics services.

In order for trucking carriers to be competitive, they have to understand the exact needs of their consignors, and offer the required logistics services. They should design efficient distribution systems from manufacturers to retail stores. An efficient distribution system can be attained by assigning proper information flow and by allocating operations of distribution processing to adequate agents. For example, it may be necessary to construct an information system that maintains close contact between the consignor and the trucking carrier. Also, the trucking carrier may be able to conduct

distribution processing work¹ such as product inventory control and printing of invoices and tags more efficiently than the consignor or the retailer. These requirements necessitate appropriate investments in various stages of the distribution channel.

In most cases, a trucking carrier must invest in specific assets which are customized and set up for the specific consignor, so it engenders considerable cost if they try to divert those assets into other customers' service; such investments are called relation-specific investments. For example, trucking carriers who achieve contracts with several consignors may have to invest in separate pieces of equipment, and each of them may serve only one consignor. Once the consignor and/or the trucking carrier invest in a relation-specific asset, they face higher switching costs, and so it becomes difficult for either of them to get out of their business relationship. This higher switching cost causes the so-called "hold-up problem," which may deter appropriate investments in relation-specific assets. *Transaction Cost Economics* asserts that it is important to resolve the hold-up problem in order to realize such investments in relation-specific assets. The long-term vertical business relationship is one device, or system, for resolving the hold-up problem. Moreover, the longer the relationship endures, the greater is the trucking carrier's competitive advantage over new logistics companies, thanks to accumulated know-how and improvements to the system over time.

The above issues motivate us to investigate the economics of vertical relationships between consignors and trucking carriers in Japan; this paper focuses particularly on the trucking business sector in the logistics markets and tries to empirically identify the factors that lead to long-term relationships between consignors and trucking carriers. We believe transaction cost economics is a useful tool for this purpose. To the best of our knowledge, no other econometric analysis has been published which pays attention to the business relationships between companies in the logistics market in Japan. Also, this is the first analysis which tries to examine what kinds of service provided by the logistics industry are useful to increase added value. We concentrated on the content of information exchanged and distribution processing operations. Moreover, this is also the first attempt at verifying long-term business relationships in the extended distribution market that includes the commercial distribution market as well as the logistics market.

¹ Generally, when talking about "distribution processing work," the common examples are invoice and tag printing, assembly, and inspection of goods, etc. Storage and inventory management, etc., are usually considered part of the main functions of logistics. However, in this paper, they are classified as distribution processing work in the sense that they are functions other than transport which are provided by trucking carriers. Refer to Section 3 for detailed classification.

We employed survey data on consignors to maintain consistency with the results of existing research on the commercial distribution market, and this is one of the prominent characteristics of this paper. The questionnaire survey was implemented by the Institute for Posts and Telecommunications Policy with the title of "A Survey on Business Relationships between Consignors and Trucking Carriers" from January 4 to February 5, 1999. It sampled a set of consignors and trucking carriers in Japan. We concentrated on the logistics of consumer goods since an advanced and diverse logistics system is generally required. A total of 338 companies responded to the questionnaire. Out of 2700 consignors to which the questionnaire was distributed, 262 responded (165 manufacturers, 63 wholesalers, 31 retailers, and 3 rental services). Out of a total of 800 trucking carriers to which the questionnaire was distributed, 76 responded (53 road freight carriers, 7 warehousing businesses, and 13 transportation-related services). Each respondent answered questions concerning logistics transactions for the two main products handled by the company. In the following sections, we used only part of the questionnaire results received from consignors to investigate the relationship between the consignors and the trucking carriers.

The main messages of this paper are summarized as follows. We would like to show empirical findings that support these hypotheses.

First, the construction of a long-term business relationship between the consignor and the trucking company is an important strategy for competitiveness. The long-term business relationship makes it possible to invest in relation-specific assets such as equipment for distribution processing proposed by the consignee as well as to maintain close communication for information sharing. Simultaneously, these assets function as "hostage" to the relationship. In this respect, the same mechanism is at work as in the commercial distribution market.

Second, in businesses where the demand for the consignors' products is stable, the strategy of a long-term business relationship becomes particularly advantageous. On the other hand, in businesses where the demand fluctuates severely, consignors tend to rely on short-term transactions with trucking companies in the spot market. In this respect, too, the findings are consistent with previous research concerning the commercial distribution market.

This paper is organized as follows. In Section 2, after surveying previous research, several hypotheses are presented concerning the factors that lead to long-term contractual relationships in the trucking market. In Section 3, an econometric model is prepared to verify the hypotheses proposed in Section 2. In Section 4, we report the results of the econometric analysis. In Section 5, lessons for postal operators and the parcel delivery companies implied by the findings obtained in the preceding sections are mentioned, and finally, the conclusions are stated.

2. LONG-TERM BUSINESS RELATIONSHIPS IN THE LOGISTICS MARKET

Logistics is often characterized by its passive nature. Since the demand for transportation service is a derived demand that arises from commercial distribution and is not final demand, it is unavoidably dependent on the demand for the consignors' products. However, as far as the logistics market reflects the business activities of consignor companies, we can assume that the same logic prevails in the logistics market as in the commercial distribution market.

Several researches have pointed out that there exist long-term business relationships in the commercial distribution market in Japan. The relationships are said to fulfill an important function in reducing the transaction cost incurred at the stage of negotiations and implementation of contracts. First, the accumulated business-related knowledge and the mutual understanding developed through the continuation of the relationship reduce communication costs necessary to form preliminary consensus. Second, the relation-specific assets raise the cost of quitting a long-term business relationship, then maintain the binding force of the relationship. In the commercial distribution market, to suppress opportunistic behavior of transacting parties, various mechanisms such as "reputation" and "hostages" are devised from the long-term viewpoint. For example, the various types of support that producers provide to retailers for efficient sales promotion, such as management guidance, sales staff training, and bearing the investment expense of storefront remodeling, are said to form a type of hostage.

