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Small and Medium Enterprise Support Policies in Japan

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I. Introduction and Overview

I-1. Objectives and Approach

This paper has two main objectives. The first is to analyze how Japan's small and medium enterprises (SMEs) developed over time, focusing on their acquisition of technological capability, marketing capability, and financial resources. The second is to examine the public sector's role in assisting SMEs to acquire these technological and marketing capabilities and financial resources.¹

We began by looking through published statistics and studies to analyze past SME performance and support policies. We then conducted intensive interviews with SMEs in three target industries to evaluate the effectiveness of more recent SME support policies.² These two approaches complement each other because the interview results can be used to check the validity of the results obtained from the literature survey, and vice versa.

Field interviews based on common survey questions were conducted during a period of two to three weeks for each industry between July and December 1992. Prior to conducting these interviews, we discussed SME issues with both national and local-level government officials as well as with a number of experts in this field to gain diverse views and identify the appropriate sectors and firms to be analyzed. At the national level, we interviewed officials from MITI, the Small and Medium Enterprise Agency under MITI, and public financial institutions. We also interviewed officials from local government, chambers of commerce, and industry associations. These discussions continued throughout the period of our research, in order to deepen our understanding of the industries involved and cross-check our findings.

¹A large number of studies on SMEs in Japan have been published in Japanese, but only a limited number have been published in English. See, for example, Kaneda (1980), Yokokura (1988), and Berry and Mazumdar (1991).

²For studies using firm-level interviews similar to those used in this paper, see, for example, Levy (1993) and Steel and Webster (1992).

Recognizing the wide diversity both in SMEs and their industrial organization in Japan, we selected three distinctive industries for this analysis: the silverware industry, the synthetic fiber-weaving industry, and the auto parts industry. These industries represent three prevalent types of industrial organization in Japan. The explicit incorporation of industrial organization as a factor in this analysis helps clarify factors affecting SME performance as well as factors involved in formulating effective SME support policies.

Despite differences in industrial organization, the three industries share several common characteristics. First, each is geographically concentrated. This characteristic is important not only because SMEs in the same industry are often focused on a particular geographic area but also because SME policies are often applied by region. The following industry-region pairs were selected for our analysis: silverware--Tsubame, synthetic fiber-weaving--Fukui-Ishikawa, and auto parts--Ohta. A second similarity is that each industry has a close subcontracting relationship with parent firms or trading houses. As we shall see, close relationships of this kind are a pervasive feature of Japanese SMEs. The third common feature is that these industries have all survived difficult times and proven themselves successful. A study of such successful cases helps to identify important factors leading to the development of SMEs.

I-2. Organization

This first section of the paper summarizes the role of SMEs in the Japanese economy. Section II discusses the industrial organization of SMEs in Japan, with particular emphasis on the three specific industry cases under study. Section III provides additional background on the three cases, setting the stage for more intensive analysis in the subsequent sections. It presents the characteristics of the firms under study and describes the support policies that have been applied to these industries. Sections IV, V, and VI examine acquisition of technological capability, marketing capability, and financial resources, respectively, utilizing both published materials and interview results. Section VII concludes the paper with a brief summary of our findings and some concluding comments.

I-3. Importance of SMEs in the Japanese Economy

Small and medium enterprises (SMEs) occupy an important position in the Japanese economy. There were approximately 6.6 million SMEs in 1989, or 99.2 percent of the total

number of non-primary sector establishments in Japan. SMEs employed 40 million people, accounting for 80 percent of non-primary sector employment. Small SMEs, (defined as enterprises with less than 20 employees), play the dominant role. Japan has some 5 million small SMEs employing 15 million people, accounting for 76.8 and 31.3 percent of the respective SME totals.³

Such statistics aside, the importance of SMEs in production needs to be emphasized. Many SMEs manufacture parts and components used in the production of final products by large firms. It is therefore not possible to fully understand the economic success of the Japanese economy without recognizing the role of SMEs.

The importance of SMEs in the Japanese economy can be seen clearly through international comparisons. Table I-1 shows the importance of SMEs in the manufacturing activities of selected industrial countries. Considering that the coverage of establishments under the Japanese definition of SMEs is wider than that in many other countries, the number of SME establishments is not much different from that of other countries. However, comparing other variables makes it clear that SMEs play a more important role in Japan than in other countries. In terms of employment, for instance, as many as 72.5 percent of Japan's total manufacturing labor force is employed by SMEs, whereas the corresponding shares for the U.S., the U.K., and West Germany range only between 25.2 and 46.2 percent. The importance of SMEs in Japan can also be observed by international comparisons of their share of the value of manufacturing shipments and value-added (Table I-1).

Turning to manufacturing subsectors in Japan, one finds that SMEs dominate all the subsectors in terms of the number of establishments, although their share of employment varies widely. The SME share of employment is about 90 percent in such light manufacturing subsectors as food, textiles, and wood products, but just 40 to 50 percent in heavy and chemical subsectors such as machinery and iron and steel (Table I-2). In the cases of silverware, synthetic fiber-weaving, and automobile parts, the three manufacturing subsectors chosen for our study, the share of SMEs in employment for each subsector is 100, 90.2, and

³Between 1957 and 1989 the number of SME establishments in the non-primary sector increased by 1.9 times, from 3.5 million to 6.6 million. The increase was most notable in the 1960s, when the Japanese economy experienced rapid growth. Over the same period, employment at SMEs increased by 2.4 times. The magnitude of increase in the number of establishments as well as in employment was greater for large firms, leading to a decline in the share of SMEs in the non-primary sector in both indicators. The observed decline in the share of SMEs in economic activities during the post World War II period reflects an increase in the scale of their operations. (Prime Minister's Office various issues.)

52.7 percent, respectively. These statistics indicate that SMEs dominate employment in the silverware and synthetic fiber-weaving industries, but not the auto parts industry.⁴

SME employment is mainly concentrated in such sectors as food, textiles and apparel, metal products, and general and electric machinery. The combined share of the silverware, synthetic fiber-weaving, and auto parts industries in terms of total SME manufacturing establishments and employment is 5.8 and 4.5 percent, respectively.

1-4. SME Policies in Japan

The Japanese government's recognition of the importance of SMEs in the Japanese economy, as well as of their relatively disadvantageous position vis-a-vis large firms, led to active SME promotion policies in the post-World War II period. These policies changed over time, as both Japan's economy and its SMEs went through various development phases.

In the early post-World War II period, heavy and chemical industries were heavily promoted, and the basic principle behind SME policies was to protect SMEs from the large firms. By the mid-1950s this principle had changed from protection to promotion and modernization. Behind the change in emphasis was the productivity disparity between Japan's large firms and SMEs, which the government wanted to eradicate in order to achieve further economic expansion.

As the Japanese economy matured after a period of rapid economic growth in the 1950s and 1960s, the objective of SME policies changed again. In the early 1970s, the emphasis of SME policies shifted from growth-oriented, larger-scale production to high quality, information-intensive production. Moreover, since the 1970s, policies have encouraged SMEs to shift from declining to growing sectors, and to improve allocation of resources in coping with rapidly changing economic developments such as yen appreciation, two oil crises, labor shortages, and environmental problems.

One may divide Japan's SME policies into two groups: those applied to SMEs in general and those applied to particular SMEs. General policies include those designed to

⁴The changes in the position of SMEs in manufacturing are of particular interest, as the share of SMEs in manufacturing employment declined from 73.5 percent in 1957 to 69.0 percent in 1969 before increasing to 73.5 percent in 1978 and further to 74.4 percent in 1989. The decline in the share of SMEs from 1957 to 1969 is due to a rapid expansion in such scale-oriented production as iron and steel. In contrast, the increase in share that followed reflects a shift in manufacturing production from scale-oriented, material-based manufacturing to process-oriented, component-based manufacturing such as electric machinery.

improve technological, management, and marketing capabilities, as well as those policies that establish institutional setting. Particularistic policies include those relating to local production networks, subcontractors, and specific sectors such as textiles.⁵

SME policies in Japan are basically formulated at the central government level, at MITI and its subordinate Small and Medium Enterprise Agency. These policies are then implemented mainly by local governments, public institutions, and semi-public institutions (Table I-3). The function of most of these institutions is either obvious from their names or will be described in subsequent discussions of financial, technical and marketing assistance. Most of these institutions have national-prefectural linkages. The central body for the formulation of SME policies is the Chusho Kigyo Seisaku Shingikai [SME Policy Council], which consists of representatives from business, academia, labor unions, journalism, and the Housewives Federation, among others.

Instruments applied to carry out SME policies include financial, tax-subsidy, and regulatory measures. Financial measures will be discussed in more detail in Section VI, so we will describe only tax subsidy and regulatory measures here.

SMEs may take advantage of preferential corporate tax treatment and special depreciation allowances. Subsidies are provided to activities such as research and development, and managerial training. There are also various laws intended to protect SMEs. For example, the Law on the Prevention of Delay in Payment of Subcontracting Charges and Related Matters (Shitauke Daikin Shiharai Chien-to Boshi Ho) was enacted in 1957 to protect subcontracting SMEs from such unwarranted business practices as delayed payment by parent firms.⁶

The impact of SME policies in the government budget may also be observed. Even at its peak, just over half of one percent (0.61 percent) of the national budget general account was allocated to SME measures, with a notable increase from the 1950s to the 1970s before a subsequent decline (Table I-4). The SME allocation was significantly higher in the Fiscal Investment and Loan Program (FILP), in which SMEs consistently received more than a 10 percent share, with a high of close to 20 percent in 1980. Recognizing the large size of FILP

⁵ For a concise description of SMEs and SME policies in Japan, see Yokokura [1988].

⁶ In fiscal 1991, the Fair Trade Commission investigated 71,603 cases and found 1,549 violations of the law. Of those cases 1,503 have been processed. In 1,492 cases, warnings were given and no action has yet been taken on the remaining 101 cases. [Fair Trade Commission (1992)]

in the national budget and the high share of the general account allocated to financing measures, one may conclude that financial assistance has played a major role in Japan's SME policies.

II. Industrial Organization and the Role of SMEs in Japan

Industry structure is crucial in evaluating the various types of support that SMEs receive from other firms. SME marketing activities are supported by the parent firms and trading houses with which SMEs often have close transactional relationships. SMEs also receive various kinds of support for acquiring technological capability from competing firms in the same local production networks, from parent companies, and from firms supplying equipments and materials.

One of the most significant features of Japan's SME support policies is that government institutions play a key role in enhancing the function of local production networks. The formation of local production networks -- that is, the concentration of many SMEs in narrow regions with highly interdependent interactions among SMEs, parent firms, and trading houses -- is the most important aspect of the pattern of SME industrial organization in Japan. This pattern is also a major determinant of the extent to which collective support systems affect SME performance.

This section begins with an overview of the determinants of inter-firm relations, followed by a detailed look at the patterns of such relations in the three chosen industries. The final section summarizes some distinct features of inter-firm relations and their implication for SME support policies.

II-1. Overview

When one looks at the whole production process of a commodity, from the upstream level of raw materials to downstream distribution, one generally observes a number of processes involved in producing that particular good. Take, for example, a synthetic fiber product. In this industry, the processes that must be carried out before the final products are exhibited in retail stores include the production of materials by chemical companies, twisting and sizing, weaving, finishing, and apparel making. Products like automobiles and home electronic appliances consist of many parts, (e.g. more than 30,000 parts for automobiles), and each part requires a different production process. Even products like silverware and

housewares, which look quite simple in their final forms, actually go through many production processes.⁷

As pointed out in the literature on vertical integration and contract theory⁸, inter-firm relations between sellers and buyers of intermediate goods are often quite complicated. Information is exchanged between the firms involved in the transactions, and cooperative behavior becomes necessary to establish efficient transactional relations.

It is not easy to establish efficient transactional relations, due to asymmetric information and conflicts of incentives between the firms involved in the transactions. Economic theories teach us that various kinds of distortions are generated by moral hazard and adverse selections. Due to such problems, simple buying/selling transactional relations often cannot be formed. Either vertical integration, in which these problems are solved as internal allocation problems inside a firm, or complicated transactional relations, (what economists call contractual relations), are devised to solve these problems.

In the case of Japan, the problems of moral hazard and adverse selection seem to be solved by interfirm relations rather than by vertical integration, at least in comparison to other industrialized nations such as the United States. A quantity of literature exists on this issue. While we do not have space here to discuss why many Japanese industries choose non-integration solutions, some of the key reasons include:

(1) Homogeneity of population: Since the Japanese economy consists of a homogeneous population with the same historical and cultural background, it is relatively easy for firms to engage in complicated transactional relations. As explained in the literature on game theory and information economics, in repeated and multiple inter-firm relations, firms can form cooperative transactional relations based on such mechanisms as reputation, hostage, and punishment.

(2) High economic growth: Many of the so called Japanese-style transactional relations (such as the subcontracting system, main bank system, and lifetime employment system), emerged

⁷See Figure II-1.

⁸ There is a vast literature on this issue. See for example Holmstrom and Tirole [1989] and Williamson [1985]. Itoh and Matsui [1987] discuss the issue from the viewpoint of Japanese-style business practices.

and expanded during the country's high growth era, from the 1950s through the early 1970s. When an economy is growing rapidly, cooperative transactional relations form more easily.⁹

(3) Geographical concentration: As explained in the section on local production networks, geographical concentration of firms and formation of local production networks are found in many regions in Japan.¹⁰ Very high population density makes it easy for firms to find business partners with which they have repeated transactional relations.

(4) Legal structure: It is often useful for larger firms to delegate various minor processes of production to smaller firms through subcontracting transactions. This separation allows larger firms to apply different wage conditions for main corporate entities and for subcontracting firms. In this way, larger firms can also enjoy the advantages of various SME support policies, including tax preferences applied to subcontracting relations.

In an environment in which many industries choose a non-integration solution, there is considerable opportunity for SMEs to play important roles in the social division of labor. The fact that the share of SMEs in production is very high in both manufacturing and service sectors indicates that the Japanese economy is basically quite decentralized.

II-2. Automobile Industry: An Example of Subcontracting

A large percentage of Japanese SMEs can be classified as subcontractors of large firms. Figure II-2 shows the importance of subcontracting relations among SMEs in the Japanese economy. According to this study, 55.9 percent of the SMEs in Japan were involved in subcontracting relations in 1987.¹¹ The automobile industry provides a classic example of the role of subcontracting.

As shown in Table II-1, one of the important characteristics of the Japanese automobile industry is the low ratio of internal to total production of large assembling

⁹On this point see Klein, Crawford and Alchian [1978] and Itoh and Matsui [1987].

¹⁰The three cases we report on in this paper all represent typical local production networks in Japan.

¹¹ These numbers change considerably depending on the definition of subcontracting relations. The definition used in this figure is not clearly stated.

firms.¹² The internal production rate of the Japanese auto producers is around 30 percent, whereas the figures are higher for U.S. producer General Motors (GM).¹³

The production structure of the Japanese motor vehicle industry is sometimes called a "pyramid" or "multi-tier structure." The relation between assembling firms and parts suppliers is shown in Figure II-3. As this figure indicates, an assembler has direct transactional relations only with first tier subcontractors (suppliers); first tier subcontractors with second tier subcontractors; second tier subcontractors with third tier subcontractors, and so on in a pyramid-like structure.

Table II-3 shows the result of a MITI study of the subcontracting relations of a Japanese automobile producer. Although the study was conducted some years ago, it provides a rough picture of the structure of multi-tier subcontractors and the number of firms in each tier.¹⁴ The basic picture of the industry has changed little since then.¹⁵

The automobile industry in Ohta is structured in pyramid-style, with Fuji Heavy Industries on top as an assembler.¹⁶ Although there is no one-to-one correspondence between the size of a firm and the type of a subcontractor, higher-tier subcontractors are generally larger than lower-tier subcontractors. A survey of subcontractors for Fuji Heavy Industries conducted by Ohta city found that the average number of employees for the first-tier, second-tier, and third-tier subcontractors are, respectively, 258 (range: 35 to 1850), 24

¹² By the ratio of internal production we mean the share of value added to which assembling firms contribute, compared to the total value added for the automobile industry.

¹³This difference can also be found by comparing the number of employees between Toyota and General Motors (GM) (Table II-2). GM employed approximately 8 times as many workers as Toyota (or 3.5 times as many if the number for the entire Toyota group is used), while the level of production at GM is only 50 percent larger than Toyota's. These observations indicate that GM undertakes on its own many activities that Toyota delegates to other firms, such as parts suppliers. Companies like Toyota and Nissan depend heavily on part suppliers not only for the production of parts and materials but also for development of these parts and adjustment of the delivery timing.

¹⁴The fact that a parent company has a small number of firms with whom it has direct transactional relations is important. The smaller the number of subcontractors, the easier it is for a parent company to establish complicated transactional relations with subcontractors, in which there are various kinds of information exchanges, coordination, and cooperation in the timing of production, (or the so-called "just-in-time" system), as well as exchanges of personnel, technical skills, market information, and so on.

¹⁵However, our case study of the auto parts industry shows that the multi-tier structure has been changing in Ohta (and probably in other local production networks) in recent years. In the case of Ohta, the second and third-tier suppliers are looking for other markets for their products, and the solid vertical hierarchical relationships are now eroding.

¹⁶Lack of data precludes more precise analysis of how such pyramid-style structures are organized. We therefore attempt to discern the structure of the pyramid-style subcontracting system in Ohta from available statistics and publications.

(5 to 78), and 6 (1 to 30).¹⁷ With this observation in mind, an examination of the size distribution of parts suppliers gives us a broad picture of the industrial structure of the automobile parts industry in Ohta.

In 1989 there were 73 establishments in Ohta's transport machinery sector.¹⁸ (Table II-4). Among them are two assemblers, Fuji Heavy Industries and Nissan Diesel. Assuming 100 employees as a cut-off point for first- and second-tier subcontractors, 11 establishments, or around 15 percent of the total, are first-tier subcontractors. This makes the number of second- and third-tier subcontractors around 60, or 82 percent of the total.¹⁹ Among the 60 second-tier and third-tier subcontractors, it may be plausible to assume that 10 to 20 are second-tier subcontractors and 40 to 50 are third-tier subcontractors, assuming 30 employees as a cut-off point. Despite the large number of second and third-tier subcontractors, they account for only 5 percent of total value added for the industry.²⁰

Both Fuji Heavy Industries and Nissan Diesel have their assembly plants in Ohta. In Gumma prefecture, where Ohta is located, Daihatsu and Hino also have assembly plants. Nissan, Honda, and Isuzu operate assembly plants in neighboring prefectures. These near-by assembly plants offer abundant business opportunities for the auto parts producers in Ohta.²¹

The importance of Fuji Heavy Industries for automobile parts producers in Ohta may be observed in Table II-5, where the number of auto parts producers in Gumma prefecture is

¹⁷ Ohta city office, internal document.

¹⁸ Lack of detailed statistics precludes one from isolating the automobile and automobile parts industry from the rest of the transport machinery sector.

¹⁹ The cut-off point of 100 employees for the first-tier and second-tier subcontractors and 30 employees for the second-tier and third-tier subcontractors is based on a survey conducted by the Ohta city office of subcontractors for Fuji Heavy Industries.

²⁰ In addition to the differences in firm size, one observes differences in the length of operation between the first-tier and second-tier subcontractors. In general, first-tier subcontractors have a longer history. In an internal report on subcontractors for Fuji Heavy Industries prepared by the Ohta city office, which surveyed 22 first-tier subcontractors and 27 second-tier subcontractors, it was found that 36 percent of the first-tier subcontractors were established before the end of WWII, while the corresponding ratio for the second-tier subcontractors was much lower, at 7 percent. These observations appear to indicate that first-tier subcontractors are the ones that survived through strong competition among subcontractors over a long period.

²¹ The size of their potential market may be indicated by the fact that the number of workers at these assembling plants in Gumma and its three neighboring prefectures amounted to over 30,000 in 1987, or approximately 20 percent of overall employment at assembly plants in Japan.

shown according to their association with particular assemblers.²² Fuji Heavy Industries has the largest number of associated parts suppliers at 116, or 28 percent of the total, followed by Nissan, with 77 parts suppliers, and Honda, with 59. The importance of Fuji Heavy Industries is higher if one considers only local parts suppliers, or those parts suppliers whose head office is located in Gumma prefecture.²³ A sample survey conducted by the Ohta city office in 1992 revealed that 50 percent of 36 subcontracting parts suppliers listed Fuji Heavy Industries as their major sales partner.²⁴

Despite the dependence of local Ohta auto parts suppliers on Fuji Heavy Industries, they also have extensive business relationships with assemblers outside of Gumma. Indeed, the dependence of parts suppliers in Ohta on Fuji Heavy Industries has increased as both auto parts suppliers and assemblers seek diversification of business relationships. Through diversification, parts suppliers attempt to minimize the costs of business fluctuations associated with a particular assembler, while assemblers seek to procure parts from the most efficient suppliers.²⁵ The transactional relationship between subcontractors and their parents in transport machinery production, of which the auto industry is a component, is not as rigid as the relationships observed in the electronics industry, which also follows a pyramid-style subcontracting pattern.²⁶

The dependence of subcontractors on parent firms has declined in recent years, as indicated by an increase in the average number of parents per subcontractor, from 4.8 in 1990 to 5.3 in 1992. It can also be seen in the share of subcontractors whose sales-dependence on their primary parent firm exceeded 80 percent: this group dropped from 36

²² In terms of the value of shipments, approximately 50 percent of prefectural totals in 1985 are accounted for by those automobile and related firms in Ohta. (Kobayashi [1992]).

