

Imperfection of Japanese Supplier Relationships: An Empirical Research of Changing Inter-Organizational Management Control

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1. INTRODUCTION

Japanese supplier relationships, or *Keiretsu* systems, are considered as a major contributing factor of Japanese firms' prosperity (Clark=Fujimoto [1991], Nishiguchi [1992], Roos *et al.* [1990]). Some Western firms have introduced *Keiretsu* systems and have achieved outcomes such as significant cost reduction and/or outstanding quality improvement (Womack=Jones [1996]). Also, *Keiretsu* systems have been discussed in management accounting field (Otley [1994], Hopwood [1996], Gietzmann [1996]). For instance, Carr=Ng [1994] described that Nissan and its U.K. suppliers implemented collaborative cost reduction activities at R&D stage. They indicated that Japanese supplier relationships had introduced in Japanese transplant (Carr=Ng [1994]). Additionally, Seal *et al.*

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[1999] mentioned that U.K. manufacturing firm tried to achieve information sharing, open book management and R&D collaboration with suppliers affected by Japanese firms' prosperity. They figured out that Western firms had begun to manage their supply chain strategically (Seal *et al.* [1999]).

Also, new types of inter-organizational cost management practices are advocated. They are discussed based on *Keiretsu* system practices such as long-term contracts, Buyer/Supplier collaborations at both R&D stage and production stage and Risk/Information sharing between buyer and supplier. For instance, Carr=Ittner [1992] discussed supplier management using total cost of ownership concept. They indicated that only purchasing price was not enough to evaluate suppliers' capability and considering other factors of purchasing items, such as quality and delivery, were important to achieve cost reduction for long-term contracts (Carr=Ittner [1992]). Further, Cooper=Slagmulder [1999] described that Japanese manufacturers had implemented Buyer/Supplier collaboration practices to reduce product cost dramatically. They called these practices as inter-organizational cost management. Based on these evidences, they developed new inter-organizational tools such as Function/Price/Quality tradeoff, Inter-organizational cost investigation and Concurrent cost management (Cooper=Slagmulder [1999]).

Against the implementation of *Keiretsu* system in Western firms, Japanese firms have begun to change their buyer-supplier relationships in recent years. Some portions of Japanese firms introduce recent Western practices (Western-type supply chain management) including global sourcing and electronic purchasing. It indicates that some limitations of *Keiretsu* system are becoming apparent. But little is known how and what extent Japanese firms change their buyer-supplier relationships¹⁾.

In this paper, the change of *Keiretsu* systems and the influence of Western-type supply chain management among Japanese firm are mainly examined.

1) Although Helper=Sako [1995] already pointed out the changes of Japanese supplier relationships, they mainly examined the type of their contracts. For instance, they denoted that Japanese firms tried to change their buyer-supplier relationships from partnerships manner to arms-length one (Helper=Sako [1995]). But they didn't explain how Japanese firms had changed their manner and what extent they abandoned their traditional way to manage.

Section 2 presents characteristics of *Keiretsu* systems through comprehensive literature survey. Section 3 presents samples about questionnaire survey, which we conducted during 2002. Section 4 discusses survey results. Section 5 concludes with the proposition of future research in inter-organizational management accounting.

2. Characteristics of *Keiretsu* System

Characteristics of *Keiretsu* systems have been compared with traditional Western practices (Cusumano=Takeishi [1991], Helper [1991], Sako [1992], Dyer=Ouchi [1993]). Differences have been mainly discussed between U.S or U.K and Japan. Cusumano=Takeishi [1991] planned questionnaire survey about Japanese automakers, Japanese transplants and U.S. automakers. Helper [1991] classified types of inter-firm contracts and sent questionnaires to U.S. automakers. Dyer=Ouchi [1993] characterized both U.S. and Japanese supplier relationships through literature survey. And Sako [1992] discussed the role of trust in buyer-supplier relationships and executed questionnaire survey about Japanese and U.K. suppliers.