Since the companies in the commercial distribution market are the consignors in the logistics market, we can assume that they form the same kind of long-term business relationships in the logistics market. Then, in what environment do they form the relationships? To the best of our knowledge, no research has addressed these topics for Japan's trucking business. For this reason, in Subsection 2.1, we try to provide theoretical analysis of these problems. Next, given that long-term business relationships are expected, we consider why the previous research has not pointed out the existence of long-term business relationships in the logistics market. Among the various consignors, there should exist some firms that do not form long-term business relationships with trucking carriers but rather repeatedly rely on spot transactions. Are there any special features in the attributes of such companies? In Subsection 2.2, these points are investigated and it is pointed out that formation of long-term business relationships may be greatly affected by the volatility of the demand for the products shipped from the consignor company.

2.1 Factors Leading to Long-term Business Relationships

When a trucking company provides logistics services to a consignor, it utilizes various human and physical assets. Provided that all of the assets are general-purpose and can be procured without incurring transaction costs in the spot markets, then it is not necessary to form a long-term business relationship. It has been pointed out that, in the logistics business, the sunk cost of the assets for providing transportation services such as truck is relatively small compared to other industries. This belief may be the reason why so few analyses have investigated long-term business relationships in logistics systems. However, although assets employed to provide transportation service itself may not be relation-specific, it is possible that equipment necessary to provide related services may be relation-specific. The related services include distribution processing operations and information exchange between the consignor and the trucking carrier, and those services are becoming more and more important recently in logistics systems and are acquiring a considerable share of the value added produced in these industries. The relation-specific assets should enhance the efficiency of transportation systems, and consignors and/or trucking carriers invest in those assets expecting that these assets produce higher efficiency in the whole production/marketing system as well. For all the necessary investment to be realized by the appropriate parties in relation-specific assets, the theory of *incomplete contracts* claims that various institutional devices are required. Long-term relationship is one of those devices that promote investment in relation-specific assets.

First, let us consider information exchange between a consignor company and its consignee trucking company. If the consignor company needs only the simple physical transportation of its products, then it should exchange information with the trucking company only in the transportation contract: the time and the place of the transport and the fee. However, to organize efficient production/marketing systems, the system should coordinate not only with the customers in the commercial distribution market such as the wholesalers and the retailers but also with the trucking company. In this sense, it is quite necessary to maintain close communication with the trucking company.

For example, typical Just-in-Time (JIT) distribution is generally defined as a distribution system that delivers “necessary goods” at the “necessary time” in the “necessary amount.” In order to make a JIT system function, the consignor and the trucking carrier should exchange detailed information, including information on inventory management, etc. Also, supply chain management (hereinafter referred to as “SCM”), which has received much

attention in recent years, is a system that goes even further and is premised on exchange of marketing information and production management information with the logistics company.

Generally speaking, as an information system exchanges larger amounts of data, the operation and maintenance of the system require more enhanced skills and know-how, because heavier data flow requires more complex and delicate systems. The inventory management system, the production management system, and the marketing management system are themselves huge information exchange systems, and connecting those heavy information systems with the information system owned by the other company is a very difficult and complicated task. So, accumulated skills and know-how in information management fields are imperative to the company. Therefore, the company should invest heavily in human capital, through training, and offering higher wage rates to qualified personnel. These resources invested in human capital are generally quite relation-specific, because the skills and the know-how required are related to the content of information flow of the system to be connected, which is specific to the company. To realize investments in these relation-specific assets, a long-term relationship is necessary. Thus, we can hypothesize that business relationships tend to be long-term, as more and more detailed information is exchanged.

This hypothesis can be rationalized from another aspect. In many cases, detailed information constitutes the consignor companies' confidential affairs which are related to sensitive management strategy. Consequently, when such information is shared with a consignee trucking company, it functions as a "hostage." This suppresses opportunistic behaviors on the part of the consignor company and helps to keep a long-term relationship with the consignee trucking company. On the other hand, if the trucking carrier leaks a consignor company's information, not only will the trucking carrier lose expected profits as the transaction with that consignor are cancelled, but profits that might be earned from transactions with new consignors will also be reduced due to the degrading of its own reputation as a trucking carrier.

The other factor considered here that leads to long-term business relationships in the logistics industry, other than information exchanged, is distribution processing operations. For example, in the case that inventory management operations are consigned to a logistics company, frequent exchange of relevant information is necessary for the logistics company to conduct the inventory management in real time, so the relation should be long-term by the above hypothesis. Also, in the case that invoice and tag printing is consigned, the information acquired through this consignment becomes a hostage because the logistics company that receives the consignment can acquire detailed information on the consignor company's customers. This hostage functions to suppress opportunistic behavior on the

side of the consignor company. At the same time, the hostage also strengthens the consignee's negotiating position, and so thereby becomes a factor that gives rise to the hold-up problem under an incomplete contract. In order to avoid this problem, it is necessary to have long-term transactions. Moreover, when the consignee needs additional investment in its equipment to operate the distribution processing, in many cases this investment results in a relation-specific asset.² So, this is another reason why long-term transactions become necessary: to induce appropriate investments in such relation-specific assets.

Note that who proposes the investment in the equipment necessary to the processing operation is an important factor in evaluating the nature of the relationship. First, consider the case in which the consignor company proposes the investment. Why does the logistics company rely on the consignor's assignment? Probably, it is because the company has little know-how of the distribution processing. And, as we cannot expect much knowledge of transportation equipment on the part of consignors, the processing equipment assigned should be a general-purpose one. Then, the equipment has less possibility of having a relation-specific nature.³

Next, consider conversely the case in which the logistics company proposes the design and the specification of the processing equipment. In this case, the logistics company should have detailed know-how of the consignor's specific processing operations. In most cases, such know-how is extremely relation-specific. On the side of the consignor, the switching cost to change to another trucking carrier rises, because the consignor would need much time and resources for accumulating human capital and know-how to get equally efficient distribution processing services from a new consignee

This is equivalent to the comparison between the "drawings supplied (*taiyozu*)" method and the "drawings approved (*shoninzu*)" method which are seen in the manufacturer-supplier relationship. Asanuma's (1984, 1997) epoch-making study on transactions between Japanese auto manufacturers and parts suppliers discovered the two types of drawings in transactions involving customized parts for specific auto manufacturers' products. For the latter of these two, the drawings approved method, not only is mere ability to manufacture parts expected of the parts maker, but active provision of the ability to develop and design parts is also expected. He claimed that the "relational transactions" or "long-term transactions" based

² Speaking of invoice and tag printing, invoice numbers are currently not standardized, and it is pointed out that additional changes of the system may be necessary.

