

**STRATEGIC SUPPLIER SEGMENTATION: A MODEL
FOR MANAGING SUPPLIERS IN THE 21ST CENTURY**

Jeffrey H. Dyer
Stanley Goldstein Term Assistant Professor of Management
Wharton School, University of Pennsylvania
2000 Steinberg-Dietrich Hall
Philadelphia, PA 19104-6370
(215) 898-9371

Dong Sung Cho
Seoul National University
Shinlim-Dong, Kwanak-Ku
Seoul 151, Korea
82-2-880-6945

Wujin Chu
Seoul National University
Shinlim-Dong, Kwanak-Ku
Seoul 151, Korea
82-2-880-6947

Draft: December 1, 1996

An earlier version of this paper was selected as a "best paper" at the Association of Japanese Business Studies annual meeting in Nagoya, Japan, June 10-12, 1996. The authors would also like to thank the Sloan Foundation and the International Motor Vehicle Program at MIT for generously supporting this research.

STRATEGIC SUPPLIER SEGMENTATION: A MODEL FOR MANAGING SUPPLIERS IN THE 21ST CENTURY

ABSTRACT

This study of 453 supplier-automaker relationships in the U.S., Japan, and Korea examines the extent to which automakers manage their "arms-length" and "partner" suppliers differently. The findings indicate that U.S. automakers have historically managed all of their suppliers in an arms-length fashion, Korean automakers have managed all suppliers as partners, and Japanese automakers have segmented their suppliers and have somewhat different relationships depending on the nature of the component. Only Japanese automakers (Toyota and Nissan) have strategically segmented suppliers in such a way as to realize the benefits of both the arms-length and partner models of supplier management. We argue that firms should think strategically about supplier management, and perhaps should not have a "one size fits all" strategy for supplier management.

During the past decade we have seen an increased emphasis on alliances, networks, and supply chain management as vehicles through which firms can achieve competitive advantage. Indeed, the typical industrial firm spends more than one half of every sales dollar on purchased products--and this percentage has been increasing with recent moves towards downsizing and outsourcing (U.S. Bureau of Census, 1985; Bresnan & Fowler, 1994). Consequently, supply chain management and purchasing performance is increasingly recognized as an important determinant of a firm's competitiveness. Two widely differing supplier management models have emerged from both practice as well as academic research on the issue of how to optimally manage suppliers. The traditional view, or the *arms-length model* of supplier management, advocates minimizing dependence on suppliers and maximizing bargaining power. Michael Porter (1980:123) describes this view of supplier management as follows:

In purchasing, then, the goal is to find mechanisms to offset or surmount these sources of suppliers' power. . . Purchases of an item can be spread among alternate suppliers in such a way as to improve the firm's bargaining power.

The key implication of this model for purchasing strategy is for buyers to deliberately keep suppliers at "arm's-length" and to avoid any form of commitment. The arms-length model was widely accepted as the most effective way to manage supplier relationships in the United States until the success of Japanese firms, who did not use this model, forced a reevaluation of the model's basic tenants.

In contrast to the arms-length model, the success of Japanese firms has often been attributed to close supplier relationships, or a *partner model* of supplier management (Cusumano, 1985; Womack et al 1990; Dyer & Ouchi, 1993; Nishiguchi, 1994). Various studies suggest that, compared to arms-length relationships, Japanese-style partnerships result in superior performance because partnering firms: (1) share more information and are better at coordinating

interdependent tasks (Fruin, 1992; Clark & Fujimoto, 1991; Womack et al, 1990; Nishiguchi, 1994), and (2) invest in relation-specific assets which lower costs, improve quality, and speed product development (Asanuma, 1989; Dyer, 1996a). However, while Japanese-style partnerships have economic benefits, some researchers have found that these types of relationships are costly to set up and maintain, and may reduce a customer's ability to switch away from inefficient suppliers (Helper, 1991; Sako, 1992).

The practical application of these two models can be found in the automotive industry, where General Motors has historically used an arms-length model while Toyota has employed a partner model. It has been well documented that particularly during the much publicized reign of Jose Ignacio Lopez de Arriortua, General Motors attempted to generate cost savings by fostering vigorous supplier competition and maintaining arms-length relationships. Dr. Lopez pushed suppliers to reduce prices by renegotiating contracts and opening up parts to competitive bidding--sometimes going through more than 5 rounds of bidding. Although critics argue that the long term negative effects of this strategy are yet to be felt, Lopez is credited with saving GM roughly \$3.0-4.0 billion as a result of these tough supplier management practices (Business Week, August 8, 1994).

In contrast, Toyota (and more recently Chrysler in the United States) has developed long term **partnerships** with suppliers who are given implicit guarantees on future business. In return, suppliers make **relation-specific** investments to enhance their productivity in the Toyota relationship.¹ Past studies indicate that these relation-specific site, physical, and human asset

¹ Transaction or relation-specific investments are assets that are uniquely tailored to a particular exchange relationship and which have low salvage value outside of the relationship. Williamson (1985) identified site, physical, human, and dedicated assets as four distinct types of transaction-specific investments.

investments reduce inventories, improve quality, and speed product development (Asanuma, 1989; Dyer, 1996a).

Of course, the key question facing purchasing executives is: which model of supplier management is superior? Many firms in considering a model for supplier management tend to dichotomize this issue--choosing either the arms-length model or the partnership model. For example, U.S. automakers have historically relied primarily on the arms-length model of supplier management, whereas Japanese automakers are believed to have exclusively relied on a partner model (though as we will show, this is not an entirely accurate perception). Our research on 453 supplier-automaker relationships in the U.S., Japan, and Korea suggests that firms should think more strategically about supplier management, and perhaps should not have a "one size fits all" strategy for supplier management (see the appendix for a brief description of the study). Instead, each supplier should be analyzed strategically to determine the extent to which the supplier's product contributes to the core competence and competitive advantage of the buying firm. As we shall show, a company's ability to strategically segment suppliers in such a way as to realize the benefits of both the arms-length as well as the partner models may be the key to future competitive advantage in supply chain management. In this article we lay out a framework to assist firms in deciding whether to manage a particular supplier in an arms-length or partnership fashion. To illustrate the advantages of supplier segmentation, it is useful to examine the supplier management practices of U.S., Japanese, and Korean automakers.