Simultaneously, Japanese researchers examine Japanese intrinsic features through formal/informal interviews (Asanuma [1985], Kato [1993]). Asanuma [1985] planed interviews about Japanese suppliers and discovered how they developed new parts for their buyers. Kato [1993] discussed Japanese supplier relationships from target costing view based on comprehensive interviews.

In this section, we discuss four major characteristics of *Keiretsu* systems indicated through literatures above. They are (a) Requests of cost reduction activities from buyers to suppliers, (b) Supports of cost reduction from suppliers to buyers, (c) Ex-post incentives for suppliers and (d) Stability of relationships.

Requests of Cost Reduction Activities from Buyers to Suppliers

First characteristic of *Keiretsu* systems is Requests of cost reduction activities from buyers to suppliers.

Japanese supplier firms have been requested sustainable cost reduction activities by buyers at R&D stage. In manufacturing companies, suppliers' cost reduc-

tion activities are indispensable for buyers' cost reduction because outside product costs, such as cost of purchasing goods and cost of ordered goods, are generally large and most of product costs are determined by suppliers' parts. For instance, Cooper [1996] discussed about this characteristic in target costing issue. He described that purchasing price was determined based on product target cost to reduce cost at R&D stage (Cooper [1996]). Additionally, Kato [1993] denoted that Japanese supplier relationships played an important role to carry out target costing activities successfully. He discovered that many Japanese firms continued requesting cost reduction activities to suppliers through R&D stage as well as Production stage (Kato [1993]).

Supports of Cost Reduction from Suppliers to Buyers

Second characteristic of *Keiretsu* systems is Supports of cost reduction from suppliers to buyers.

Japanese supplier firms have supported buyers' cost reduction to meet their cost reduction requests. For instance, Dyer=Ouchi [1994] discussed about Japanese-style partnerships. They indicated that mutual assistance between buyers and suppliers was an important factor of maintaining such partnerships (Dyer=Ouchi [1994]). Further, Cooper=Slagmulder [1999] described employee sharing between buyers and suppliers. They indicated that Japanese suppliers supported Japanese buyers' cost reduction by sending guest engineers and trainee engineers to buyers. They also indicated that buyers promoted suppliers' cost reduction activities by sending middle managers to suppliers (Cooper=Slagmulder [1999]).

Ex-post Incentives for suppliers

Third characteristic of *Keiretsu* systems is Ex-post incentives for suppliers.

Japanese supplier relationships are regarded as corporative, whereas traditional Western supplier relationships are essentially adversarial. These relationships lie in mutual benefits for both buyers and suppliers. For instance, Asanuma [1985] discussed ex-post incentives for suppliers at both R&D and production

stages. He indicated that purchasing price would fix for a given period if suppliers' cost reduction activities has succeeded (Asanuma [1985]). Fixing purchasing price by buyers means that suppliers might gain cost reduction profits as rewards for improvements. Further, buyers might evaluate these suppliers as superior ones who could succeed outstanding cost reduction activities.

Stability of Relationships

Fourth characteristic of *Keiretsu* systems is Stability of relationships.

Japanese supplier relationships are considered to be more stable than traditional Western supplier relationships. For instance, Cusumano=Takeishi [1991] described that length of contracts between buyers and suppliers was different among U.S. automakers, Japanese transplants and Japanese automakers. They suggested that Japanese supplier relationships were stable in 1980's, because these automakers tended to make long-term contracts with suppliers (Cusumano=Takeishi [1991]). Also, Cooper=Slagmulder [1999] discussed that stability of relationships was one of the most important characteristics of Japanese supplier relationships. They indicated that this characteristic brought trusting relationship, goal congruence, mutual investments and efficient coordination between buyers and suppliers (Cooper=Slagmulder [1999]).

From literatures about *Keiretsu* systems, these 4 characteristics have influenced each other and led to enhance specific investments and information sharing between buyers and suppliers. Also, these characteristics have made barriers to contract with outside *Keiretsu* suppliers.

Although many features are indicated by the description of 80s' or early 90s' *Keiretsu* systems, there is little evidence about these features of *Keiretsu* systems are still seen in Japanese firms nowadays. Mentioned above, Western-type supply chain management practices might influence Japanese supplier relationships in this decade. For discussion, to recognize recent Japanese actual supplier system is needed.