³ In interview studies, there were cases in which consignor companies (in the convenience store business) lent equipment to trucking carriers. In such cases, the switching cost incurred when consignor companies switch their consignee can be reduced.

on relation-specific assets which Williamson (1985) asserted can also be generally divided into two corresponding categories, and stressed the importance of the difference. Asanuma goes on to analyze the concept of relation-specific capabilities in connection with the concept of relational quasi-rent, and he showed that, overall, the drawing approved method requires greater accumulation of advanced relation-specific capabilities than the drawing supplied method.

If the same logic can be applied to the relation between the consignors and the trucking carriers, we expect closer relations to prevail in the case when the consignor agrees to the processing equipment that the consignee proposed and designed.⁴ We assume this analogy here. So, this paper examines whether the distribution processing equipment introduced has been proposed by the consignee or not, and this paper utilizes this difference as a measure of relation-specificity. By maintaining a long-term business relationship between the consignor and the logistics company and promoting the introduction of equipment proposed and designed by the logistics company, the logistics system can be constructed to perform efficient distribution processing, and then the system can secure strong dynamic competitiveness.

2.2 Demand Volatility and Long-term Business Relationships

In Subsection 2.1, we argued that a consignor company and its consignee trucking carrier (logistics company) can maintain a long-term business relationship. Then why has the existence of long-term business relationships in the logistics market not been pointed out in the literature until now? Among the various consignors, there should exist some firms that do not form long-term business relationships with trucking carriers but rather repeatedly rely on spot transactions. Are there any special features in the attributes of such companies?

One possible answer to these queries is that trucking carriers who appear in the spot market are not major traders. The logistics market in Japan has a multilayer structure from huge transportation network companies with thousands of trucks to small subcontracting firms with a couple of trucks.

⁴ This may be largely related to “proposal capability” of trucking carrier, which is frequently pointed out in logistics market. There are many questionnaire results which shows that consignor company expects “consignee’s proposal capability” for achieving entire efficiency in logistics system (ex. Yusokeizai Shimbun (1998.8.11)). In the context of this paper, we may paraphrase this kind of proposal capability as “investment for relation-specific asset including consignee’s know-how which is necessary for achieving efficiency in logistics system.”

The smaller firms are likely to serve complementary needs for consignors. So, there is a high possibility that spot demand for transportation may be filled by those very small trucking companies.

This inference may be true. In some industries, however, consignors may usually rely on unspecified trucking carriers with temporal or short-term contracts for the transportation of their main products. In those industries, the demand for the product should be severely volatile and vulnerable to environmental changes. Then, the cost to adjust transportation schedule may exceed the expected benefits from building a stable relationship and working in close coordination with a specific trucking carrier. In such cases, consignors should rationally choose to depend on some low-cost trucking carriers in the spot logistics market. We assume that frequently observed spot-transaction behavior of trucking carriers reflects this tendency. We would like to point out that the demand volatility of the consignor's products is one of the essential factors in determining the term of the transaction.

A study which analyzed the commercial distribution channel with a similar hypothesis is that done by Torii and Nariu (1995). Torii and Nariu used the ratio of companies in the Japanese wholesale industries that provide guidance and support (i.e. (1) fund support, (2) dispatch of executives and employees, (3) management guidance, and (4) information provision) for suppliers and buyers as a proxy of the long-term business relationship, and they empirically investigated the association between this proxy and demand uncertainty. They successfully found a significant negative correlation between both variables; when demand volatility is small and inventory adjustment for production and marketing is not difficult, more companies establish long-term business relationships. The long-term business relationships seen in the businesses where demand uncertainty is small are to facilitate the investment in relation-specific assets, and not to protect their markets from competition, they insisted.

The same logic in the commercial market should be applied in the logistics market, because the adjustment costs are expected to be high also for trucking carriers. Note that trucking carriers have a heavy network nature. Generally speaking, the coordination of a whole network system is harder than bilateral coordination. Thus, we have sound reason to state that the hypothesis is valid also in the logistics market. So we assume that long-term business relationships with trucking carriers have a close association with the demand volatility of the consignor's product. In industries with severe demand volatility, the adjustment cost is so large that to procure trucking service in spot markets is a more rational strategy than to construct a long-term business relationship with a specific trucking carrier. On the other hand, long-term business relationships are expected to be observed in

industries with stable demand. This paper tries to test this hypothesis empirically.

3. ECONOMETRIC MODEL

This section constructs regression equations that test the two hypotheses explained in Section 2.

This paper uses only the samples which responded that they consign logistics services to some trucking carriers. This is because we concentrate on the consigned logistics services in this analysis. In cases where the consignee is a logistics subsidiary that is owned by the consignor with more than fifty percent of the total shares, the purpose of establishing that subsidiary is probably to decentralize decision-making and/or to take advantage of the accounting and taxation merits.⁵ Then, it is quite natural that transactions are long-term, and there is no difference from the parent company's logistics department. Of course, more detailed study is needed on those logistics subsidiaries employing the theory of the boundary of firms. It may be quite a challenging theme to undertake. However, that analysis is beyond the scope of this paper. In this paper we adopt a strategy to avoid influence from such difficult-to-control factors. So we chose only the samples with no logistics subsidiaries and those that own subsidiaries with less than fifty percent of the total shares issued.

The dependent variable, *DURATION*, is the number of months of consignment between the consignor and the trucking carrier. We calculated the number of the months from the question on the survey: "In what month/year did consignments first begin?" Note that the "term of transaction" is often used in two different senses. In one sense, it is the ex-ante viewpoint, in which the contract conditions and the consignment details are reviewed. The other sense is the ex post viewpoint, in which consignment is successively renewed. In this paper, we define the term of transaction from the latter ex post viewpoint.

