

4

Globalization of Japanese Subcontract Transaction and Asian Suppliers

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1. INTRODUCTION

The usual form of business in Asian and other developing countries is undertaken by small- and medium-sized enterprises (SMEs), however, their level of technological development is usually low.

A major reason for this is that capital restrictions make technical reform such as the installation of equipment difficult. A general lack of confidence in SMEs makes it hard for them to raise money on the capital market, and, indeed, in many instances, they are unable to raise capital on these markets. Moreover, high interest rates charged by commercial banks on loans to SMEs pushes up their costs. Another reason why SMEs are in a technologically inferior position is that acquiring technological information for their business is difficult. This does not necessarily mean that the cost of purchasing technology is high, but rather, that SMEs lack the correct information about where and how it can be accessed. Given these circumstances, the employment and training of a highly-skilled work force becomes difficult, which in turn, restricts the level of technology available to SMEs.

Along with the backwardness of their technology, one more difficulty concerning SMEs is the problem of marketing. Here, SMEs face difficulties because of the small scale of their operations. Marketing is often

neglected due to low sales demand, while funding for building distribution routes is meager, making market expansion difficult. Indeed, marketing problems are strongly related to technological ones, as technological development is dependent on information released by the market or consumer trends (claims against goods, needs, etc.), as shown by Klein and Rosenberg's [1986] 'chain-linked model.' Therefore, the weakness of the SMEs relationship with the market is directly connected to their technological backwardness.

The development policies of governments attach great importance to large enterprises, and tend to neglect SMEs. One reason for this is that large enterprises wield greater political clout, but it is also because the concentration of limited resources into specific businesses makes economies of scale possible and saves on administrative costs.

The low level of technology among SMEs is often highlighted as being a hindrance to production in developing countries, especially in assembly industries. There is an understanding that underdevelopment in component, parts and other supporting industries restricts development of assembly industries.

However, Minato [1992] advocates a different view, based on the experience of Japan's machinery industries. He argues that the early development of the machinery industries in Japan was not achieved by the advanced technology of SMEs, but rather, that loose business relations were formed between large enterprises (assemblers) and SMEs (component manufacturers) which encouraged the transfer of technology from the assemblers and resulted in the technology advances of SMEs. In other words, the low level of technology among SMEs is not necessarily restrictive for the assembly industries, but rather, it is the character of the transact relationship between enterprises, and whether or not this encourages technology transfer, that is important. The importance of interaction between enterprises in general was pointed out by Lundval [1988].

This paper aims to clarify how subcontract transactions promote the technological development of SMEs, and what implications the experience of Japan's subcontract transactions hold for SMEs in Asian and other developing countries. In discussing the Japanese experience we refer to the changing nature of the subcontracting system fostered by changes in technology and market conditions. Particularly, we focus on how economic globalization is increasing fluidity in transaction relationships and, how this in turn, is reforming the Japanese subcontracting system. Furthermore, while we acknowledge that this change has increased

the opportunities for Asian SMEs to participate in Japanese subcontract transactions, we also point out that globalization involves risks for the Asian suppliers, i.e., marginalization.

2. ADVANTAGES OF SUBCONTRACT TRANSACTIONS

2.1. Continuous Transaction

Japanese businesses have generally had a policy of continuous transaction. This is true not only in the purchasing of parts and components from subcontractors, but also elsewhere. This occurred because of the division of labor that developed in the parts and components industries created by the '*keiretsu*' system (affiliated companies), and also because continuous transactions yield economic profits. One source of profits is the economization of transaction costs – if the goods are not standardized transaction costs are high. Naturally, such specialized goods cannot easily be supplied by the market.

Continuous transactions yield profits in the standardized parts and components markets, too. Here, it is possible that component supply on the spot market from outside the system is temporarily cheaper and of higher quality. However, continuous orders to subcontractors produces lower prices and improved quality, over a long period of time.

One of the reasons for this is the learning effect. Repeated and continuous orders of parts and component production, including similar or different kinds of operations, results in shortened manufacturing time and material savings which reduces costs and improves quality. This learning effect can be seen in mass-produced products, and, of course, prototype products.

Another effect of continuous transactions is the formation of organizational 'quasi-rent'. Various types of information relating to production and transactions between business parties, which has an affect on production and quality, is amassed by the continuation of transactions. However, it is only of value to the business parties involved in the transactions.

Finally, there is the issue discussed by Hirshman [1970] 'exit or voice.' When prices are high or quality is low, the act of suspending transactions and changing supplier (exit) creates pressure on the supplier to improve quality and renew technology. However, such a step usually means that useful information is not transferred. On the other hand,

pointing out problems with regard to pricing and quality to the supplier and indicating the causes and solutions (voice), leads to the transfer of information for technological renewal. This voice is made possible by continuous transaction.

In Japan, so-called 'design-in' is carried out, here, component manufacturers participate in the design of assembly manufacturers' products. Japanese design methods have developed along different lines from those in Europe and the United States. According to Sei's investigation into automobile manufacturers (Sei [1991]), the design of new models for the automobile industry in Europe and the United States is fundamentally carried out by the assembler, with component manufacturers and engineering companies being commissioned as assistants. The completed plans are collected together by the assembly manufacturer and put out for public tender, the supplier is decided upon and preparation for mass-production begins.