3. SAMPLES

We use questionnaire survey data to examine the features of *Keiretsu* systems nowadays. Questionnaires were mailed to 353 Japanese manufactures by The Management Accounting Research Group at Kobe University Group during 2002. 353 Companies are listed in section 1 of the Tokyo Stock Exchange and also belong to Machinery, Electrical/electronics, Transportation equipment or Precision equipment industries. These industries were selected because they had explicitly sustained *Keiretsu* systems. Questionnaires were sent to the each company's Procurement Division Manager. Finally, a total of 106 companies replied the questionnaire, representing a 30.0% response rate.

4. DISCUSSION BASED ON SURVEY DATA

We use 17 questions from questionnaire survey to assess the features of *Keiretsu* systems mentioned above. These question issues can be divided into 4 groups as following.

G1: Requests of cost reduction activities from buyers to suppliers (6 questions)

First group includes questions about (a) Parts improvement at R&D stage, (b) Process improvement at R&D Stage, (c) Part improvement at production stage, (d) Process improvement at production stage, (e) New parts development for buyers' product and (f) Improvement ideas proposal for buyers' product. Scores are scaled 1 for no expecting, scaled 2 for seldom expecting, scaled 3 for moderately expecting, scaled 4 for expecting, and scaled 5 for strongly expecting.

Table 1 describes a summary statistics of these questions. As stated in section 2, table 1 shows all questions tend to have high scores and it means that Japanese firms often request many kinds of cost reduction activities to suppliers. This indicates that suppliers' cost reduction activities are very important vehicles for reducing buyers' product cost. Also, it suggests that only bargaining with parts price isn't enough for buyers' cost reduction.

Table 1
Descriptive Statistics of Questions about
Requests of Cost Reduction Activity from Buyers to Suppliers*

Question	N	Mean	Standard Deviation
To Improve and/or customize parts (R&D stage)	106	4.56	0.634
To improve processes (R&D stage)	105	4.34	0.718
To Improve and/or customize parts (production stage)	104	4.41	0.705
To improve processes (production stage)	104	4.41	0.732
To develop new parts for buyer's products	105	3.77	1.076
To propose improvement ideas for buyer's products and/or process	105	4.33	0.873

* Scaled 1 for No expecting, Scaled 2 for Seldom expecting, Scaled 3 for Moderately expecting, Scaled 4 for Expecting and Scaled 5 for Strongly expecting.

G2: Suppliers' supports for buyers' cost reduction (6 questions)

Second group includes questions about (a) Meeting attendance at R&D stage, (b) Engineer sending at R&D stage, (c) Cost reduction ideas proposal at R&D stage, (d) Meeting attendance at production stage, (e) Engineer sending at production stage, (f) Cost reduction ideas proposal at production stage. Scores are scaled 1 for not supporting, scaled 2 for seldom supporting, scaled 3 for moderately supporting, scaled 4 for supporting, and scaled 5 for strongly supporting.

Table 2 describes a summary statistics of these questions. Table 2 presents that respond average is below 3 for Engineer sending at both R&D stage and production stage. This could be due to high cost of sending engineers from suppliers to buyers. Kato [1993] suggested that sending engineer from suppliers to buyers weakened suppliers' new product development capabilities.

Additionally, Table 2 shows that suppliers' support for buyers' cost reduction is relatively high at the R&D stage. Berliner=Brimson [1988] mentioned that cost reduction activities were effective at earlier stages, such as pre design stage

Table 2
Descriptive Statistics of Questions about
about Suppliers' Supports for Buyers' Cost Reduction*

Question	N	Mean	Standard Deviation
To attend meetings (R&D stage)	105	3.21	1.199
To send engineers (R&D stage)	105	2.34	1.125
To propose cost saving ideas (R&D stage)	105	3.52	0.822
To attend meetings (Production stage)	103	3.06	1.153
To send engineers (Production stage)	103	2.07	0.889
To propose cost saving ideas (Production stage)	104	3.45	0.799

* Scaled 1 for Not supporting, Scaled 2 for Seldom supporting, Scaled 3 for Moderately supporting, Scaled 4 for Supporting and Scaled 5 for Strongly supporting.

