

Título: Restructuring supplier relationships in U.S. manufacturing for improved quality

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Resumo:

The Japanese model of long-term, tightly integrated, and exclusive buyer-supplier relationships has had a strong influence on U.S. manufacturing industries. Quality practitioners advocate such relationships and there has been widespread interest among U.S. manufacturers seeking to improve quality. We surveyed companies in three internationally competitive manufacturing industries and found widespread efforts to restructure supplier relationships but found varying degrees of progress toward, commitment to, and satisfaction with the Japanese model. Industry structure and competitive forces help to explain the differences. There is also evidence that important elements of Japanese practice are missing in U.S. implementations. (Reprinted by permission of the publisher.)

Texto completo:

Introduction

During the late 1970's and through the 1980's, Japanese manufacturers in a number of industries established a reputation for superior quality. Superior quality is now widely regarded as an important source of competitive advantage and a major factor in the U.S. market share growth of Japanese manufacturers. Their U.S. competitors have responded by implementing quality improvement programs. An important element of these programs has been improved input quality through improved relations with suppliers.

The quality management programs of W. Edwards Deming, Total Quality Management (TQM), and others highlight the necessity of controlling input quality, and with good reason. Suppliers have a significant role in both U.S. and Japanese manufacturing and therefore in the quality of the final products. For example, the large Japanese auto assemblers such as Toyota and Nissan rely on suppliers for both design and manufacture of components which comprise over 70% of the value of the final product. U.S. auto manufacturers are not far below this.

Evidence indicates that the Japanese auto makers have had much better relations with their suppliers that resulted in lower costs, higher quality, and greater innovativeness (e.g., Womack et al. 1990). Indeed, the Japanese Ministry for International Trade and Industry has attributed much of the competitive advantage of Japanese manufacturing to the "strength of its subcontracting structure" (MITI 1984).

U.S. manufacturers looked to Japan for a model of supplier relations and began to emulate key features. The Japanese practice falls between the archetypal cases of arms-length exchange and vertical integration that have characterized U.S. practice. A form of quasi-vertical integration, the relationships have been characterized as long-lived, close, and exclusive. Quality practitioners and others (e.g., Womack et al.) point to the Japanese model for managing supplier quality. In particular, the highly influential W. Edwards Deming (1986) recommends long term relationships with a sole source as the route to improved quality and lower total cost. During the 1980's, U.S.

manufacturers moved to increase their use of subcontracting and build longer-term relationship with fewer suppliers (Heide and John 1990, Lyons et al. 1990, and McMillan 1990).

The trend to restructure supplier relationships in the U.S. following the Japanese model raises a number of questions and concerns. A basic question is whether they have got the model right, that is, whether the common conception of Japanese practice reflects their actual practice. Recent research indicates that the common conception of Japanese practice is incomplete and probably inaccurate, in particular regarding exclusivity. From a strategy perspective, investment in an exclusive buyer-supplier relationship seems unlikely to produce high supplier performance without some other incentives or forces present.

An important question is whether the model portrayed by quality management practitioners and others is an accurate description of Japanese practice (McMillan 1990). There have now been a number of studies which have contributed immensely to our understanding of supplier relationships in Japan (e.g., Asanuma 1985, Cusumano and Takeishi 1991, McMillan 1990, Smitka 1991, Taylor 1991, Womack et al. 1990). Practices vary among Japanese manufacturers, even within the automobile industry. Nevertheless, the description emerging from this research is consistent with the common conception of long-term, tightly integrated relationships, though exclusivity has been overstated (McMillan 1990). Mutual trust is often cited as an important factor (Smitka 1991). But the explanation of superior supplier performance appears to be more complex. McMillan (1990) has described how Japanese practice incorporates a number of incentives for suppliers to control cost and provide good performance. Ongoing relationships, risk sharing, the form of organization, bidding practices, and pricing all contribute to the success of supplier relations in Japanese manufacturing industries. Richardson (1991) has shown how the practice of parallel sourcing, a hybrid of sole and multiple sourcing, contributes to supplier performance in the Japanese auto industry.