In Japan's case, first the supplier is chosen centering on affiliated companies, the target price and specifications are given, and the new product is designed in partnership. This method improves quality, while at the same time, shortening the development period of new products and lowering development costs, as shown by Clark and Fujimoto [1991] and others.

Nearly all component specifications are determined in the design-in stage, so components are specific to each assembler or each model. In effect, while being a prerequisite of continuous transaction, design-in also strengthens continuous transaction.

2.2. Competition Among a Limited Number of Firms

There are few transact partners in subcontract transactions. However, the limited number of partners does not cause a decline in competition.

In subcontract transactions in Japan, assemblers carry out continuous transactions with a limited number of subcontractors, while encouraging competition among them by ordering the same components from several firms. Itoh and Matsui [1989], called competition between a limited number of parties "face-to-face competition" and stated that it is more severe than market competition. The reason for this being that "face-to-face competition" brings out characteristics such as rank-order competition and rival observation competition. Itami and Senbongi [1988], called competition under the subcontracting system in the automobile industry

“organized competition”, and contrasted it with market competition characteristics – short-sighted preoccupation with a small number of indicators such as price. While organized competition was characterized as taking a long-term view, made possible by a variety of factors, not least the subcontractors’ technological and product development capability.

Assemblers set up formats for technological exchange among the subcontractors, to encourage joint ownership of technology while working in friendly rivalry to improve technology.

Competition in subcontract transactions centers around not only component price, but also costs. In Japan, assembly manufacturers ask component manufacturers for detailed indications of the production costs of components. Furthermore, they set target prices and put pressure on individual component manufacturers, especially those whose costs are relatively high, and encourage technological innovations in order to lower costs.

With regard to transaction price setting for components in the automobile industry, Asanuma [1984], points out that component unit prices are determined by assemblers to encourage rationalization investment and technological advance. The unit price of a component is decided by the assembler taking into consideration that a percentage of the surplus generated by the component manufacturer’s rationalization investment would be returned. Likewise a part of the profit obtained from the component manufacturer’s proposal for design change is returned as an improvement proposal reward.

In short, although transaction partners are limited in Japan, competition among component manufacturers is directly encouraged by the assembler using rewards and sanctions, as a result of which, not only are costs lowered but quality is raised, while the modernization of the technology required to make this possible is encouraged.

2.3. Conditions for the Subcontracting System

What are the conditions under which the subcontracting system has been maintained? The most important reason is that the subcontracting system offered economic benefits as mentioned above, and those concerned recognized this fact. However, the subcontracting system cannot be developed by this alone, as it is not easy to get rid of the opportunistic behavior of component producers and assemblers.

Nakamura [1983] cites the “ie” (household) system – the sense of

belonging to a group and the loyalty factor which exist among people – as the main cause for the subcontracting system in Japan being set up and maintained. However, even if these cultural and social factors have influenced the development of the Japanese subcontracting system, insofar as subcontract transactions are economic acts, the conditions under which the subcontracting system was set up and maintained has to be explained in economic terms.

Using the concept of ‘transaction-specific investment,’ Williamson [1985] argues that inasmuch as assets are held which only yield value between specific transaction partners, breaking away from a transaction is controlled. Such assets are a kind of ‘hostage’ (Williamson [1983]). Investment in specialized machinery is one such example.

But why do firms invest in the first place in specialized machinery, thereby, offering a hostage? According to Minato [1988], in order for investment to take place in specialized machinery which cannot be converted to another use, secure and reliable relationships with purchasers are necessary and social norms regulating relations between companies are required. For example, subcontract reorganizations during a recession was considered as a deviation from the social norm, as subcontracts could not be guaranteed during an economic boom. Through such sanctions, the social norms that a company should obey were formed, and thus the subcontracting system was maintained for a long period.

The reason for the subcontracting system being stable lies within the subcontracting system’s formation and development process. Assembly manufacturers nurtured component manufacturers while providing them with technical assistance. Component design was carried out by ‘design-in.’ Components were specialized, and as a result the subcontractors’ equipment was specialized. Assembly manufacturers’ products came to depend on such specialized components and equipment. By this process, they formed assets that were special to transactions that gave rise to ‘quasi-rent’ (The result was that stopping transactions created a large opportunity cost).

Moreover, it is necessary to focus on the external environment surrounding transactions as a principal factor behind the subcontracting system being maintained for such a long time. For despite a number of ups and downs in business conditions, the Japanese economy has achieved generally consistent and high growth over the last thirty years and apart from one period prices have remained stable. Such economic conditions helped to control opportunistic behavior and deterred assemblers from

frequently replacing transaction partners who demanded favorable transaction conditions. Another important factor was that the production technology in the subcontracting systems' development period was continuous. This made it possible for assemblers to adapt to technological change without replacing transaction partners.