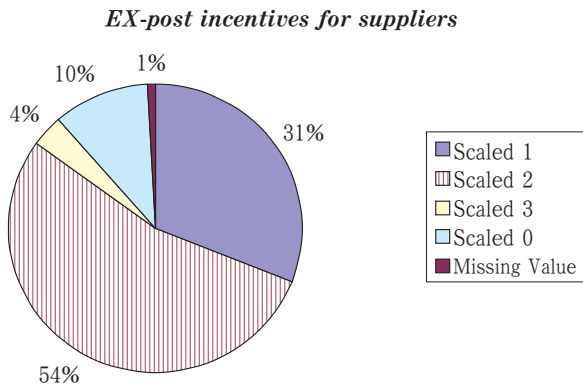
and concept design stage, because almost all the costs were determined at these stages.

G3: Ex-post incentives for suppliers (1 question)

Third Group indicates question about rewards for cost reduction activities from buyers to suppliers. For the cost reduction rewards, we ask whether respondents agree following statement: 'In R&D stage or Production stage, we could achieve cost reduction with supplier's collaboration. Therefore, profit from cost reduction should be divided in proportion to each company's efforts' or not.

4 statements are provided to select: (1) 'Absolutely. We must divide cost reduction profit in proportion to each company's efforts', (2) 'Mostly. But we can't satisfactorily divide cost reduction profit. Therefore, portion rises to occasion', (3) 'No. Cost reduction mostly results from our management efforts. Therefore, we can gain whole of the cost reduction profit', (0) 'We don't collaborate with suppliers'.

Figure 1 presents a respond proportion of Ex-post incentives for suppliers. In figure 1, 31.1% of survey data are indicated (1), 53.8% of survey data are indi-

Figure 1²⁾**Proportions of Replies about a Question of *Ex-Post Incentives for Suppliers***

Statement: In R&D stage or Production stage, we could achieve cost reduction with suppliers' collaboration. Therefore, profit from cost reduction should be divided in proportion to each company's efforts

cated (2), 3.8% of survey data are indicated (3), and 10.4% of survey data are indicated (0) and 0.9% of survey data are missing value. Figure 1 provides the evidence that many Japanese firms share cost reduction profit with suppliers in some way. Although most of Japanese firms are sharing it with suppliers, large portion of them aren't satisfied with the way of sharing.

G4: Relationships with Suppliers (4 questions)

Last group includes questions about (a) Long-term contracts, (b) Risk sharing, (c) Innovative information sharing and (d) Contracts outside *Keiretsu* sup-

- 2) The followings are the comments of the statement provided by researchers
- Scaled 1: Absolutely. We must divide cost reduction profit in proportion to each company's efforts (N=33).
 - Scaled 2: Mostly. But we can't satisfactorily divide cost reduction profit. Therefore, portion rises to occasion (N=57).
 - Scaled 3: No. Cost reduction mostly results from our management efforts. Therefore, we can gain whole of the cost reduction profit (N=4).
 - Scaled 0: We don't collaborate with suppliers (N=11).
 - Missing value (N=1).

pliers.

For Long-term contracts, we ask whether long-term relationships are considered sustainable or not. 3 statements are provided to select: (1) 'No. We may be contract with beneficial suppliers for us without regarding past contract profile', (2) 'Mostly. But it tends to be difficult to sustain long-term relationships with current suppliers' (3) 'Absolutely. We will basically sustain win-win long-term relationships with current suppliers'.

For Risk sharing, we ask whether suppliers' accidental losses are guaranteed or not. 3 statements are provided to select: (1) 'No. Because suppliers are independent entity, we don't guaranty any of the suppliers' accidental losses even if the losses are unpredictable for suppliers', (2) 'We must partly guaranty suppliers' accidental losses. But we'd not have to guaranty all of them', (3) 'Absolutely. We must basically guaranty all of the suppliers' accidental losses'.