²³ Out of 254 local auto parts suppliers associated with assemblers, 95 firms, or 37 percent, have a close relationship with Fuji Heavy Industries. Dependence on Fuji Heavy Industries by parts suppliers in Ohta appears to be greater than the case for Gumma prefecture as a whole.

²⁴ Ohta City Office [1992].

²⁵ Jomo Shimbun [Jomo News], November 7, 1992.

²⁶ The following statistics attest to this observation. The average number of parents per subcontractor for transport machinery is higher at 5.3 than that for electric machinery at 4.4, implying that subcontractors in transport machinery rely less on one particular parent (Ohta City Office [1992]). This point may also be observed in the degree of dependence of subcontractors on parent firms for their sales in these two sectors. In transport machinery, those subcontractors whose dependence on their main parent firm (ie the firm taking in the largest sales) exceeds 80 percent, account for 30 percent of the total, while the corresponding ratio in electric machinery is significantly higher at 50 percent.

percent of subcontractors to 30 percent over the same period.²⁷ In particular, dependence on Fuji Heavy Industries is dropping rapidly, as the share of Ohta subcontractors that transact with Fuji Heavy Industries declined from 64.4 percent in 1990 to 49.5 percent in 1992.²⁸

The degree of dependence on parent firms differs between the first- and second-tier subcontractors. First-tier subcontractors, generally with higher technological capabilities, produce high quality parts that could be sold on their own. Therefore, they rely less on subcontracting arrangements for their sales than do the second-tier subcontractors. Based on a survey of subcontractors associated with Fuji Heavy Industries conducted by the Ohta city office, the sales dependence of first-tier subcontractors on parent firms was 43 percent, while the corresponding number for second-tier subcontractors was a much higher 75 percent.²⁹ These observations indicate that the second-tier subcontractors have less flexibility in their transactions due to their greater dependence on a single dominant parent firm.³⁰ Although the statistics are not available, these observations about second-tier subcontractors appear to apply to an even greater degree to the third-tier suppliers.

II-3. Silverware in Tsubame: Organization of a Traditional Local Production Network

Many of Japan's SMEs have long histories, with origins in Japan's traditional craft activities. Often these craft-based industries are concentrated in a particular geographic locality, where various factors such as natural environment and merchant activity contributed to the development of the production area.³¹ Commercial activities during the Edo period (1603-1867) were very busy, with handicrafts and local produce from around the country brought to central economic areas such as Tokyo and Osaka for sale. Many of Japan's local production areas can be traced back to this period. Tsubame city can be classified as such a case, in which nail-making, a traditional handicraft industry in the feudal period, developed

²⁷ Ohta City Office (1990 and 1992).

²⁸ Ohta City office, Internal document.

²⁹ Ohta City Office, Internal document.

³⁰ According to a survey conducted by the Ohta City Office, transport machinery subcontractors specialize in production of parts for transport machinery, while electrical machinery subcontractors sell their products not only to the electric sector but also to the transport sector. Thus, when it comes to overcoming difficulties specific to the industry, subcontractors in transport machinery are in a less favorable position. (Ohta City Office (1992)).

³¹A copper mine near Tsubame is one of the reasons why metal production started in this area.

into a modern form. In a subsequent section, we will examine how Tsubame's SMEs evolved from traditional handicraft producers to suppliers of contemporary silverware and housewares. The present section details the inter-firm relations within which Tsubame SMEs are embedded.

Tsubame city is the center of silverware production not only in Japan but also in the world.³² In recent years, production of housewares (pots, pans, and other metal products used mainly in the household) and other metal products has been gradually replacing silverware production. The basic silverware production process has remained the same since the start of mass production in the early 1900s. A typical production process for silverware and housewares, shown in Figure II-1,³³ requires a number of subprocesses.³⁴

Only a few firms undertake the entire production process, while most focus on just one or several of these processes. The production of silverware and housewares therefore involves a number of firms. Generally the production system is organized as a pyramid-style subcontracting system. Parent firms, which receive orders for final products from trading houses or which engage in the production of final products at their own risk, consign several processes to the first-tier subcontractors, which in turn consign some processes to the second-tier subcontractors. First-tier subcontractors are generally engaged in such processes as shearing, rolling and other activities except for polishing. Second-tier subcontractors mainly specialize in polishing. The relationship among the parent firms, first-tier subcontractors, and second-tier subcontractors is quite flexible, since subcontracting arrangements are not formulated on an exclusive one-to-one basis (Figure II-4).

The silverware and housewares industries had 148 and 127 parent firms, respectively, in 1991, according to statistics reported by the city office (Table II-6). In the silverware and housewares industries there were 182 and 265 subcontractors, respectively, while there were 1014 second-tier subcontractors, who specialize in polishing for both silverware and

³²According to estimates by the Japan Metal Flatware Industry Association, world silverware production amounted to 200 million dozens in 1985, of which 59 million dozens, or approximately 30 percent, were produced in Japan.

³³For forks and spoons, a metal sheet is first cut according to the required shape (shearing). Then the part other than the handle is thinned with the use of a rolling machine (rolling). After the rolling process, the handle is cut exactly according to the shape that one sees in the final product (punching). Up to this point, the material is still flat. The material is next given its three-dimensional shape by the press machine (pressing). For knives, the edge-making process is required as well. Finally, polishing is carried out. Each of these processes requires a number of subprocesses. For example, there maybe up to four steps in polishing: rough polish (machine-operated), rough electric polish, finishing electric polish, and finishing polish (manual).

³⁴The production process of housewares is basically the same as that for silverware. One major difference, however, is welding, which often takes place in housewares production but not silverware production.

housewares. Parent firms often undertake subcontracting business for other parent or trading firms. Parent firms range in size from small firms with only one employee to medium-sized firms with more than one hundred employees, while first and second-tier subcontractors on average employ less than ten people.³⁵

Parent firms are engaged in purchasing materials (such as stainless steel from metal producers) and inspection of finished products. Since the quality of silverware depends largely on the quality of materials, silverware producers, especially the large ones, are actively engaged in the development of new materials, working with material producers and such public R&D institutions as the prefectural technical center. Smaller silverware manufacturers generally purchase materials from trading houses. It is important to note that parent firms also provide technical and other types of assistance on a regular basis to subcontractors to improve the quality of the products. We will come back to this issue when technical assistance is discussed in section IV.

It is often argued that the pyramid style of production, which relies heavily on subcontractors, is well-suited to Japanese-style silverware production, in which a variety of silverware is produced in limited quantities. Production of silverware requires flexibility in both design and quantity, for which small-scale producers under the subcontracting system have proven effective.

II-4. Fukui-Ishikawa: Complex Vertical Relations in a Synthetic Fiber Textiles Local Production Network

As with other textile materials industries, the synthetic fiber industry is made up of many tasks, from the upstream production of yarn by large chemical firms to the downstream production of apparel. Figure II-5 illustrates a simplified production process, which consists of (1) material production by chemical firms (through which yarn is produced), (2) yarn processing such as twisting and sizing, (3) weaving, (4) dyeing and finishing, and (5) apparel making.

³⁵The following numbers indicate the importance of subcontracting in the silverware industry. In 1990 as many as 41.5 percent of the firms in the industry consigned work to other firms; for medium-sized firms with 20 or more employees, 96.2 percent had such arrangements (Small and Medium Enterprise Agency [1990], pp. 58-59). The share of all firms engaged in subcontracting was 68.9 percent, while the corresponding share for firms with less than 20 employees was higher at 74.3 percent.

Production steps (2), (3), and (4) take place in Fukui-Ishikawa. Table II-7 shows the size distribution of weaving firms in terms of the number of looms in the two prefectures. A large number of weaving houses have 50 looms or less. These are very small-scale firms, mostly family-run, with less than 10 workers. However, even the larger firms with more than 100 looms are classified as SMEs, since they employ less than 300 workers.

Figure II-6 illustrates the transactional relationships within the synthetic fiber textile industry. There are several important players in this figure: chemical companies producing yarn, large trading houses, local wholesalers, and weaving houses. The position of weaving houses in Japan's synthetic fiber textile industry is quite different from that of weaving houses in other textile industries in Japan or from the weaving sector for synthetic fiber industries in other countries. Much of the weaving process takes place under weaving service fee contracts with chemical companies, trading houses, or local wholesalers.

A service fee contract operates as follows: Either chemical companies or trading houses supply yarn to weaving houses, who return the woven textiles to them after the weaving and dyeing is finished. Weaving houses are paid service fees based on the amount of woven textiles they produce. Sales risk is covered by either the trading houses or the chemical industry. This contractual form was common historically in the traditional silk weaving industry.³⁶ The practice became dominant after World War II, when chemical companies became heavily involved in this industry.³⁷

Table II-8 shows the share of such fee contracts in Fukui-Ishikawa's textile production. The share has increased in recent years, which suggests that weaving houses in Fukui-Ishikawa have increased their dependence on chemical companies and trading houses for risk-taking, technical support, and sales of their products.³⁸

It is necessary to distinguish between cases in which weaving houses transact directly with chemical companies and cases in which weaving houses transact with trading houses

³⁶Note that the synthetic fiber industry in Fukui-Ishikawa developed from silk production.

³⁷For the wool textile industry, see Itoh and Hatanaka [1990] and Itoh [1991].

³⁸All 33 firms we interviewed made this kind of contract either with chemical companies or with trading houses. In fact, 66% of the firms we interviewed answered that 100% of their products were produced under fee contracts. For the remainder, 10 to 30% of their products are sold to third parties (through trading houses) with the risk taken by weaving houses. This is quite different from, say, the wool product industry, where weaving houses are more independent.

or wholesalers.³⁹ When weaving houses transact directly with chemical companies, the process is called "maker chop" in Japanese, which means the products are under the control of the chemical companies. When weaving houses transact with trading houses or local wholesalers, the process is called "unbra," meaning non-brand products.⁴⁰

"Maker chop" products are given the brand names of the large national chemical companies.⁴¹ These firms are heavily involved in the marketing of their products, both textiles and final goods. Only weaving houses with a reputation for sophisticated weaving skills are invited to be members of production networks under chemical companies. The weaving fees under "maker chop" contracts are generally higher than those under "unbra" contracts. Chemical companies have been nurturing keiretsu weaving houses and have introduced a series of new materials to the market in an attempt to improve competitiveness. When new materials are developed, the technical skills of weaving houses are essential for the quick realization of new products.

The textiles produced under "unbra" contracts are not national brands. Since trading houses and wholesalers purchase yarn from chemical companies, the material they use is not the most advanced. The weaving houses in this production network are relatively small and have less technological skill in dealing with new materials than weaving houses under "maker chop" contracts.

The coexistence of two types of weaving houses in this production area is important for various reasons. Synthetic fiber products vary widely, from simple low-price products to expensive and technologically sophisticated products, while the distribution of weaving houses between the two types of contracts reflects the wide variety of products produced in this area. Even the firms with high technical skills involved in "maker chop" transactions

³⁹The term "trading houses" here means large trading companies (sogo shosha) such as C.Itoh and Marubeni, while the term "wholesalers" means local trading companies. It is not necessary to distinguish between the two for this discussion.

⁴⁰There are some differences between Fukui and Ishikawa. In Ishikawa there are several large local wholesalers, so "unbra" is more common than in Fukui. Since local wholesalers were very influential in Ishikawa, they organize the local weaving houses under their control. Thus national trading houses and chemical companies have difficulty gaining direct access to these weaving houses. The local wholesalers purchase yarn from several chemical companies so that they do not depend heavily on one particular company. National trading houses such as C.Itoh and Marubeni are more influential in the Fukui area, where they have established their own production networks. Large chemical companies have also established their own production network in Fukui by inviting weaving houses with high technical skills to be members of their production networks.

⁴¹The leading chemical companies include Toray, Teijin and Asahikasei, all of which are classified as large-scale corporations.

also get involved in transactions with trading houses or local wholesalers.⁴² For firms mainly involved in "maker chop" contracts, "unbra" contracts are a way to stabilize production, since orders from chemical companies fluctuate considerably depending on market conditions. In addition, weaving houses involved in "maker chop" production find that contracts with trading houses and local wholesalers provide an important alternative sales channel for them, as well as helping to develop new markets for new products.⁴³

Trading houses play an important role in this industry as organizers of the total system. They find markets for new products, purchase materials, and organize the weaving, dyeing, and production of final products, at their own risk. The wide network of large trading houses and their organizing ability provide local weaving houses with opportunities to enter new markets.

As mentioned above, most firms have business relations with more than two trading houses. There is a continuous flow of inquiries from trading houses to weaving houses about the possibility of weaving various kinds of textiles. For their part, when weaving houses have new product ideas, they go to trading houses to find out about the potential for selling these products.

II-5. The Importance of Industrial Organization Structure

In terms of the economic role of SMEs and the implication of various support measures introduced by the Japanese government, the Japanese economy has several noteworthy features. These include: (1) widespread subcontracting in many industries and regions, (2) the functioning of local production networks, called "sanchi" in Japanese, (3) the complicated division of labor among many firms in the vertical flow of goods encompassing various industries, and (4) the intricate and complicated transactional relations observed between firms.

It is very difficult for SMEs to stand alone in the Japanese economy without the help of larger firms; most depend upon the help of local production networks and subcontracting

⁴²In our sample, 27 out of 33 firms are involved in both types of contracts.

⁴³Stable production is crucial for the efficient use of equipment and workers, so there are other ways in which weaving houses attempt to stabilize their production. Some large weaving houses have subcontracting weaving houses. Some of these are 100% subcontractors while others accept orders from more than two sources. By utilizing these subcontractors, major weaving houses can cope with the fluctuation in orders from chemical companies. Major weaving houses under the same chemical company also reallocate their orders among them in order to stabilize the production of each company.

relations for survival. SMEs sell their products mainly to parent companies or to trading houses, not directly to final consumers. They receive a continuous flow of information from parent companies, trading houses, and rival producers. Trading houses and parent companies even provide SMEs with financial support in forms such as commercial credits.

Under these circumstances, public SME support policies can be effective only when they are implemented through local production networks. Understanding the function of the industrial organization surrounding SMEs is essential in order to conduct meaningful research on SME support policies. In fact, as we will see below, many public SME support policies in Japan are formulated and implemented through local production networks. Furthermore, one of the most important contributions of public SME support policies has been to enhance the function of local production networks. Beneficiaries of these support policies are not only the SMEs that require local production networks and subcontracting relations to survive, but also the larger firms whose competitiveness depends on the efficiency of subcontracting SMEs and on active interactions with the local production network.

III. Support Systems and Characteristics of Sample Firms

Before we begin our analysis of the operation of technical, marketing, and financial support systems of SMEs in Tsubame, Fukui, and Ohta, this chapter will provide some useful background information. First, we will give an overview of the support systems in these three localities, followed by an introduction to the firms surveyed in each locality.

III-1. SME Support Systems in Tsubame, Fukui, and Ohta

Three types of institutions generally provide support to SMEs, regardless of the locality (See Table I-3). First are those institutions providing functional support in specialized fields regardless of the industry in question, such as public financial institutions and technical centers. These institutions are usually operated by either national or local governments. Sector-specific organizations, such as industry associations, are a second type of supporting institution. These are generally private or semi-private organizations, although they often receive some form of public support, including preferential loans and tax rates. Finally, various local governments and chambers of commerce provide support to all kinds of SMEs regardless of their business activity. These city and prefectural governments and local chambers of commerce are also generally engaged in coordinating SME policies. These three

types of supporting institutions exist in most localities in Japan. In the following sections we will focus on their specific characteristics in Tsubame, Fukui, and Ohta.

Tsubame: Table III-1 shows important SME public support institutions for silverware producers in Tsubame. Since the silverware industry has a significant position in Tsubame's economic activities, support provided by non-sector specific institutions centers is often focused on the silverware industry. A case in point is the Tsubame Wholesalers Cooperative Association. Although set up to promote wholesalers' dealings with Tsubame products in general, this association's major activity is distributing silverware.

Supporting institutions in Tsubame appear to be quite active compared to other regions, with the city office and the chamber of commerce playing a central role. Behind this activity is the locality's success in obtaining public assistance from the central government. Indeed, Tsubame has long been a recipient of special central government assistance for local production networks (Table III-2). This relates to the fact that the city has a strong information exchange network among various institutions, including the city office, the chamber of commerce, and industry associations. These institutions actively collect information about the silverware industry and its needs by hosting a number of meetings with producers. Second, the city has established an effective system making its needs known to the central government through the network it has established. Strong ties between the industry and the central government date back to the 1950s, when the silverware industry restrained exports at MITI's request.

Fukui-Ishikawa: Textiles producers in Fukui-Ishikawa receive support from a number of institutions; in this section we will focus mainly on the role of industry associations. Several voluntary associations closely connected to the textiles industry have been organized, corresponding to different industry subsectors, such as the Industry Association of Twisting Firms and the Industry Association of Local Wholesalers. On top of these subsector industry associations are two important industry associations: the Industry Association of Structural Reform of Weaving Houses (Fukui-ken Orimono Kozo Kaizen Kumiai) and the Industry Association of Textile Products (Fukui Sen'i Kyokai). These two industry associations are

semi-public, and are involved in various kinds of public support programs. Subsector industry groups maintain close associations with these two semi-public industry associations.⁴⁴

Industry associations do not offer technical or financial assistance to firms in the industry. Their main functions are to improve communication among firms in the industry, to assist in communication between firms and the local and national government, and to organize trade fairs, public lectures, and other activities for the workers of the member firms. They also collect industry data and conduct research on foreign competitors. The small size of the associations, most of which have approximately 10 officials (although sometimes less than five), precludes them from providing more extensive forms of support.

The role of the Industry Association of Structural Reform of Weaving Houses differs from that of other industry associations. This association's present structure took shape when the national government started the first round of structural reforms in 1967, although the association had a long tradition dating back to the late 1800s (Table III-3). Since 1967 this association has become the window for various public loan programs and subsidies for replacement and removal of old equipment under structural reform plans.⁴⁵

Table III-3 indicates the considerable level of public financial support that has gone to this sector, most of it directed toward structural reform of the industry. New machinery has been introduced such as water-jet looms, air-jet looms, double twisting machines, and repia-type looms, with public financial support programs used extensively used for replacement of old machines.

Ohta: As in other parts of Japan, SMEs in Ohta have received collective support from various institutions. Because the small and medium auto parts suppliers of Ohta have relied most extensively on financial support, we concentrate our discussion first on financial support systems in Ohta, and then on other supporting institutions.

National, prefectural, and city governments are all sources of public financial assistance for SMEs. Three SME financial institutions at the national government level, in addition to the Japan Development Bank and other public financial institutions, have played a major role.

⁴⁴In fact, in Fukui prefecture, many of these associations have their offices on the same floor of the same building.

⁴⁵For example, one or two members of the associations are often sent from local governments or are ex-officials of the local or national government.

Financial assistance provided to parts producers in Ohta was generally allocated regardless of regional location. Financial assistance in the 1950s and 1960s was provided under the Machinery Industry Promotion Temporary Measures Law (1956) and the Electronic Industry Promotion Temporary Measures Law (1957).

Financial support was provided to industry associations as well as individual firms. To take advantage of this resource, a number of industry associations were set up in Ohta and other parts of Japan. As of 1992 Ohta had more than 30 industry associations, including four machinery and metal industry associations for the auto parts industry. Beyond obtaining public loans, their activities have been limited mainly to organizing social gatherings. The Ohta Machinery and Metal Industry Cooperative Association, [Ohta Kikai Kinzoku Kogyo Kumiai] is the oldest, established in 1961. It has only two officials in its secretariat, one engaged in clerical work, and an annual budget of 7 million yen, most of which comes from membership fees from its 148 members.

Machinery and metal industry associations in Ohta have not been more active in part because influential parts producers are already heavily involved with associations organized under their parent firms. In the case of auto parts producers affiliated with Fuji Heavy Industries, the Subaru Hiyu-kai association has 217 producers, including 70 first-tier subcontractors from Ohta. At meetings, members of Subaru Hiyu-kai actively exchange business information among themselves, and also with Fuji Heavy Industries.

SME policies applied to auto parts producers in Ohta do not have a regional focus. The absence of influential regional industry associations and the presence of other manufacturing sectors in Ohta (such as electrical machinery and textiles) make it difficult for public organizations such as the city office and the chamber of commerce to focus solely on the auto parts industry.