3. CHANGING NATURE OF SUBCONTRACTING SYSTEM

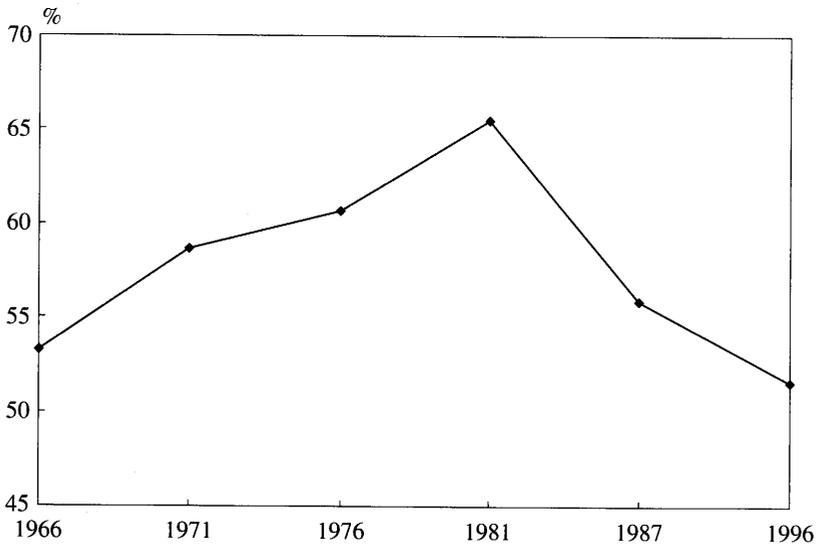
3.1. Growing Opportunity Cost of Continuous Transaction

The subcontracting system has benefited from the above advantages, nonetheless, it also has some disadvantages. Continuous transaction with a specific firm based on the subcontracting system might mean a loss of profit that could have been obtained by transactions with another company, in other words, it is accompanied by opportunity cost. If this opportunity cost is greater than the profit gained from continuous transaction, a different form of transaction is selected by both the parent company and the subcontractor.

The Japanese subcontracting system is changing. It is becoming more open. The subcontractor ratio (weight of subcontract SMEs) increased in the 1960s and 1970s and reached a peak of 65.5 percent in 1981. However, the ratio started to decline in the 1980s and 1990s, and by 1996 it was down to 51.6 percent. As for the degree of dependence of subcontracting SMEs on subcontract work, in 1987 more than 80 percent (81.5%) of SMEs were totally dependent on subcontract work. By 1996, the proportion had fallen to less than 50 percent (48.4%), while the proportion of SMEs whose subcontract work constituted less than 30 percent to total sales increased from 4.4 percent in 1987 to 15.9 percent in 1996 (see Figure 4.1).

The primary reason for subcontract reorganization is technological change. Part of technological change is the standardization of technology. One reason why continuous transaction is chosen is to save transaction costs. Transaction costs are high particularly when the goods are not standardized. On the contrary, if goods are standardized they can be supplied from the market easily without transaction costs.

Other technological change which encourages subcontract reorganization is the increase of unit parts. Unit parts, which are especially aimed at reducing costs, reduces orders to lower position subcontractor firms in particular, by increasing the in-house production of parts at the parent

Figure 4.1: Changes in Small and Medium Subcontractor Ratio

Source: Small and Medium Enterprise Agency [1997].

company, and by ordering in package to upper position subcontractors.

The second major reason of subcontract reorganization is the parent company's diversification and business changes. If new operations are technically related to previous operations, there is a good possibility that the subcontract relationship will be continued. The subcontractor can catch up with new activities by using its own labor force and technology. However, it is not easy for the subcontractor to catch up if it has few technological relationships, as it takes time to learn new component production techniques and industrial technology. On the other hand, if a company exists which is already carrying out such component production and industrial technology, or has been carrying them out for a short while, it will be more profitable for a parent company to have transactions with that company. In short, if the technology that requires new operations already exists then continuing a subcontract transaction is not profitable.

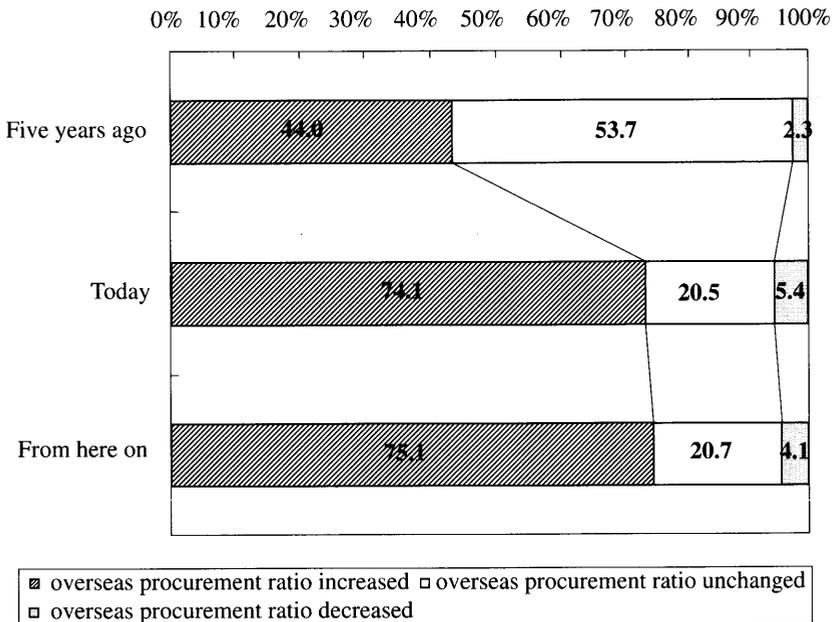
The third major reason of subcontract reorganization is related to the globalization of production and component procurement.

Part of this is the parent company's overseas production. Even if the parent company has commenced overseas production, the relationship

with the subcontractor will continue so long as parts are exported to the overseas factory. There are even cases where the subcontractor ventures into overseas production itself. However the relationship with the subcontractor will undergo major changes if import taxes are high, the same kind of component industry already exists in the region, or when buying from local component manufacturers is politically sanctioned.