For Innovative information sharing, we ask whether innovative information is spread among suppliers or not. 3 statements are provided to select: (1) 'No. Our innovative information is one of the most important resources for us. Therefore, we must use innovative information for facilitating our competitive advantage and sustaining our bargaining power', (2) 'Mostly. But we must select information to share with suppliers for sustaining our bargaining power', (3) 'Absolutely. We must share our innovative information with suppliers for facilitating whole supply-chains' competitive advantage'.

For Contracts outside *Keiretsu* suppliers, we ask whether contract is closed with outside *Keiretsu* suppliers via E-web. Scores are scaled 1 for not closed, scaled 2 for seldom closed, scaled 3 for sometime closed, scaled 4 for often closed, and scaled 5 for always closed.

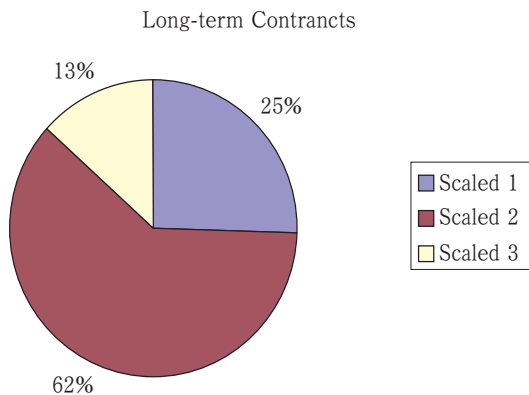
Table 3 describes a summary statistics of these questions. Long-term contracts and Risk sharing score below 2 and Sharing innovative information scores above 2. This result shows Sharing innovation information with suppliers is often seen in Japanese firms nowadays relative to risk sharing and Long-term contracts.

Additionally, Figure 2, Figure3 and Figure4 show the proportions of respondents of Long-term relationship, Risk sharing, Innovative information sharing.

Table 3**Descriptive Statistics of Questions about *Relationships with Suppliers****

Question	N	Mean	Standard Deviation
Long term contracts	106	1.88	0.613
Risk sharing	104	1.77	0.526
Sharing Innovative Information	106	2.09	0.578

* Scaled 1 for No, Scaled 2 for Mostly and Scaled 3 for Absolutely.

Figure 2³⁾**Proportions of replies about a Question of Long-term Contracts**

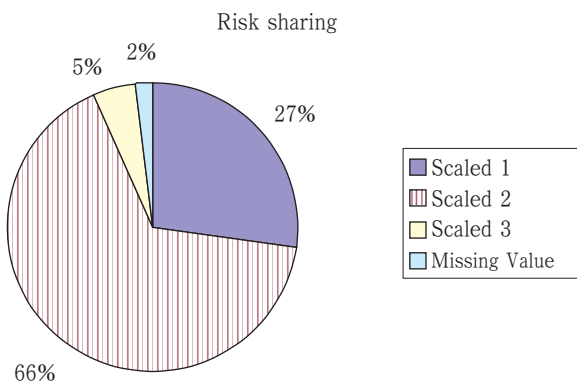
Statement: We have had long-term relationships with suppliers. Thus we will continue long-term relationships with current suppliers for future.

3) The followings are the comments of the statement provided by researchers

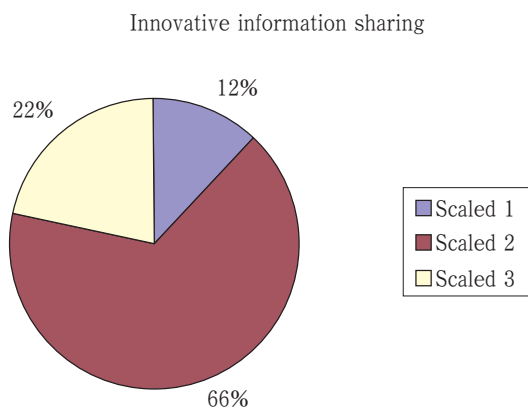
Scaled 1: No. We may be contract with beneficial suppliers for us without regarding past contract profile (N=27).