Supplier-Automaker Relationships in the United States

Previous studies suggest that arms-length supplier relationships differ from supplier

partnerships on a number of key dimensions, including: length of contract, continuity of relationship, degree of information sharing, investments in relation-specific investments, and levels of trust (Helper, 1991; Dyer & Ouchi, 1993). Data from a sample of arms-length supplier relationships (as selected by U.S. automakers) are shown in Table 1. As predicted, these relationships are characterized by: short term contracts, frequent rebidding, low levels of information sharing, low levels of relation-specific investments, and low levels of trust.

[Insert Table 1 about here]

However, an intriguing finding emerged when we asked U.S. automakers to select a sample of supplier relationships that were partnerships or "most like a keiretsu relationship." Data from the "partner" sample are also provided in Table 1. What is particularly important to note is that the "partner" relationships do not differ significantly from the arms-length relationships. The U.S. automakers' most partner-like supplier relationships are also characterized by frequent rebidding, low levels of information sharing, low levels of relation-specific investments and low levels of trust. These findings suggest that U.S. automakers' relationships with "partners" were not significantly different than their relationships with "arms-length" suppliers. The only real (statistically significant) difference between "arms-length" suppliers and "partners" was the length of the contract awarded to the "partners." Partner suppliers received contracts of much longer duration (4.7 years vs. 2.4 years). In effect, the partner suppliers were simply those higher performing suppliers who were more likely to re-win business and receive long term contracts because they were better at meeting automaker expectations. U.S. automakers have historically managed all suppliers in an arms-length fashion - "partners" are not really treated much differently than "arms-length" relationships. By way of

comparison, let us examine the case of Japan.

Supplier-Automaker Relationships in Japan

Of course, by now it is well known that Japanese automakers have networks of *keiretsu* suppliers with whom they have close (and most U.S. managers believe exclusive) relationships. Many studies of supplier-assembler relationships in Japan give the impression that all suppliers are part of the *keiretsu*. For example, in the automobile industry one hears about the "Toyota Group" or the "Nissan Group." However, this perception is inaccurate. Although it is true that most Japanese suppliers work closely with their customers, affiliated suppliers (*kankei kaisha*) definitely fall into the *keiretsu* category, while independent suppliers (*dokuritsu kaisha*) do not. To understand how purchasing executives at one Japanese automaker thought about supplier management, our conversation with the purchasing general manager at a Japanese automaker is illustrative. In response to the questions, "do you think about your suppliers differently?" and "do you interact with suppliers differently?", the purchasing general manager proceeded to draw a set of concentric circles (See Figure 1). After doing so, he explained that there were roughly 30-35 suppliers that fit into the innermost ring. These were suppliers that were subsidiaries (*kogaisha*) or affiliated suppliers (*kankei kaisha*) of the automaker. In Japan, these companies would definitely be considered as *keiretsu* companies. The automaker holds an equity stake in these companies (greater than 20 percent) and typically transfers personnel to work at these companies on a part or full time basis. The automaker has a subsidiaries department that works with these companies on such matters as long term strategic plans, capital investments and capacity planning, finance, and personnel transfers. These are in fact the automaker's set of

closest suppliers. Not surprisingly, these suppliers produce high value components that tend to be highly customized to the automaker's particular models (See Figure 1).

[Insert Figure 1 about here]

In the second concentric ring, the purchasing manager identified roughly 90 suppliers (including the 35 subsidiary suppliers) who were members of one of the automaker's supplier associations. Members of this supplier association were those suppliers who were making customized inputs. It included some independent suppliers (like Yazaki, a wire harness supplier, and Zexcel, a supplier of air conditioners) with whom the automaker had to work closely due to a high degree of component customization and a high degree of interdependence. In some cases the automaker held a small equity stake (typically less than 10 percent) in the independent supplier and on occasion the automaker would transfer personnel to work at these suppliers. In short, this group of suppliers included the inner *keiretsu* group of suppliers as well as a few independent firms who provided competition for the keiretsu suppliers. Not all suppliers were allowed to join this association, primarily because the nature of the information exchanged was often proprietary and the automaker needed to coordinate closely with these suppliers.²

Finally, the outer ring represented a second supplier association which was open to all first tier suppliers. The suppliers in this association (who were not allowed to participate in activities of the first supplier association or subsidiaries department) tended to make more standardized or commodity-like parts such as tires, fasteners, batteries, belts, spark plugs, etc.--

² We should note, however, that due to U.S. pressure on Japanese automakers to open their markets and eliminate supplier exclusivity, the automaker has combined the two supplier associations into a single association.

parts that were not customized to a particular customer's model. Consequently, it wasn't as important for the supplier and automaker to coordinate closely on design, development, and manufacturing activities.

Although our interviews with Japanese executives suggested that automakers had somewhat different relationships with *kankei kaisha* than with *dokuritsu kaisha*, we wanted to empirically verify these differences. Consequently, we conducted the same supplier-automaker analysis in Japan that we had done in the United States. We asked Toyota and Nissan for a sample of their most independent or arms-length suppliers, as well as a sample of their closest partnerships. We compared these two groups using the same measures as in the United States. Interestingly, the findings were quite different than what we found in the United States (See Table 2). The data indicate that while there were some similarities between the arms-length and partner suppliers (i.e. both groups of suppliers reported high levels of trust), there were also significant differences. Although all Japanese suppliers reported high levels of information sharing, face-to-face contact, trust, and "re-win" rates (compared to the U.S. sample), the partners shared more information with the automaker, had twice as much face-to-face contact and twice the number of co-located engineers, and received greater assistance from the automaker. The partners also made significantly greater investments in relation-specific assets (e.g., partner supplier plants were, on average, 80 miles closer to the automaker). The differences between arms-length and partner suppliers were much greater in Japan than in the United States.

[Insert Table 2 about here]

These data raise an important question. Why do Japanese automakers distinguish

differently?³ Furthermore, why do we find differences in the way automakers manage supplier relationships in Japan, but not in the United States? Before fully exploring the answers to these questions, we turn to the case of Korea.