Another aspect of globalization is the increased use of imported components by the parent company. The parent company might switch to purchasing from foreign suppliers instead of its subcontractors if there is a large difference between domestic and foreign prices. A shift to imported components carries problems of quality stability, but there is no problem if the components are technologically standardized. Delivery unreliability can also be reduced by the development of computerized inventory management and transportation.

Figure 4.2: Changes in the Overseas Procurement Ratio (Main Contractors)



Note: Main contractors include primary and secondary subcontractors that have their own subcontractors

Source: Small and Medium Enterprise Agency [1996].

Figure 4.3: Changes in What Customers Want from Their Subcontractors (Small and Medium Subcontractors) (First Seven Requirements in Order of Importance)

	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7
10 years ago	Firm delivery dates (42.0%)	Higher quality and precision (26.8%)	Large lot production (26.4%)	Reliable supply of materials and semifinished goods (20.0%)	Quality assurance (19.9%)	Thorough-going cost reductions (19.0%)	Shorter delivery times (12.5%)
5 years ago	Thorough-going cost reductions (31.6%)	Firm delivery dates (30.1%)	Shorter delivery times (28.7%)	Quality assurance (25.1%)	Higher quality and precision (25.1%)	Large lot production (18.8%)	Large lot production (13.2%)
Today	Thorough-going cost reductions (55.2%)	Shorter delivery times (31.7%)	Higher quality and precision (25.3%)	Quality assurance (22.0%)	Large lot production (21.0%)	Firm delivery dates (14.7%)	Capacity to deal with sporadic ordering (11.3%)

Source: Same as Figure 4.2.

A survey in 1996 showed that parent companies, which include primary and secondary subcontractors that have their own subcontractors, are currently increasing overseas procurement. The number of parent companies which indicated by their responses that they had increased overseas procurement was 44 percent five years ago. This ratio went up to 74.1 percent in 1996 and 75.1 percent of them intend to carry on increasing overseas procurement (see Figure 4.2).

A re-examination of purchasing policy in the Japanese assembly industries is being carried out. Today the assemblers tend to attach greater importance to cheap cost over other factors. The survey cited above showed that the most important requirement for subcontracting was 'firm delivery dates' ten years ago (42% of parent companies gave it priority). Today the majority (55.2%) of parent companies give 'thoroughgoing cost reduction' as the most important requirement. This was not cited in the top seven requirements ten years ago. Which means that quality instability and delivery unreliability have become less important factors (see Figure 4.3). Meanwhile the growing importance of cost reduction is also promoting the increase of parts and components supplied from abroad.

The opportunity cost of continuous transaction is the same for subcontractors. Transactions with a specific parent company narrows business opportunities in which accumulated management resources such as technology and capital can be used. The opportunity cost of transactions with a single firm or a small number of firms which is characteristic of subcontractors is therefore increasing.

3.2. Uniformity of Parts

Parts differentiation by model and assembler is also being reconsidered. Most components originating from the subcontract transaction are not common because components are made according to the specifications designated by the parent company. As mentioned above, component specifications are determined in order to suit the product design, by the 'design-in' process. Product design is not necessarily done with already existing parts as a prerequisite. Such product design methods make parts specific while product diversification (small scale production of many product types), makes parts even more specific.

A company can make a profit even after specializing the components in each model, because there are some benefits over and above that spe-

cialization. One such advantage is a reduction in product development costs owing to 'design-in.' Product market expansion also makes production possible at a minimum optimum range. Product diversification increases the number of components and raises the cost of the components, but the consequent rise in cost of high value-added products can be converted into their price and the administration costs accompanying the variety of products and components can be controlled by total quality control (TQC), just-in-time (JIT), etc.

The separation of the market for components (component specialization) originating from the subcontract transaction as explained above yielded a profit for assemblers and component manufacturers in excess of the resulting loss of the opportunity cost. However, it should be confirmed that such a method was not necessarily selected because component specialization had some advantages, but rather, that it was due to historical circumstances whereby assemblers nurtured subcontractors by giving technical assistance because of the need for component development.

According to Fujimoto [1995], among the parts used in the Japanese automobile industry, parts for common use account for 10 percent or less of purchasing costs, and the rate of component uniformity among models of the same companies is no more than about 20 percent. This is low compared with 30 percent among European companies and 40 percent among US companies. It goes without saying that this is a reason for increased costs. Fujimoto calls this 'over-design.' It can also be called 'over-differentiation.'

There is no problem if consumers place a high value on such product differentiation. The pursuit of differentiation is at the source of technological renewal and new product creation. However, if consumers do not place a value on product differentiation or they are not satisfied with the differentiation, they will not purchase a new model. In that case, firms cannot recover the costs of product development and the high cost of the special component production.

There is also a trend toward component uniformity among rivals engaged in oligopolistic competition. Or, contrary to before, a trend toward carrying out product design assuming components already on the market (including overseas). The development of the use of common parts and components in models and even among assemblers may drastically change the subcontracting system. This re-examination of purchasing policy naturally accompanies subcontract reorganization. The sub-

contracting system, which has been a closed production system, is becoming more open.

3.3. Macro- and Mezzo-Economic Problems

The subcontracting system can sometimes delay the production adjustment of companies or industries.