Scaled 2: Mostly. But it tends to be difficult to sustain long-term relationships with current suppliers (N=65).

Scaled 3: Absolutely. We will basically sustain win-win long-term relationships with current suppliers (N=14).

Figure 3⁴⁾**Proportions of replies about a Question of Risk sharing**

Statement: Suppliers had an accidental loss that wasn't predictable. (e.g. Our product sales volume are seriously decreased) We must guarantee suppliers' losses like this.

Figure 4⁵⁾**Proportions of replies about a Question of Innovative information sharing**

Statement: We develop an innovative way for competitive advantage. (e.g. product development, production, Quality Management Logistics etc) We must share this innovative information with suppliers.

Table 4
Relationship between Long-term Contracts and Risk Sharing
(Cross Table)

	Long-term contracts (No)	Long-term contracts (Mostly)	Long-term contracts (absolutely)	Total
Risk Sharing (No)	7 26.9%	19 29.7%	3 21.4%	29 27.9%
Risk Sharing (Mostly)	18 69.2%	42 65.6%	10 71.4%	70 67.3%
Risk Sharing (Absolutely)	1 3.8%	3 4.7%	1 7.1%	5 4.8%
Total	26	64	14	104
	100.0%	100.0%	100.0%	100.0%

All figures show that majority of respondent answers 2. On the other side, the proportion of scaled 3 changes. For this proportion, Innovative information sharing is larger than Long-term relationship or Risk sharing.

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- 4) The followings are the comments of the statement provided by researchers
- Scaled 1: No. Because suppliers are independence entity, we don't guaranty any of the suppliers' accidental losses even if the losses are unpredictable for suppliers (N=29).
- Scaled 2: We must partly guaranty suppliers' accidental losses. But we'd not have to guaranty all of them (N=70).
- Scaled 3: Absolutely. We must basically guaranty all of the suppliers' accidental losses (N=5).
- Missing value (N=2).
- 5) The followings are the comments of the statement provided by researchers
- Scaled 1: No. Our innovative information is one of the most important resources for us. Therefore, we must use innovative information for facilitating our competitive advantage and sustaining our bargaining power (N=13).
- Scaled 2: Mostly. But we must select information to share with suppliers for sustaining our bargaining power (N=70).
- Scaled 3: Absolutely. We must share our innovative information with suppliers for facilitating whole supply-chains' competitive advantage (N=23).

Table 5
Relationship between Long-term Contracts and Sharing Innovative Information
(Cross Table)

	Long-term contracts (No)	Long-term contracts (Mostly)	Long-term contracts (absolutely)	Total
Sharing innovative information (No)	3 11.1%	6 9.2%	4 28.6%	13 12.3%
Sharing innovative information (Mostly)	17 63.0%	44 67.7%	9 64.3%	70 66.0%
Sharing innovative information (Absolutely)	7 25.9%	15 23.1%	1 7.1%	23 21.7%
Total	27 100.0%	65 100.0%	14 100.0%	106 100.0%

Table 4 and Table 5 present relationships between Long-term contracts and Risk sharing, Long-term contracts and Innovative information sharing respectively.

From these tables, firms tend to share innovative information with suppliers without guarantying suppliers' accidental losses. Recently, Japanese economy has fallen into a state of depression. This depression has weakened Japanese firms' competitive advantages and disturbed *Keiretsu* systems. Guarantying suppliers' accidental losses often impose highly costs for buyers. Therefore, this evidence shows that some portions of Japanese firms abandon *Keiretsu* systems without regarding its competitiveness.