Supplier-Automaker Relationships in Korea

Korea has been a late entrant into the auto industry with automakers Hyundai, Kia, and Daewoo attempting to catch up to their U.S. and Japanese competitors. These late entrants have had the opportunity to see different supplier management models being practiced by their Japanese and U.S. competitors. Thus, we were interested to see if Korean supplier relationships followed the U.S. model or the Japanese model. To study this issue, we studied a sample of *chaebol* (partner) suppliers in Korea and compared these relationships with a sample of non-*chaebol* relationships.

Generally speaking, the Korean model of supplier management follows the Japanese model in that it is characterized by a close relationship between the automaker and the supplier with high levels of interaction between the two parties (Table 3). Korean suppliers and automakers typically have an exclusive relationship with 72 percent of all suppliers supplying to only one automaker (Oh, 1995). The relationships tend to be characterized by substantial face-to-face contact and the automaker may transfer personnel to the supplier's organization. Table 3 shows that suppliers have also made specialized capital investments that are specifically tailored to the current automaker.

³ Asanuma (1989) and Kamath and Liker (1994) have also noted that Japanese firms think about and manage different groups of suppliers somewhat differently; however, no previous studies have compared "partners" with "non-partners" nor have they been comparative with other countries.

[Insert Table 3 about here]

Korean automakers also provide assistance to their suppliers in the areas of quality, cost reduction, factory layout and inventory management. Not surprisingly, there is much information sharing between the supplier and the automaker. First-tier Korean suppliers tend to be small and unsophisticated compared to their Japanese counterparts. As a result, providing assistance to suppliers is a virtual necessity for the Korean automakers' own survival.

The formal duration of the typical legal contract is 3 years but most contracts are renewed automatically. In fact the average length of the continuing relationship is 12½ years, with a third of all first-tier suppliers enjoying a continuing relationship with the automaker since the founding of the automaker (Chung 1995). However, despite the fact that suppliers are highly dedicated to a particular automaker, the level of trust between the supplier and the automaker is significantly lower than what we find in Japan. Surprisingly, trust levels are comparable to U.S. levels.

Although the Korean model of supplier management closely follows the Japanese model in many respects, beyond the issue of trust there is another important difference: we do not find strategic supplier segmentation. All suppliers are managed in a similar manner. Consequently, the level of relation-specific investments, information sharing, assistance, and trust is not significantly different between *chaebol* and non-*chaebol* of suppliers (Table 3).

Strategic Supplier Segmentation

What are the implications of these three different approaches to managing supplier relationships? To answer that question, we must first examine the strengths and weaknesses of each approach to supplier management. In Figure 2 we summarize the strengths and weaknesses

of each approach to supplier management. The population of suppliers used by each automaker is represented by a circular sphere (for simplicity, we ignore the small set of suppliers that sell to automakers in each country). The extent to which the circle overlaps another automaker's circle indicates the extent to which the two automakers share suppliers. In the United States, Chrysler, GM, and Ford have maintained non-exclusive (arms-length) arrangements with suppliers. Consequently, they share a common set of suppliers. As a result, many suppliers have been able to grow to sizable scale. Furthermore, suppliers can learn from working with multiple customers. However, by attempting to maintain multiple sources of supply and a high degree of relative bargaining power, U.S. automakers have also restricted, to some extent, the size and scale of suppliers. Thus, suppliers are smaller on average, than 1st tier Japanese suppliers to Toyota and Nissan (see Tables 1 & 2). Furthermore, due to low levels of trust, suppliers' investments in relation-specific assets are low relative to Korean and Japanese suppliers.

[Insert Figure 2 about here]

Korean automakers are on the other extreme. Rather than share all suppliers (through arms-length relationships) Korean automakers demand a high degree of loyalty from suppliers. As one Korean supplier executive commented, "[Our customer] would unsheath the swords if we tried to supply to other Korean automakers" (Interview, July 1, 1994). As a result, suppliers make **relation-specific** investments and coordinate their activities closely with their primary automaker customer. Thus, Korean automakers enjoy the benefits of dedicated, specialized suppliers. Furthermore, investments made by one automaker to develop its suppliers do not spillover to competitors. However, these practices also keep suppliers small, thereby resulting in suboptimal economies of scale. Moreover, because suppliers only work primarily with one

customer, they do not have opportunities to learn from multiple customers. Consequently, this impedes the suppliers' abilities to learn and upgrade their technological capabilities.

The Japanese automakers in our study (Nissan & Toyota) were the most effective at strategically segmenting suppliers to realize the benefits of both the arms-length and partner models.⁴ Independent Japanese suppliers such as Bridgestone (tires) and Mitsuboshi Belting Co. (belts, hoses) realized economies of scale by selling their relatively standardized products to all automakers. Moreover, these suppliers made fewer investments in assets dedicated to a particular automaker. Automakers provided less direct assistance to these suppliers in large part because the benefits of assistance to the supplier would easily spillover to competitors. In contrast, affiliated suppliers like Nippondenso and Calsonic made substantial investments in relation-specific assets and coordinated activities closely with automakers through frequent face-to-face interactions. Toyota and Nissan provided significantly more assistance to affiliated suppliers to help them lower production costs, improve quality, and minimize inventories. Toyota and Nissan had greater incentives to assist these suppliers since their own success is inextricably tied to the success of these particular suppliers.

Furthermore, we found that this segmentation of suppliers extended through the value chain, to first and second tier suppliers. For example, Nippondenso also segments its suppliers and provides **differential assistance** to suppliers depending on the nature of the component and relationship. **Not all suppliers are allowed to join the Nippondenso supplier association, but**

⁴ However, while Toyota and Nissan were more likely to segment suppliers than their U.S. and Korean counterparts, they did not realize the full benefits of the arms-length model due to an overreliance on partnerships. This may explain why Nobeoka (1995) found that higher performing Japanese automakers were more likely to use more suppliers for a given component.

rather only those suppliers who meet specific size, dependency, and performance criteria (i.e. suppliers must sell at least \$10 million per year to Nippondenso and have 30 percent of their total sales to Nippondenso). Consequently, Nippondenso focuses its assistance on the 69 suppliers in its supplier association while other suppliers must work their way into the association or somehow demonstrate that their contribution is worthy of Nippondenso assistance and resources. Thus, by replicating this pattern down through the supply chain, Toyota's entire production network realizes the benefits of strategic supplier segmentation.