When there is continuous change in the market or in technology, the subcontracting system can adjust flexibly to such changes. However, when a product appears which is completely different to conventional ones, the subcontracting system cannot easily cope. Furthermore, a production system cannot be easily organized by assemblers, who rely on subcontractors for most of their components, as the old production system must be scrapped before a new one is set up and the subcontracting system restructured. But this involves a social cost. Originally the aim of the subcontracting system was to economize investment and to use cheap labor through the externalization of part of the production process. However, as it could be easier for parent companies to terminate subcontracting than to cut away integrated sections within an assembler, the reorganization of subcontractors might possibly receive social sanction.

For end subcontractors, in extreme cases, there are situations where they do not even know what components their own company is manufacturing or processing. It is extremely difficult for such a company to leave the subcontract transaction and develop products independently. In other words, excessive subdivision of production based on the subcontracting system discourages SMEs from conducting new product development which might be one of the most important social function of SMEs.

Most subcontractors have accumulated work force skills to support advanced processing technology. However, a situation has emerged among subcontractors whereby they can no longer attract young workers due to low processing fees and wages, and inevitably they lose these accumulated skills. This in turn, weakens their capacity for creating new products and new production technology.

The subcontracting system has another social problem – unfair transaction. The use of the capital cost economization and low wages have been historically important reasons for large enterprises carrying out subcontract transactions. To achieve vertical integration embracing every production process requires enormous investment, however such capital power even among large enterprises is scarce. Vertical integration also

faces high-risk factors such as large fluctuations in the business climate. SMEs play the role of shock absorbers for fluctuations in business conditions. The postwar lifetime employment system became widespread in large enterprises, but in order to maintain it, part-time and seasonal workers were engaged on the periphery, and it was necessary to externalize part of the production process and rely on subcontractors. Thereby creating a subcontracting system that utilized the wage gap between large enterprises and SMEs.

This dual structure between large enterprises and SMEs was eventually reduced due to economic growth and a shortage of labor. Indeed, Kiyonari [1973] declared that the dual structure had disappeared, while Miwa [1990] pointed to the profit rates of different business areas in order to show that the dual structure had never existed.

The reason why the shock absorber role against fluctuations in business conditions did not face any serious problems is because the Japanese economy attained continuous growth. During recession, however, reorganization of subcontractors along with the dismissal of temporary and seasonal workers was carried out. And, although the wage gap was reduced, it unmistakably existed. The wage gap was greatest in cases where fringe benefits such as welfare programs were taken into consideration. Perhaps differences in the working environment should also be included.

Subcontractors were also in a commercially disadvantageous position. A difference in economic power exists between a parent company and its subcontractors. Subcontractors are commercially controlled, particularly in the case of exclusive subcontracts. It was because of this asymmetric relationship that parent companies interfered with production cost details and demanded cost cuts, and were able to create competition among subcontractors. Basically, the relationship between a parent company and its subcontractors is an unfair one.

In short, the Japanese subcontracting system is being reorganized to represent a more open system for reasons mentioned above, and such an undertaking is necessary for both parent company and subcontractors alike.

As a consequence of these developments, it is possible that a convergence of the Japanese model and US-European model may occur, because the industries in the United States and Europe have copied Japanese production and procurement methods by decreasing integrated production as well as increasing purchases from a limited number of sup-

pliers. The book, *Machine that Changed the World*, by Roos et al. [1990], also stimulated this change.

We could well see the future profile of the Japanese subcontracting process in the US and European auto industry, as assemblers try to produce a world car to stimulate a single world market. Such world car production realizes the economies of scale and consequent standardization of components, which reduces production costs. The assemblers also have to satisfy consumers by product differentiation. Furthermore, response to market needs in product development and delivery are important.

In order to realize two goals assemblers uniform the platforms, where several models are assembled over a few platforms. In this system the parts and components for each model are procured worldwide by a limited number of suppliers and sometimes one supplier (single sourcing). The assemblers encourage the suppliers to locate in the surrounding area (follow sourcing). This single and follow sourcing are similar to the model followed by Japanese firms (concepts of new production system, see Table 4.1).

It differs, however, from the traditional Japanese subcontract transaction in two ways. Firstly, the suppliers are not subcontractors which depend on the parent company for their sales, and secondly, the suppliers supply parts and components to all factories which produce the same model.

We can see a similar production system in the electronic industry. But there the parts are highly standardized and follow sourcing is not common and unnecessary because of relatively easy transportation.

Table 4.1: Global Production and Sourcing

Business conditions	Business objectives	Production concept	Parts & components	Procurement policy
low economic growth	cost reduction	"platform"	standardization	follow sourcing
stagnated technological innovation	differentiation		unit parts (module)	global sourcing
varied demands	quick delivery			
mega-competition			parts for common use	

Source: Author.

4. ASIAN SUPPLIERS AND THEIR LIMITATIONS

4.1. Organizing Subcontracting System by Japanese Subsidiaries

As mentioned above, Japanese enterprises have increased foreign direct investment to developed and developing countries. This process could promote the development of local suppliers and a subcontracting system in a host country. As Japanese assemblers depend on subcontract transaction at home, it is logical to organize a similar system in a host country, so that they can enjoy the benefits of subcontract transaction.