Additionally, from Table 6, purchasing outside *Keiretsu* suppliers via E-web is

Table 6
Relationship between
Long-term Contracts and Purchasing outside *Keiretsu* Suppliers Using E-web
(Cross Table)

	Long-term contracts (No)	Long-term contracts (Mostly)	Long-term contracts (absolutely)	Total
Purchasing outside <i>Keiretsu</i> suppliers using E-web (Not Closed)	8 29.6%	24 36.9%	5 35.7%	37 34.9%
Purchasing outside <i>Keiretsu</i> suppliers using E-web (Seldom Closed)	5 18.5%	18 27.7%	4 28.6%	27 25.5%
Purchasing outside <i>Keiretsu</i> suppliers using E-web (Sometimes Closed)	5 18.5%	13 20.0%	3 21.4%	21 19.8%
Purchasing outside <i>Keiretsu</i> suppliers using E-web (Often Closed)	7 25.9%	9 13.8%	1 7.1%	17 16.0%
Purchasing outside <i>Keiretsu</i> suppliers using E-web (Always Closed)	2 7.4%	1 1.5%	1 7.1%	4 3.8%
Total	27 100.0%	65 100.0%	14 100.0%	106 100.0%

not popular among Japanese firms at present. But Table 6 points out that the firms that contract suppliers without regarding past contract profile mainly introduce purchasing outside *Keiretsu* via E-web. Therefore, this evidence indicates that some portions of Japanese firms begin to purchase outside *Keiretsu* suppliers via E-web, which makes to decrease costs of processing transaction with new suppliers.

5. CONCLUSIONS AND FUTURE RESEARCH ISSUES

In this paper, changes of supplier relationships and the influence of Western-type supply chain management among Japanese firms are examined. Japanese supplier relationships, or *Keiretsu* systems, are characterized by (a) Requests of cost reduction activities from buyers to suppliers, (b) Supports of cost reduction from suppliers to buyers, (c) Ex-post incentives for suppliers and (d) Stability of relationships. Survey results present supportive evidences in some extent. Supplier firms have been requested cost reduction activities by buyers and they have supported buyers cost reduction in various ways. Further, suppliers have gained cost reduction profits as rewards in proportion to their efforts. But these profits are able to change in occasion. It means that *Keiretsu* systems are not always beneficial for suppliers.

Survey results also present conflicting evidences. Japanese firms have tended to share innovative information with suppliers without guarantying suppliers' accidental losses. Additionally, purchasing outside *Keiretsu* systems via E-web has been introduced by the firms which contract suppliers without regarding past contract profile. These evidences indicate that *Keiretsu* systems are beginning to be costly for buyers because of serious depression and decreasing costs of processing transaction with new suppliers.

Keiretsu systems are regarded as a source of competitive advantage in Japanese firms. But these systems are not always beneficial for suppliers and begin to impose highly costs to buyers. In recent years, these imperfections of *Keiretsu* systems are especially significant. Therefore an avenue for future research is conducted a series of intense interviews among Japanese firms to find what has really changed for buyer-supplier relationships in each firm. Through the investigations, some unknown characteristics of *Keiretsu* systems can be revealed.

Based on these new evidences, we'll be prepared to discuss how to adapt the inter-organizational cost management (e.g. Target Cost Management) in current status or in future.

(付記)

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Japanese supplier relationships, or *Keiretsu* systems, are recognized as a major contributing factor of competitive advantage of Japanese firms. Some Western firms have introduced this practice and have achieved outcomes such as significant cost reduction and/or outstanding quality improvement.

Against the reputation, *Keiretsu* systems among Japanese firms are facing various difficulties. Especially, costs of maintaining systems become significant. Some portions of Japanese firms abandon their existing value chain and introduce recent Western practices including global sourcing and electronic purchasing. But little is known how Japanese firms have perceived their supply chain and try to change.

In this paper, changes of supplier relationships and supply chain management among Japanese firms are examined. Firstly, characteristics of Japanese firms' supplier relationships are figured out through the comprehensive literature surveys. Secondly, the closer look of Japanese supply chain management are presented. The main focus here is the collaborative efforts between buyers and suppliers, especially at both R&D and production stages. Thirdly, the result of

questionnaire survey is presented. Questionnaires were mailed to 353 manufacturing companies listed their stocks in Section One of Tokyo Stock Exchange. Finally, the new avenue of inter-organizational managerial accounting research is indicated to stimulate the future research in this field.