The explaining variables used to determine the dependent variables are the proxies of information flow, distribution processing activities, and the demand volatility of consignor's products. We explain these proxies respectively. First, we define the proxy of information density. We prepared

⁵ However, some companies say that the major reason for establishing logistics subsidiaries is to reduce personnel expenses and to slim down the parent company. This means that they don't recognize the positive role of logistics subsidiaries. For example, refer to "Ryutsu Sekkei" (1999, No. 2, Yuso Keizai Shimbunsha) [English translation: "Distribution Design"]. Also, Itoh, Kikutani and Hayashida (1997) present research on the externalization of organizations in Japan.

the questionnaire for the type of information exchanged in eight categories (fig. 2). Then, we classified these eight categories into three levels. Level 0 information is related to the transportation contract and transport/delivery operations. This is basic information that must be exchanged even for the consignment of simple transport operations. Level 1 information is related to management of clearance to/from inventory, distribution processing operations,⁶ inventory management, and calculation/billing of freight and storage charges, which is necessary to exchange when consignment includes distribution processing operations other than mere transportation service. Furthermore, level 2 information is marketing and production management information, which is necessary for advanced management decision-making and for more sophisticated coordination.

Figure 2: Levels of Information

Information Level	No.	Type of Information
LEVEL 0	1	Transportation Contract
	2	Transport/Delivery Operations
LEVEL 1	3	Management of Clearance To/From Inventory
	4	Distribution Processing Operations
	5	Inventory Management
	6	Calculation/Billing of Freight/Storage Charges
LEVEL 2	7	Marketing
	8	Production Management

The higher the information level, the more detailed the information becomes, and the more closely concerned with management strategy it is. Companies have to invest heavily in human capital to maintain and manage system to exchange real-time based information. In addition, the exchange of more detailed and more sensitive information with outside consignee companies would be difficult without a long-term business relationship based on trust. We can hypothesize that as more detailed information is exchanged, the longer the terms of transaction become. The proxy variable

⁶ Here, we refer to distribution processing operations in the narrow sense. As stated in footnote 2 as well, in this paper, inventory management and storage are classified as distribution processing operations in the broad sense since they are services other than transportation. Thus, "Level 1 information" means the information that needs to be exchanged to consign distribution processing work in the broad sense.

is utilized to reflect the information level discretely, and denoted as *INFO*. In the regression analysis, the levels are further summarized into two levels, with level 0 as *INFO*=0, and level 1 and level 2 as *INFO*=1, so *INFO* is a dummy variable, because we found that there are very few companies so far in Japan that have already introduced sharing of information level 2, marketing information and production management information in the form of SCM. We expect that *INFO* has a positive association with the dependent variable *DURATION*.

Second, we prepared an explanatory variable which represents distribution processing operations. The questionnaire posed questions about 10 distribution processing operations items. The questions asked whether the respective operation is performed at all, regardless of who did it, and, if so, whether it is consigned to the trucking carrier (see fig. 3). Since questions are restricted to relationships with trucking carriers to which the transportation of the main products of the consignor is consigned, almost all the consignors consigned some form of distribution processing. The theory examined in Section 2 implied that if some distribution processing operations are consigned, and if relation-specific human capital and/or intangible assets are sunk, and if information exchanged is likely to become hostage, we expect long-term business relationship. We set a dummy variable, *PROCESS*, as a proxy to exhibit the operation of processing of this nature. When at least one of the four kinds of processing work among the distribution processing operations shown in Figure 3 — (1) invoice and tag printing, (2) product inspection, (3) assembly, and (8) inventory management — is provided by the consignee, we set the dummy variable *PROCESS*=1.⁷ Otherwise, *PROCESS*=0. *PROCESS* is expected to have a positive association with the dependent variable *DURATION*.

Figure 3: Types of Distribution Processing Operations

No.	Type of Distribution Processing Operation
1	Invoice/Tag Printing
2	Product Inspection
3	Assembly
4	Price Tagging
5	Packaging/Crating
6	Sorting
7	Storage
8	Inventory Management
9	Transport/Delivery
10	Bill Collection

⁷ As stated in the questionnaire, the consignor will not be required to assemble or disassemble the equipment of the consignee. For example, the consignor is required to assemble or disassemble the equipment of the consignee for computer assembly (hardware assembly and software installation) and for assembly of automobiles and motorbikes.

We cannot avoid the arbitrariness in the selection of these distribution processing operations. So, we implement still other variables for further refinements of the regression analysis. The first variable is a proxy of investments in machinery and equipment necessary to fulfill the consignment, denoted as *EQUIP*, with the value 1 when some investment is made and 0 otherwise. The second dummy variable, *PROPOSE*, indicates whether the investment is proposed by the consignee. It takes the value 1 when proposed by the consignee, otherwise 0. The third dummy variable, *INVEST*, is the product of *EQUIP* and *PROPOSE*, that is, $INVEST=1$ only when some investment is realized by a proposal of the consignee. When machinery and equipment are introduced at the proposal of the consignee, the consignor company faces higher switching cost if it changes to another trucking carrier. Then, once a relationship is constructed, the parties cannot quit the relation easily, and as a result, the duration of the consignment is likely to become long-term. Thus, these variables are expected to exhibit positive associations with the dependent variable *DURATION*. We prepared also the product of *PROCESS* and *INVEST*, denoted as *PROCESSINV*, which takes the value 1 when distribution processing operations are conducted with the introduction of equipment proposed by the consignee.

The third explanatory variable indicates the demand volatility of the consignor's product. To get the variable, we prepared the time series data of shipments from manufactures classified by the 4-digit JSIC (Japan SIC) to which the consignor company belongs. The data are from the "Census of Manufacturers" for the five years from 1991 to 1995. Next, the logarithms of the shipment amount are regressed on the variable indicating the calendar year. The standard error of that regression is the index of demand volatility called *UNCERTAIN*. If the demand grows steadily year by year at a fixed rate in a certain industry, changes in demand can be easily predicted, so that it is not difficult to coordinate the long-term plans of the producer and of the trucking carrier. On the other hand, when there is a large unpredictable demand fluctuation that deviates from the trend, it will usually require massive cost to attain mutual agreement on those plans. *UNCERTAIN* is the variable that estimates this unpredictable deviation. In industries where the demand volatility is large, the duration of consignments is expected to be shorter, because the consignors can save their costs by absorbing the demand uncertainty by procuring transportation services in the spot market rather than sustaining a long-term relationship with a specific trucking

carrier. Consequently, *UNCERTAIN* is expected to show a negative association with the dependent variable *DURATION*. However, since no data other than from the manufacturing industries was available, regression analyses involving *UNCERTAIN* are limited to the subset of samples whose consignor company belongs to some manufacturing industries.