Developing long-term, tightly integrated relationships with fewer suppliers, especially with a sole source, conflicts with conventional wisdom and historical U.S. practice (Lyons et al. 1990, Helper 1991, Cusumano and Takeishi 1991). The idea of making a substantial investment in a relationship with a sole source raises concerns about dependence and vulnerability. In addition to increased exposure to unexpected problems, such a relationship exposes the buyer to possible opportunistic behavior by the supplier (Williamson 1988). Porter (1980, 1985) recommends using few enough suppliers to make the volume of business important to them, but retaining multiple sources and competing them with one another to reduce supplier bargaining power, improve quality, and lower total costs. Multiple sourcing, competitive bidding, and short-term commitments have been typical U.S. practice.

This study was undertaken to discover the extent of progress and commitment to implementing long-term, tightly integrated, and especially exclusive supplier relationships in U.S. manufacturing. We are particularly interested in the practice of sole sourcing. Given the concerns noted above, are firms adopting this practice? How is it working and what factors contribute to its success or failure? The Japanese auto industry has been the model(2). Are U.S. manufacturers following a model that corresponds to actual Japanese practice? Does the model work well in the U.S. auto industry? What about other industries? We expect industry structure, firm, and product characteristics to play a role. Factors such as relative size and industry concentration which affect the bargaining power of buyers and suppliers (Porter 1980) should shape successful practice. Similarly, technology (fixed costs, complexity, etc.) and the observability of quality should influence the buyer's willingness and ability to use alternative supplier arrangements.

We looked at three internationally competitive manufacturing industries with varied structure -- automobiles, heavy construction equipment, and consumer electronics (televisions). We surveyed senior managers responsible for purchasing policies in most of the U.S. firms in these industries. But because these industries are concentrated, our sample sizes are small. Also, because the practices are new and still evolving, many of the firms are not ready to draw conclusions about their effectiveness. What we present is a comprehensive picture of evolving practice and thinking in these industries. By associating this information with industry, firm, and product characteristics, we are able to form hypotheses about the conditions under which long term, tightly integrated, exclusive supplier relationships are likely to work. We also found important elements of Japanese practice missing or underdeveloped in U.S. implementations.

We begin with a discussion of theory and prior empirical findings about buyer-supplier relationships. Relevant theory includes transaction cost economics and strategic management. We also attempt to frame Deming's argument for sole sourcing in terms of transaction cost economics. Next we discuss our research questions and method. Following that we present our findings. Conclusions and remarks are in the final section.

Theory and Prior Empirical Findings on Buyer-Supplier Relationships

Transaction Cost Economics, Quality Management, and Supplier Relationships

Transaction cost economics (Williamson 1988) provides theoretical insight into the use of long-term, tightly integrated supplier relationships and the practice of sole sourcing. Transaction costs economics seeks to explain alternative forms of organization and governance structures used within and between firms. Much work has been done on vertical integration that is directly relevant to supplier relationships (Williamson 1988). In seeking to explain when firms will buy rather than make, transaction cost theory addresses many of the same tradeoffs important to evaluating alternative supplier arrangements.

Central concepts in transaction cost economics are specific assets, uncertainty, bounded rationality, and opportunistic behavior. In supplier relationships, specific assets are assets which only have value within the relationship. For example, if a buyer were to invest in training and transferring technology to a supplier, the value of that investment would be lost if the relationship is ended. Specific assets represent sunk costs in the relationship. The role of uncertainty and bounded rationality is to limit the ability to write contracts. Contracts which cover all possible contingencies are considered impossible to write and/or enforce.