Despite the lack of sectoral focus in public SME support provided to the auto parts industry, the Ohta chamber of commerce actively promotes Ohta's auto parts producers along with other businesses in the region. The Ohta chamber, established in 1947, currently has 3,162 members, 23 secretariat members, and an annual budget of 200 million yen. In addition to providing managerial assistance, the chamber sends out information on SME policies to member firms and lobbies for SMEs in Ohta. It also acts as an intermediary for SMEs interested in obtaining loans from public as well as private sources.

III-2. Characteristics of Sample Firms

Differences in size, history, and other characteristics often affect the behavior and performance of firms. For example, a large firm with a long history tends to have better access to loans than a smaller, younger firm. Similarly, differences in the educational background and job experience of the firm's owners may lead to differences in patterns of acquiring technological capability. Owners with an engineering degree may be more technologically innovative than those from other backgrounds, for instance. Additional background on the general characteristics of our sample firms may therefore facilitate interpretation of the survey results. With these considerations in mind, we provide a brief description of the sample firms in each of the three industries under examination.

Tsubame: All of the sample firms in Tsubame are silverware producers rather than polishers. Our interviews covered approximately 6 percent of the 700 silverware producers in the area. Table III-4 shows that the sample firms had an average of 54.2 employees, with most of them employing less than 80 workers. Eight firms (20 percent of the sample) are engaged solely in subcontracting work, while the remainder, labeled as parent firms in Table III-4, consign processing to subcontractors. As pointed out earlier, most of the parent firms are also engaged in subcontracting, with approximately 20 subcontractors per parent.

All but one of the sample firms were set up before the 1980s, with most of them starting operations in the 1950s or 1960s. There appears to be a positive correlation between the size of the firm and the length of the firm history: the larger the firm, the longer the years in operation. Most of the firm owners and managers are in their 40s and 50s and hold a high school diploma with an engineering specialization. A large number of these owners started their silverware business as a spin-off from a previous employer. The younger generation of owners, who are usually second-generation in the business, tend to have a university education.

Fukui-Ishikawa: Table III-5 shows the size and time of establishment of the sample firms. All employ less than 200 workers and most have less than 100 employees. Since the firms selected for our study were relatively large, the majority of weaving firms in this area

are very small.⁴⁶ Out of the 33 firms we interviewed, 17 started their business after World War II. But even most of the firms established after the war have been in business for more than 30 years. Table III-5 indicates the positive relation between the length of operation and the size of the firm, as all the firms with more than 100 workers started their business before World War II.

Most of the firm owners and managers are at least second generation in the business, reflecting the relatively long history of these firms. Only seven out of 33 owners are first-generation. Two-thirds of the owners are in their 50s and 60s, and 19 have university degrees. Compared to the other industries we examine, the educational background of the textiles producers is quite high. Typically, the owner worked in a large trading company or chemical company in Tokyo or Osaka for four or five years before joining a firm managed by his father or a relative. His experience in a trading company or chemical company gave him not only technical and marketing skills but also useful contacts, which are important in managing a textile weaving company.

Ohta: Table III-6 illustrates basic characteristics of the sample firms in Ohta,⁴⁷ several of which will also be discussed in the next section. First, the majority of automobile part producers in Ohta have less than 50 employees, as do our sample firms. There are only six first-tier suppliers in our sample, five of which employ more than 100 workers. Second, most firms started their business after World War II, especially during the high growth period. Twenty-five firms began operations after 1955, and eleven began operations after 1970. Three firms that went into business before World War II are now first-tier subcontractors to Fuji Heavy Industries.

Our sample shows that Nakajima Hikoki Seisakusho (Nakajima Airplane Manufacturing Company, or Nakajima Hikoki for short), which was superseded mainly by Fuji Heavy Industries and Sanyo Electronics after WWII, played an important role in nurturing Ohta's parts

⁴⁶Dyeing and finishing firms are larger than weaving firms. Twisting and sizing firms are smaller than weaving firms. Although the latter two types of firms are also concentrated in the Fukui-Ishikawa area and receive large subsidies, we concentrate on weaving houses in our case study, since they form the core of the industry in this area to which intensive public support was directed.

⁴⁷The firms in our sample are doing better than average firms in Ohta city. In that sense, we have some sample bias, since it is difficult to obtain interviews with firms that are not doing well.

suppliers. Among the six first-tier suppliers, three were started by people who had been working in Nakajima Hikoki and two were suppliers to Nakajima Hikoki before WWII.⁴⁸ The background of the smaller firms is more diverse. Among the 30 firms that answered this question, six were started by previous employees of Nakajima Hikoki or Fuji Heavy Industries, and 19 were started by people working for suppliers of Fuji Heavy Industries.

The sample firm owners and managers are mostly in their 40s and 50s, and 19 of them are first-generation. Their educational level is relatively low compared to the other industry cases, as six of them had only a junior high school education.

IV. Acquisition of Technological Capability by SMEs

This section identifies the mechanisms through which Japan's SMEs acquired technological capability, paying particular attention to the role of public support in that effort. Two approaches have been used in each of the three industry cases. One is a historical review of how the industry developed technological capability, mainly using published studies and documents. The other examines recent experience in acquiring technological capability, based on the results of our interview surveys. After presenting each case study (silverware, woven textiles, and auto parts), this section will conclude by comparing our results with those of other studies, and discussing lessons for SME technology policies.

In the initial period when these industries took root in their localities, collective technical support acted as both a direct and indirect catalyst to innovation. In subsequent periods, private channels, such as subcontracting parent firms and material and equipment suppliers, have been the dominant source of technical support, with a few exceptions. Public support in these later periods played only a limited role in a relatively small number of innovations.

Public technical support at the local level often comes through technical centers, or in some cases universities, and functions to a large degree as a node in a network, rather than as a direct means of support. Such support often facilitates communication among private firms that might otherwise not have taken place. Our findings thus indicate that public technical support has played at most a modest role in directly helping to build the technological capability of SMEs.

⁴⁸We could not get an answer to the company origin question from one firm.

IV-1. Public Support for Acquisition of Technological Capability by SMEs

Public assistance for upgrading the technological capability of SMEs can be broadly divided into three groups: provision of preferential loans, fiscal measures, and technical assistance. In this section we examine these three types in turn.⁴⁹

For investment with the purpose of modernizing and upgrading facilities to improve technological capability, preferential loans have been provided to SMEs since 1954 under the Chusho Kigyo Shinko Josei-Ho [The Law on Financial Assistance on SME Promotion].⁵⁰ The loans, for up to 50 percent of the cost of such investment, were provided by local governments at no interest and with 5-year maturity. Funds for this program were provided by the central government. Loans totalling 15 billion yen were provided to SMEs under this program in 1965, equivalent to 2.1 percent of fixed investment (704 billion yen) by SMEs in manufacturing.⁵¹

Preferential loans from the Small Business Finance Corporation and the Japan Small Business Corporation became available following revisions of the law in subsequent years. These loans targeted designated sectors whose modernization the government considered necessary for improving competitiveness. The program has continued and in 1990, loans extended under the equipment modernization program totalled 45 billion yen, or 0.8 percent of fixed investment by SMEs in manufacturing. This is a significantly smaller share than that in earlier years.⁵² However, without taking into account the fact that these public loans facilitated additional SME loans from different sources, the importance of these public loans is likely to be underestimated.

Two types of public fiscal measures are used to promote acquisition of technological capability by SMEs: provision of subsidies and preferential tax treatment. Subsidies are provided to SMEs and SME industry associations to promote research and development. They are also provided to national and local technical institutions to undertake R&D related to the technologies used by SMEs. For fiscal 1991, 3.5 billion yen was budgeted for such

⁴⁹ See Small and Medium Enterprise Agency (1991b and 1992) for details.

⁵⁰ See section VI for more details on financial assistance.

⁵¹ Shoko Chukin Bank (1987), p. 335.

⁵² Small and Medium Enterprise Agency (1992), p.197.

subsidies.⁵³ Preferential tax treatment is applied to R&D expenditures. Specifically, SMEs may deduct a fixed proportion of R&D expenditures from taxable income. A special depreciation allowance is also applicable to machinery and equipment under the SME Modernization Program, which provides incentives for SMEs to install new and improved equipment to upgrade technological capability.

National and local governments provide a variety of other opportunities for SMEs to upgrade technological capabilities.⁵⁴ First, seminars on technologies are offered by local governments as well as by such SME-related institutions as the Japan Small Business Corporation. These seminars include cover basic theories as well as their applications for specific sectors. They may last from a few days to a year, and are usually financed equally by sponsoring institutions and participants.

Local government also offer individualized technical advice and information to SMEs. Under this program, a technical adviser or team of technical experts from the private sector and/or public research institutes and universities, is sent to SMEs upon request to provide information about technological upgrading. SMEs can also obtain technical assistance from local technical centers.

Finally, SMEs may benefit from other services at local research laboratories, such as testing of new materials and products. Presently, approximately 170 public research laboratories are operated by local governments. Technical experts at these laboratories attend seminars and training courses sponsored by central and local governments so that they can provide up-to-date technical information to SMEs.

While central and local governments play the primary role in providing technical assistance, such other institutions as local chambers of commerce and industry associations also play a role. These institutions help disseminate information on technical support, and sometimes arrange for the provision of specific technical support.

IV-2. Technological Support Systems in the Tsubame Silverware Industry

⁵³ Small and Medium Enterprise Agency (1991a), appendix p.22.

⁵⁴ For details, see Small and Medium Enterprise Agency (1992).

Historical Developments: Manufacturers in Tsubame have experienced a number of technological changes since the mid-1700s, when nail production, the root of silverware production, began.⁵⁵ Major technological breakthroughs in Tsubame include: the start of nail production (1700s), the start of fork production (1911), the mechanization of silverware production (1920s), the start of knife production (1920s), the use of stainless-steel (1950s), and the development of new polishing methods (1950s).

Of these technological breakthroughs, the public sector took the initiative only in the case of nail production, when a Tsubame official invited nail producers from Edo (Tokyo) to teach nail production to village manufacturers. For other technological breakthroughs, the private sector took the initiative. Kichiemon Sasage, a local trader, produced the first fork in 1911 in response to an order from a Tokyo trading house. Other manufacturers with experience in metal production followed Sasage's example and started producing forks. Successful fork production led to orders for spoons, which began to be produced in the mid-1910s using basically the same production technique as forks.

To meet increased demand, silverware producers sought mechanized systems of production. The first machine for silverware production was developed in 1921 by an equipment manufacturer located near Tsubame. Technological developments in this period were undertaken by the private sector in the form of apprenticeships. When the public sector was involved, it played a supporting role in such areas as testing of new machines and materials at the public technical centers.

Although they may not be considered major breakthroughs, a number of technological improvements have taken place in silverware production since the 1960s, such as the development of high quality stainless steel and the development of new products such as a variety of housewares. The role of the public sector in these improvements has been limited mainly to testing. Successful development of a new material called 18-12 (18 chrome and 12 nickel) stainless steel by Oizumi Bussan, a medium-sized producer, followed a typical pattern. Research and development was undertaken jointly with Nippon Yakin, a large material producer located outside of Tsubame, with which Oizumi Bussan had a long business relationship. The local technical center was used for testing of the new material.

⁵⁵ See Shimoda and Kasahara [1991] and Sasage [1971 and 1977] for detailed descriptions of the history of Tsubame.

Sources and Evaluation of Technical Support: The technological gains of the immediate post-war period provided the springboard for a major expansion of silverware exports (Figure IV-1). Indeed, when silverware production started to accelerate in the mid-1950s, the export-output ratio exceeded 90 percent. The growth rate of silverware production started to decrease in the 1960s as restrictions on the part of importing countries slowed Japan's export sales. An increase in Japanese wages and the appreciation of the yen further reduced growth momentum. Rapid progress on the part of other Asian countries also affected Japanese exports unfavorably. As can be seen clearly from Figure IV-1, rapid yen appreciation in the mid-1980s caused a drastic decline in export sales and posed a serious challenge to silverware producers in the latter half of the 1980s. The seriousness of the problem was indicated by the fact that 52.5 percent of the silverware industry respondents to this survey pointed out that they faced declining exports as a result of the yen appreciation (Table IV-1). A decline in domestic sales and competition from imports were also noted as major problems. Silverware producers adopted various coping strategies, including quality upgrading, development of new products, technology improvement, and cost reduction.

Almost all the firms regarded their own efforts as a primary source of technology for the development and/or production of new materials and products (Table IV-2). Next to their own efforts they ranked reverse engineering, joint technological development, and patents as other important sources of technology, although their respective importance is significantly lower. Each of these other sources has been utilized by about 30 percent of the producers interviewed. Reverse engineering scored highest, at 37 percent. Since silverware and housewares production requires relatively simple technologies, reverse engineering is mainly a process of copying product design and/or manufacturing processes. Design, a crucial factor in determining success or failure of a product, is believed to be copied by competitors in Tsubame. Indeed, the fact that copying has been widely practiced among silverware and housewares producers in Tsubame appears to have contributed to the success of production in Tsubame by putting pressure on innovative firms to develop new products and improve technologies.

Formal channels such as joint technological development, patents, and technology ties are used for technology acquisition by approximately 30 percent of the firms. Large firms, which engage in the development of new products more actively than smaller firms, tend to

use high-quality technologies acquired through formal channels with greater frequency than small firms.

Silverware producers have utilized various types of technological support (Table IV-3). More than 50 percent of the respondents received technical support from parent firms and public technology support agencies such as prefectural technical centers. The technical center engages in research and development, exchange of technical information with firms and universities, and provision of technical assistance to small and medium firms. At Sanjo technical center near Tsubame, three types of assistance -- hosting seminars, sending technical advisers, and providing testing services -- are available. In fiscal year 1992, technical advisers were scheduled to visit 50 firms and spend a total of 240 work-days providing technical assistance to the metal industry, composed largely of silverware and housewares producers.

Active communications have taken place between the technical center and some leading firms, particularly as the demand for high technologies on the part of these firms increases. Very small firms do not use technical centers as much as large firms (Table IV-4), because they tend to be less engaged in technologically-oriented activities.

Following parent firms and the public technical center, other popular sources of technical support include equipment suppliers, firms in the same business, and industry associations. As many as 30 percent of the producers received support from these institutions. Technical literature, the chamber of commerce, private consulting firms, buyers, and universities are more limited source of technological support, used by less than a quarter of the respondent firms.

As for the usefulness of technical assistance, support from parent firms scored highest, averaging 3.8 on a scale of 1 to 5 (Table IV-4). Recognizing the fact that most producers are involved with subcontracting in one way or another, the importance of parent firms in technology support is easily understood. Medium-sized producers with 30 to 80 employees gave the highest score to technical support from parent firms, with all five firms in this size category giving such support the ranking of 5 (the highest score). Support from equipment suppliers ranked next highest, with an average score of 3.2, although the evaluation of such support by producers varies widely: five firms ranked it 5, or most useful, while four firms gave it a score of just 1.

Technical support from public sources, (i.e. the public technical center, industry associations, chambers of commerce and universities) scored relatively low in our survey of silverware producers. Four respondents, all of them relatively large firms, highly valued technical support from the public technical center, but a number of other respondents felt that the assistance provided by these public support institutions was out-of-date and/or difficult to use commercially.

Technology support from firms in the same line of business tends to be seen as more useful. Use of this channel is rather limited, however, and the evaluation of such support is mixed. Despite the seemingly limited importance of buyers in providing technical support, it was pointed out in one interview that buyers often provide ideas for new products.

The interview results bring out an interesting contrast in the evaluation of technical support by small and large firms (Table IV-4). For small firms, technical support from other firms in the same business and from equipment suppliers ranks relatively high, while large firms are more enthusiastic about assistance from the technical center. Such differences in evaluation indicate the different approaches to technology by firms of different sizes. Building on their own ideas and efforts, large and leading firms develop new technologies with assistance from parent firms and the technical center, while small firms obtain established technologies from parent firms and other firms in the same business, with limited assistance from public institutions.

Development of A New Material: The Case of Aoyoshi Seisakusho: Aoyoshi Seisakusho, a medium-sized silverware producing firm, developed silverware with a handle made from "shape-memory" polymer in 1990. The product, named "WILL," has a special handle that can be changed into any shape to suit the need of the user, since shape-memory polymer becomes flexible in hot water. Once set, the material solidifies and maintains the desired shape.

The idea for this product came from Yoshiro Aoyagi, the founder and president of Aoyoshi Seisakusho, out of his concern for handicapped and aged persons, several of whom are employed by the company. Aoyagi attended a number of seminars and exhibitions on new materials on the basis of information obtained from his own information network and public support institutions such as the chamber of commerce and the Japan Metal Flatware Industry Association. He experimented with various types of materials, obtained from a number of sources, before he came across the shape-memory polymer. This new material was being

developed by a company named Enaki, a subcontractor for the giant Mitsubishi Heavy Industries. As head of small company in a local city, Aoyagi used Shinanogawa Technopolis, a public research center in Niigata, to make contact with Mitsubishi Heavy Industries. Through a two-year joint research with Enaki, which was introduced to Aoyoshi Seisakusho by Mitsubishi Heavy Industries, the new material was successfully developed and applied to silverware. Without assistance from Shinanogawa Technopolis, it would have been almost impossible for Aoyoshi Seisakusho to conduct joint research with Mitsubishi and its subcontractor.

The new product, WILL, has received several awards for creativity in contests hosted by supporting institutions. With the attention given to WILL through trade fairs and the mass media, the product is off to a good start, and Aoyoshi Seisakusho is in the process of obtaining patents for the new product.

IV-3 Acquisition of Technological Capability for Weaving Houses in Fukui-Ishikawa

Historical Developments: Small and medium textile producers in Fukui-Ishikawa have profited substantially from technical support provided by the public sector, in the form of technical information and training as well as financial support for the purchase of new machines.

The textile industry in Fukui got its start with assistance from the Fukui prefectural government in the early 1900s, which introduced the technology for the production of silk products ("Habutae") from the Kiryu region in Gumma Prefecture. A number of middle-class landlords in the prefecture were enthusiastic about the silk textile industry, and the firms they established became the root of the successful textile industry in subsequent years.

The technical center run by the local Fukui government played an important role in introducing and disseminating the technology for rayon production in the 1910-30 period. The local government also sent special missions to Europe to purchase new machines for rayon production. During World War II, most of the region's looms were forcibly donated to the central government. Although the number of weaving machines in the area declined as a result, most of the weaving houses that existed before the war were started up again in the post-war period.

The importance of technical assistance from the public sector in Fukui diminished in the post-war period as the private sector, especially large chemical and trading companies,

began to play a greater role in introducing new products and technologies. Nylon, invented by Dupont and introduced to Japan by Toray, a leading chemical company, was woven in the Fukui region without much time lag. Polyester, invented in the United Kingdom and commercially developed in the United States, was introduced to this area by Sakai Sen'i, a leading weaving firm, by leading weaving houses such as Keitei through Toray. Although the role of technical center in introducing new technologies diminished, it remained important as a disseminator of technologies to SMEs. Realizing that large firms would not readily disclose or share their technologies, the technical center actively provided such technology to SMEs.

Forms of public assistance in SME technology acquisition changed in the 1970s. The yen appreciation after 1971 and increases in Japan's wage cost relative to other Asian countries made it difficult for Japanese products to compete with foreign goods. In response, the Japanese government started the first round of a structural adjustment program for the synthetic fiber industry, to increase efficiency through installation of such new machines as the water-jet loom. The Japanese central government provided financial support to facilitate producers' purchases of new machinery. As for technical assistance, the public technical centers were engaged mainly in testing materials and products for SMEs rather than in disseminating technical skills.

The Impact of Recent Yen Appreciation on Acquisition of Technologies by SMEs: The rapid yen appreciation after 1985⁵⁶ weakened the competitive position of textiles woven by Fukui producers. As a result, as many as 75 percent of the respondents to our survey adopted a strategy of introducing new products to the market (Table IV-5). Specifically, a number of producers in Fukui made serious efforts to shift to a new synthetic material in order to differentiate themselves from foreign competitors. They relied in this effort on technical support from various sources, in particular from parent firms, equipment suppliers, and the public technical center. As Table IV-6 indicates, more than half the respondents used these sources of support. In contrast, technical support from other firms in the weaving industry, industry associations, and universities was very limited. Recognizing the importance of parent firms, equipment suppliers, and the public technical center in providing technical assistance to weaving SMEs in Fukui-Ishikawa, our discussions below will focus on these sources.

⁵⁶ ⁵⁶The yen appreciated from 250 yen per dollar in 1985 to 125 yen per dollar in 1988.

In their attempt to introduce new products, textile producers highly valued the assistance extended by their parent, whether it be a chemical or trading firm (Table IV-6). Out of 30 textile producers interviewed, 27 firms, or 90 percent, utilized technical assistance from parent firms, and two-thirds of the firms gave such assistance a rating of 5, the highest score. Indeed, technical assistance from parent firms received the highest average score among the various sources of rated technical assistance. In particular, all the small weaving houses with less than 19 workers gave technical assistance from their parent firm the highest score (Table IV-7).

These observations indicate the importance of chemical companies and, to a lesser degree, trading houses, in the acquisition by SMEs of technical skills for new textile products. Several weaving houses noted that chemical companies sent technical personnel to them when they started weaving new materials, while some weaving houses teamed with them chemical firms in a partnership to develop new products.