In a country where there are few restrictions on imports the advantages of setting up such a system is relatively small. But many countries which promote industrialization enforce a national content law and put other import restrictions into operation. However, even where there are no restriction on imports, the assemblers will usually try to organize a subcontracting system in order to decrease the unreliability of imports (uncertainty of shipment, foreign exchange, etc.), and increase the flexibility of parts and component procurement.

Flexibility in component procurement is necessary for assemblers to supply their products quickly in response to demand. The production by quick response is growing in importance in both the domestic and export markets and flexible parts procurement is indispensable for the success of production by quick response. Furthermore, the geographical proximity of suppliers is important for flexible parts procurement, as it decreases components in stock, which is vital for cost reduction.

The geographical proximity of suppliers also helps organizational "quasi-rent" formation, which makes possible the technological advance in production and product development through good communications.

In Asian and developing countries, assemblers can use local suppliers as subcontractors. In this case, component production is carried out in small batches and the processing is labor intensive and can be undertaken at low cost by local suppliers. This outsourcing enables the assembler to economize on fixed asset investment and employment.

Another reason why transaction with local suppliers is necessary is that it is not easy for Japanese subcontractors at the secondary and lower tiers to invest abroad. For them, foreign investment is a risky business because they are relatively small operators and, even if the investment were undertaken, they cannot easily obtain the orders necessary for optimal size production because the customer is almost always limited to

their parent company.

4.2. Limitations

Moreover, transactions with local suppliers in Asian countries may be limited to a number of components and elements of the production process. The most important reason for this is that the technological level in the host country is usually very low and technology transfer requires a great deal of organizing and is expensive. The opportunistic behavior of suppliers also discourages technological transfer.

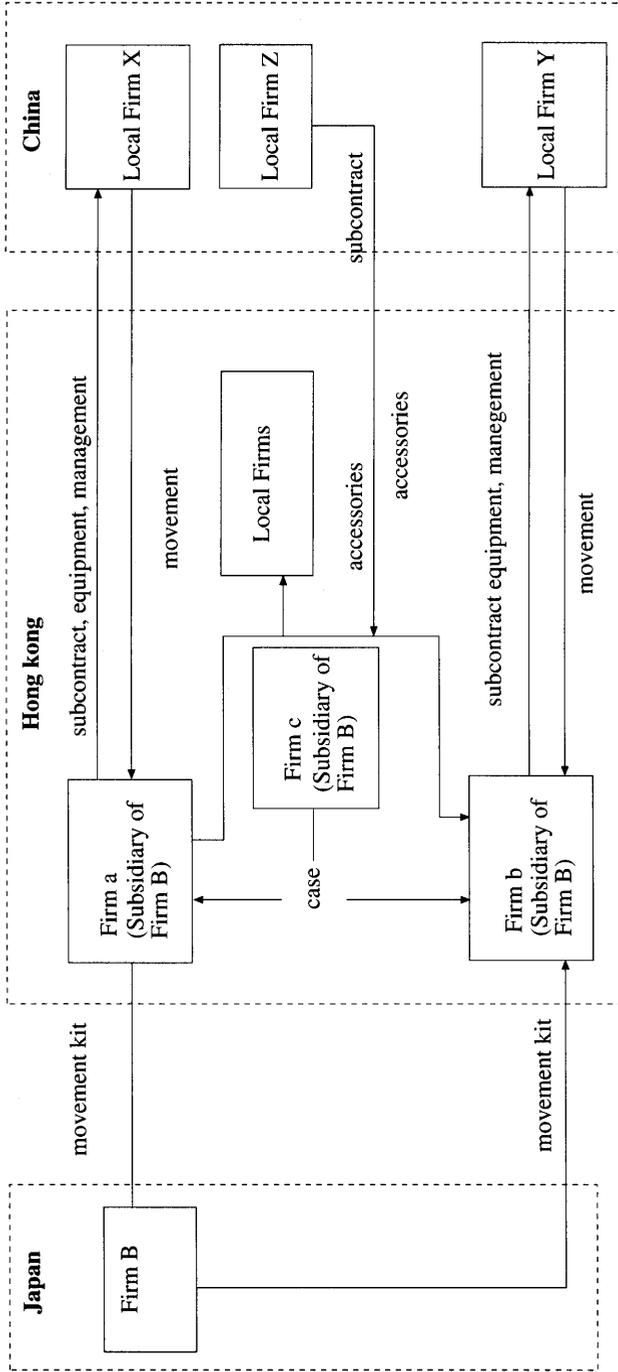
A good example of the above can be seen in the case of watch production in Hong Kong, where the movement kit, the most important component, is imported from Japan while accessory parts are purchased in Hong Kong and mainland China (see Figure 4.4). Another example is automobile electric parts in Thailand, here the majority of the components in terms of value are imported from Japan and more than half of the domestic components come from Japanese subsidiaries in Thailand. Raw materials for electric parts are also procured from Japan and from Japanese subsidiaries (Table 4.2). The reason for this being that the imported components are essential to the final product quality. Yet another example can be seen in the case of a Japanese camera assembler in Taiwan, although in this case several processes such as machining, injection and others are done by local suppliers (Figure 4.5).

Furthermore, globalization worldwide is bringing a large number of changes to the production system. Liberalization of imports and reductions in customs duties in Asian countries have an acute effect on the procurement policies of assemblers, who are shifting some of their domestic production components in favor of imported components. This shift to imports is vital for assembly manufacturers to achieve competitiveness with their own products.