To achieve the advantages of both the arms-length and partner models, our research suggests that suppliers should be analyzed strategically and then segmented into two groups: one group of suppliers that provide necessary, but non-strategic inputs, and another group that provides strategic inputs. By "strategic" we mean those high value inputs that may be useful in differentiating the buying firm's product. In the Japanese auto industry, these are transmission and engine parts, air conditioners, body and instrument panels, etc.--inputs provided by Japanese affiliated suppliers. These parts are customized to the model and help differentiate the model from competitor offerings. Non-strategic parts, which are typically provided by independent suppliers, are those parts such as belts, tires, batteries, etc. that are not customized and do not differentiate the model. Our research suggests that these two groups of suppliers should be managed differently in order to optimize purchasing strategy.

Durable Arms-Length Relationships

For inputs that are necessary, but non-strategic, firms should employ *durable arms-length (quasi-market) relationships*. Non-strategic inputs are those which are standardized and stand alone--meaning that there is a low degree of supplier-buyer interdependence and the need for

coordination is low. Of course, the phrase *durable arms-length relationships* seems paradoxical since arms-length relationships suggest short term, rather than long-term trading expectations. However, the traditional notion of arms-length relationships--buyers frequently rotating purchases across multiple supplier sources while employing short term contracts--is no longer an economically sensible approach in most industries. There are three primary reasons that the traditional arms-length model is no longer valid:

- (1) The administrative or transaction costs associated with managing a large number of vendors typically outweigh the benefits. In fact, some studies have found that in some instances the administrative and inventory holding costs associated with procurement actually outweigh the unit costs (Hannaford, 1983). As surprising as it may seem, firms may spend more money negotiating and processing an order than they do on the item itself. To illustrate, GM has traditionally employed roughly 8-10 times more people in procurement than Toyota due to the high cost of managing a large supplier base.
- (2) Dividing purchases across multiple suppliers reduces the ability of suppliers to achieve significant economies of scale (Dyer & Ouchi, 1993). Furthermore, it is not clear that a buying firm has more relative bargaining power simply by having more alternative sources of supply. Buyer bargaining power may increase as much (or perhaps more) by increasing purchases from a single supplier, thereby making that particular supplier more dependent on the buyer for a higher percentage of its sales. As Chrysler purchasing chief Tom Stallkamp observed in describing Chrysler's move towards supplier partnerships, "We have found that the more we buy from a particular supplier, the more responsive the supplier is to our needs" (Interview, December 1, 1995).
- (3) Vigorous competition can be achieved with two or three suppliers as long as the suppliers are equally competent and managed skillfully (McMillan, 1990; Dyer & Ouchi, 1993). Buying firms do not need a large number of suppliers in order to maintain vigorous supplier competition. For example, vigorous competition exists in the commercial aircraft industry between Boeing, McDonnell Douglas, and Airbus even though there are only **three suppliers** of aircraft (Vayle & Yoffie, 1991). Similarly, Toyota maintains effective competition between just two suppliers by adjusting volume between the suppliers based on their performance.

In terms of actually managing suppliers, the durable arms-length model differs from the traditional arms-length model in the following respects. First, initial supplier selection requires

some *capabilities benchmarking* to determine which suppliers have the potential for the lowest costs over the long term. Then, two or three suppliers can be selected to be long term suppliers. The traditional arms-length model simply opens up the bidding to all suppliers without regard for their capabilities or the costs of working with and managing a large supplier set.

Second, the supplier and buyer make some dedicated investments in interfirm coordination mechanisms, such as order entry systems, electronic data exchange, and logistics systems which will get the product to the buyer where and when the buyer needs it.

Finally, the supplier is assured of future business as long as prices are competitive. Relatively frequent *price benchmarking* is necessary to maintain vigorous price competition between the two suppliers. For example, the buyer may create some automatic reorder dates (i.e. once a year) at which time suppliers must rebid for business. Bidding and reordering can also be carried out electronically according to preannounced criteria so that procurement administrative cost can be kept to a minimum. The frequent price benchmarking (bids) keeps suppliers on their toes--they know they must continually offer low prices. However, they are willing to make the necessary investments in coordination mechanisms and logistics processes because they have a long term commitment for at least some business.

In summary, this quasi-market approach is superior to the traditional arms-length approach because it: a) minimizes procurement (transaction) costs, b) allows suppliers to maximize economies of scale which is critical in standardized, commodity-like products, and c) maintains vigorous competition. Buyers may also reopen the business to all bidders at longer time intervals (i.e. every five years), to ensure that their long term suppliers still have the lowest costs and best capabilities. The price benchmarking (and open bidding) intervals should be

shorter the more commodity-like the product and the greater the environmental and technological uncertainty regarding the factors which influence the cost structure of suppliers (i.e. the more frequently suppliers' production costs are likely to change). Since durable arms-length suppliers provide inputs which do not differentiate the buyer's product, the key is to secure these inputs at low cost in terms of both unit price and administrative cost.

Strategic Partnerships

Strategic partnerships (*quasi-hierarchies*) are necessary when supplying firms provide strategic inputs, which are typically of high value and play an important role in differentiating the buyer's final product. Generally speaking, these inputs are not subject to industry standards and may benefit from customization due to multiple interaction effects with other components in the final product. Due to the potential benefits of customization (i.e. higher quality, or new features) these strategic inputs require a high degree of coordination between supplier and buyer. Thus, strategic partnerships require multiple function-to-function interfaces between supplier and buyer. For example, a strategic supplier's design engineers must coordinate with buyer design engineers to ensure flawless product fit/smooth interfaces. The buyer's sales organization must share marketing information with the supplier's sales and product development functions to ensure that the supplier clearly understands the final customer's needs and the role of their component in the overall product strategy. Buyer manufacturing engineers must coordinate with supplier engineers to ensure that the supplier's product can be easily assembled at the buyer's plant. Not surprisingly, relation-specific investments are necessary in order for the supplying firm to coordinate effectively with the buying firm and customize the component. These include

investments in dedicated plant and equipment, dedicated personnel, and tailored manufacturing processes. It is not unusual for an affiliated supplier in Japan to have plants tailored and dedicated to the "parent" company customer.