When the first two elements, specific assets and incomplete contracts, are combined, possibilities for opportunistic behavior arise. For example, once a buyer has invested considerable resources into improving a supplier's capabilities, the prospect of losing that investment will make the buyer hesitant to end the relationship. This may give the supplier an opportunity to shirk or hold up the buyer with higher prices and/or lower quality, citing some unforeseen contingency. There will usually need to be incentives, monitoring efforts, or some form of governance structure in place to ensure supplier performance.

The theory of transaction costs says that firms will organize or arrange their supplier relationships to minimize total cost including transaction costs. Transaction costs include the costs of finding qualified suppliers, negotiating contracts, developing suppliers' capabilities, monitoring supplier performance, enforcing contracts, and dealing with such things as delays, scrap, rework, etc. caused by poor supplier performance.

A number of empirical studies have found some support for the transaction cost explanation of the make versus buy decision (Monteverde and Teece 1982, Walker and Weber 1987) and supplier arrangements (Walker and Poppo 1991). There is a tendency to vertically integrate in the presence of specific assets and uncertainty as the theory predicts. However, the story is complicated by the many intermediate forms of quasi-integrated relationships (Walker and Poppo 1991).

Deming's argument in support of sole sourcing can be recast in terms of transaction costs. Deming suggests that sole sourcing minimizes the total costs of dealing with suppliers (Deming 1986). The total costs include purchase price as well as the cost to control quality and the cost of poor quality resulting from inadequate quality control. To adequately control the quality of critical inputs, buyers must invest considerable resources into the supplier relationship. Searching out and selecting suppliers, providing training and transferring technology, educating suppliers on the buyer's processes and requirements, learning about the supplier's processes and requirements, monitoring supplier performance and assisting the supplier on process control are all necessary to reduce the variability in the supplier's product, i.e., ensure high quality. The alternative is to incur the costs of delay, scrap, rework, process adjustment, etc. associated with poor supplier performance. Deming's argument is that making these necessary investments in multiple suppliers for the same input would be simply too costly (Walton 1986, Deming 1986). Using multiple suppliers can introduce additional variance. Even if each one is producing high quality, differences between supplier's products make quality control even more difficult and more costly. In other words, the transaction costs of setting up and coordinating with suppliers to ensure quality are lower with a sole source. In contrast to the transaction cost theory, however, Deming is not overly concerned with the possibility of opportunistic behavior and shirking. He suggests that firms search out and select suppliers who are committed to quality and continuous improvement.

There has been little empirical study of the practice of sole sourcing (Cusumano and Takeishi 1991, Walker and Poppo 1991). The present study seeks to add to our knowledge of this practice.

Strategic Management and Supplier Relationships

Economic and strategic management theorists have provided a useful framework for understanding the buyer-supplier relationship (Porter 1980). Structural characteristics of industries influence the relative bargaining power of buyers and suppliers and will affect the relative advantage of alternative supplier arrangements. Based on this framework, Porter (1980, 1985) generally recommends using multiple sources to ensure high supplier performance and the lowest total costs. The problem with making specific investments in an exclusive supplier relationship is that it creates switching costs and increases the bargaining power of the supplier. Without competitive pressure, the supplier may come to view the business as an entitlement and use the increased bargaining power to get by with lower quality and/or higher cost. Even so, other industry characteristics may reduce the bargaining power of suppliers and offset the effect of an exclusive relationship.

Evidence suggests that suppliers with relative bargaining power consistently earn higher profits (Cowley 1988). In Cowley's model, supplier power results from concentration of the suppliers' industry relative to the buyers' industry and low cost-importance for buyers. These factors are among the industry structure, firm, and product characteristics cited by Porter. In Porter's model, the bargaining power of suppliers is increased by

-- High concentration in the suppliers' industry relative to the buyers'

- Buyers who purchase in small quantities
- Differentiation of supplier's products
- Switching costs for buyers
- Lack of substitutes for suppliers' products
- The buyer's industry not being an important customer to the suppliers
- The supplier's product being an important input, e.g. a major cost or critical performance item
- Suppliers that pose a credible threat of forward integration
- Buyers that have incomplete information or knowledge of suppliers
- Buyers that are profitable or not price sensitive.