Globalization also promotes reorganization of overseas production bases. Table 4.3 shows the location strategy of a Japanese electric auto parts producer in Asia. As the parts market in each country is very small, the company intends to centralize production into a single country, from where the parts will be supplied to the other countries.

The production of a model for the world market equipped with standardized parts and components (the world car mentioned in Section 3 is a typical example) will drastically decrease the number of suppliers. Most of these suppliers, particularly suppliers in the primary tier are multina-

Figure 4.4: Watch Production and Parts Procurement by Japanese Firm B



Source: Koike [1990].

Table 4.2: Procurement by Japanese Parts Producer A in Thailand

		Number of suppliers		Value
		Number	%	%
Parts	from Japan	50	39	79
	ASEAN	2	1	1
	local Japanese subsidiaries	18	14	14
	others	59	46	6
	Total	129	100	100
Raw materials	from Japan	9	65	58
	ASEAN	0	0	0
	local Japanese subsidiaries	2	14	34
	others	1	7	4
	Total	14	100	100

Source: Denso [1996].

Table 4.3: Cost Penalty of Automobile Parts Production in Asia and Production Concentration Program

(unit: 1,000/ year)

	Optimum minimum ¹⁾ production (1 line, 2 turns)	Production quantity in ASEAN (1998)	Production base in ASEAN ²⁾			
			NDT	NDI	NDM	PAC
alternator	1,500	600	◎	○	○	
starter	1,500	800	◎	○	○	
compressor	600	400		◎	○	
evaporator	600	400	○	○	○	
spark plug	10,000	18,000	○	◎		
combination meter	500	240				◎
wiper motor	600	400	◎		○	
engine ECU	350	350			◎	
air cleaner element	700	440	○	○		
radiator	600	700	○		○	

Notes: 1) Production level in Japan.

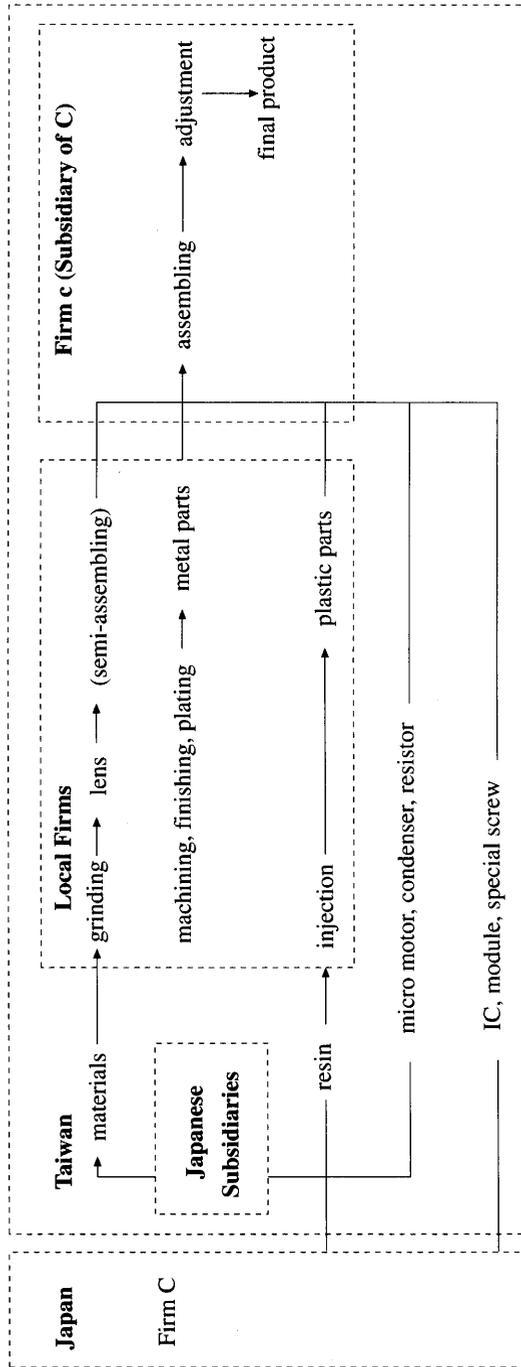
2) ○ shows production base at present.

◎ shows country in which the production will be concentrated.

NDT: Thailand, NDI: Indonesia, NDM: Malaysia, PAC: Philippines.

Source: Ishiro [1997].

Figure 4.5: Camera Production and Parts Procurement by Japanese Firm C in Taiwan



Source: Koike [1991].

tional enterprises which have many factories worldwide. Most local suppliers will be excluded from the production network of the assemblers and components procured from local suppliers will be limited to a few bulky and technologically less sophisticated components or processes, particularly those at the secondary and lower tiers.

Of course, assemblers have not completely shifted to imported components and excluded local suppliers from their production networks. Some components have to be produced domestically and some of them procured from local suppliers. There are some local enterprises which have a high technological capability and assemblers have strengthened transaction relations with these firms by carrying out technological transfers. Thus the selection of suppliers is stimulated.

However, generally speaking, assemblers are taking the easier path of increasing imports and choosing procurement from multinationals, rather than the more difficult path of nurturing a local component industry. It seems rational at a glance, considering the fact that most components produced by local suppliers are inferior in cost and quality. While, at the same time, holding onto ineffective suppliers might create many difficulties.