Large chemical companies also play other important support roles. Among the 24 respondents to the question about sources of ideas for new products, 16 firms answered that they obtained crucial assistance or suggestions from the chemical companies. New products often resulted from joint ventures with chemical firms. Introduction of such items as new synthetic fiber products, computer ribbons, new industrial materials, and synthetic fiber kimonos is important to the business strategy of large chemical companies, which have to support their highly skilled subcontracting weaving houses.

Next to the parent firms, equipment suppliers are a popular source of technical support (Table IV-6). They are particularly helpful in teaching firms how to operate new machines. Half of the firms utilizing such assistance give it a score of 5, although as many as 6 firms gave it a score of 2, indicating a wide gap in the perception of weaving houses about the usefulness of technical assistance from equipment companies. Relatively small firms gave such assistance a higher score (averaging 4.1), while large firms with 100 or more workers gave it an average score of only 2.3. This contrast reflects differences in the technological capabilities of firms of different sizes. Large firms have less need for technical assistance from external sources, while small firms with limited technical skills rely heavily on external sources for acquisition of technological capability.

According to the firms that gave high scores to equipment companies, engineers sent by the equipment firms to teach employees to use new machines were most useful. This is

not surprising, considering the fact that the industry has undergone a rapid shift from traditional looms and twisting machines to modern water-jet and air-jet looms and double twister machines.

The public technical center is also a popular source of support for weaving houses in Fukui-Ishikawa, as more than half of the respondents listed it as a source of technical support. Large firms appear as the most common recipients of such technical assistance, while none of the smallest firms with less than 19 workers reported using the public technical center. This may be attributable to the fact that small firms tend to use standard technologies rather than new ones, and thus have limited need for the technical center's assistance.

The technical center can be a convenient place to get quick answers. As one local government bureaucrat noted, the Fukui technical center received 5497 inquiries in 1991, of which about 4000 were related to the textile industry. Typical inquiries included questions about "how to adjust the loom," "the easy way to make double-size weaving," "how to weave nylon yarn," and "how to use new twisting machines."⁵⁷ Most of these inquiries came from very small weaving houses, which seems inconsistent with our earlier interview findings that small firms do not utilize the public technical center much. This inconsistency may be due to the way the questions were posed. We asked about using technical assistance for the development of new products or processes, rather than use of technical center in general. It therefore seems likely that SMEs use the technical center for problems that arise from normal business practices such as equipment operation, but not for technical assistance with innovations.

Most of the inquiries were handled by phone, although one of the center's 19 technical advisers can be sent out under the "adviser system" for complicated questions. In 1991, the center sent advisers to 70 companies. It takes an adviser an average of three to four days to complete assistance for one inquiry.

Despite extensive use of public technical centers by relatively large producers, their evaluation of the effectiveness of such support varies widely. Specifically, four firms gave it the lowest score of 1, while three firms gave it the highest score of 5. This wide variation

⁵⁷For Ishikawa prefecture we could not obtain similar data, but the Noto branch of the Ishikawa technical center receives about 600 inquiries every year. Ishikawa prefecture is a wide prefecture from the south to the north, so it takes a few hours for the SMEs in Noto Peninsula to come to Kanazawa, site of the prefecture's main technical center. As a result, the prefecture started a subsidiary center in the Noto area, and the number of inquiries there indicates that the situation is similar to that in Fukui.

may reflect differing expectations of the technical center. The firms giving low scores tend to have successfully used the technical center in the past, and thus have high expectations. However, such expectations are often not realized now, since the technical center is no longer as up-to-date as it once was. On the other hand, firms that used the technical center for quality inspections give it a relatively high score.

The technical center's role has diminished in recent years. The technology level has become so sophisticated that only large companies such as chemical firms and machinery manufacturers can keep up with the new technology. After the yen appreciation of 1985, chemical companies were quite active in introducing new synthetic fiber, or "shin-gosen." The pace of the introduction of new materials became so rapid that only the chemical companies could keep up with the new skills required; as a result they have begun to play more dominant technology roles in recent years.

Technical centers still play an important role in providing inspection and technical analysis services, however. Considering the small number of people working at the technical center, there is a limit to what they can do. However, such services as quality inspection of new materials can generally be supplied only by large firms or a public technical center. The role of the center should therefore not be underestimated in an area like Fukui-Ishikawa, where most of the firms are SMEs.

The public sector generally does not play an essential role in the introduction of new products. However, when the characteristics of new products differ markedly from those of older products, the technical center may become more important. One firm, involved in producing such high-tech products as films for artificial satellites and synthetic fiber baseball bats, noted that its relations with the engineering departments of various universities are crucial to obtaining ideas and technologies for new products.

IV-4. Acquisition of Technological Capability in the Automobile Parts Industry in Ohta

Historical Developments: The roots of the automobile industry in Ohta date back to 1918, with the establishment of the airplane manufacturing firm known as Nakajima Hikoki. With the outbreak of war in Manchuria in 1931 and World War II in 1941, Nakajima Hikoki rapidly increased production of military airplanes and soon became the largest airplane manufacturer

in Japan. Workers came from around the country, and the number of company employees increased precipitously from 619 in 1927 to 49,591 in 1944.

With the end of World War II, Nakajima Hikoki was dissolved, and some of its former employees established Fuji Industries in 1945. Fuji Industries began producing electric parts and small motors, and in 1946 manufactured the first Japanese motor scooter. In 1958 Fuji Industries began producing the Subaru 360, a subcompact car, and automobile production expanded rapidly after 1960.

At the same time that Fuji Industries was set up by former employees of Nakajima Hikoki, other former employees started their own firms, mainly in the machinery sector. It was only natural for them to engage in business with nearby Fuji Heavy Industries, which increasingly required close coordination with parts producers to manufacture automobiles efficiently. This is how the subcontracting system centering on Fuji Heavy Industries formed in Ohta in the 1950s and 1960s.

The region's automobile parts suppliers gradually expanded their business relationships with other suppliers, including Honda and Nissan. Technology transfer from parent firms to their subcontractors was an important source of technology acquisition. But it was not just the private sector that contributed to upgrading the technological capability of the auto parts producers. Fuji Heavy Industries and related automobile parts producers received public assistance in the form of import protection and preferential financial and fiscal treatment for the purchase of modern equipment under the Machinery Industry Promotion Temporary Measures Law (1956). This public sector role in the acquisition of technological capability by Ohta's automobile parts producers has diminished over time. As will be discussed more fully below, based on interview results, the role of the parent firm remains essential to automobile parts producers, most of whom engage in subcontracting.

Sources of Ideas for New Products and New Production Process: Faced with stagnating sales in the mid-1980s, automobile parts producers basically adopted two strategies -- to broaden their activities and to improve efficiency in production (Table IV-8). Some automobile parts producers started producing parts for the electronics industry such as electric wires and floppy disks. This was a logical move, since the technologies required for the production of these electronic parts were basically the same as those used for auto parts production, and major electronics producers such as Sanyo Electronics and Mitsubishi Electronics were located in

Ohta. At the same time, many automobile parts producers installed such new equipment as numerically controlled (NC) machines, which were useful not only in improving productivity but also in reducing the number of workers needed, which was important in dealing with labor shortages.

Firms listed their "own efforts," as the most important source of new ideas leading to the development of new products and/or equipment (Table IV-9). The next important source of ideas was the suggestions of parent firms, with close to 50 percent of the respondents acknowledging such support. In most cases these two sources are closely related. For instance, a suggestion is often given by the parent firm, based on which the parts producers will come up with their own more concrete ideas, which lead to the development of new products and equipment. One firm developed a new auto part after learning that its parent firm needed new parts for a new model. Five respondents said they received ideas for new products while attending seminars or training sessions at their parent firms. These sessions are often held by parent firms to upgrade the technological capability of their subcontractors. Three firms noted that exhibitions sponsored by industry associations and the local chamber of commerce proved quite useful for getting information not only on the state of art technologies but also on products developed by other firms in the same business. Two respondents noted the usefulness of suggestions made by the technical center.

Sources of Technical Support and Their Effectiveness: To convert ideas into new products and production technologies, automobile parts producers utilize technical support from various sources. Table IV-10 shows that parent firms are the most popular source of technical support, with 24 out of 33 firms utilizing such help. Small firms tend to use technical support from their parent firms more than large firms (Table IV-11). Recognizing the almost one-to-one correspondence between the size of the firm and its position in the subcontracting chain, this observation indicates that lower-tier subcontractors rely more on technical support from their parents than higher-tier subcontractors.⁵⁸ Higher-tier subcontractors with advanced technological capabilities rely less on parent firms than lower-tier subcontractors with lower technological levels.

⁵⁸ Among the firms that we interviewed, there are six first-tier subcontractors. Five of them are included in the group consisting of large firms with 50 or more employees.

Equipment suppliers another popular source of technical support, with 21 out of 33 firms using such support. Firms in the same line of business also provided technical support, with one-third of the respondents receiving such support. Other sources of collective technical support (including the public technical center, technical literature, industry associations, and universities) are less popular among automobile parts producers in Ohta.

Turning to the evaluation of technical support, one finds a relatively low score of 3.3 given to support provided by the parent firms, although they are the most common source of such support. The help of equipment suppliers, who provide such services as training workers the use and maintenance of new machines, is highly rated. Ten out of 21 recipients of this support gave it the highest ranking of 5. There are a number of equipment suppliers in Ohta, providing a good service network for parts producers.

Although not as commonly used, the technical support provided by the public technical center and universities is highly regarded by some automobile parts producers. One of three firms that received technical support from the universities gave it a ranking of 5, while the others gave it a 4. The firm giving a score of 5 received assistance in the form of university experiments with the development of a pipe used for melting snow on the street. The other firms also received assistance in the form of technical experiments relating to their new products.

The types of technical center support services that ranked highly among auto parts producers are product quality inspections and acquisition of new technologies. The technical center does not always have the necessary skills to develop new technologies, but it can help in such other ways as organizing study groups for the development of new technologies. Another interesting form of assistance provided by the technical center is the loan of expensive machines for experimental use. One technical center loaned expensive machines to a firm that was attempting to develop laser technology for measuring the surface of metals, and requested that the firm report the results of the various technical analyses it conducted with the machines.

IV-5. Patterns of Acquisition of Technological Capability by SMEs in the 1960s: Results of MITI Surveys

The previous sections analyzed recent patterns of acquiring technological capability on the part of SMEs, based on the results of our interview surveys. It is also useful to compare

our results with those from other studies conducted during earlier periods. The Small and Medium Enterprise Agency conducted a survey of the sources of technologies obtained by SMEs between 1963 and 1968. The results of the survey, reproduced in Table IV-12, are more or less consistent with the results obtained in our survey. Taking a simple average of technological advances in six different areas, the percentage of advances attributable to the support of other firms in the same industry, parent firms, and material and equipment suppliers each registered between 25 and 29 percent. Since the category called "Other," which encompasses such public institutions as the technical center and industry associations, captured 20.9 percent on average, the share of advances attributable to individual public institutions in this general category is likely to be much smaller.

Several interesting observations can be made. As one might expect, material and machinery suppliers were major sources of technological support in the area of materials and machinery. Other firms in the same industry are found to be major source of manufacturing process technology, while parent firms are major providers of technology for new product development. Finally, although specific sources cannot be identified, the "Other" category is the major source of new design and ideas. These results appear to confirm the findings of our three case studies, i.e. that private channels have been the major source of technical support for SMEs.

IV-6. Lessons for Technology Policy toward SMEs

Private channels such as parent firms, equipment suppliers, and firms in the same business, have been shown to be the dominant sources of technological capability acquired by SMEs. Public technical support, provided mainly through technical centers, plays a subordinate role. Although technical assistance from the public sector played an important role in the early stages of industry development, its role as a key source of support has been largely replaced by the private sources. Rapid technological progress has made it difficult for public institutions, whose activities are constrained by financial as well as human resources, to keep up with the technological capabilities of the private sector, especially the large parent firms and equipment suppliers who have increased their position as a result of successful business performance.

Despite the diminishing role of public support in the acquisition of technological capability by SMEs, the public sector still makes a variety of contributions. First, the public

sector may assist SMEs in obtaining technical information through its well-developed networks. Second, the public sector may provide useful testing services for new materials and new products. These functions are particularly helpful to very small firms and independent SMEs, whose relationship with other private sources of technical assistance is limited.

V. Marketing and Support Systems

Most firms sampled in all three subsectors find their marketing needs satisfied by their relations with parent firms and trading companies, and they make no use of public marketing support. Considering the government's limited resources, direct support from public institutions can have only limited benefits for the marketing activities of SMEs. A small number of SMEs do utilize public support, however, when they enter a new market or launch new products directly, rather than through the intermediation of other firms.

This section reviews marketing assistance provided by the public sector in the post-World War II period. It then analyzes marketing support mechanisms and their effectiveness in the three subsectors, based on the results of our interview survey.

V-1. Marketing Support to SMEs

SMEs in general do not have the resources to explore their own markets. Instead, they depend heavily on their trading partners for marketing of their products, within the framework of local production networks and subcontracting relationships. Most SMEs produce intermediate goods whose markets are different from the market for final goods. Among the three cases in our study, silverware is a final product, while synthetic fiber textiles and automobile parts are intermediate goods. We therefore observed differences in the way SMEs sell their products. In the case of silverware, efforts of silverware manufacturers and trading houses are important, while for synthetic fiber textiles and automobile parts, subcontracting relations and local production networks play key roles in marketing.

Public sector marketing assistance to SMEs is provided mainly through industry associations and the chamber or board of commerce, regardless of whether the markets are domestic or overseas. This assistance takes such forms as the hosting of trade fairs, sponsoring of exploratory tours, and provision of market information.

In the case of export marketing, industry associations and the chamber/board of commerce are usually assisted by the Japan External Trade Organization (JETRO).⁵⁹ Reliance on JETRO for foreign trade information increased rapidly during the 1960s, with the number of inquiries rising from 6,026 in 1961 to 21,882 in 1970.⁶⁰ Requests from Japanese companies for introductions to foreign buyers and consultations on trading practices were popular in the early to mid-1960s, while in the late 1960s, foreign buyer inquiries about Japanese exports increased substantially.⁶¹

Another type of SME marketing support provided by the government should be noted. The government and other public agencies are encouraged to procure products from SMEs by the 1966 Law on Ensuring the Receipt of Orders from the Government and Other Public Agencies by Small and Medium Enterprises. Since enactment of the law, the SME share of procurements made by the government and other public agencies has increased steadily.⁶²

We will now examine the use and the effectiveness of marketing assistance provided by the public sector, excluding government procurement. In all three industries, public marketing support does not get high scores from the SMEs we interviewed, in contrast to the highly-regarded public financial support discussed in section VI. Most SMEs do not appreciate direct marketing support from the government. However, it should be noted that some firms in the silverware industry do view government support as useful to their marketing activities, especially in locating new trading partners. This may reflect the fact that silverware producers have a potentially greater number of sales destinations because they are making final

⁵⁹In addition to supporting the organizations, JETRO, which at present has 77 overseas offices, provides information on overseas markets to SMEs. JETRO not only accepts inquiries from SMEs about overseas markets but also introduces foreign buyers to SMEs. Assistance provided by JETRO for the promotion of exports appeared to have been particularly helpful in the early post-WWII period, when obtaining information on foreign markets was difficult. A questionnaire survey conducted in 1955 shows that 61 percent of the participants in trade fairs organized by JETRO thought that the fairs had positive effects in the form of sales expansion and development of new sales channels, while 26 percent thought that they did not have any effects (JETRO (1973), p. 381).

⁶⁰ JETRO, *ibid.*, p.273.

⁶¹The change in the type of inquiries received by JETRO during the 1960s appears to reflect changes in the competitiveness of Japanese products during the same period. When Japanese products were not competitive in the early 1960s, Japanese firms were eager to obtain information on foreign markets in order to expand export sales. When Japanese products became more competitive toward the end of the 1960s, it was foreign buyers that were interested in obtaining information on possible export items and exporters.

⁶²For the national government and its agencies, the share increased from 25.9 percent in 1966 to 37.4 percent in 1990. For local governments the share did not change much but remained at a much higher level of about 70 percent (SME Agency [1992] pp. 145-146). In 1990 procurement from SMEs on the part of governments and public agencies amounted to 15 trillion yen, or approximately 9 percent of manufacturing sales made by SMEs (here defined as firms with 4 to 299 employees). These statistics indicate that demand-side measures taken by governments have a sizeable impact on SMEs.

products. In contrast, the users of intermediate products such as woven textiles and automobile parts are limited to apparel and automobile producers, respectively.

In the case of the silverware industry, we examine not only marketing support and its evaluation, but also the industry's marketing system. Since the marketing system for woven textiles and automobile parts is closely embedded in each industry's subcontracting activity (see section II), we will not examine the marketing systems in these two industries.

V-2. Silverware

Marketing channels for silverware depend on whether the product is destined for the domestic or export market. On the domestic market, trading houses in Tsubame and those in the area of final consumption play a major role (Figure V-1). Indeed, as much as 90 percent of the products pass through trading houses before reaching retail stores, with the remaining 10 percent sold directly to retail stores.

Two kinds of marketing channels rely on trading houses: one uses trading houses in Tsubame, and the other sells products directly to trading houses located in the place of consumption. Presently, approximately 40 percent of total product sales rely on the first channel and 50 percent use the second channel. In recent years, a number of producers have gained a reputation for their high quality products. As their brand names become recognized by consumers, direct marketing -- in which producers distribute their products directly to retail stores -- increases. Direct marketing allows producers to better control the price of the products, but at the same time it increases their risks, as the sale of their products is not guaranteed.

Export marketing has been conducted mainly through export trading houses in large cities like Tokyo and Osaka that sell to foreign buyers. This type of indirect export is utilized mainly by small and medium producers. Large producers, which tend to have more experience and resources, began to trade directly with foreign importers in the 1960s, taking advantage of the opportunity to make larger profits. Although the number remains small, a few firms now have their own overseas marketing offices. An estimated 20 percent of exported silverware is still handled directly by the producer.

Marketing support has been provided mainly by industry associations and the chamber of commerce (Table III-1), and usually consists of hosting trade fairs and sending interested buyers to local manufacturers. Often public institutions such as the Japan External Trade

Organization (JETRO) and the Tsubame city office provide additional assistance.⁶³ The Tsubame Wholesalers Cooperative Association specializes in assisting wholesalers in Tsubame, and thus indirectly supports silverware marketing.

Since a large part of sales by silverware producers have been made to their parent firms through subcontracting relationships, producers have had limited need for marketing support. But when it comes to developing new markets, a firm's own marketing efforts and assistance from public sources become very important, according to both historical experience and results of the interviews, which will be discussed later.

During the early years of silverware production, prior to World War II, silverware producers in Tsubame made only limited marketing efforts, since most of their production was in response to orders placed by trading houses in Tsubame, Tokyo, and Osaka. Although trading houses in Tokyo and Osaka and foreign importers played a major role in expanding silverware exports, marketing efforts by trading houses in Tsubame contributed to the expansion.⁶⁴

After World War II, the Japanese government set up three public export promotion agencies, which were later integrated as the Japan Export Trade Organization (JETRO). Silverware producers from Tsubame actively participated in trade fairs in overseas markets, hosted by JETRO. The trade fair participation of silverware producers was arranged mainly by the Tsubame Flatware Industry Association until 1957 and by the Japan Metal Flatware Industry Association thereafter, with assistance from the city office and the chamber of commerce. The type of public support for promotion of silverware exports remained the same, despite some changes in market emphasis.⁶⁵

Quality inspection systems also contributed to the expansion of exports. Quality inspections were carried out voluntarily by the industry association in the pre-war period to win and maintain a reputation for good quality. In the post-war period, inspections became mandatory under the Yushutsuhin Torishimari-Ho ([Export Product Control Law] of 1948.

⁶³For example, the Tsubame chamber of commerce hosted or co-hosted four trade fairs in Tokyo and in Tsubame in fiscal year 1991, and transmitted 668 inquiries to Tsubame manufacturers.

⁶⁴For example, Kichiemon Sasage, a local trader, travelled to various parts of Asia in the 1920s to promote silverware sales, with an introduction from trading companies in Tokyo.

⁶⁵For example, when silverware exports to the U.S. and other developed countries were restricted, export promotion focused on non-restricted areas such as the Middle East.

Public marketing support made an important contribution to the expansion of silverware sales, especially in export markets. However, with the decline in export sales, the public sector's role appears to have diminished. We examine below how silverware producers now view marketing support provided by the public sector and other sources, based on our survey.

As marketing channels for new products, local trading houses and parent firms were found to be important for relatively small silverware producers, while non-local trading houses and direct marketing were most important to relatively large firms (Table V-1).

All 30 respondents felt that their own efforts were most important to successful marketing. One firm hired two marketers to visit as many potential buyers as possible. Another firm used a headhunter to recruit an able salesperson from a trading house in Tokyo. Support from such private sources as trading houses and parent firms is undoubtedly the most important factor for silverware producers involved in subcontracting.