In our survey we have gathered information related to transaction costs, quality management, and supplier bargaining power. We have also compiled information on industry structure, firm, and product characteristics. We expect to see different practices and different degrees of satisfaction and commitment to sole sourcing for different types of components in different industries.

Research Method

Our research objectives are part descriptive and part theory driven. First, we want to describe the extent to which U.S. manufacturers are implementing the Japanese model, particularly sole sourcing, and what alternative arrangements have arisen. Second, we are looking for the influence of transaction costs and supplier bargaining power on the choice of supplier arrangements and on supplier performance.

We contacted senior managers in purchasing in most of the U.S. firms in the three industries. In the auto industry, there are the big three and Saturn which is considered separately from G.M. because of its unique practices. We contacted three of these and two participated. In the heavy construction equipment industry there are six or seven major firms, four of which participated. In consumer electronics, there is only one remaining large U.S. firm involved in manufacturing and they elected not to participate. We surveyed two subsidiaries of European companies that manufacture in the U.S., one a former U.S. company. Only a few firms elected not to participate. All the firms were in the process of transforming their supplier relationships and were interested in the study. We used a written questionnaire to gather the information and followed up with a telephone interview.

Results

Table 1 provides some comparative statistics on the three industries. The auto industry is the most concentrated and has the largest firms followed by heavy construction equipment and televisions.

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Importance of Supplier Quality

All of the firms reported that product quality is critical to competition in their industry and that their suppliers play a critical role in both their product quality and cost. Suppliers provide a large percentage of the value of their final products, ranging from 40 to 60% for autos up to over 80% for televisions. Suppliers produce significant components that are specialized to the buyer's requirements and suppliers are involved in design for all of the firms. The television manufacturers rely to a greater degree on suppliers. But all of the firms are, to some extent, integrated with their suppliers and all are clearly highly dependent upon them.

Number of Suppliers

All of the firms are in the process of reducing the number of suppliers they deal with. As shown in Table 3, autos and heavy construction equipment use more suppliers per product model than TV manufacturers, reflecting the larger number of parts in their products. These numbers represent large reductions since the 1970's. All of the firms use sole sources, in some cases because they have no choice. Proprietary technology or high fixed costs often make multiple sourcing impossible or too costly. Firms from all three industries are intentionally establishing sole source relationships. But only in autos were all the firms committed to sole sourcing. In heavy construction equipment and TV's half the firms were implementing sole sourcing while half were targeting two suppliers as the preferred number. In the TV industry, high fixed costs and short product life cycles were constraining the firms to use sole sources even when they would rather use two.

Table 3. Number of Suppliers

	Autos	Heavy const. equipment	TV
Total across product line	1,100	1,275	375
Number per product model	16	29	3.1
Typical number per part	1	1.5	1
Preferred number per part	1	1.5	1.5
Use sole sources	Yes	Yes	Yes
Use parallel sources(1)	3	2.3	2.5
Contract length (years)	3	3.1	1.5
Relationship length (years)	5	15	Many

1 1: Never to 5: Always.

In the follow-up interviews, all of the firms cited the benefits of sole sourcing claimed by quality practitioners as their reasons for reducing their numbers of suppliers (e.g., reduced variability, closer working relationships, and greater long-term commitment). Most of the firms expressed some reservations about dependence on sole sources. The auto industry moved earlier to reduce their suppliers and they expressed the belief that the benefits of using fewer suppliers outweighed the risks. Parallel sources(3) are used for some components by all of the firms, an auto marker, strategically implemented parallel sourcing.

Contract lengths varied from 1 to 5 years and are shortest for televisions, reflecting the shorter product life cycle in that industry. Relationships with suppliers often last much longer but are quite varied. All of the firms expressed commitment to developing longer-term relationships with their suppliers.