Due to multiple functional interfaces and relation-specific investments, organizational boundaries between supplier and buyer begin to blur. The partners' destinies become tightly intertwined. Furthermore, the incentive compatibility of the partners is high because each party has made co-specialized investments which are of little value outside of the relationship. Thus, each party has strong incentives to help the other as much as possible. This explains why Toyota and Nissan provide such high levels of assistance to their affiliated suppliers--because their own success is highly dependent on the success of these suppliers. Thus, creating interfirm knowledge-sharing routines which transfer knowhow and technology to suppliers is important because it is critical that their affiliated suppliers have world class capabilities. Similarly, because the success of strategic suppliers is tied closely to the success of the buying firm, strategic suppliers must be dedicated to helping the buying firm create competitive advantage in the final product market. This means that partner suppliers must be willing to exert efforts at innovation and quality and be responsive in ways that go beyond the explicit requirements of the contract.

In **managing strategic partnerships**, the buying firm must be effective at: (1) capabilities benchmarking to ensure that the best possible partners are chosen, (2) developing trust so that partners will be willing to make relation-specific investments and share information, and (3) creating interfirm knowledge-sharing routines to effectively coordinate activities and optimize interfirm learning. For a comparison of the durable arms-length relationship model and the

strategic partnership model see Table 4.

[Insert Table 4 about here]

We should also note that strategic partnerships tend to work well during an economic expansion (when scarcity of resources may be a problem) and when long term value creation (through quality, new technologies, etc) is the goal. In contrast, durable arms-length relationships may work better during a recession (when suppliers have excess capacity) and when short term cost reduction is the primary goal.

A question that we have been asked by executives is: *What percentage of my suppliers should be strategic partners versus durable arms-length suppliers?* Of course, the answer to that question depends on a specific analysis of each supplier's product and the nature of the interdependence between the buyer and supplier. However, typically we would expect that firms who are positioned downstream in the value added chain are more likely to require a higher percentage of strategic partnerships. The reason is that firms which are downstream in the value chain are more likely to purchase inputs with a higher degree of value-added and customization. Upstream suppliers are more likely to purchase raw materials or inputs with less value added. Thus, in the auto industry we would expect automakers to have a higher percentage of suppliers fall into the partner category than their first or second tier automotive suppliers. Likewise, the demands of product complexity increase the demands for effective interfirm coordination. Consequently, firms in "complex-product" industries are more likely to benefit from strategic partnerships than firms in "simple-product" industries.⁵

⁵ Complex products are defined as products/systems comprised of a large number of interdependent components, functions, and process steps (see Clark & Fujimoto, 1991:9-10).

Conclusion

As global competition has increased during the past decade, executives have been under tremendous pressure to make their organizations as "lean" and efficient as possible. To meet the challenges of the new competition, executives have been encouraged to downsize their organizations, focus on their "core competencies," and outsource all other "non-core" activities. Due to this trend towards outsourcing, effective supplier management has become increasingly important to a firm's overall competitiveness. Our research indicates that rather than employ a "one size fits all" strategy for procurement, firms should think strategically about supply chain management. To optimize purchasing effectiveness, executives should strategically segment their suppliers into strategic partners and durable arms-length suppliers in order to allocate different levels of resources to each group. Since resources are a scarce commodity in any company, they should be allocated mainly to suppliers who fall into the partner category. Strategic partners are those suppliers that provide inputs which are typically of high value and play an important role in differentiating the buyer's final product. The buyer should maintain high levels of communication with these suppliers, provide managerial assistance, exchange personnel, make relation-specific investments, and make every effort to ensure that these suppliers are world class in terms of their overall capabilities.

On the other hand, buyers do not need to allocate significant resources to manage and work with durable arms-length suppliers. Durable arms-length suppliers are those that provide non-strategic inputs (i.e., standardized inputs that do not contribute to the differential advantage of the buyer's final product). As a result, durable arms-length suppliers do not need the same

degree of attention or resources as strategic partners. Durable arms-length relationships will tend to be characterized by less face-to-face communication, less assistance, fewer relation-specific investments, and frequent price benchmarking relative to strategic partnerships. However, like strategic partnerships, long term (enduring) relationships are fostered in order to minimize the administrative costs of procurement and to allow suppliers to realize economies of scale in production. For these suppliers, the buyer should attempt to minimize total procurement costs, which includes both unit price and administrative costs.

Our research on supplier-automaker relationships in the U.S., Japan, and Korea indicates that relationships in the U.S. (as of 1992) have been characterized by arms-length relationships,⁶ while those of Korea have been characterized by partnerships (though it is important to note that partner (*keiretsu*) suppliers in Japan have closer automaker relationships based on virtually all criteria when compared to partner (*chaebol*) suppliers in Korea). We also found that automakers in the U.S. and Korea have tended to manage their suppliers in a uniform way. Consequently, U.S. automakers have not realized the benefits associated with supplier partnerships, while Korean automakers have not enjoyed the benefits associated with the arms-length model. Of the automakers in our sample, only Toyota and Nissan had realized the benefits of both the partner and arms-length models by strategically segmenting their suppliers. Many previous studies have suggested that the Japanese model of supplier management has been a major source of differential advantage for Japanese automakers. Our research shows that strategic supplier segmentation is one of the reasons for this differential advantage.

⁶ However, we should note that supplier management practices at Chrysler have recently changed significantly in the direction of the partner model (Kamath & Liker, 1994; Dyer, 1996c).