Marketing support from public institutions is not much utilized by silverware producers in Tsubame, although it is widely available to them (Table V-2). On average about 10 percent of the respondents used such services. Of those who used public marketing support, only a few producers rated the effectiveness of such services highly. Indeed, only two producers thought marketing support from public sources was very helpful, with one giving the highest score to assistance from the city office and the industry association. These two firms found the most helpful services to be market information and exploratory tours.

Silverware producers usually give two reasons for their limited use of public marketing support. First, silverware and housewares producers have established marketing networks and therefore have limited need for new channels. Second, their information needs are too specific and too difficult for public institutions to satisfy.

V-3. Synthetic Fiber Textiles

Textile weaving firms produce intermediate goods sold to chemical companies, trading houses, and wholesalers under fee contracts or sales contracts. Very few weavers act as full-time subcontractors to a particular parent firm. As a rule, most firms sell their products to more than two firms and in many cases to several firms. Marketing channels often differ depending on the type of products.

Generally, in order for weaving houses to increase their production and sales, they must introduce new products. For example, in a number of cases, a weaving house that

previously wove textile materials for apparel began to produce such non-apparel items as printer ribbons and industrial materials. As we saw earlier, about 40 percent of these firms began to produce entirely new products in order to deal with the problems brought on by the substantial yen appreciation (Table IV-5). New marketing channels had to be developed for these products. Yet even for new products, weaving houses tended to rely on parent firms to conduct marketing rather than cultivating markets on their own.

Interactions among various producers are important to the success of the weaving houses in developing new products. Chemical companies and trading houses also support developments in this area. The important role of trading houses in Fukui-Ishikawa is worth stressing. Many major trading houses have branches in this area and make continuous efforts to initiate business with weaving houses. Thus, trading houses and weaving houses approach each other whenever they see the possibility of a new market. Trading houses are also involved in such business as the sale of used machines from the weaving houses of Fukui-Ishikawa to other Asian countries.

Marketing assistance from chemical companies and trading firms is highly rated by the weaving houses in Fukui-Ishikawa (Table V-3). This observation is not surprising, considering the importance of the parent firms in almost every aspect of the subcontracting weaving houses' business activities. In contrast, the public sector does not play any essential role in the introduction and marketing of new products.

V-4. Automobile Parts

The industrial organization of Ohta's automobile parts industry, discussed in section II, revealed that auto parts suppliers are tightly organized under the subcontracting system of Fuji Heavy Industries, a major automobile assembler in Ohta. Faced with declining sales and increasing costs in the mid-1980s, auto parts suppliers attempted to improve their technological capability by adopting new manufacturing processes and/or putting new machines into use (Table IV-8). They did not pursue diversification strategies, as was done by the weaving sector. Accordingly, auto parts suppliers had a more limited need to open up new marketing channels.

The evaluation of marketing assistance by auto parts producers in Ohta is shown in Tables V-4 and V-5. As expected, the subcontracting auto parts suppliers, especially the smaller ones, have a relatively high regard for such assistance from their parent firms.

Marketing assistance from the government and other official organizations gets some credit from firms entering new markets, as four such firms gave it the highest score of 5.

Specifically, marketing assistance provided by the SME Promotion Center, run by the prefectural government, is highly regarded. Some respondents remarked that their need for marketing support from public sources may increase in the future as they diversify and start producing entirely new products.

V-5. Lessons for Marketing Support Policies

Our field research indicates that SMEs have not utilized public marketing support much in recent years, although such support was relatively effective in earlier periods. Both the silverware and synthetic textile industries took advantage of assistance with trade fairs in foreign countries during early periods of their development, when producers were heavily dependent on exports and information on foreign markets was largely unavailable to SMEs. Comparison of the three industry cases makes it clear that the usefulness of public marketing support depends on the availability of support from other sources. In the case of automobile parts and synthetic fiber textiles, where subcontracting relations are well established, there is not much room for public institutions to offer marketing support. This type of support is more popular among producers of final products such as silverware than among producers of intermediate products such as synthetic woven textiles and automobile parts.

VI. Financial Support

Public financial assistance has received high ratings from most producers of woven textiles and auto parts, who require large sums for investment. Most of these SMEs indicated that they rely on public funds to meet some of their investment requirements. In both cases, public loan programs were often the source of more than 50 percent of their investment funds. Silverware producers, who have relatively small investment requirements, depend less on public funds. It should also be noted that the pattern of financial procurement differs considerably among the sample SMEs, depending on their size. Larger SMEs have better access to commercial loans, whereas smaller SMEs depend more heavily on public financial loan programs.

This section begins with a review of SME financial assistance since World War II. It then turns to an examination of the pattern and effectiveness of financial assistance extended

to each of the three subsectors, with emphasis on synthetic textiles and auto parts, where such assistance has had the greatest impact.

VI-1. The Financial Situation of the SMEs After World War II

The financial resources of SMEs are limited compared to those of large firms. To begin with, SMEs have limited savings and other forms of internal funds almost by definition. As for external sources, lack of market credibility often precludes SMEs from obtaining funds from capital markets through such means as issuing bonds. Consequently, SMEs often have to rely on borrowing from financial institutions although they are often discriminated against even by potential lenders.

SMEs actively invested in fixed assets during the high growth period of the 1950s and 1960s, in order to expand productive capacity and modernize production facilities. Behind this expansion and modernization was an increased demand for SME products and intensified competition from foreign countries, especially developing countries. SMEs relied heavily on external sources for fixed investment funds. Table V1-1 summarizes the financial condition of SMEs and large firms between 1954 and 1962, the first half of the high growth period.⁶⁶

Since the 1970s, both SMEs and large firms have begun to rely more on internal sources of funds. For SMEs, the percentage share of internal sources (retained earnings and depreciation) in total financing increased from 41.0 percent in 1970 to 52.9 percent in 1982, before starting to decline.⁶⁷ One also observes changes in borrowing patterns for both SMEs

⁶⁶ SMEs utilized 43.2 percent of the financial resources available for fixed investment, somewhat lower than the corresponding value for large firms at 52.3 percent. An examination of the sources of financial resources for financing fixed investment reveals an interesting contrast between SMEs and large firms. For large firms, fixed investment is financed by internal funds (paid-in capital and depreciation) and long-term borrowing (loans and bonds). In contrast, SMEs had to rely on short-term financial resources, since internal financial resources and long-term financing from external sources was not available in sufficient quantities. The notable difference in the financial situation of SMEs and large firms may be seen more clearly from the following statistics. Concerning the proportion of the sum of internal funds and long-term borrowing in fixed investment for the 1954-62 period, the value for SMEs was 0.87, indicating an insufficiency of long-term and stable financial resources. The corresponding value for large firms was 1.02, meaning that the magnitude of long-term and stable financial resources exceeded the amount necessary for fixed investment. Another indicator that shows a quite different financial situations for SMEs and for large firms is the ratio of long-term loans to total loans (long-term and short-term loans). For SMEs the ratio was 21.5 percent, significantly lower than the corresponding ratio of 47.9 percent for large firms. These observations point to the vulnerability and instability of SMEs in obtaining financial resources for fixed investment.

⁶⁷ In spite of the significant increase recorded by SMEs, the share of internal sources in total financing for SMEs was notably smaller than that of large firms, whose corresponding share reached as much as 67.8 percent in 1983. The increase in the importance of internal sources for large firms was attributable to their favorable economic performance and sizeable amounts of depreciation, which in turn was due to active fixed investment.

and large firms over time. For SMEs, the share of long-term borrowing in total borrowing from financial institutions increased from 27.2 percent in 1970 to 42.8 percent in 1980 before declining to 33.0 percent in 1984. Another notable change was the decline in the share of borrowing from non-financial institutions, from 9.4 percent in 1970 to 3.0 percent in 1984.⁶⁸

Loans from financial institutions often cost more for SMEs than for large firms, as SME loans are subject to greater risk and higher transaction costs.⁶⁹ A survey of loans for fixed investment made to 1,932 large firms and SMEs in 1968 indicates that large firms (with paid-in capital exceeding 1 billion yen) had no problem obtaining long-term loans, while a large number of SMEs had difficulty. The smaller the firm, the greater the difficulty it faced in obtaining long-term loans. More specifically, only 65 percent of the small firms (i.e., those with less than 10 million yen of capital) received the loan amount they requested.⁷⁰

VI-2. Financial Assistance to SMEs

Financial assistance to SMEs in the post- World War II period began with the provision of loans and guarantees from the Reconstruction Finance Corporation in the second half of the 1940s. Around 1950, various public as well as private institutions specializing in the provision of loans to SMEs were set up, and their function was strengthened over time.

Two public financial institutions specializing in SME lending, Kokumin Kinyu Koko [The People's Finance Corporation] and Chushokigyo Kinyu Koko [The Small Business Finance Corporation] were established in 1949 and 1953, respectively. Together with the pre-war Shoko Chukin Bank [The Central Bank for Commercial and Industrial Cooperatives],

⁶⁸ The increase in the share of long-term borrowing and the decline in the share of non-financial institutions in the share of total borrowing for SMEs resulted from the shift in the sources of financing by large firms away from financial institutions to other sources such as capital markets and foreign exchange markets. As a result of increased importance of sources other than financial institutions for funds utilized by large firms, increasing amounts of financial resources, including long-term loans from financial institutions, were made available to SMEs.

⁶⁹ Based on a study by Horiuchi and Shibayama (1985), the interest rate charged on loans to SMEs exceeded that charged to large firms by approximately 0.5-1.0 percentage point during the expansionary monetary phase of the 1970s and 1980s. This gap almost disappeared during the period of tight monetary conditions. In order to cover the risks associated with lending to SMEs, financial institutions often require the borrowing SMEs to maintain a certain amount on deposit with the lending institutions. Although details are not available, one may infer the extent of this practice by computing the proportion of the sum of cash and deposits to outstanding loans from the financial institutions. Between 1965 and 1985 the proportion for SMEs fluctuated at close to 40 percent with a slight downward trend, while the corresponding proportion for large firms was around 30 percent.

⁷⁰See Chushokigyo Kinyu-koko (1984), p.189

established in 1936, these public institutions provided long-term loans to SMEs. The main source of funds for the People's Finance Corporation and the Small Business Finance Corporation was paid-up capital provided by the government and borrowings from the Fiscal Investment and Loan Program (FILP). FILP is run by the government, using surplus funds obtained from the postal savings and social security funds. In addition to these sources, the Small Business Finance Corporation started to collect funds by issuing government-guaranteed debt in 1984.⁷¹

These three public financial institutions specialize in different aspects of SME finance. The People's Finance Corporation provides loans to small enterprises, while the Small Business Finance Corporation is mainly engaged in long-term lending for modernization and rationalization purposes. Shoko Chukin Bank specializes in lending for the institutionalization of SMEs. The terms of loans from these public financial institutions are more favorable to SMEs than those of private lenders. In particular, these public institutions set up special loan programs in accordance with SME policies, the terms of which are even more favorable to SMEs than general program loans.⁷²

The share of public financial institutions in total SME lending stayed around 10 percent, with small fluctuations and a slight upward trend. Public financial institutions contributed significantly to promotion of fixed investment by SMEs in the early post-World War II period, as the share of lending from public financial institutions in total SME fixed investment lending was more than 30 percent in the 1960s (See Table VI-2).

Unlike the similarity in the shares of overall lending (fixed investment and working capital) among the three institutions, they registered significant differences in the relative shares of lending for fixed investment and working capital (Table VI-3). The Small Business Finance Corporation accounted for approximately 70 percent of cumulative lending for fixed investment provided by the three financial institutions at the end of fiscal-year 1955. Although its share has since declined notably, it was still the highest of the three financial institutions at the end of 1989, at 44 percent. The People's Finance Corporation came next in fixed investment lending, with a slightly greater share than the Shoko Chukin Bank. By

⁷¹The sources of funds for Shoko Chukin Bank are more diversified. In addition to paid-up capital provided by the government and by member cooperatives, the Shoko Chukin Bank utilizes funds collected from the members in the form of deposits, funds from issuing debt, and funds from fiscal sources.

⁷²We will refer later to a concrete example of these programs in the case of synthetic fiber textiles.

contrast, the Shoko Chukin Bank has the largest share of lending for working capital. Thus these three public financial institutions play different roles in the financing of SMEs.

To see how effectively these institutions pursued their objective of making financial resources available to SMEs, we examine the pattern of public lending in relation to monetary conditions. Figure VI-1 depicts the growth rate of lending to SMEs by three different financial institutions from 1954 to 1962: private banks, and public and private financial institutions specializing in SME lending. SMEs experienced acute difficulty obtaining loans during these years, since private financial institutions were largely interested in lending to large firms actively undertaking fixed investment. One notices large fluctuations in the growth rate of lending by the private banks, while relatively stable growth in lending is observed from private and public institutions that specialize in SME lending. During the period shown, four tight monetary situations can be identified. In each instance, the growth rate of lending from the private banks declined, while the growth rate of lending from the public financial institutions increased, offsetting the private sector decline. These observations indicate the effectiveness of public institutions in providing loans to SMEs during periods of tight monetary conditions when such loans are most acutely needed.

In addition to providing financial assistance to SMEs in dealing with cyclical problems, public financial institutions were also able to assist SMEs in dealing with longer-term or structural problems such as modernization and rationalization. SME modernization was actively sought under the Small and Medium Enterprise Modernization Promotion Law enacted in 1963 and revised several times since. Under the law, the Small Business Finance Corporation was to provide special loans to designated industries.⁷³ For loans from the special account, preferential interest rates applied. For general loans, the interest rate was 0.2 to 0.5 percent lower than the prime rate, while for special loans the interest rate was lowered an additional 0.2 to 0.5 percent.⁷⁴ SMEs that obtained such loans benefitted not only from access to financial resources but also from subsidies in the form of low interest

⁷³For example, more than 20 industries were designated under the special program in the years between 1963 and 1965. Since then, the number of designated industries has declined. For the 1964-70 period, the total amount of financial assistance given under the law was 153 billion yen, amounting to as much as 18 percent of the cumulative value of fixed investment undertaken by SMEs during that period. Of the 153 billion yen total, 90 billion was provided from the special account.

⁷⁴These values are for the 1971-74 period. See Chushokigyo Kinyu Koko (1984), Tables 4-2-26 and 4-2-29.

payments. The case of synthetic fiber textiles discussed below is a typical example, although the period of financial support is relatively recent.

A large part of public financial institution lending to SMEs is financed by the Fiscal Investment and Loan Program (FILP). It is of interest to examine the allocation of FILP resources, which reflects government industrial policy. Table V1-4 shows the financial resources allocated to the three public financial institutions from FILP. Two points are worth noting. First, the realized share of the resources allocated to these institutions increased steadily over time. The share increased from 8 percent in 1955 to 12.1 percent in 1960, and since then at a somewhat slower rate, to 15.2 percent in 1970 and 17.4 percent in 1982. Second, in most years the realized amount of resources allocated to the public financial institutions from FILP was greater than the planned amount, reflecting the government's increasing concern about SMEs. These findings may also indicate that a consensus was relatively easily reached among the political parties regarding the need for assisting SMEs.⁷⁵

Local governments are actively engaged in providing loans to SMEs in their jurisdictions. Basically these loans take three different forms. One takes the form of consignments to private financial institution, i.e. the local government provides funds to private financial institutions, which in turn provide loans to SMEs. Another form is direct lending from local governments to SMEs. In the third form, the local government supplements the lending of private financial institutions or central government financial institutions by providing financial resources for interest payments. Loans under this program have increased substantially, from 180 billion yen in 1965 to over 2700 billion yen in 1983, and are now roughly equivalent to the amounts disbursed by the Small Business Finance Corporation. A large part of the loans are for working capital, thus mitigating the financial burden of SMEs in times of tight monetary conditions.⁷⁶

⁷⁵In addition to the three major public financial institutions specializing in SME finance, several other sources provide loans to SMEs. Chushokigyo Jigyo-Dan [The Japan Small Business Corporation], which was established in 1967 to promote modernization of SMEs, has provided loans to SMEs. The amount of loans provided by the Japan Small Business Corporation increased steadily from 16 billion yen to 90 billion yen in 1980. In the 1980s, annual disbursement stayed around 100 billion yen, approximately 7-10 percent of the corresponding value disbursed by the Small Business Finance Corporation.

⁷⁶The financial lending programs discussed so far apply to both small and medium enterprises. There are also programs designed just for small firms, defined as manufacturing firms with less than 20 employees and retail, wholesale, and services firms with less than 4 employees. Two major examples of such programs are the financial lending program for modernization, and the equipment and machinery leasing program. Resources for these programs come jointly from the central and local governments. The amount of loans provided to small firms under the financial lending program for modernization, which started in 1954, increased from 200 million yen in 1950 to 40 billion yen in 1984. Although the size of the loans was not large compared to those provided under other programs, these loans contributed to the modernization of small firm facilities.

The central government's credit guarantee and insurance program is called the public credit supplementation system.⁷⁷ The Credit Guarantee Associations, located in 52 cities, provide guarantees to SMEs, and the Credit Guarantee Associations in turn insure the guaranteed amount with the Small Business Credit Insurance Corporation. In addition to insurance services, the Small Business Credit Insurance Corporation provides loans to the Credit Guarantee Associations.

The public credit supplementation system has been conducted flexibly in order to assist SMEs. For example, a special insurance system for small firms was introduced in 1965 to deal with the unfavorable business climate caused by a recession. Under the new system, small firms required no collateral to apply for a guarantee.

The performance of the Credit Guarantee Associations and the Small Business Credit Insurance Corporation is shown in Table VI-5. The amount of loans guaranteed by the Credit Guarantee Associations and insured by the Small Business Credit Insurance Corporation increased remarkably over time.⁷⁸

VI-3. Financial Assistance from the Firm Perspective

As we have seen above, the government has used a large amount of financial resources to support SMEs, and a high percentage of SMEs have utilized loans from public financial institutions and local governments. But these facts do not necessarily indicate that such financial support programs have been effective. Since public financial loan programs offer favorable loan terms, many SMEs naturally took advantage of the loans.⁷⁹ The

The equipment and machinery leasing program for small firms began in 1966, in recognition of the fact that they need not only financial assistance but also other kinds of assistance. Specifically, it was thought that small firms suffered from a shortage of skilled human resources able to identify appropriate machinery and equipment. This led to establishment of the equipment and machinery leasing program, to help firms save money through timely replacement of old equipment. In addition, technical guidance provided under the program is believed to have benefitted small firms. The cumulative value of financial resources expended for the program from 1966 through 1984 amounted to 342 billion yen.

⁷⁷In the post WWII period, the credit guarantee system was initially administered at the local level, while the central government pursued the credit insurance system. As for legalization of the system, the Shinyo Hoken-Ho [Law on Credit Guarantee] and the Shinyo Hoken Kyokai-Ho [Law on Credit Insurance Association] were enacted in 1950 and 1953, respectively. With several changes in the system, the Chushokigyo Shinyo Hoken Koko [The Small Business Credit Insurance Corporation, which was set up in 1958, began to play a central role in the public credit supplementation system.

⁷⁸The cumulative values through 1984 for the respective programs reached over 60 trillion yen. At the end 1984 the balance for outstanding loans under the loan guarantee program was 8,551 billion yen, or 7.5 percent of the balance of private loans.

⁷⁹It should be noted that in dealing with business fluctuations, public loans were a much more stable source of finance for SMEs than private loans.

question is whether such measures were effective in enhancing the position of the SMEs and inducing investment expansion of the firms.

It is difficult to directly evaluate the effects of the financial support measures. The results of our field studies, however, provide an indirect method of examining how the sample firms viewed various financial support policies.

Tables VI-6 through VI-10 illustrate the sample firms' evaluation of the various sources of financial support, including public loan programs, in the three industries under study. Although direct comparison of average scores for each item among the three cases may be less meaningful, given that the scoring system can vary among interviewers or interviewees, one can still get a sense of the relative usefulness of financial supports in the three industries from the distribution of scores.

Among the three industries, the sample firms in Tsubame generally score lowest on utilization of public financial programs. This may be due to the fact that the size of investment needed by silverware producers, and thus the need for external financial assistance, is small compared to other sectors. We therefore focus only on the cases of Fukui-Ishikawa and Ohta in the discussion that follows.

Woven Textiles in Fukui-Ishikawa: We saw in section IV and Table IV-5 that in coping with the yen appreciation of the mid-1980s, weaving houses in Fukui-Ishikawa chose the introduction of new equipment and processes as their second most common strategy after the development of new products. A large amount of public financial assistance has been made available to this industry in the last 20 years, largely for replacing old machines with newer high-tech ones. As a result, the synthetic fiber weaving industry has become relatively capital-intensive, considering the size of firms in the industry.