There are still other control variables in addition to these three types of explanatory variables. No doubt, consignors who require long-distance transportation of large lots need to secure reliable trucking carriers that can meet their need. The logistics service is an intangible product; the service can be produced only at the point of sale and the supplier/consumer cannot make inventory. For this reason, trucking carriers must unavoidably bear a considerable level of risk, since even if they prepare the necessary capacity by securing required equipment and labor power, not all of those resources may be utilized when the demand is less than anticipated. In particular, one should note that because most Japanese trucking companies are small and medium-size firms, it is difficult for them to maintain a certain level of transportation or storage capacity unless they have secured a consignment term of a certain length. Then we assume that as the magnitude of service increases, trucking carriers need a larger amount of so-called dedicated assets, and a long-term relationship becomes necessary to secure those capacities. In the operation of a trucking company, the main parameters that indicate the amount of service provided are the transported weight (tons) and the transported distance (km) per trip. Consequently this transported weight and transported distance are expected to be valid as factors that lead to a longer transaction term. From the questionnaire, we employed the annual weight handled, *LQUANT*, for the transported weight, and the distance between the pick-up and delivery points, *LDIST*, for the transported distance. To avoid the problem of heteroscedasticity, both of the two variables are transformed by the logarithm. Furthermore, since we do not know, *a priori*, which parameter is appropriate as the variable to indicate the quantity of transportation service, we prepared the product of both, denoted as *LDISQ*, as a variable that approximates the overall quantity of service provided. These three variables are expected to show positive associations with the dependent variable *DURATION*.

To test the above hypotheses, we set up the regression equations to be estimated. To test the hypotheses presented in Subsection 2.1, the regression equations:

$$\begin{aligned} DURATION = & \alpha_0 + \alpha_1 \text{ LDISQ} \\ & + \alpha_2 \text{ INFO} + \alpha_3 \text{ PROCESS} + \alpha_4 \text{ INVEST} + e_1 \end{aligned} \quad (1)$$

$$\begin{aligned}
 DURATION = & \beta_0 + \beta_1 LQUANT + \beta_2 INFO \\
 & + \beta_3 PROCESS + \beta_4 INVEST + e_2
 \end{aligned} \tag{2}$$

are estimated. Then, to test the hypothesis presented in Subsection 2.2, the regression equation:

$$\begin{aligned}
 DURATION = & \gamma_0 + \gamma_1 UNCERTAIN + \gamma_2 INFO \\
 & + \gamma_3 PROCESS + \gamma_4 INVEST + e_3
 \end{aligned} \tag{3}$$

is estimated. The signs of the regression coefficients predicted by the theory are: $\alpha_1 > 0$, $\alpha_2 > 0$, $\alpha_3 > 0$, $\alpha_4 > 0$, $\beta_1 > 0$, $\beta_2 > 0$, $\beta_3 > 0$, $\beta_4 > 0$, and $\gamma_1 < 0$, $\gamma_2 > 0$, $\gamma_3 > 0$, $\gamma_4 > 0$.

Also, the equations prepared to test the hypotheses, when *PROCESSINV* is substituted for *PROCESS* and *INVEST*, are:

$$\begin{aligned}
 DURATION = & \delta_0 + \delta_1 LDISQ \\
 & + \delta_2 INFO + \delta_3 PROCESSINV + e_4
 \end{aligned} \tag{4}$$

$$\begin{aligned}
 DURATION = & \phi_0 + \phi_1 LQUANT \\
 & + \phi_2 INFO + \phi_3 PROCESSINV + e_5
 \end{aligned} \tag{5}$$

With regard to Subsection 2.2, the regression equation estimated is:

$$\begin{aligned}
 DURATION = & \theta_0 + \theta_1 UNCERTAIN + \theta_2 INFO \\
 & + \theta_3 PROCESSINV + e_6
 \end{aligned} \tag{6}$$

The signs of the regression coefficients predicted by the theory are: $\delta_1 > 0$, $\delta_2 > 0$, $\delta_3 > 0$, $\phi_1 > 0$, $\phi_2 > 0$, $\phi_3 > 0$, and $\theta_1 < 0$, $\theta_2 > 0$, $\theta_3 > 0$.

Further, when we extend the data set to involve samples which did not contain answers regarding consignment of distribution processing operations, the estimated equations are:

$$DURATION = \kappa_0 + \kappa_1 LDISQ + \kappa_2 INFO + e_7 \quad (7)$$

$$DURATION = \xi_0 + \xi_1 LQUANT + \xi_2 INFO + e_8 \quad (8)$$

With regard to Subsection 2.2. the regression equation is:

$$DURATION = \omega_0 + \omega_1 UNCERTAIN + \omega_2 INFO + e_9 \quad (9)$$

The signs of the regression coefficients predicted by the theory are: $\kappa_1 > 0$, $\kappa_2 > 0$, $\xi_1 > 0$, $\xi_2 > 0$, and $\omega_1 < 0$, $\omega_2 > 0$.

The list of all variables which are used in our econometric models is shown in Table 1.