Appendix

The sample consisted of three U.S. (General Motors, Ford, Chrysler), two Japanese (Toyota, Nissan), and three Korean (Hyundai, Daewoo, Kia) automakers and a sample of their suppliers. Each automaker's purchasing department selected a representative sample of suppliers which included both partners (i.e. *keiretsu/chaebol* suppliers) and non-partner (i.e. independent) suppliers. U.S. automakers were asked to identify suppliers they felt were "most like a keiretsu" relationship. We interviewed sales and engineering vice-presidents at 70 suppliers (30 U.S., 20 Japanese, 20 Korean), during which the survey was developed and pretested. To minimize key-informant bias and follow the general recommendation to use the most knowledgeable informant (Kumar et al, 1993), we asked the purchasing managers at each automaker to identify the supplier executive who was most responsible for managing the day-to-day relationship. This person was typically the supplier's sales vice-president, sales account manager, or in some cases, the president. The final survey was then sent to the key supplier informant identified by the automaker. Key informants had been employed at their respective organizations for an average of 16 years and thus had a long history of working with the automaker. Usable responses were obtained from 135 U.S. (66% response rate), 101 Japanese (68% response rate) and 217 Korean (55% response rate) suppliers. The data collection was done between 1992 and 1994. The U.S. and Japanese data were collected in 1992, reflecting data for 1991, and the Korean data were collected in 1994, reflecting data for 1993.

TABLE 1

SUPPLIER-AUTOMAKER RELATIONSHIPS IN THE UNITED STATES

<u>General Characteristics</u>	<u>"Arms-Length" Suppliers</u> N = 46	<u>"Partner" Suppliers</u> N = 46
· Annual Sales	\$428 MM	\$373 MM
· Percent of Sales to automaker	33.5%	33.9%
<u>Relation-specific Assets</u>		
· Distance between plants (miles)	589 miles	413 miles
· Percent of capital equipment that is not redeployable	15.4%	17.7%
· Annual "man-days" of face to face contact	1,169	1,385
· Number of guest engineers	.45	.47
<u>Information sharing/Assistance</u>		
· Extent to which supplier shares confidential information+	3.1	3.3
· Extent to which supplier shares detailed cost data+	4.5	4.3
· Extent to which automaker assists supplier with cost reduction+	2.1	1.9
· Extent to which automaker assists supplier with quality+	2.9	3.1
<u>Trust/Contracts</u>		
· Extent to which supplier trusts automaker to be fair+	4.2	4.7
· Extent to which supplier expects unfair treatment if automaker has the chance+	4.2	3.6
· Average contract duration (years)	2.4 yrs.	4.7 yrs.**

+Supplier response on a 1-7 Likert scale; 1 = Not at all, 7 = to a very great extent

**significantly different from arms-length sample (p<.05)

TABLE 2
SUPPLIER-AUTOMAKER RELATIONSHIPS IN JAPAN

<u>General Characteristics</u>	<u>"Arms-Length" Suppliers</u> N = 48	<u>"Partner" Suppliers</u> N = 45
· Annual Sales	\$1,400 MM	\$935 MM
· Percent of Sales to automaker	18.9%	60%**
<u>Relation-Specific Assets</u>		
· Distance between plants (miles)	125 miles	41 miles**
· Percent of capital equipment that is not redeployable	13.2%	30.6%**
· Annual "man-days" of face to face contact	3181	7270**
· Number of guest engineers	2.3	7.2**
<u>Information sharing/Assistance</u>		
· Extent to which supplier shares confidential information+	5.3	6.2**
· Extent to which supplier shares detailed cost data+	4.3	5.9**
· Extent to which automaker assists supplier with cost reduction+	2.6	4.2**
· Extent to which automaker assists supplier with quality+	3.0	4.4**
<u>Trust/Contracts</u>		
· Extent to which supplier trusts automaker to be fair+	6.0	6.3
· Extent to which supplier expects unfair treatment if automaker has the chance+	1.6	1.6
· Average contract duration (years)	3.0 yrs.	3.0 yrs.

+Supplier response on a 1-7 Likert scale; 1 = Not at all, 7 = To a very great extent

**significantly different from arms-length sample (p<.05)

TABLE 3

SUPPLIER-AUTOMAKER RELATIONSHIPS IN KOREA

<u>General Characteristics</u>	<u>"Arms-Length" Suppliers</u> N = 202	<u>"Partner" Suppliers</u> N = 15
· Annual Sales	\$29.5 MM	\$37.7 MM
· Percent of Sales to automaker	49.6%	81.9%**
<u>Relation-Specific Assets</u>		
· Distance between plants (miles)	78 miles	87 miles
· Percent of capital equipment that is not redeployable	39%	53%**
· Annual "man-days" of face to face contact	1072	4886
· Number of guest engineers	.61	.73
<u>Information sharing/Assistance</u>		
· Extent to which supplier shares confidential information+	4.9	5.0
· Extent to which supplier shares detailed cost data+	5.6	4.4
· Extent to which automaker assists supplier with cost reduction+	3.3	3.4
· Extent to which automaker assists supplier with quality+	3.8	4.3
<u>Trust/Contracts</u>		
· Extent to which supplier trusts automaker to be fair+	4.9	5.0
· Extent to which supplier expects unfair treatment if automaker has the chance+	3.8	4.9
· Average contract duration (years)	3.0 yrs.	3.0 yrs.

+Supplier response on a 1-7 Likert scale; 1 = Not at all, 7 = To a very great extent

**significantly different from arms-length sample (p<.05)

TABLE 4

**CONTRASTING DURABLE ARMS-LENGTH RELATIONSHIPS
WITH STRATEGIC PARTNERSHIPS**

	DURABLE ARMS-LENGTH RELATIONSHIPS (QUASI MARKETS)	STRATEGIC PARTNERSHIPS (QUASI HIERARCHIES)
PRODUCT/INPUT CHARACTERISTICS:	<ul style="list-style-type: none"> • Commodity/standardized products • Open architecture products • Stand alone (no or few interaction effects with other inputs) • Low degree of supplier-buyer interdependence • Low value inputs 	<ul style="list-style-type: none"> • Customized, non-standard products • Closed architecture products • Multiple interaction effects with other inputs • High degree of supplier-buyer interdependence • High value inputs
SUPPLIER MANAGEMENT PRACTICES:	<ul style="list-style-type: none"> • Single functional interface (i.e., sales to purchasing) • Price benchmarking • Minimal assistance (minimal investment in interfirm knowledge-sharing routines) • Supplier performance can be easily contracted for ex ante • Contractual safeguards are sufficient to enforce agreements 	<ul style="list-style-type: none"> • Multiple functional interfaces (i.e., engineering to engineering, mfg. to mfg.) • Capabilities benchmarking • Substantial assistance (substantial investments in interfirm knowledge-sharing routines) • Supplier performance on non-contractibles (i.e., innovation, quality, responsiveness) is important • Self-enforcing agreements are necessary for optimal performance (i.e., trust, stock ownership, etc.)