Before analyzing the results of the survey, we will briefly summarize the six financial programs available in Ishikawa prefecture in fiscal 1992.⁸⁰ These programs consisted of the following: (1) Sen'i Kogyo Kozo Kaizen Jigyo (Structural Reform Project of the Textile

⁸⁰ Here we present a brief picture of financial support policies based on a document of the Ishikawa prefectural government. However, it must be noted that the industrial policies of the central government are implemented through local governments. Therefore, if one analyzes the policies of one local government, such as Ishikawa prefecture, one obtains a fairly good picture of the national policies. The terms of the loans such as the interest rates and loan requirements are the same for all the prefectures. The amount of the loan and the subsidies differ among the regions, but are basically proportional to the size of the industry in the region. The case of Ishikawa analyzed here thus captures the basic picture of the loan program.

Industry)⁸¹, (2) Setsubi Kyodo Haiki Jigyo (Coordinated Equipment Abolition Program)⁸², (3) Sen'i Sangyo Chukaku Kigyo Ikusei Yushi Seido (Loan Program for Nurturing Leading Textile Companies)⁸³, (4) Tokutei Chiiki Chusho Kigyo Taisaku (SME Support Policy for Special Regions)⁸⁴, (5) Chusho Kigyo Setsubi Kindaika Shikin (Loans for Modernization of SME Equipment)⁸⁵, and (6) Chusyo Kiyu Koudo ka Kashitsuke Jigyo (Loan Program for the Sophistication of SMEs).⁸⁶

Tables VI-7 and VI-8 show the average evaluation scores textile firms gave to the various financial resources that made it possible for them to invest in new machinery. Local banks and loan programs of the prefectural government received the highest scores. Financial support from the national government (through industry associations) and public financial institutions also received high scores.⁸⁷ These observations indicate that many firms depend heavily on outside loans for their investments. Parents companies and the People's Finance Corporation, however, did not get high scores.⁸⁸

⁸¹This is based on MITI's Structural Reform Project of the Textile Industry. The government has been spending a large amount of money on both financial loan supports and subsidies for the textile industry. Loans were provided at low interest rates, ranging from 0% to 2%, or about 1/3 of the market rate or less.

⁸²This is a financial support program with which the government intended to reduce the production capacity of textile machines and to replace old machines with newer ones. Loans for this project totalled about 40 billion yen.

⁸³This is a special loan program of the prefectural government. The interest rate in 1991 was about 2% lower than the market rate (5.3%) and the loan amount could be up to 100 million yen or 2/3 of total expenses. The purpose of this program is to enhance investment opportunities for SMEs planning to diversify their business activities.

⁸⁴The fourth, fifth and six projects are general loan and subsidy programs of the national government that can be used by the textile industry. The interest rate on the fourth program is 4.4% (in 1992), with loan limits of 80 million yen for physical investment and 30 million yen for operating expenses. These loans are provided only to 51 areas (covering 216 cities and towns) specified by the national government, including 20 cities and towns in Ishikawa.

⁸⁵Under the fifth program, interest-free loans of up to 30 million yen are provided to SMEs that plan to replace old machines. The loan must be less than 50% of the amount of investment. There are 38 industries specified by the government that can utilize this loan program.

⁸⁶The sixth program supports such joint activities of SMEs as merging and coordinating equipment use.

⁸⁷Although the score for People's Finance Corporation (Kokumin Kinyu Koko) is not high, this may reflect our sample choice. This financial institution can lend only to very small firms. Most of the firms we interviewed are larger than this category. Note also that some of the firms we interviewed mentioned that since they can utilize either loan programs of the prefectural government or loans from public financial institutions, they utilized the former due to better interest rates.

⁸⁸One firm mentioned that its parent firm (a local wholesaler) provided the weaving firm with 10 free second-hand looms during the difficult period of yen appreciation. This kind of assistance from parent companies occurs occasionally, but is relatively rare.

Table VI-8 desegregates the scores from Table VI-7 for four subcategories of firms classified by the number of workers in the firms. Local banks scored considerably higher among larger firms, suggesting that larger firms have better access to the bank loan market than do smaller firms. In contrast, smaller firms depend more heavily on public loan programs, confirmed by the fact that small firms gave relatively high scores to national government loan programs, prefectural government loan programs, the Small Business Finance Corporation, and the People's Finance Corporation. The table also shows that no firms with more than 100 employees depend on parent firms for finance, whereas some smaller firms do.

As for public financial support, only four firms among the 31 firms surveyed did not make use of the public financial loan program.⁸⁹ Since Shoko-Chukin is somewhat different in character, we also excluded firms that utilized only this loan program, but still found that 20 out of 31 firms (about 65 percent) utilized the financial loan programs of the national government or the local prefectural government. There were considerable differences in interest rates between public loan programs and commercial loans, making public loans worthwhile despite the often cumbersome procedures required to obtain them.

All the firms we interviewed were well aware of the kinds of financial support available. Many mentioned the industry association as their source for such information. In fact, the Industry Association of Structural Reform is also a window for the provision of financial support, and publicity of loan policies is an important association activity. Several firms maintain relations with the local branch of public financial institutions, and several firms received information from local commercial banks about public financial support programs. Most public financial support programs limit the total amount that can be borrowed to a certain percentage of the expense of new equipment; therefore many firms must borrow the remainder from commercial banks. This gives commercial banks an incentive to let their customers know about public financial programs. Some firms also mentioned a local newspaper that focuses on the synthetic fiber textile industry as a source of information about loan programs.⁹⁰

⁸⁹We could not get answers from two firms on this question.

⁹⁰Most firms felt that the special depreciation tax treatment for investment was useful. However, most firms answered "No" to the question of whether they would have delayed the timing of their investment if the depreciation treatment were not available. This indicates that the special depreciation tax treatment was not that effective in altering the timing and the volume of investment.

Automobile Parts in Ohta: Faced with an unfavorable business climate in the mid-1980s, auto parts producers in Ohta responded with various strategies. Process innovation and equipment upgrades were the most popular strategies among the firms surveyed (Table IV-8), followed by cost reductions, employment adjustments, and introduction of new products.⁹¹ The fact that many sample firms emphasized process innovation and equipment upgrading is reflected in large amount of investment undertaken (Table VI-11).

Table VI-12 exhibits the percentage share of investment costs covered by public financial programs. About 60 percent of the firms use public loans for more than 30 percent of their investments, with about half of them financing more than 60 percent of their investments with public funds. The table also exhibits the size of firms (in terms of the number of employees) for each category. It is evident from these figures that larger firms, which can utilize commercial bank loans, do not depend on public financial loan programs as much as smaller ones.⁹² All six first-tier suppliers ranked bank loans as the most useful source of financing for their investment costs. The fact that smaller firms find it more difficult to obtain commercial loans is reflected in their high dependence on public financial programs.⁹³

Tables VI-9 and VI-10 exhibit how our sample firms in Ohta see the usefulness of financial loans from various sources. Commercial bank loans get the highest score, followed by loans from local governments, both prefectural and city. The picture is quite different if we divide the sample into different groups by size (Table VI-10). Loans from commercial banks are highly regarded by large firms with 50 or more employees, while local government loans are more highly regarded by smaller firms.

The evaluation of loans from different public financial institutions also differs according to firm size. The Small Business Corporation is given high ratings by firms with 10 or more employees, while the People's Finance Corporation is regarded highly by firms with less than 20 employees. The Shoko Chukin Bank is highly regarded by large firms with 50 or more

⁹¹Only two firms gave foreign direct investment a ranking of 5. This is due to the fact that the majority of our sample firms are second- and third-tier suppliers. As far as first-tier suppliers are concerned, many started up their factories in Lafayette, Indiana when Fuji Heavy Industries started its factory there.

⁹²However, one large firm (with about 600 employees) mentioned that it depended on loans from the Import Export Bank of Japan when it started production in the United States.

⁹³Several smaller firms commented that the size of their investment was limited by the availability of public financial loan programs.

employees. These differing perceptions reflect the different mandates pursued by these financial institutions: the Small Business Corporation and Shoko Chukin Bank specialize in loans to relatively large SMEs, while the People's Finance Corporation specializes in loans to smaller firms.

The introduction of various new machines required these firms to make large investments. Because they could not obtain enough money from commercial banks, they were forced to turn to public financial loan programs.⁹⁴ Prefectural government loan programs received a higher score than the loans from public financial institutions, which probably indicates that, when faced with alternative programs, firms have chosen the loans that offer the most favorable interest rates.

Financial Support by the Non-Financial Sector: SMEs depend heavily on nonfinancial institutions for financial resources, especially working capital. In this section we present two such cases, one from the weaving industry and another from the silverware industry.

The fee contract, widely used in the weaving industry, helps provide working capital to weaving houses. The roots of the fee contract go back to the early post-World War II period, when many weaving houses in this area did not have the financial resources to purchase synthetic yarn and could not borrow money from banks. To deal with the situation, some industry leaders in this area asked a leading chemical company, Teijin, to provide its yarn free of charge for weaving, and to then repurchase the woven products for a weaving fee. This began the special contractual arrangement known as "fee contracts" between chemical companies and weaving houses. As we mentioned in Section II, the fee contract is so common in this industry that it is impossible for weaving houses to continue production without the financial support of chemical companies and trading houses.

The case in Tsubame involves an equipment supplier who accepted installment payments on generous terms for equipment he sold to silverware producers in the 1950s. At this time, the growing silverware market was attracting new producers, many of whom had formerly worked in silverware firms. What these new entrants needed most was machines, but they often lacked the financial resources to purchase them. Hirasaburo Kirishima, an

⁹⁴For the question of where firms get information about public loan programs, the chamber of commerce and commercial banks received the highest score. It is interesting to note that commercial banks (including small financial companies) provide information about public financial programs. By encouraging their customers to use public financial loans to cover a part of their investment cost, commercial banks decreasing their risk in lending to these firms.

equipment manufacturer, offered installment payments with two- to three-year maturity periods to assist these new market entrants. A major motive of the local entrepreneurs who provided such financial assistance to the silverware producers appears to have been their desire to see the local industry develop, not only to benefit their own business but also to improve the economic and social environment of their hometown.

VII. Conclusions

Small and medium enterprise policies in Japan cover financing, technical and marketing assistance, organizational arrangements, and labor relations. SME policies are basically formulated by the national government, and carried out by various public and semi-public institutions including the national government, local governments, public financial institutions, technical centers, the chamber/board of commerce, and industry associations.

Evaluation of the effectiveness of SME policies requires examination of the impact of SME policies not only at the macroeconomic level but also at the industry and firm level. In this study we selected three distinct industries: silverware in Tsubame, synthetic fiber weaving in Fukui-Ishikawa, and automobile parts in Ohta. We survey firms in each industry on the effect and perceived usefulness of SME policies and institutions related to financial, technical, and marketing assistance.

In all three industries, the SMEs under study engage in transactions with various kinds of firms including parent firms, material and equipment suppliers, trading houses, and rival firms. These relations provide both assistance and pressure. It is important to understand the kinds of assistance transmitted through such "markets" in order to evaluate the effectiveness of public support. This is because the role of public support is generally to complement private support, due to the limitations of public support in both financing and human resource terms.

The effectiveness of SME policies often differs among industries. In the area of technical assistance, we found significant differences among the three industries. For the silverware industry in Tsubame, the prefectural technical center and other public R&D institutions contributed notably to the development of new products. One important reason for this key role was the absence of large firms that might have provided technical assistance to the smaller firms.

For the synthetic fiber weaving industry in Fukui-Ishikawa, prefectural technical centers actively promoted the transfer of new technology and equipment during the industry's early development stages. Once the industry was established, however, SMEs in this industry generally obtained technical assistance and information from the chemical companies with which they maintained strong ties. Accordingly, the role of prefectural technical centers diminished over time and came to focus more on auxiliary functions such as product quality testing and technical assistance, especially for SMEs without strong ties to large chemical firms.

Interviews with SMEs in both the silverware and synthetic fiber weaving industries point to the limited role of technical centers in recent years, despite their usefulness in the past. Such views, common among leading SMEs, are based on the perception that these SMEs are now more up-to-date on the latest technologies and technical skills than the technical centers, which are constrained by limited resources. These observations imply that public technical assistance may be most useful in the early stages of development, when SMEs have limited resources of their own available for research and development activities.

Unlike the first two cases, technical centers did not play an important role for the auto parts industry in Ohta at any stage, mainly because auto parts producers were heavily involved in subcontracting with Fuji Heavy Industries, a large automobile producer in Ohta. Moreover, the inconvenient location of the prefectural technical center, an hour drive from Ohta, reduced use of the center by SMEs in Ohta. Although technical assistance from parent firms was important in the beginning, SMEs often diversified their technical and transactional relations with other automobile producers and producers in other industries following successful expansion of their business. Diversification was sought as a means of minimizing risk, and was possible because Fuji Heavy Industries did not control its subcontractors as closely as most other automobile producers.

In the area of marketing assistance, we found that public institutions played a very limited role. Instead, marketing has been largely an activity of private firms: trading houses in the cases of silverware and synthetic fiber weaving, and parent firms in the case of automobile parts. Having noted the limited effectiveness of public marketing assistance in general, we did find such assistance to be helpful to SMEs entering new markets.

Finally, financial support was found to be particularly useful to the synthetic fiber weaving and auto parts industries. The amount of financial resources required for investment

in these industries is substantially larger than in the silverware industry. The relatively large scale of investment makes it difficult for these industries to finance investment through commercial loans alone, creating a greater need for loans from public sources. Among these, loans from local governments are highly valued because of the preferential conditions attached to them, such as low interest rates and lenient collateral requirements.

An important element common to all three cases is the geographical concentration of SMEs in respective industries and their tendency to form local production networks. This trend is common for SMEs in other industries in Japan as well. Geographical concentration of SMEs creates various external economies. For example, strong competition leads to an increase in allocative and technical efficiency through quick dissemination of new technologies. Production levels may be adjusted easily. Moreover, employee hiring and development of human resources become relatively effective.

Another important feature related to geographical concentration is the strong competition among different regions. In our interviews in Ohta, we often heard firms express concern about the performance of firms producing similar products in rival cities. In fact, this kind of competition among regions is an important force in enhancing industry performance. Local governments as well as firms may get involved in competing with each other.

The importance of local production networks naturally leads to questions about the relative role of public support in creating and maintaining such a system. Our study found that it was the initiative of SMEs and the firms related to them that played the crucial role rather than the public sector. At the same time, however, it should be emphasized that public support systems are tightly imbedded in the daily routine of SMEs through such important activities as exchanging information on the availability of financial assistance. Without public support, the activities of SMEs would be hindered.

Some policies were quite effective at inducing SMEs to locate close to each other and at enhancing interaction among firms in a particular regions. The construction of industrial parks should be mentioned in this respect. Local governments have been quite enthusiastic about building industrial parks to attract both large and small firms.⁹⁵ The attraction of large firms to these industrial parks offers marketing opportunities to local SMEs, since larger firms purchase various types of intermediate goods from the local firms. This concentration of local

⁹⁵For example, in the case of Ohta, nine industrial parks have been built, and nine of our sample firms built their new factories in these parks.

SMEs enhances interaction and competition among firms. Through such processes, the function of local production networks has been strengthened.

We have discussed the effectiveness of SME policies from the point of view of particular industries without explicitly considering their direct and indirect impact on other parts of the economy. As noted at the outset, one of the special characteristics of the Japanese economy is the important position of SMEs, which exist mostly as complements to, rather than competitors of, large firms. Recognizing this special position of SMEs in the Japanese economy may lead to a fuller appreciation of the impact of SME policies. Evaluation of SME policies becomes even more complex when one considers their cost. We have chosen not to comment on these issues, but to leave them as subjects for future research.

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TABLE I-1
SMEs IN MANUFACTURING: SELECTED COUNTRIES
 (Percentage Share of Totals)

	Establishments	Employment	Value of Shipments	Value-Added
Japan (1989) ¹	99.1	72.5	51.8	54.8
US (1985) ²	96.0	46.2	38.2	38.4
UK (1987)	96.9	38.7	-	31.8
W Germany (1986) ³	84.5	25.2	20.7	-
France (1971) ⁴	98.9	-	-	-

Source: Census of Manufacturing, 1989 edition, MITI; The White Paper on Small and Medium Enterprises 1991; The Small and Medium Enterprise Agency, MITI, 1991.

Notes: In Japan, SMEs are defined as those establishments with less than 300 workers; for the US, SMEs are defined as those with less than 250 workers. For the rest of the countries, SMEs are defined as enterprises with less than 200 workers.

¹ Value-added establishments, enterprises with less than 3 workers are not included.

² For value of shipments and value-added, the figures are for 1982.

³ Excluding handicraft industry.

⁴ Including mining.

TABLE I-2
SMEs IN JAPANESE MANUFACTURING

	Establishments			Employment		
	Number (1.000)	Share in Each Sector	Share in Manufac- turing	Number (1.000)	Share in Each Sector	Share in Manufac- turing
Manufacturing total	713,431	99.5	100.0	8,575	74.0	100.0
Food	56,857	99.4	8.0	1,053	85.9	12.3
Textiles	80,050	99.8	11.2	580	90.5	6.8
Synthetic weaving	26,998	99.9	3.8	111	90.2	1.3
Apparel	50,387	99.9	7.1	602	97.9	7.0
Wood	33,450	99.9	4.7	274	97.5	3.2
Furniture	40,452	99.9	5.7	263	96.0	3.1
Pulp	15,488	99.5	2.2	240	82.4	2.8
Publishing	46,020	99.7	6.5	481	83.4	5.6
Chemicals	5,689	95.6	0.8	216	54.8	2.5
Petroleum	1,187	97.4	0.2	18	53.7	0.2
Rubber	8,527	98.9	1.2	112	64.4	1.3
Leather	12,174	99.9	1.7	88	97.0	1.0
Clay, Stone, Ceramics	31,098	99.7	4.4	411	85.8	4.8
Nonferrous metals	13,423	98.3	1.9	264	51.8	3.1
Metal products	86,425	99.8	12.1	805	89.6	9.4
Silverware	547	100.0	0.1	4	100.0	0.05
General machinery	75,520	99.4	10.2	867	72.1	10.1
Electric machinery	41,586	97.7	5.8	1,052	54.4	12.3
Transport machinery	20,557	97.8	2.9	375	40.6	4.4
Automobile parts	13,785	97.8	1.9	276	52.7	3.2
Precision machinery	10,958	99.0	1.5	169	66.9	2.0
Other manufacturing	37,454	99.9	5.2	260	90.2	3.0

Source: Census of Manufacturers, MITI, 1989.

TABLE I-3
COLLECTIVE ORGANIZATIONS INVOLVED
WITH SME POLICIES (Select List)

National Level	<p><i>Administratoon:</i> MITI, Small and Medium Agency</p> <p><i>Technical, Managerial, and Financial Assistance:</i> Japan Small Business Corporation</p> <p><i>Financial Assistance:</i> Small Business Finance Corporation (main office) People's Finance Corporation (main office) Shoko Chukin Bank (main office) Small Business Credit Insurance Corporation Small Business Investment Companies (3)</p> <p><i>Provision of Information on Marketing:</i> Japan External Trade Organization (JETRO)</p> <p><i>Promotion of Organized Activities:</i> National Federation of Small Business Associations National Association for Subcontracting Enterprise Promotion Assistance in Broad Areas including Managerial and Marketing Assistance- Japan Chamber of Commerce and Industry Central Federation of Boards of Commerce and Industry</p>
Regional Level	<p><i>Administration:</i> Regional Bureau of MITI</p>
Prefecture and Major City Level	<p><i>Administration:</i> Division in Charge of SMEs at Prefectural Government</p> <p><i>Provision of Guidance in General:</i> Comprehensive Guidance Centers for SMEs (59)</p> <p><i>Technical Assistance:</i> Public Research and Testing Centers (170)</p> <p><i>Provision of Information:</i> Regional Information Centers (47)</p> <p><i>Financial Assistance:</i> Small Business Finance Corporation (583) People's Finance Corporation (151) Shoko Chukin Bank (90) Credit Guarantee Association (52)</p> <p><i>Promotion of Organized Activities:</i> Prefectural Federation of Small Business Associations Small Business Associations (cooperatives)</p> <p><i>Assistance in Broad Areas including Managerial and Marketing Assistance:</i> Chamber of Commerce and Industry (507) Boards of Commerce and Industry (2,384)</p>

Note: Figures in parentheses indicate the number of offices.
Source: Small and Medium Enterprise Agency (1991 and 1993b).

TABLE I-4
FINANCIAL AND FISCAL POLICIES FOR SMEs

	1960	1970	1980	1991
<u>General Budget (¥ million)</u>				
Promotion of SME modernization	1,475	29,988	100,181	89,256
SME consulting activities	711	6,043	40,387	18,969
Financing measures	-	11,750	90,300	76,034
Total including others	2,581	50,318	243,475	194,965
SMEs Share of total general budget (%)	0.15	0.61	0.56	0.28
<u>Fiscal Investment and Loan Program (FILP) (¥ billion)</u>				
Small Business Finance Corporation	32	226	1,527	1,967
People's Finance Corporation	29	236	1,507	2,235
Shokon Chukin Bank	3	12	72	84
Japan Small Business Corporation	-	20	16	20
Total (including misc. items)	74	552	3,400	4,544
Share of FILP total	11.8	14.5	18.8	12.3
<u>Share of Government Financing in Total SME Financing (%)</u>				
Fixed capital	29.0	17.9	20.1	9.8
Working capital	5.2	6.6	10.3	8.1
Total	8.7	9.3	12.6	8.6

Note: The values for 1960, 1970 and 1980 are taken from Yokokura. For 1991, the budget values are taken from Chushokigyo-Cho (1992b). The values for FILP are taken from Prime Minister's Office (1992), and the values for SME financing are taken from Chushokigyo-Cho (1992a).