Table 1 : Definition, Derivation, and Predictions for Dependent & Independent Variables

Variables	Construction	Prediction
Dependent		
DURATION	Number of Passed Months from the First Transaction.	---
Independent		
LDISQ	Logarithm of (Quantity per year * Distance)	+
LQUANT	Logarithm of (Quantity per year)	+
LDIST	Logarithm of (Distance(km) from Origination Point to Destination Point)	+
UNCERTAIN	Indicator of Demand Uncertainty.	-
INFO	:= 1 if Type of Exchanged Information are Categorized Level 1 or Level 2.	+
PROCESS INV	:= PROCESS * INVEST	+
PROCESS	:= 1 if Relatively High Level of Distribution Processing are Consigned	+
INVEST	:= EQUIP * PROPOSE	+
EQUIP	:= 1 if Equipment are Introduced for Distribution Processing.	---
PROPOSE	:= 1 if Equipment are Introduced by Truck Carrier's Proposal.	---

4. RESULT AND INTERPRETATION OF THE ECONOMETRIC ANALYSIS

The descriptive statistics of variables used in the analysis are summarized in Table 2. Table 3-1 shows the table of correlation coefficients between variables used in the regression to test the hypothesis presented in Subsection 2.1, while Table 3-2 shows those employed to test the hypothesis presented in Subsection 2.2. Table 4-1 and Table 4-2 show the results of the regression analyses. Nine equations were estimated, in the cases using *LDISQ* (equations (1), (4), (7)), *LQUANT* (equations (2), (5), (8)), and *UNCERTAIN* (equations (3), (6), (9)). The regression equations (7)-(9) in Table 4-2 show equations when we extend the data set to involve samples which did not contain answers regarding consignment of distribution processing operations. The number of samples are shown in the tables. The differences in the number of samples between equations (1) & (4) and equation (7) (17 samples), the difference between equations (2) & (5) and equation (8) (18 samples), and the difference between equations (3) & (6) and equation (9) (14 samples) represent the number of companies that do not consign distribution processing operations at all. Thus, nearly 90% of consignors consign some of their distribution processing operations.⁸

First we can recognize that, in all nine estimated equations, the coefficients of the information dummy variables are significantly positive, which supports the robustness of our hypotheses; detailed information flow should bring about a kind of relation-specific asset in the firms. For the sake of reference, we produced a dummy variable that takes the value 1 only when both (7) marketing information and (8) production management information are shared. However, the coefficient of the regression was not

⁸ The number of selected samples are close, but since the data for consignors other than manufacturers had to be eliminated for equations (3), (6), (9) due to data restrictions, the sample selection conditions of equations (3) (6) (9) are basically different from those of other equations. To confirm this point, we compared equation (8) and equation (9) in detail, both of which ended up with 142 samples; there were 28 (approx. 20%) samples that were included in equation (8) but not in equation (9). There is a high possibility that this could lead to significantly different results in the econometric analysis; therefore, in that sense, it should be noted that we obtain robust results to strongly support our hypotheses from two different sample sets, equations (3), (6), (9), and the other equations.

significant. The possible reasons are: it is only recently that the need for organized logistics such as SCM has been recognized in Japanese industries, and in selecting trucking carriers competitive bidding has become popular, allowing entries of new trucking companies specialized in logistics.

With regard to distribution processing operations, positive signs are shown, as expected, for the coefficient of *PROCESS*, but the significance levels are low (equations (1)-(3)). Then, we attempted another regression analysis. With regard to the processing activity, (6) sorting, the assets for the work have reason to be relation-specific if work such as “digital picking” is performed. So, we employed a proxy indicating the consignment of the sorting activities in place of the proxy for (2) inspection / (3) assembly activities. However, the results remained insignificant. Table 4-1 shows the results of the cases where *PROCESS* takes a value of 1 when any of (1) invoice/tag printing, (2) inspection, (3) assembly, or (8) inventory management activities are consigned. In these regressions, relatively high significance was shown. Moreover, we can recognize that the transaction term is significantly longer when investments on equipment are based on the proposal of the consignee (equations (1)-(3)). Also, very robust regression results are obtained when the product of both variables, *PROCESSINV*, is introduced (which corresponds to the case when equipment is introduced based on the proposal by the consignee, which is necessary to provide distribution processing operations and which is likely to be relation-specific) (equations (4)-(6)).⁹

In the regression analyses including the transported weight, transported distance, and product of the two, as explanatory variables, *LDISQ* and *LQUANT* show high significances, as expected. The coefficient of *LDIST* is not significant, so, as far as we check these results, the distance of transportation seems to have no significant effects as a factor for maintaining longer business relationships (equations (1), (4), (7) and equations (2), (5), (8)).

As for demand volatility, we recognize significantly negative coefficients, just as our hypothesis predicts (equations (3), (6), (9)). Thus, we have sound reason to say that, also in the logistics market, long-term business relationships are constructed in the industries where demand is stable, just as in the commercial distribution market. On the other hand, when it is difficult to forecast the demand, consignors tend to seek contracts with trucking carriers in a shorter term.

⁹ Even if consignor proposes the introduction of equipment, it is possible that term of relationship tends to be longer if consignor assists to finance consignee's investment. However, there is no such samples in this questionnaire survey, therefore we couldn't test this hypothesis.

Table 2 : Descriptive Statistics

Variables	Mean	Std. Dev	Minimum	Maximum
DURATION	221.16	151.49	5.00	584.00
LDISQ	5.5564	3.2286	-2.8134	12.9480
LQUANT	7.4067	3.0264	-0.9163	13.9978
LDIST	5.0575	1.2937	1.3863	7.0031
UNCERTAIN	0.0594	0.0471	0.0069	0.2059
INFO	0.5172	0.5019	0	1
PROCESS INV	0.0172	0.1307	0	1
PROCESS	0.1724	0.3794	0	1
INVEST	0.1035	0.3059	0	1
EQUIP	0.1983	0.4004	0	1
PROPOSE	0.1035	0.3059	0	1

Note that all variables are plotted on UNCERTAIN in the 116 sample case.
 UNCERTAIN include only manufacturing company (128 sample).