Transaction Costs

We asked a number of questions to assess the relative importance of transaction costs in choosing supplier arrangements. The cost of coordinating TABULAR DATA OMITTED with suppliers for ordering, delivery, monitoring quality, etc. was cited as an important factor in choosing the number

of suppliers to deal with. All the firms reported that their suppliers make moderate to substantial specific investments in the relationship, with autos reporting the greatest amount. On the other hand, all firms except autos reported making similar investments in their suppliers. Even so, autos reported high costs to switch suppliers along with the other firms.

Table 5. Supplier Bargaining Power

	Autos	Heavy const. equipment	TV
Number of alternative suppliers	4.8	1.75	2.6
Can manufacture in-house	67%	42%	17%
Substitutes are available	67%	25%	17%
Relative size of firms(1)	1.5	2.5	2.4
Share of supplier's business	52%	6.5%	9%
Differentiation of suppliers(2)	1.3	2.8	2.9
Suppliers are competitors	0%	9%	33%

1 1: Much smaller to 5: Much larger.

2 1: None to 5: High.

Supplier Bargaining Power

In Table 5 we compare the industries on a number of factors which affect supplier bargaining power. For these numbers we asked the firms to supply information on three parts of their own choosing. There is a great deal of variation between types of parts supplied to an industry. For example, heavy construction equipment companies buy electric motors from companies larger than themselves in more concentrated industries while they buy many specialized parts from small companies in fragmented industries. Even so, the averages show notable overall differences between the industries on these factors.

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The auto companies have more alternative suppliers, can manufacture much more in-house if necessary, often have substitutes available, tend to work with suppliers much smaller than themselves, provide a large share (over half) of each supplier's business, have less differentiated suppliers, and rarely work with suppliers who are competitors. In short, the auto companies are in a relatively favorable bargaining position with their suppliers compared to the heavy construction equipment or TV firms. The TV firms are in the worst position of the three with few suppliers to choose from who are similar in size to themselves, offer differentiated products, and are often their competitors. The TV firms tend to provide a small share of the supplier's business and for the most part are unable to produce the part in-house. For example, custom IC chips are purchased from large Japanese electronics companies that also make TV's. Moreover, the fixed costs and short product life cycles often compel the TV firms to sole source custom IC chips. In interviews the firms reported high satisfaction with the quality and delivery obtained but low satisfaction with the cost.

Supplier Performance

We asked about overall expectations and satisfaction which is reported in Table 6. All of the firms expected continuous improvement on both quality and cost. But none of the firms was more than moderately satisfied with supplier performance. Most indicated that suppliers are improving, but several cited poor supplier performance as a critical shortcoming in their own competitiveness as well as that of U.S. manufacturing generally.

We did not directly collect information on quality measures, such as defect rates, to compare

suppliers. We are relying on the manufacturers for their overall assessment of supplier performance across products and suppliers. We did ask the manufacturers how they measure supplier performance. All use some form of multicriteria rating system incorporating quality, delivery, cost, and so on. Hence the satisfaction levels reported here are based on underlying performance measures compared to the manufacturers expectations.

Conclusion

Before concluding, let us repeat that we are dealing with small numbers of firms (though highly representative of these three industries), all of which are in the process of transforming their supplier arrangements. With that in mind, we can draw a number of conclusions about practices in these industries that can serve as hypotheses about supplier relationships more generally.

The trend to restructure supplier relationships along the lines of the Japanese model is evident. All of the firms were moving to develop longer-term and closer relationships with fewer suppliers. All of the firms cited the benefits of lower cost and higher quality claimed by quality practitioners, including the auto firms which began the process as much as ten years ago. Even so, many of the firms were not committed to using sole sources and none of the firms expressed more than moderate satisfaction with supplier performance. We offer the following hypotheses to help explain the mixed commitment to sole sourcing and the low satisfaction with supplier performance.