Source: Small and Medium Enterprise Agency (1991 and 1992b) and Prime Minister's Office (1992).

TABLE II-1
U.S. AND JAPANESE AUTOMOTIVE FIRMS: LEVELS OF INTERNAL PRODUCTION
1965-1983 (By Percent)

Fiscal Year	Nissan		Toyota		GM	Ford	Chrysler
	In-House	Group	In-House	Group	In-House	In-House	In-House
1965	32	54	41	74	50	36	36
1970	29	52	35	66	49	39	36
1975	22	50	30	73	45	36	36
1979	26	70	29	74	43	36	32
1980	26	73	29	76	-	-	34
1981	26	71	28	75	-	-	31
1982	26	75	26	70	-	-	34
1983	26	78	26	73	-	-	28

Sources: Cusumano (1989), Table 46.

Notes: Assumes that the level of payments to suppliers (as a percentage of sales) in 1975 equaled the average for 1974 (64.1%) and 1976 (64.3%), since Chrysler did not publish this figure in 1975.

TABLE II-2
EMPLOYMENT AND LABOR PRODUCTIVITY FOR SELECTED AUTOMOBILE ASSEMBLERS

Company	Vehicles	Employees	Productivity Vehicles/Employee
GM (US)	5,098,338	463,000	11
Ford (US)	2,476,458	163,400	15
Chrysler (US)	1,051,955	65,832	16
VW (Germany)	1,538,206	148,100	10
Toyota	3,376,224	58,706	58
(Toyota Group)		(132,085)	(26)
Nissan	2,518,491	59,335	42
(Nissan Group)		(105,094)	(24)
Mazda	1,171,350	27,395	43
Honda	1,032,440	27,969	37
Mitsubishi	974,705	24,000	41

Sources: Cusumano (1989), Table 44.

Notes: Employee totals for this and other tables include the employees at Toyota Motor Sales prior to the 1982 merger, unless noted.

TABLE II-3
STRUCTURE OF THE AUTOMOBILE INDUSTRY
 (Number of Subcontractors By Parts
 For a Japanese Automobile Producer)

	Engine Parts	Electrical Parts	Driving, Transmitting and Controlling Gear Parts	Braking Gear Parts	Articles	Chassis Parts	Body Parts	Other	Total
1st-tier subcontractor	25	1	31	18	18	3	41	31	168
2nd-tier subcontractor	912	34	609	792	926	27	1,213	924	5,437
3rd-tier subcontractor	4,960	352	7,354	6,204	5,936	85	8,221	8,591	41,703
Total	5,897	387	7,994	7,014	6,880	115	9,475	9,546	47,308

Source: SME Agency, MIT 1977

TABLE II-4
TRANSPORT MACHINERY INDUSTRY IN OHTA - 1989

Size by Employment	Number of Establishments	Number of Employees	Value of Sales (¥ Million)	Value Added (¥ Million)
1-9	30	182	1,915	1,091
10-19	14	191	2,114	1,028
20-29	11	258	4,488	2,215
30-49	7	310	10,243	2,899
50-99	3	220	7,251	2,094
100-199	2	} 9,727	} 702,206	} 175,992
200-299	1			
300-499	2			
500-999	2			
1000+	1	10,888	728,217	185,319
Total	73			

Source: Ohta City Office

TABLE II-5
ASSEMBLERS AND SUPPORTING PART SUPPLIERS
UNDER VARIOUS ORGANIZATIONAL FORMS IN OHTA

Assembler	Local Suppliers				Non-local Suppliers				Total			
	A	B	C	D	A	B	C	D	A	B	C	D
Fuji*	3	51	41	95	0	14	7	21	3	65	48	116
Nissan	2	3	45	50	7	10	10	27	9	13	55	77
Honda	0	4	35	39	2	16	2	20	2	20	37	59
Nissan Diesel	0	0	0	0	0	3	0	3	0	3	0	3
Hino*	1	5	1	7	1	12	0	13	2	17	1	20
Daihatsu*	1	0	5	6	0	6	0	6	1	6	5	12
Toyota	0	1	8	9	2	6	6	14	2	7	14	23
Mazda	0	2	4	6	0	11	2	13	0	13	6	19
Suzuki	0	3	2	5	0	9	5	14	0	12	7	19
Mitsubishi	0	2	17	19	0	14	4	18	0	16	21	37
Isuzu	0	7	11	18	0	12	0	12	0	19	11	30
Total	7	78	169	254	12	113	36	161	19	191	205	415

Source: Sadayoshi Kobayashi "Kennai Jidosha oyobi Do Kanren Seizogyo no Genjo to Tembo"[Current Situation and Future Prospect of Automobile and Its Related Industry in Gumma Prefecture]. Chosa Geppo. Gumma Keizai Kenkyusho.

Notes: A - Member of group; B - Participant in supporting committee; C - Other supporting groups; D - Total.

* Assemblers with plants in Gumma prefecture.

TABLE II-6
STRUCTURE OF SILVERWARE AND HOUSEWARE INDUSTRIES
IN TSUBAME: 1991

Firm Size (Employees)	Silverware		Houseware		Polishing
	Parents	Subcontractors	Parents	Subcontractors	Subcontractors
Total	148	182	127	265	1,014
1-3	24	140	21	188	915
4-9	72	41	49	72	87
10-19	20	-	28	5	11
20-29	20	1	11	-	*1
30-49	5	-	9	-	-
50-99	5	-	7	-	-
100+	2	-	2	-	-

Source: Tsubame City Office(1991). Tsubame no Kogyo [Industry in Tsubame], 1991.

Note: * indicates 20 and above.

TABLE II-7
SIZE DISTRIBUTION OF WEAVING HOUSES IN FUKUI-ISHIKAWA
 (Number of Firms)

Region	Number of Machines							Total
	1-10	11-20	21-30	31-50	51-100	101-200	201+	
Fukui	415	624	201	180	81	59	27	1,587
Ishikawa	222	958	326	155	66	24	18	1,769

Source: Fukui Sen'i Kyokai, Internal Document.
 Ishikawa Prefecture Government, Internal Document.

TABLE II-8
SHARE OF FEE CONTRACT (CHIO-ORD) OUTPUT IN FUKUI-ISHIKAWA

Year	Total Output (A) (1000m ²)	Fee Contracts (B) (1000m ²)	Share of Fee Contracts (B/A) (%)
1955	337,766	180,778	53.5
1960	446,055	285,520	64.0
1970	828,439	692,458	83.6
1980	910,111	757,314	83.2
1989	888,221	743,337	84.4

Source: Fukui Sen'i Kyokai, Internal Document.
 Ishikawa Prefecture Government, Internal Document.

TABLE III-1
SELECTED PUBLIC SUPPORT INSTITUTIONS IN TSUBAME

Name	Established	Members	Staff	Budget	Activities
<u>Industry Associations</u>					
The Japan Metal Flatware Assoc.	1957	138	8	¥80 million (20% from city and prefecture)	Marketing and R&D
The Japan Metal Houseware Assoc.	1964	79	7	¥100 million (30% from city and prefecture)	Marketing and R&D
The Tsubame Wholesalers Cooperative Assoc.	1973	35	5	¥68 million (¥12 million from city and prefecture)	Marketing
<u>Other Institutions</u>					
Tsubame Chamber of Commerce	1949	3138	23	¥171 million (¥60 million from city and prefecture)	Provision of info. on almost everything incl. R&D, markets, finance
Niigata Prefectural Technical Center	1974	n.a.	14	¥1.4 billion (prefecture)	

Source: Interviews with officials and official documents of respective institutions.

TABLE III-2
GOVERNMENT POLICIES APPLIED TO THE
SILVERWARE INDUSTRY IN TSUBAME

1960	Small and Medium Enterprise Sector Specific Promotion Temporary Measures Law. The silverware industry in Tsubame was designated as one of sixteen industries covered by this law. Accordingly, the industry was given guidance directly by the central government and by the SME council.
1963	Small and Medium Enterprise Modernization Promotion Law. The silverware industry was designated as an industry to be modernized. Under the law 5-year plan was formulated and carried out mainly concerning desired level of output and reduction in wage rate. The law was revised and extended in 1969 and 1974.
1971	Special measures to deal with the "dollar shock" (devaluation of US dollar) were applied to SMEs.
1977	Special loan program was implemented to deal with the problems caused by fluctuation of the yen value implemented. Small and Medium Enterprise Temporary Measures Law Concerning the Yen Appreciation was enacted to provide assistance to SMEs suffering from the problems caused by yen appreciation.
1979	Temporary Measures Law for Small and Medium Enterprises in Local Production Network. Silverware industry and metal houseware industry in Tsubame were designated under the law for industry promotion. Under the law a promotion plan was formulated by the Japan Metal Flatware Industry Association.
1986	Temporary Measures Law for Small and Medium Enterprises in Specified Areas. Tsubame was selected as one of 51 areas and 216 cities, towns and villages designated to receive help with promotion.

Source: Constructed from information obtained from government documents.

TABLE III-3
A BRIEF HISTORY OF TEXTILE INDUSTRY
POLICY IN FUKUI PREFECTURE

1902	Fukui Technical Support Center was established.
1956-59	Government purchased excess capacity (13,752 machines).
1963	Fukui Technical Support Center restructured as Fukui Textile Technical Support Center.
1967	First structural reform project (until 1974) (total budget ¥49,634 million). The main purpose of this project was to replace old machines with new ones.
1970-71	Emergent loan by the prefecture government (979 cases, ¥2,866 million) to deal with the demand reduction due to Japan-US textile treaty. (The national government provided special loans in the same period.)
1971-72	Government purchased old machines from weaving houses to assist in their restructuring.
1974	Second structural reform project (¥3,175 million) to strengthen software technology.
1977-83	Coordinated scrapping of machines (10,596 machines; ¥14,895 million).
1979	Third structural reform project (¥9,349 million).
1984-89	Fourth structural reform project (¥3,593 million).
1985-87	Coordinated scrapping of machines (15,559 machines).
1989	Fifth structural reform project.
1991	Special loan program of the local government (¥1,200 million).

Source: Constructed from information obtained from government document.

TABLE III-4
CHARACTERISTICS OF THE SAMPLE FIRMS IN TSUBAME

	Firm Size				
	E < 10	10 < E < 30	30 < E < 80	80 < E	Total
Number of firms	13	11	10	6	40
<u>Type of Operation:</u>					
Parent Firms	7	9	10	6	32
Subcontractors	6	2	0	0	8
<u>Year Established:</u>					
Before 1950	1 (7.6)	0 (0.0)	1 (10.0)	1 (16.7)	3 (7.5)
1950s	4 (30.8)	2 (19.2)	3 (30.0)	4 (66.7)	13 (32.5)
1960s	5 (38.5)	5 (45.5)	5 (50.0)	1 (16.7)	16 (40.0)
1970s	2 (15.4)	4 (36.4)	1 (10.0)	0 (0.0)	7 (17.5)
1980s	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
1990s	1 (7.6)	0 (0.0)	0 (0.0)	0 (0.0)	1 (2.5)

Note: E = number of employees. The numbers in parentheses are percentage shares of the total number of firms in each respective size category. Subcontractor in this table indicates a firm engaged in subcontracting activities only, while parent firms are generally those engaged in non-subcontracting as well as subcontracting activities.

Source: Interview results.

TABLE III-5
DISTRIBUTION OF SAMPLE FIRMS IN FUKUI-ISHIKAWA
(By Date of Establishment)

Number of Employees	Established before WWII	Established after WWII	Total
less than 50	3	11	14
50-100	7	6	13
more than 100	6	0	6
Total	16	17	33

Source: Interview results.

TABLE III-6
CHARACTERISTICS OF SAMPLE FIRMS IN OHTA

Size (number of workers)

1-9	10-19	20-50	50-100	100-
10	12	6	0	6

Starting Year

-1945	1945-1955	1955-	no answer
3	5	25	1

Background

Former employee of Nakajima Hiroki	6
Former employee of parts suppliers for Nakajima Hiroki or Fuji Heavy Industry	10
Others	14
No answer	4

TABLE IV-1
IMPACT OF MID-1980s YEN APPRECIATION
ON SILVERWARE INDUSTRY IN TSUBAME

	E < 10	10 < E < 30	30 < E < 50	50 < E	Total
Main Problems Caused:					
Decline in export sales	5 (38.5)	7 (63.6)	6 (60.0)	3 (50.0)	21 (52.5)
Decline in domestic sales	5 (38.5)	3 (27.3)	0 (0.0)	1 (16.7)	9 (22.5)
Competition from imports	11 (7.6)	2 (19.2)	2 (20.0)	0 (0.0)	5 (12.5)
Other	4 (30.8)	2 (19.2)	4 (40.0)	2 (33.3)	12 (30.0)
Response:					
New products	4 (30.8)	8 (72.7)	5 (50.0)	4 (66.7)	21 (52.5)
Diversification	3 (23.1)	6 (54.5)	5 (50.0)	3 (50.0)	17 (42.5)
Technology improvement	7 (53.8)	7 (63.6)	5 (50.0)	2 (33.3)	21 (52.5)
Cost reduction:					
Material costs	8 (61.5)	3 (18.2)	3 (30.0)	2 (33.3)	16 (40.0)
Wages	5 (38.5)	4 (36.4)	3 (30.0)	0 (0.0)	12 (30.0)
Rationalization	3 (23.1)	1 (9.1)	3 (30.0)	0 (0.0)	7 (17.5)
Layoffs	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Foreign direct investment	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Source: Interview Results

Note: The numbers in parentheses are percentage shares in the total number of firms in respective size categories.
 E = number of employees.

TABLE IV-2
SOURCES OF TECHNOLOGY ACQUISITION IN TSUBAME
 (PERCENTAGE SHARES OF FIRMS INDICATING THE SOURCES
 OF TECHNOLOGY ACQUISITION)

Source	Firm Size				Total
	E < 10	10 < E < 30	30 < E < 80	80 < E	
Own efforts	100	100	88	100	97
Reverse engineering	10	36	63	50	37
Joint development	30	45	0	67	34
Patents	0	45	25	50	29
Technology tie	20	27	25	50	29
Number of respondents	10	11	8	6	35

Source: Interview results.

Note: E = number of employees

TABLE IV-3
USEFULNESS OF TECHNOLOGY SUPPORT SYSTEMS IN TSUBAME

	Recipients/ Respon- dents	Least -----> Most Useful					Average Score
		1	2	3	4	5	
Parent firms	19/36	5	0	1	0	13	3.8
Public technology center	18/36	8	0	6	1	3	2.5
Firms in same business	13/36	4	0	6	0	3	2.8
Equipment suppliers	13/35	4	0	3	1	5	3.2
Industry association	13/35	7	0	4	1	1	2.2
Technical literature	8/36	3	2	2	0	1	2.3
Chamber of Commerce	7/36	6	0	1	0	0	1.3
Buyers	6/36	5	0	0	0	1	1.7
Private consulting firms	6/36	4	0	1	0	1	2.0
University	7/36	6	0	1	0	0	1.4

Source: Authors' tabulation based on interview results.

TABLE IV-4
USEFULNESS OF TECHNOLOGY SUPPORT SYSTEMS
FOR FIRMS OF DIFFERENT SIZES IN TSUBAME

Type of Firm/ Number of Workers		Recipients/ Respondents	Least -----> Most Useful					Average Score
			1	2	3	4	5	
Parent firms	>80	5/6	2	0	0	0	3	3.4
	30-80	5/8	0	0	0	0	5	5.0
	10-29	3/11	1	0	0	0	2	3.7
	<10	6/11	2	0	1	0	3	3.3
Public Technology Center	>80	4/6	2	0	0	1	1	2.8
	30-80	4/8	2	0	0	0	2	3.0
	10-29	7/11	2	0	5	0	0	2.4
	<10	3/11	2	0	1	0	0	1.7
Firms in Same Business	>80	3/6	2	0	0	0	1	2.3
	30-80	1/8	0	0	1	0	0	3.0
	10-29	4/11	1	0	3	0	0	2.5
	<10	5/11	1	0	2	0	2	3.4
Equipment Suppliers	>80	3/6	2	0	0	1	0	2.0
	30-80	2/8	0	0	0	0	1	4.0
	10-29	4/11	1	0	2	0	1	3.0
	<10	4/11	1	0	0	0	3	4.0
Industry Association/ Chamber of Commerce	>80	4/6	3	0	1	0	0	1.5
	30-80	1/8	0	0	0	0	1	5.0
	10-29	7/11	3	0	3	1	0	2.3
	<10	1/11	1	0	0	0	0	1.0

Source: Authors' tabulation based on interview results.

TABLE IV-5
RESPONSE TO YEN APPRECIATION IN FUKUI-ISHIKAWA

Strategy	Number of Firms (and percent %)
New products along the traditional product line	21 (75.0)
Completely new product lines	12 (42.9)
Enhanced production process	0 (0.0)
Cost reduction of materials and parts	3 (10.7)
Employment adjustment	11 (39.3)
Capacity reduction	1 (3.6)
Foreign investment	1 (3.6)

Source: Interview results

Note: Multiple answers allowed.

TABLE IV-6
USEFULNESS OF TECHNOLOGY SUPPORT SYSTEMS
IN FUKUI-ISHIKAWA

	Recipients/ Respon- dents	Least ----- > Most Useful					Average Score
		1	2	3	4	5	
Parent firms	27/30	0	3	4	2	18	4.3
Equipment suppliers	20/30	0	6	3	1	10	3.8
Public technology center	14/29	4	2	1	4	3	3.0
Firms in same business	4/30	1	1	1	0	1	2.8
Technical literature	3/29	0	0	1	0	1	4.0
Industry association	3/30	0	1	0	1	1	3.7
Seminars	3/30	0	1	1	0	1	3.3
University	3/30	1	0	1	0	1	3.0
Buyers	2/30	0	1	1	0	0	2.5
Private consulting firms	2/30	0	0	1	0	1	4.0
Chamber of Commerce	0/30	0	0	0	0	0	0.0

Source: Authors' tabulation based on interview results.

TABLE IV-7
USEFULNESS OF TECHNOLOGY SUPPORT SYSTEMS
FOR TYPES OF FIRMS IN FUKUI-ISHIKAWA

Type of Firm/Workers		Recipients Respondents	Least -----> Most Useful					Average Score
			1	2	3	4	5	
Parent firms	E > 100	5/7	0	2	0	2	2	4.4
	50-100	10/11	0	1	3	0	6	4.1
	20-49	6/6	0	1	1	0	4	4.2
	< 19	6/6	0	0	0	0	6	5.0
Equipment Suppliers	E > 100	4/7	0	3	1	0	0	2.3
	50-100	7/11	0	2	0	0	5	4.1
	20-49	5/6	0	0	2	0	3	4.2
	< 19	4/6	0	1	0	1	2	4.0
Public Technology Center	E > 100	5/7	1	1	0	2	1	3.2
	50-100	5/11	1	1	1	1	1	3.0
	20-49	4/6	2	0	0	1	1	2.8
	< 19	0/5	0	0	0	0	0	0.0

Source: Authors' tabulation based on interview results.

Note: E = number of employees

TABLE IV-8
STRUCTURAL CHANGE STRATEGIES OF SAMPLE FIRMS IN OHTA

STRATEGY

RANKING BY IMPORTANCE

New products along the traditional product lines	2.2
New area (diversification)	1.5
Process changes and upgrading of equipment	4.1
Cost reduction of materials and parts	2.9
Employment adjustment	2.4
Equipment disposal	1.3
Foreign direct investment	1.1

Source: Interview Results

Scale: 5 (most important) to 1 (least important).

TABLE IV-9
SOURCES OF IDEAS FOR NEW PRODUCTS AND
NEW MANUFACTURING PROCESSES IN OHTA

Size of Firm	Recipients		Respondents
	Own Efforts	Parent Firms	Others
50 < E	5/6	2/5	0/5
20 < E < 49	7/7	4/7	3/7 (technical center, equipment supplier)
10 < E < 19	8/10	6/9	2/8 (exhibition, trading company)
E < 10	9/9	4/14	5/14 (technical center, exhibition)

Source: Interview results

Note: E = number of employees

TABLE IV-10
USEFULNESS OF TECHNOLOGY SUPPORT
SYSTEMS IN OHTA (I)

	Recipients/ Respon- dents	Least ----->Most Useful					Average Score
		1	2	3	4	5	
Parent firms	24/33	4	0	11	4	5	3.3
Equipment suppliers	21/33	3	0	3	5	10	3.9
Public technology center	6/33	1	0	1	1	3	3.8
Firms in same business	11/33	4	0	2	3	2	2.9
Technical literature	4/31	3	0	0	1	0	1.8
Industry association	5/30	1	0	2	1	1	3.2
University	3/32	0	0	0	2	1	4.3

Source: Authors' tabulation based on interview results.