116 Observation Sample Equation (1), (4)	124 Observation Sample Equation (2), (5)						
	LDISQ	LDIST	LQUANT	INFO	PROCESSINV	PROCESS	INVEST
LDISQ	-	-	-	-	-	-	-
LDIST	0.35179	-	-	-	-	-	-
LQUANT	0.91645	-0.05218	-	0.19967	0.01538	0.23938	0.02796
INFO	0.17454	-0.03366	0.20060	-	0.12599	0.22927	-0.03185
PROCESSINV	0.06979	0.13335	0.01745	0.12796	-	0.28356	0.37413
PROCESS	0.23684	0.01085	0.24804	0.21261	0.29019	-	-0.01415
INVEST	0.03897	0.09806	-0.00034	-0.01720	0.38993	-0.00517	-

Note that : LDISQ = LOG (DISTANCE * QUANTITY)
 PROCESSINV = PROCESS * INVEST

Table 3-2 : Correlation Matrix (2)

128 Observation Sample Equation (3), (6)	UNCERTAIN	INFO	PROCESSINV	PROCESS	INVEST
UNCERTAIN	-	-	-	-	-
INFO	0.10446	-	-	-	-
PROCESSINV	0.05529	0.13625	-	-	-
PROCESS	-0.00094	0.29558	0.25573	-	-
INVEST	-0.01482	-0.04454	0.34580	-0.05696	-

Note that : This correlation matrix only includes manufacturing company.
 PROCESSINV = PROCESS * INVEST

Table 4-1 : Regression Results (1)

	OLS	OLS	OLS	OLS	OLS	OLS
Independent Variable	DURATION (1)	DURATION (2)	DURATION (3)	DURATION (4)	DURATION (5)	DURATION (6)
LDISQ	7.738 * (1.827)	-	-	8.590 ** (2.078)	-	-
LQUANT	-	7.836 * (1.815)	-	-	9.011 ** (2.135)	-
UNCERTAIN	-	-	-471.418 * (-1.767)	-	-	-567.340 ** (-2.167)
INFO	78.573 *** (2.903)	71.080 *** (2.710)	83.390 *** (3.204)	76.658 *** (2.866)	66.204 ** (2.555)	82.020 *** (3.300)
PROCESSINV	-	-	-	198.714 * (1.961)	219.081 ** (2.174)	214.056 ** (2.151)
PROCESS	38.685 (1.066)	30.567 (0.867)	28.968 (0.889)	-	-	-
INVEST	77.223 * (1.794)	89.727 ** (2.178)	64.991 * (1.675)	-	-	-
Constant	122.861 *** (4.358)	107.607 *** (3.137)	201.037 *** (8.529)	130.349 *** (4.677)	112.401 *** (3.313)	217.292 *** (9.890)
F-stat	5.3973	5.2554	4.7926	7.0680	6.7814	6.8720
Adj. R-squared	0.1327	0.1216	0.1067	0.1367	0.1236	0.1218
Observations	116	124	128	116	124	128

t-ratios are shown in parentheses.
 Note that Equation (3) and (6) include only manufacturing company.
 *** denotes significance at 1% level.
 ** denotes significance at 5% level.
 * denotes significance at 10% level.

Table 4-2 : Regression Results (2)

	OLS	OLS	OLS
Independent Variable	DURATION (7)	DURATION (8)	DURATION (9)
LDISQ	8.355 ** (2.234)	-	-
LQUANT	-	8.791 ** (2.273)	-
UNCERTAIN	-	-	-445.273 * (-1.746)
INFO	66.086 *** (2.677)	60.545 ** (2.566)	75.878 *** (3.182)
Constant	140.999 *** (5.855)	119.765 *** (3.874)	211.689 *** (10.288)
F-stat	7.4071	6.8759	5.8896
Adj. R-squared	0.0885	0.0769	0.0649
Observations	133	142	142

t-ratios are shown in parentheses.
 Note that Equation (9) include only manufacturing company.
 *** denotes significance at 1% level.
 ** denotes significance at 5% level.
 * denotes significance at 10% level.

5. LESSONS FOR POSTAL OPERATORS

The analysis in this paper concerns the logistics between companies. However, the same logic should be applied to the logistics from companies to consumers, where postal operators and parcel delivery businesses face the consumer as transportation carriers.¹⁰ In the logistics market from companies to consumers, retailers such as department stores and/or bookstores are assumed to be the main consignors. The question is: what are the most important factors for postal operators to establish stable relationships with such consignor companies? We would like to consider this point below.

The first point is to achieve “trust” with the consignor companies. In order to provide advanced logistics services to meet the consignors’ needs, it is necessary to acquire the consignment of the consignor’s detailed and sensitive information flow. The information flow may be related even to the consignors’ confidential management strategies. Therefore, it is quite important to establish a good reputation as a trustworthy trucking carrier that will lead to selection as the consignee. When consignments are won, the carrier needs to establish a sound staff management system which enables information flow to be kept safe and confidential.

In addition, in cases when distribution processing operations are consigned, it is necessary for the employees to acquire sufficient knowledge of the consignor’s products involved. It is highly likely that such training of staff will be specific to the given consignor company, and this may function so as to increase the switching cost of the consignor. Furthermore, if proposals can be made to the consignor company for streamlining distribution processing by introducing new equipment, then the likelihood of sustaining stable transactions is probably high.

Under the current conditions, the distribution processing operation that is most likely to be consigned to postal operators and parcel delivery businesses is “bill collection” in Japan (refer to Tani (1996)). Judging from the empirical results of this paper, it may be difficult to maintain a stable relationship from the consignor’s standpoint if bill collection is the only distribution processing operation that is consigned. It will probably be important to propose more advanced distribution processing operations, and ensuring the consignees’ flexibility and preparing the legal groundwork for postal operators are likely to be important, as well.

¹⁰ When we focus on pick-up/delivery points, logistics between companies is transportation from a few companies to a few companies, while logistics from companies to consumers is transportation from a few companies to many consumers. However, the same relationship is formed between the consignor and trucking carrier at the pick-up point.

Of course, as we pointed out, it occurs adjustment costs to maintain long-term business relationships. Therefore, postal operators have to be cautious about the demand volatility for the consignor's product when they invest in relation-specific equipment in distribution processing. If the demand is volatile, it might be rational for postal operators not to invest in relation-specific equipment and to use spot market. On the other hand, if the demand is stable, postal operators might be worth investing in relation-specific equipment even in the case that the amount of consigned transportation volume is not so large. In other words, this paper suggests that the demand volatility is the another important aspects in addition to consigned volume when postal operators consider the long-term business strategy.