Transaction costs are an important factor in the choice of supplier arrangements and may be a source of low supplier performance. For all of the firms, the costs of setting up supplier relationships and coordinating with suppliers were important considerations in choosing to reduce the number of suppliers. As Deming argues, it is costly to work closely with suppliers. The generally substantial specific investments these firms make in suppliers and the high switching costs they face may expose them to opportunism, particularly from sole sources. We cannot say how much of the low satisfaction with supplier performance may be due to shirking, but there was dissatisfaction expressed in the interviews with the level of effort made by many suppliers.

The relative bargaining power of buyers and suppliers affects the commitment to sole sourcing. In the auto industry, where the bargaining power of suppliers is relatively low, all three firms contacted were using sole sources but one was using them in a parallel arrangement. In the other two industries, where suppliers tend to have greater bargaining power, only half the firms were moving to sole sourcing.

There are signs of trouble for the practice of sole sourcing. The moderate to low levels of satisfaction with supplier performance reported here are reinforced by recent studies of the auto industry. For example, Cusumano and Takeishi (1991) report relatively high defect rates and rising costs in the U.S. compared to very low defect rates and falling costs in Japan. Because the auto firms began to restructure their supplier relationships as much as ten years ago, the continued dissatisfaction is significant. If sole sourcing appears problematic in the auto industry, where the bargaining power is relatively favorable for the buyer, then we would expect problems in industries such as heavy construction equipment and consumer electronics where suppliers have greater power. There is evidence that many component suppliers across the U.S. have not made the strong commitment to quality that Deming advises buyers to look for in a sole source. Reitsperger and Daniel (1991) report a significantly greater willingness on the part of U.S. manufacturers to ship lower quality components compared to Japanese manufacturers.

Missing or underdeveloped elements of Japanese practice may be a source of dissatisfaction with the Japanese model. As we discussed earlier, Japanese supplier relations include a variety of incentives for supplier performance. When adopting Japanese practice, it is very important to fully understand all of the elements and devise a complete implementation. It is useful to revisit the model, the Japanese auto industry, to see what elements may be missing or not well developed in the U.S.

Commitment - Specific investment is one of the most powerful signals of commitment to a long term relationship. All of the firms reported some specific investments in suppliers, but the auto industry reported the least. In the Japanese auto industry, specific investments in suppliers to transfer technology and improve their capabilities are substantial (Asanuma 1985, Smitka 1991, Taylor 1991).

Full information -- Japanese auto makers demand and receive detailed information and knowledge of suppliers costs and capabilities (Asanuma 1985, McMillan 1990, Smitka 1991). They use this information to negotiate contract prices and to renegotiate them. Target cost reductions are expected to be met. Requests for cost increases are scrutinized carefully and are only allowed for circumstances beyond the control of supplier management, such as the cost of raw materials. Many of these U.S. firms reported that they are asking for detailed information from suppliers. But suppliers seem to be reluctant to provide it and somewhat suspicious (Helper 1991).

Competition -- The quality management story of cooperative sole sourcing in the Japanese auto industry is not complete. Japanese auto firms use a hybrid arrangement that has been called parallel sourcing (Richardson 1991) as well as multiple sourcing (McMillan 1990, Womack et al. 1990). In parallel sourcing, they use sole sources for specific parts, but they have other suppliers producing the same part for a different model or at a different assembly plant. At the end of the contract period, suppliers are compared for performance and new contracts are awarded to top performers. Suppliers are rarely let go, but their volume of business may decline. The key to parallel sourcing is that switching costs are low in spite of substantial specific investment to set up a sole supplier. One U.S. auto maker we surveyed was quite knowledgeable about Japanese practice and uses parallel sourcing. The others were implementing simple sole sourcing.

The transformation from short-term, arms-length supplier relationships to long-term, tightly integrated ones will no doubt take years. As U.S. manufacturers continue to restructure their supplier relationships, it will be important for them to make the necessary commitment to their suppliers and to put in place the necessary incentives for supplier performance given the forces operating in their industry.