As mentioned in section two, Japanese enterprises are increasing parts procurement from abroad. However, most of these parts are of a less sophisticated type. Although it is difficult to get a clear picture because very little information is available, some of these imported parts from developing countries might be produced by Japanese subsidiaries.

Overseas subcontracting to Asian and other developing countries by Japanese enterprises is more active in final goods than parts and components. Apparel and footwear are typical cases. While subcontracting is also important for the electronic appliance industry. The enterprises who subcontract in this manner are both manufactures and retailers, and cheap labor is seen as the main advantage. Furthermore, products subcontracted abroad are technologically standardized.

5. CONCLUSION AND POLICY RECOMMENDATIONS

Global production and sourcing by Japanese enterprises could increase opportunities for market-in production of final goods as well as component procurement from local suppliers in Asian countries. However, there is no certainty that it will become a reality. Market-in production will be carried out in a limited number of countries which offer potential advan-

tages such as large and expanding markets, advanced technological and educational levels, relatively cheap labor and so on.

Local component procurement will also be limited. The components procured from local suppliers in Asia will continue to be the less sophisticated ones, while the more sophisticated components will increasingly be procured from Japanese and other foreign suppliers. Follow sourcing will decrease the number of suppliers. The prevalence of unit parts or module production will downsize the multitiered subcontracting system, which will drastically decrease the tertiary and lower-tier subcontractors. Finally, global sourcing, partly caused by economic liberalization, will continue to increase the procurement of parts and components from abroad. And as a consequence, some component industries will be marginalized.

However, this does not mean that the component industry should be cutback. As the decline of SMEs would badly effect employment levels, trade balances and the regional economy. Indeed, efforts to cultivate the local suppliers are necessary.

From the viewpoint of cultivating the component industry and local suppliers, the Japanese subcontracting system has a lot of useful lessons to offer. It should be acknowledged here again that the Japanese subcontracting system was not an efficient production organization from the beginning. Indeed, the technological backwardness of SMEs was a serious hindrance to the development of the assembly industry. At a time when restrictions were placed on the importation of components because of a lack of foreign currency. On the other hand, the domestic component market was not developed. Accordingly, large enterprises incorporated SMEs into their own production systems while promoting technology transfer.

Even if the advantages of continuous transaction and technology transfer are recognized by large enterprises, it is not easy for them to refrain themselves from behaving like free-riders. Large enterprises might try to avoid economizing on technology transfer costs. This is a chief cause of SMEs' technology becoming more retarded. Therefore government initiatives are required to promote the technological improvement of SMEs.

Here again, in the case of Japan, governmental financial and technological support was important to assist SMEs. Furthermore, the government, although it was not satisfactory, watched that large enterprises did not take advantage of unfair transaction practices.

Because the scope of SMEs is small by nature, they cannot easily raise

business resources such as funds, technology and labor forces. This lowers the level of technology of SMEs, and reduces their business opportunities. What is required here is not direct assistance to SMEs but rather to establish paths for easy access to funds, technology and labor power.

As for technology, SMEs look to the government to supply information such as the latest technological trends, the whereabouts of technology, and how to acquire it. This is because SMEs cannot easily obtain such information. Supplying quality testing services is also an important function of government bodies, as individual SMEs cannot install expensive testing equipment.

With regard to the work force, supplying training opportunities and the creation of training facilities is required. Neither the fee nor the actual market cost of such services are relevant to the SME, as the SMEs' difficulty is not the cost of these services, but that they cannot access or provide them by themselves.

A more serious problem than the level of available technology for SMEs is the problem of the market. A role exists for government here, too. Firstly, there is the mediation of subcontract transactions, namely 'subcontract exchange.' Assemblers hoping for outside orders cannot easily determine which firms can produce and process the necessary parts, while the SMEs cannot easily find out where and what kind of demand there is. So an organization is needed to mediate in transactions between assembly manufacturers and SMEs. Trade fairs are also useful for SMEs to get orders from big enterprises (as to the importance of the demand side, see Humphrey and Schmitz [1996]).

Yet another aspect of the above, relates to technology and management assistance with special regard to the needs of SMEs. Here the promotion of cooperative order-receiving groups may be helpful, as individual companies may not be able to deal with some orders. This could well be the case where many different kinds of technology are needed for component production. Cooperative order-receiving is effective over and above making transaction conditions with large enterprises favorable, as information exchange by SMEs makes expanding their order-receiving opportunities possible.

Horizontal clustering has many advantages for SMEs, as it brings collective efficiency (Schmitz [1990]). The cooperative organization of SMEs not only strengthens their situation with regard to receiving orders from large enterprises, but also increases the possibility of receiving advanced technology, which helps them to develop new products and

enlarge their market. As Japan's experience shows, technological and commercial dependency on the assemblers has big disadvantages and risks. Therefore, the government has to encourage SMEs to support themselves by collective action.

The government has many roles to play in the development of subcontract transactions for SMEs, but none is more important than the provision of an environment that supports a macroeconomic policy for steady economic development.

Industrial policy should be gradual and consistent. Indeed, gradualism is necessary for trade policy. Sudden liberalization and other drastic changes of trade policy create enormous difficulties for SMEs and in extreme cases forces them to abandon their business. Moreover, sudden changes of policy encourages rash short-term actions and opportunistic behavior among large firms, which disintegrates subcontract transaction.

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