Given the current rapid environmental changes, it is not sufficient for the postal operators to stay in providing delivery services of the packages received. An important factor for constructing stable business relationships with consignor companies is to study and develop an efficient information network through which even detailed and sensitive information can be exchanged safely and/or a comprehensive distribution processing system which enables enhanced processing services.

6. CONCLUSION

In this paper, we have empirically analyzed the factors that lead to longer business relationships in the logistics industry. The main conclusions of this paper are summarized as follows.

First, the terms of relationships observed between the consignors and the trucking carriers that receive consignment of the transportation of the consignor's main products have significantly positive associations with the level of information exchanged and consignments of distribution processing operations proposed by the consignee. Transaction cost economics implies that long-term relationships facilitate investment in relation-specific assets so as to improve efficiency. Then, we have sound reason to assume that the content of the shared information and the equipment for distribution processing have a significantly relation-specific nature, and accumulation of the related human capital, such as skill in workers and know-how, is important to improve efficiency of the whole logistics system. At the same time, these assets may function as hostages to maintain the long-term relationships. In regard to all of these points, the same mechanism is at work as in the commercial distribution market.

The second conclusion is that the long-term business relationship is affected by the demand volatility of the consignor's product. Consignors who belong to industries with a large volatility of demand tend to rely on

transportation services procured from spot logistics markets with a shorter contract term. This finding is also consistent with previous research in the commercial distribution market.

These results suggest that the mechanism to minimize transaction costs by establishing long-term business relationships is likely to exist in the logistics market. This is the same mechanism which is pointed out in the commercial distribution market. Generally, assets consisting of a system with a network structure tend to be sunken. Therefore, in order to save coordination costs which are incurred to make the whole distribution market function efficiently, long-term business relationships are indispensable. Thus, relationships between companies in the logistics market are likely to be affected by the shortening of the delivery time in the commercial distribution market.

This paper is the first practical attempt to analyze the logistics market in Japan, keeping attention on the economic mechanisms of that market, which are expected to be similar to those prevailing in the commercial distribution market. While this paper stands as a benchmark for future analyses, it also leaves many problems as topics for future study. The directions for future studies are discussed below.

First, this analysis focused on consignments of logistics services. Prior to consignment decisions, there exists the problem of how companies select whether to integrate logistics services vertically or to consign them. In the logistics market in Japan, outsourcing has become popular in recent years. So, it is necessary to study what sort of merits accompany outsourcing compared to in-house logistics operations. In particular, an analysis related to the purpose of establishing logistics subsidiaries is a very intriguing and challenging theme involving the problem of the "scope of the firm," which refers to how far companies commit themselves to performing operations.

Second, this paper presented an analysis on the primary trucking carriers which receive consignment of the consignor companies' two main products. However, the actual logistics market has a stratified pyramid structure in which secondary and tertiary subcontractors provide trucking services to the major trucking carriers. A more detailed analysis investigating relationships among these companies is required. This type of analysis requires time-consuming fieldwork in a limited target market (for examples, refer to Asanuma (1998), Fujimoto et al. (1998)). These topics alone present large themes and should be adopted as topics of future research.

Currently, unprecedented attention is directed at the logistics market, but very few economic studies with econometric analysis are reported. Therefore, efforts to elucidate the logistics market through the accumulation of this type of analysis are requisite.

REFERENCES

[In Japanese]

- Asanuma, B. 1984. "Jidosya sangyo ni okeru buhin torihiki no kozo -- Cyosei to kakushin teki tekiou no mechanism," *Kikan Gendai Keizai*, No.58, pp. 38-48. ("The Organization of Parts Purchases in the Japanese Automotive Industry," *Japanese Economic Studies*, Summer 1985, pp. 32-53.)
- _____ (1997), "Nihon no kigyo soshiki -- Kakushin teki tekiou no mechanism," Toyo Keizai Shinpo-sya. [English translation: "Organization of Japanese Corporations -- Mechanisms for Innovative Adaptation," Toyo Keizai Inc.]
- Itoh, H, T. Kikutani, and O. Hayashida. 1997. "Nihon kigyo no bunsya-ka senryaku to kengen ijou." *Tusan Kenkyu Review No.10*. [English translation: "Japanese Corporations' Downsizing Strategy and Authority Transfer," *MITI Research Review*. No. 10]
- Nariu, T. 1994. "Ryutsu no keizai riron," Nagoya Daigaku Syuppankai. [English translation: "An Economic Theory of Distribution," University of Nagoya Press]
- Maruyama, M. 1992. "Nihon Shijou no Kyosou Kozo." Sobunsha. [English translation: "Competitive Structure of the Japanese Market"]
- Torii, A., and T. Nariu. 1995. "Keizoku teki torihiki kankei to ryutu keiretsu-ka." *Economia* 46-3: 34-51. [English translation: "Long-term Business Relationships and the Tendency toward "keiretsu" in the Japanese Distribution Sector"] edited by Fujimoto, T., T. Nishiguchi, and H. Itoh ed. 1998. "Supplier System." Yuhikaku.
- Miwa Y., and K. Nishimura ed., "Nihon no ryutsu." Tokyo Daigaku Syuppankai. [English translation: "Distribution in Japan." University of Tokyo Press]

[In English]

- Hubbard, T. N. 1999. "How Wide is the Scope of Hold-Up-Based Theories of Governance? Shipper-Carrier Relationships in Trucking," *mimeo*.
- Joskow, P. 1987. "Contract Duration and Relation-specific Investments: Empirical Evidence from Coal Markets." *American Economic Review* 77: 168-185.
- Nickerson, J. A., and B. S. Silverman. 1997. "Integrating Strategic Positioning and Transaction Cost Economics: An Operationalization of Fit in the Interstate Trucking Industry." John M. Olin School of Business Working Paper (Olin-97-06).
- Pirrong, S. C. 1993. "Contracting Practices in Bulk Shipping Markets: A Transactions Cost Explanation." *Journal of Law and Economics* 36: 937-975.
- Williamson, O. E. 1985. *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting*, New York: Free Press.