FIGURE 1

STRATEGIC SUPPLIER MANAGEMENT

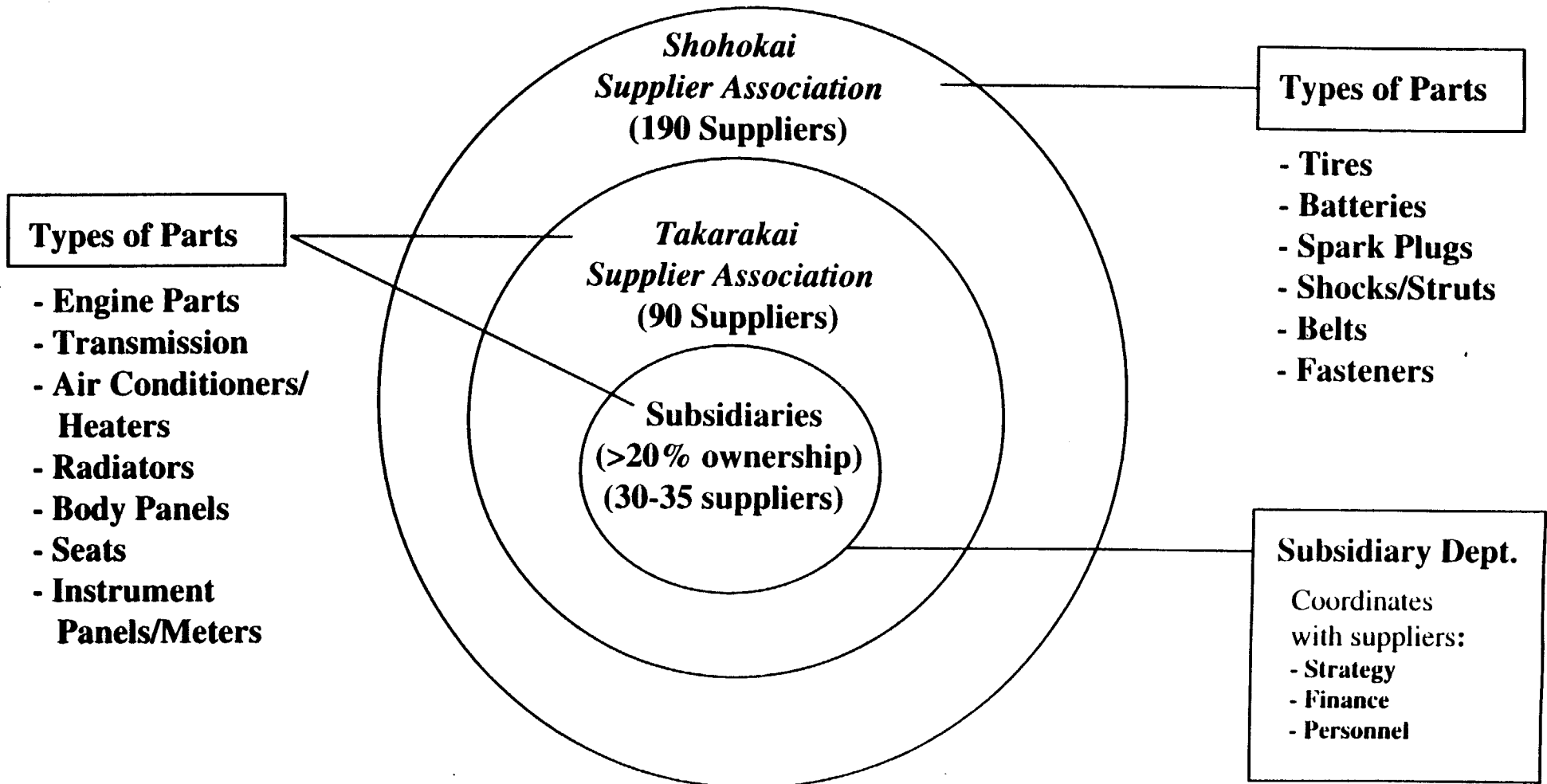
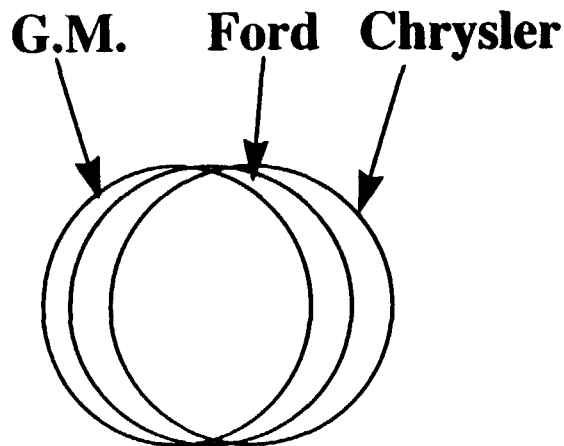


FIGURE 2 CHARACTERISTICS OF SUPPLIER MANAGEMENT (U.S., JAPAN, & KOREA)

U.S.