Notes

2 Acknowledging the variation in Japanese practice, we will refer to the central features in the common conception, longevity, closeness, and exclusivity, as the Japanese model.

3 See the section on competition in the conclusion for a definition of parallel sourcing.

References

Asanuma, B., 'The Organization of Parts Supply in the Japanese Automotive Industry', Japanese Economic Studies, 15, Summer 1985, pp. 32-35.

Cowley, P.R., 'Market Structure and Business Performance: An Evaluation of Buyer/Seller Power in the PIMS Database', *Strategic Management Journal*, 9, 1988, pp. 271-278.

Cusumano, M.A. and A. Takeishi, 'Supplier Relations and Management: A Survey of Japanese, Japanese Transplant, and U.S. Auto Plants', *Strategic Management Journal*, 12, 1991, pp. 563-588.

Deming, W.E., *Out of the Crisis*, MIT Center for Advanced Engineering Study, 1986.

Helde, J.B. and G. John, *Alliances in Industrial purchasing: the determinants of joint action in buyer-supplier relationships*, *Journal of Marketing Research*, 27 Feb. 1990, pp. 24-38.

Helper, S., 'How Much Has Really Changed Between U.S. Automakers and Their Suppliers?', *Sloan Management Review*, 32, No. 4, 1991, pp. 15-28.

Lyons, T.F., A.R. Krachenberg, and J.W. Henke, Jr. 'Mixed-motive marriages: What's next for buyer-supplier relations?', *Sloan Management Review*, Spring 1990, pp. 29-36.

McMillan, J., 'Managing suppliers: incentive systems in Japanese and United States industry', *California Management Review*, Summer 1990, pp. 38-55.

Ministry of International Trade and Industry, *Annual Report on Small Enterprises (in Japanese)*, MITI, Tokyo, 1984, p. 401.

Monteverde, K. and D.J. Teece, 'Supplier switching costs and vertical integration in the automobile industry', *Bell Journal of Economics*, 13, Spring 1982, pp. 206-213.

Porter, M., *Competitive Strategy*, Free Press, New York, 1980.

Porter, M., *Competitive Advantage*, Free Press, New York, 1985.

OQPF (Ohio Quality and Productivity Forum), 'Deming's Point Four: A Study', *Quality Progress*, Vol 21 (12), Dec. 1988.

Reitsperger, W.D. and S.J. Daniel, 'A Comparison of Quality Attitudes in the USA and Japan: Empirical Evidence', *Journal of Management Studies*, Vol 28 (6), Nov. 1991, pp. 585-599.

Richardson, J.E., 'Parallel Sourcing and Supplier Performance in the Japanese Automobile Industry', Dept. of management working paper, Univ. of Hawaii College of Business Admin., 1991.

Smitka, M.J., *Competitive Ties: Subcontracting in the Japanese Automotive Industry*, Columbia University Press, New York, 1991.

Taylor, G.S., 'Parallel Inter-Firm Systems: The Quality Movement and Tiered Supply Infrastructures in the Automobile Industry in Japan and North America', unpublished Ph.D. dissertation, Graduate Program in Administrative Studies, York University, Toronto, 1991.

Walker, G. and L. Poppo, 'Profit Centers, Single-Source Suppliers, and Transaction Costs', *Administrative Science Quarterly*, 36, 1991, pp. 66-87.

Walker, G. and D. Weber, 'Supplier competition, uncertainty, and make or buy decisions', *Academy of Management Journal*, 30, 1987, pp. 589-596.

Walton, M., *The Deming Management Method*, Pedigree Books, New York, 1986.

Williamson, O.E., *Markets and Hierarchies: Analysis and antitrust implications*, Free Press, New York, 1975.

Williamson, Oliver E., 'The Logic of Economic Organization', *Journal of Law, Economics & Organization*, 4, Spring 1988, pp. 65-94.

Womack, J.P., D.T. Jones, and D. Roos, *The Machine that Changed the World*, Macmillan, New York, 1990.

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