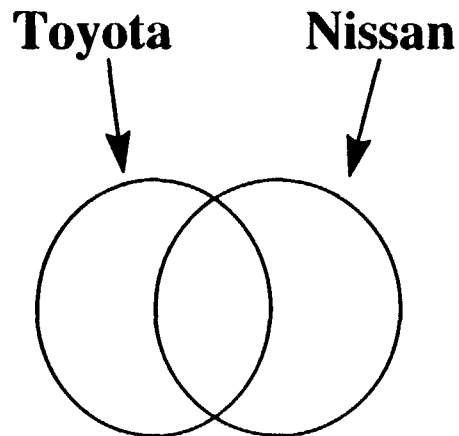


- Arms-length model has prevailed; moving to partnerships
- Large suppliers with economies of scale
- Low supplier-OEM specialization and coordination



No strategic segmentation of suppliers

JAPAN

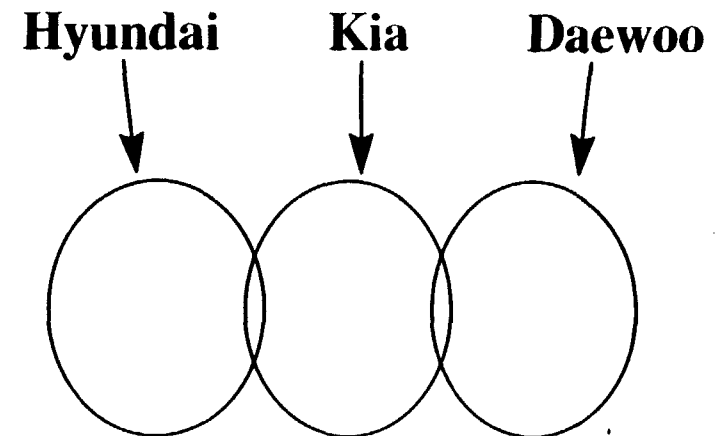


- Mix of partners and independent suppliers
- Independent suppliers realize economies of scale
- High level of supplier-OEM specialization and coordination with partners



Strategic segmentation of suppliers

KOREA



- Partner model prevails
- Small suppliers with suboptimal economies of scale and technology
- High level of supplier-OEM specialization and coordination



No strategic segmentation of suppliers

REFERENCES

- Aoki, M. (1988). *Information, Incentives, and Bargaining in the Japanese Economy*, New York: Cambridge University Press.
- Asanuma, B. (1989). 'Manufacturer-Supplier Relationships in Japan and the Concept of Relation-Specific Skill'. *Journal of the Japanese and International Economies*, 3, 1-30.
- Bresnen, M. & C. Fowler (1994). "The organizational correlates and consequences of subcontracting: Evidence from a survey of South Wales Businesses." *Journal of Management Studies*, 31, 6, 847-864.
- Business Week, (1994). "Hardball is Still GM's Game," August 8, pg. 26-27.
- Chung, Ji-Taek (1995), "A Study on the Performances by Configurations of Assembler-Supplier Relationships: In Korean Auto Industry," MA Thesis, College of Business Administration, Seoul National University, Seoul, Korea.
- Clark, K. B. & T. Fujimoto (1991). *Product Development Performance*. Boston: Harvard Business School Press.
- Cusumano, M.A. (1985) *The Japanese Automobile Industry: Technology and Management at Nissan and Toyota*. Harvard University: The Council on East Asian Studies, Cambridge, MA.
- Dore, Ronald (1983). "Goodwill and the Spirit of Market Capitalism." *British Journal of Sociology*. Volume XXXIV, No.4.
- Dyer, J.H. & W.G. Ouchi (1993). "Japanese Style Business Partnerships: Giving Companies a Competitive Edge." *Sloan Management Review*, Volume 35, No. 1, 51-63.
- Dyer, Jeffrey H. (1996a). "Specialized Supplier Networks as a Source of Competitive Advantage: Evidence from the Auto Industry," *Strategic Management Journal*, Vol. 17, 4, 271-292.
- Dyer, Jeffrey H. (1996b). "Does Governance Matter? Keiretsu Alliances and Asset Specificity as Sources of Japanese Competitive Advantage." *Organization Science*, Vol. 7, 6, 649-666.
- Dyer, J. H. (1996c). "How Chrysler Created an American Keiretsu." *Harvard Business Review*, July-August, 42-56.
- Fruin, W. Mark (1992). *The Japanese Enterprise System*. New York: Oxford University Press.
- Fukuyama, F. (1995). *Trust: The Social Virtues and the Creation of Prosperity*, New York: The Free Press.
- Gerlach, M.L. (1992). *Alliance Capitalism*. Berkeley: University of California Press.
- Helper, Susan (1991). "How much has really changed between U.S. automakers and their suppliers." *Sloan Management Review*, Summer.
- Kamath, R. R. & J. K. Liker (1994). "A second look at Japanese product development." *Harvard Business Review*, November-December, 154-170.
- McMillan, J. (1990). "Managing Suppliers: Incentive Systems in the Japanese and U.S. Industry." *California Management Review*. Summer, pg. 47-58.
- Ministry of International Trade and Industry (1987). *White Paper on Small and Medium Enterprises in Japan*, Tokyo: MITI, pp.36-37.
- Nishiguchi, T. (1994). *Strategic Industrial Sourcing*. New York: Oxford University Press.
- Nobeoka, K. (1995). "Benefits of Quasi-Market Strategy within the Assembler-Supplier Network: A Case Study in the Japanese Automobile Industry," Discussion Paper Series No. 54, RIEB, Kobe University.

- Oh, Kyu Chang (1995). "An International Comparison of Product Development and Supply Systems in the Automobile Industry," Research Report 364, Korea Institute for Industrial Economics and Trade, Seoul, Korea.
- Porter, M.E. (1980). *Competitive Strategy*. New York: The Free Press.
- Powell, W. W. (1990). "Neither Market Nor Hierarchy: Network Forms of Organization." In *Research in Organizational Behavior*, (Ed. B. Staw and L. Cummings) JAI Press, Vol. 12, pages 295-336.
- Sako, M. (1991). "The Role of 'Trust' in Japanese Buyer-Supplier Relationships." *Ricerche Economiche*, XLV, 2-3, aprile-settembre, pp. 449-474.
- Sako, M. (1992). *Prices, Quality, and Trust*. Cambridge: Cambridge University Press.
- Smitka, Michael J. (1991). *Competitive Ties: Subcontracting in the Japanese Automotive Industry*. New York: Columbia University Press.
- Vayle, E. J. & D. B. Yoffie (1991). "Collision Course in Commercial Aircraft: Boeing-Airbus-McDonnell Douglas--1991 (A), Cambridge MA: Harvard Business School Press.
- Williamson, Oliver E. (1985). *The Economic Institutions of Capitalism*. New York: Free Press.
- Womack, James P., Daniel T. Jones & Daniel Roos (1990). *The Machine that Changed the World*. New York: Harper Perennial.