**TABLE IV-11
USEFULNESS OF TECHNOLOGY SUPPORT
SYSTEMS IN OHTA (II)**

Type of Firm/ Number of Workers		Recipients Respondents	Least ----->Most Useful					Average Score
			1	2	3	4	5	
Parent firms	E > 50	3/6	0	0	1	1	1	4.0
	20-50	4/7	1	0	3	0	0	2.5
	10-19	10/10	2	0	5	2	1	3.0
	< 10	7/10	1	0	2	1	3	3.7
Equipment Suppliers	> 50	4/6	1	0	0	1	2	3.8
	20-50	4/7	1	0	1	0	2	3.5
	10-19	6/10	0	0	1	3	2	4.2
	> 10	7/10	1	0	1	1	4	4.0
Public Technology Center	> 50	1/6	0	0	1	0	0	3.0
	20-50	2/7	0	0	0	0	2	5.0
	10-19	2/10	1	0	0	0	1	3.0
	< 10	1/10	0	0	0	1	0	3.0

Source: Authors' tabulation based on interview results.

Note: E = number of employees

TABLE IV-12
TYPES AND SOURCES OF SME TECHNOLOGICAL ADVANCES IN JAPAN
1963-1968
 (%)

Source of
 Technological Advance

Types of Technological Advance

	A	B	C	D	E	F	G
Developed through R&D	11.2	45.2	50.1	32.6	35.0	18.5	32.1
Adopted from other firms in same industry	15.1	49.8	42.9	24.1	23.8	16.7	28.7
Adopted from primary firms	20.0	24.8	28.0	41.2	25.2	19.6	26.5
Adopted from material or machinery producers	30.6	56.7	22.4	17.2	12.7	8.4	24.7
Imported from foreign firms	10.4	47.0	23.5	27.8	6.1	19.1	22.3
Other	14.9	31.9	19.1	23.4	10.6	25.5	20.9

Notes: A - Materials; B - major machinery and equipment; C - manufacturing process; D - development of new products; E - improvement of existing products; F - development of new designs and ideas; G - simple average.

Source: Survey of Modernization by SMEs, SME Agency, MITI

TABLE V-1
CHANNELS OF DISTRIBUTION OF NEW PRODUCTS IN TSUBAME

Channel	% of Firms Using Channel (by firm size)				
	E < 10	10 < E < 30	30 < E < 80	80 < E	Total
Parent firms	43	33	25	20	31
Local trading house	43	67	50	40	52
Non-local trading house	14	22	50	47	31
Direct marketing	0	33	25	80	31
Number of respondents	7	9	8	5	29

Note: E = number of employees

Source: Authors' calculation based on interview results.

TABLE V-2
USEFULNESS OF MARKETING SUPPORT SYSTEMS IN TSUBAME

	Recipients Respon- dents	Least ----- > Most Useful					Average Score
		1	2	3	4	5	
<u>Supporting Institutions:</u>							
City office	4/29	1	0	2	0	1	3.0
Industry association	4/30	0	1	1	0	2	3.8
Chamber of Commerce	4/30	1	1	1	0	0	2.0
<u>Type of Support:</u>							
Provision of information	4/27	0	0	2	0	2	4.0
Sending buyers	2/27	0	0	1	0	1	4.0
Identification of buyers	3/27	0	1	2	0	0	2.3
Sending in orders	3/27	2	0	0	0	1	2.3
Organizing trade fairs	4/28	3	0	1	0	0	1.5
Exploratory trips	4/28	0	1	1	0	2	3.8

Source: Authors' tabulation based on interview results.

TABLE V-3
MARKET SUPPORT IN FUKUI-ISHIKAWA

	Recipients Respon- dents	Least ----- > Most Useful					Average Score
		1	2	3	4	5	
Parent company	9/33	0	2	0	1	6	4.2
Industry association	9/33	9	0	0	0	0	1.0
Chamber of Commerce	9/33	9	0	0	0	0	1.0
Government	9/33	9	0	0	0	0	1.0
Others	5/33	4	0	0	0	1	1.8

Source: Interview results.

TABLE V-4
MARKET SUPPORT IN OHTA

	Recipients/ Respon- dents	Least ----- > Most Useful					Average Score
		1	2	3	4	5	
Parent company	21/34	10	1	1	1	8	2.8
Industry association/ Chamber of Commerce	21/34	19	1	0	0	1	1.2
Government	21/34	17	0	0	0	4	1.7
Trading House	21/34	16	3	1	1	0	1.4

Source: Interview results.

TABLE V-5
USEFULNESS OF MARKET SUPPORT SYSTEMS
FOR FIRMS OF DIFFERENT SIZES IN OHTA

Type of Firm/ Number of Workers		Recipients/ Respon- dents	Least ----- > Most Useful					Average Score
			1	2	3	4	5	
Parent firms	> 50	4/6	3	0	0	0	1	2.0
	20-50	6/6	4	1	0	0	1	1.8
	10-19	6/12	2	0	0	1	3	3.5
	< 10	5/10	1	0	1	0	3	3.8
Industry Association	> 50	4/6	4	0	0	0	0	1.0
	20-50	6/6	5	1	0	0	0	1.2
	10-19	6/12	6	0	0	0	0	1.0
	< 10	5/10	4	0	0	0	1	1.8
Government	> 50	4/6	4	0	0	0	0	1.0
	20-50	6/6	5	0	0	0	1	1.7
	10-19	6/12	5	0	0	0	1	1.7
	< 10	5/10	3	0	0	0	2	2.6
Trading House	> 50	4/6	2	1	1	0	0	1.8
	20-50	6/6	6	0	0	0	0	1.0
	10-19	6/12	5	1	0	0	0	1.2
	< 10	5/10	3	1	0	1	0	1.8

Source: Authors' tabulation based on interview results.

Note: E = number of employees

TABLE VI-1
SOURCES AND USES OF FUNDS: 1954-62

	SMEs	Large Firms
<u>Uses:</u>		
Fixed investment	43.2	52.3
Shortage in long-term funds (-)	-5.7	0.8
Inventory investment	12.4	10.9
Sales credit	23.7	22.4
Cash and savings	16.2	9.0
Others	4.5	5.4
Subtotal	56.8	47.7
Total	100%	100%
<u>Sources:</u>		
Paid-in capital	11.9	18.0
Depreciation	18.6	15.4
Long-term borrowing	5.2	13.2
Bonds	-	3.1
Other long-term debt	1.8	3.5
Subtotal	37.5	53.1
Short-term borrowing	19.1	14.3
Purchase debt	32.3	22.1
Other short-term debt	11.1	10.4
Shortage in short-term funds (-)	5.7	-0.8
Total	100%	100%

Source: Interview results.

TABLE VI-2
OUTSTANDING LENDING BALANCES TO SMES
(100 Million Yen: %)

	1960		1970		1980		1985	
	Value	Share	Value	Share	Value	Share	Value	Share
Private banks								
A	22,900	55.7	103,121	45.0	541,138	50.3	961,806	55.7
B	1,331	25.3	19,683	34.8	113,733	45.7	186,667	50.3
Private SME finance institutions								
A	14,468	35.1	101,354	44.2	405,178	37.7	582,006	33.7
B	2,241	42.7	23,334	41.2	83,700	33.6	121,573	32.7
Public SME finance institutions								
A	3,808	9.2	24,608	10.7	129,329	12.0	184,183	10.7
B	1,680	32.0	13,562	24.0	51,659	20.7	63,196	17.5
Total lending to SMEs								
A	41,268	100.0	229,085	100.0	1,075,645	100.0	1,727,994	100.0
B	5,253	100.0	56,580	100.0	249,092	100.0	371,436	100.0
Share of lending to SMEs in overall lending (%)								
A	41.2		43.4		56.7		58.5	
B	21.8		37.2		50.9		54.5	

Source: Japan's Economic Development and Small and Medium Enterprises, Doyukan, 1987, Table 3-4.

Chushokigyo Kinyu Koko, Chushokigyo Kinyu Koko 30 Nenshi [30 Year History of the Small Business Corporation, 1984], and Chushokigyo Hakusho [White Paper on Small and Medium Enterprises], 1991 Volume, Chushokigyo Cho.

Note: A and B respectively indicate overall lending and lending for fixed investment only, at the end of March for respective years.

TABLE VI-3
OUTSTANDING LENDING BALANCE BY PUBLIC
FINANCE INSTITUTIONS TO SMES
(Billion Yen: %)

	1960		1970		1980		1985		
	Value	Share	Value	Share	Value	Share	Value	Share	
Small Business Finance Corporation	A	27	12.8	109	9.9	1,815	23.4	2,589	23.0
	B	104	63.0	657	52.1	1,999	44.4	2,594	45.9
	A+B	131	34.8	766	32.4	3,814	31.1	5,183	30.7
People's Finance Corporation	A	77	36.2	350	31.7	2,251	29.0	3,456	30.7
	B	30	18.0	240	19.0	1,210	26.8	1,318	23.3
	A+B	107	28.3	590	24.9	3,461	28.2	4,774	28.2
Shoko Chukin Bank	A	108	51.0	645	58.4	3,701	47.6	5,208	46.3
	B	31	19.0	364	28.9	1,297	28.8	1,745	30.8
	A+B	140	36.9	1,010	42.7	4,998	40.7	6,952	41.1
Total	A	213	100.0	1,105	100.0	7,767	100.0	11,253	100.0
	B	165	100.0	1,262	100.0	4,506	100.0	5,657	100.0
	A+B	378	100.0	2,366	100.0	12,273	100.0	16,909	100.0

Source: Japan's Economic Development and Small and Medium Enterprises, Doyukan, 1987, Table 3-4.

Chushokigyo Kinyu Koko, Chushokigyo Kinyu Koko 30 Nenshi [30 Year History of the Small Business Corporation, 1984], and Chushokigyo Hakusho [White Paper on Small and Medium Enterprises], 1991 Volume, Chushokigyo Cho.

Note: A and B respectively indicate overall lending and lending for fixed investment only, at the end of March for respective years.

TABLE VI-4
PUBLIC SME FINANCIAL INSTITUTIONS AND THE
FISCAL INVESTMENT AND LOAN PROGRAM
(Billion Yen; %)

	1955		1965		1975		1982		
	Value	Share	Value	Share	Value	Share	Value	Share	
Small Business Finance Corporation	A	100	3.1	1,043	6.4	5,830	6.3	16,071	7.9
	B	120	4.0	1,153	6.5	7,150	6.8	15,956	7.7
People's Finance Corporation	A	90	2.8	868	5.4	6,217	6.7	19,289	9.5
	B	110	3.7	968	5.4	7,417	7.0	19,289	9.4
Shoko Chukin Bank	A	10	0.3	134	0.8	473	0.5	731	0.4
	B	10	0.3	164	0.9	622	0.6	730	0.4
Subtotal	A	200	6.2	2,045	12.6	12,520	13.4	36,091	17.8
	B	240	8.0	2,285	12.9	15,189	14.4	35,975	17.4
Overall Fiscal Investment and Loan Program	A	3,219	100.0	16,206	100.0	93,100	100.0	202,888	100.0
	B	2,998	100.0	17,764	100.0	105,610	100.0	206,197	100.0

Source: Japan's Economic Development and Small and Medium Enterprises, Doyukan, 1987, Table 3-4.

Chushokigyo Kinyu Koko, Chushokigyo Kinyu Koko 30 Nenshi [30 Year History of the Small Business Corporation, 1984], and Chushokigyo Hakusho [White Paper on Small and Medium Enterprises], 1991 Volume, Chushokigyo Cho.

Note: A and B respectively indicate overall lending and lending for fixed investment only, at the end of March for respective years.

TABLE VI-5
PUBLIC CREDIT SUPPLEMENTATION SYSTEM
(Billion Yen)

		1950	1960	1970	1980	1984
<u>The Credit Guarantee Association:</u>						
	Value of loans guaranteed	25	177	1,364	5,203	5,712
	Annual Cumulative	-	898	8,287	42,427	64,101
Balance of outstanding loans guaranteed	11	124	1,314	7,129	8,551	
<u>The Small Business Credit Insurance Corporation:</u>						
	Value of loans insured	57	142	1,274	5,118	5,585
	Annual Cumulative	241	474	7,344	40,677	61,847
Balance of outstanding loans to The Credit Guarantee Association	3	7	64	233	304	

Source: Japan's Economic Development and Small and Medium Enterprises, Doyukan, 1987, Tables 3-12.

Note: The first year that the values are given for the Small Business Credit Insurance Corporation is 1958 instead of 1950.

TABLE VI-6
USEFULNESS OF FINANCIAL SUPPORT SYSTEMS IN TSUBAME

	Recipients/ Respon- dents	Least -----> Most Useful					Average Score
		1	2	3	4	5	
Own fund	25/34	0	0	5	0	20	4.6
Loans from private sources:							
Commercial banks	26/34	0	0	11	1	14	4.1
Credit associations	9/34	1	0	2	1	5	4.0
Loans from governments:							
Central government	9/34	0	0	6	0	3	3.7
Prefectural government	15/34	1	0	8	1	5	3.6
City government	5/34	0	0	3	1	1	3.9
Loans from public financial institutions:							
Small Business Finance Corp.	14/34	0	0	8	2	7	4.4
People's Finance Corp.	6/34	0	0	4	1	9	3.7
Shoko Chukin Bank	2/34	0	0	4	0	2	3.5

Source: Authors' tabulation based on interview results.

TABLE VI-7
USEFULNESS OF FINANCIAL SUPPORT SYSTEMS IN FUKUI-ISHIKAWA (I)

	Recipients/ Respon- dents	Least -----> Most Useful					Average Score
		1	2	3	4	5	
Own fund	31/33	6	5	13	2	5	2.8
Loans from private sources:							
Commercial banks	31/33	8	2	1	2	18	3.6
Credit associations	28/33	24	2	0	1	1	1.3
Loans from governments:							
Central government	28/33	13	1	1	0	13	3.0
Prefectural government	30/33	6	2	4	5	13	3.6
City government	27/33	26	0	0	1	0	1.1
Loans from public financial institutions:							
Small Business Finance Corp.	30/33	12	3	1	2	12	3.0
People's Finance Corp.	30/33	24	2	1	0	3	1.5
Shoko Chukin Bank	29/33	11	3	1	4	10	3.0

Source: Interview results.

TABLE VI-8
USEFULNESS OF FINANCIAL SUPPORT SYSTEMS IN FUKUI-ISHIKAWA (II)

Firm Size		Recipients/ Respon- dents	Least -----> Most Useful					Average Score
			1	2	3	4	5	
Own fund	E > 100	5/6	0	2	3	0	0	2.6
	50-100	13/13	3	1	6	1	2	2.8
	20-49	6/7	1	1	2	0	2	3.2
	< 20	7/7	2	1	2	1	1	2.7
Loans from private sources: commercial banks	> 100	5/6	1	0	0	0	4	4.2
	50-100	13/13	1	1	0	1	10	4.4
	20-49	6/7	3	1	0	0	2	2.5
	< 20	7/7	3	0	1	1	2	2.9
Credit associations	> 100	5/6	4	1	0	0	0	1.2
	50-100	12/13	10	1	0	1	0	1.3
	20-49	6/7	6	0	0	0	0	1.0
	< 20	5/7	4	0	0	0	1	1.8
Loans from governments: Central government	> 100	5/6	3	0	0	0	2	2.6
	50-100	12/13	7	0	0	0	5	2.7
	20-49	5/7	1	0	0	0	4	4.2
	< 20	6/7	2	1	1	1	2	2.8
Prefectural government	> 100	5/6	1	1	0	1	2	3.4
	50-100	12/13	3	1	3	0	5	3.3
	20-49	6/7	2	0	0	1	3	3.5
	< 20	7/7	0	0	1	3	3	4.3
City government	> 100	5/6	5	0	0	0	0	1.0
	50-100	11/13	11	0	0	0	0	1.0
	20-49	6/7	5	0	0	1	0	1.5
	< 20	5/7	5	0	0	0	0	1.0
Loans from public financial institutions: Small Business Finance Corp.	> 100	5/6	3	1	0	1	0	1.8
	50-100	13/13	3	1	1	0	8	3.7
	20-49	6/7	2	0	0	1	3	3.5
	< 20	6/7	4	1	0	0	1	1.8
People's Finance Corporations	> 100	5/6	5	0	0	0	0	1.0
	50-100	13/13	10	1	1	0	1	1.5
	20-49	6/7	6	0	0	0	0	1.0
	< 20	6/7	3	1	0	0	2	2.5
Shoko Chukin Bank	> 100	5/6	1	1	0	1	2	3.4
	50-100	12/13	4	1	1	0	6	3.3
	20-49	6/7	3	0	0	1	2	2.8
	< 20	6/7	3	1	0	2	0	2.2

Source: Interview results.

Note: E = number of employees

TABLE VI-9
USEFULNESS OF FINANCIAL SUPPORT SYSTEMS IN OHTA

	Recipients/Respon-dents	Least ----- > Most Useful					Average Score
		1	2	3	4	5	
Own fund	30/34	9	3	4	0	14	3.2
Loans from private sources:							
Commercial banks	27/34	7	0	2	2	16	3.7
Credit associations	21/34	10	0	1	2	8	2.9
Loans from governments:							
Central government	19/34	15	0	1	0	3	1.7
Prefectural government	25/34	7	2	2	0	14	3.5
City government	23/34	10	0	1	0	12	3.2
Loans from public financial institutions:							
Small Business Finance Corp.	23/34	13	0	2	1	7	2.5
People's Finance Corp.	24/34	15	0	2	0	7	2.3
Shoko Chukin Bank	22/34	17	0	1	1	3	1.8

Source: Interview results.

		Recipients/Respondents	Least -----> Most Useful					Average Score
			1	2	3	4	5	
Own fund	E>50	6/6	0	1	2	0	3	3.8
	20-50	6/6	2	0	1	0	3	3.3
	10-19	9/12	5	1	0	0	3	2.4
	<10	9/10	2	1	1	0	5	3.6
Loans from private sources:	>50	6/6	0	0	0	0	6	5.0
	20-50	5/6	2	0	1	1	1	2.8
	10-19	8/12	3	0	0	1	4	3.4
	<10	8/10	2	0	1	0	5	3.8
Commercial banks	>50	4/6	2	0	0	0	2	3.0
	20-50	4/6	3	0	0	1	0	1.8
	10-19	6/12	3	0	0	1	2	2.8
	<10	7/10	2	0	1	0	4	3.6
Credit associations	>50	5/6	4	0	0	0	1	1.8
	20-50	5/6	3	0	1	0	1	2.2
	10-19	4/12	4	0	0	0	0	1.0
	<10	5/10	4	0	0	0	1	1.8
Loans from governments: Central government	>50	6/6	3	2	0	0	1	2.0
	20-50	4/6	0	0	1	0	3	4.5
	10-19	8/12	1	0	1	0	6	4.3
	<10	7/10	3	0	0	0	4	3.3
Prefectural government	>50	6/6	5	0	0	0	1	1.7
	20-50	3/6	1	0	1	0	1	3.0
	10-19	8/12	3	0	0	0	5	3.5
	<10	6/10	1	0	0	0	5	4.3
City government	>50	6/6	3	0	0	0	3	3.0
	20-50	5/6	2	0	0	1	2	3.2
	10-19	6/12	3	0	2	0	1	2.3
	<10	6/10	5	0	0	0	1	1.7
Public loans from: Small Business Finance Corp.	>50	6/6	6	0	0	0	0	1.0
	20-50	5/6	4	0	1	0	0	1.4
	10-19	6/12	2	0	1	0	3	3.3
	<10	7/10	3	0	0	0	4	3.3
Shoko Chukin Bank	>50	5/6	1	0	1	0	3	3.8
	20-50	5/6	4	0	0	1	0	1.6
	10-19	5/12	5	0	0	0	0	1.0
	<10	7/10	7	0	0	0	0	1.0

Source: Interview results.

Note: E = number of employees

TABLE VI-11
CUMULATIVE INVESTMENT (LAST 5 YEARS)
AND AVERAGE AMOUNT OF ANNUAL SALES IN OHTA

Investment Amount	Number of Firms	Average Annual Sales	Average Number of Employees
No answer	0		
< ¥10 million	6	¥97 million	13
¥10 - ¥30 million	7	¥120 million	12
¥30 - ¥60 million	6	¥64 million	8
¥60 - ¥100 million	6	¥318 million	14
> ¥100 million	9	¥9,967 million	238

Source: Interview results.

TABLE VI-12
TOTAL SHARE OF PUBLIC LOANS

Share	Number of Firms	Average Number of Employees
No answer	1	12
0%	7	34
1-30%	4	314
30-60%	13	64
60-90%	6	7.2
>90%	3	15

Source: Interview results.

Figure II-1. PRODUCTION SYSTEM OF SIVERWARE AND HOUSEWARES INDUSTRIES IN TSUBAME

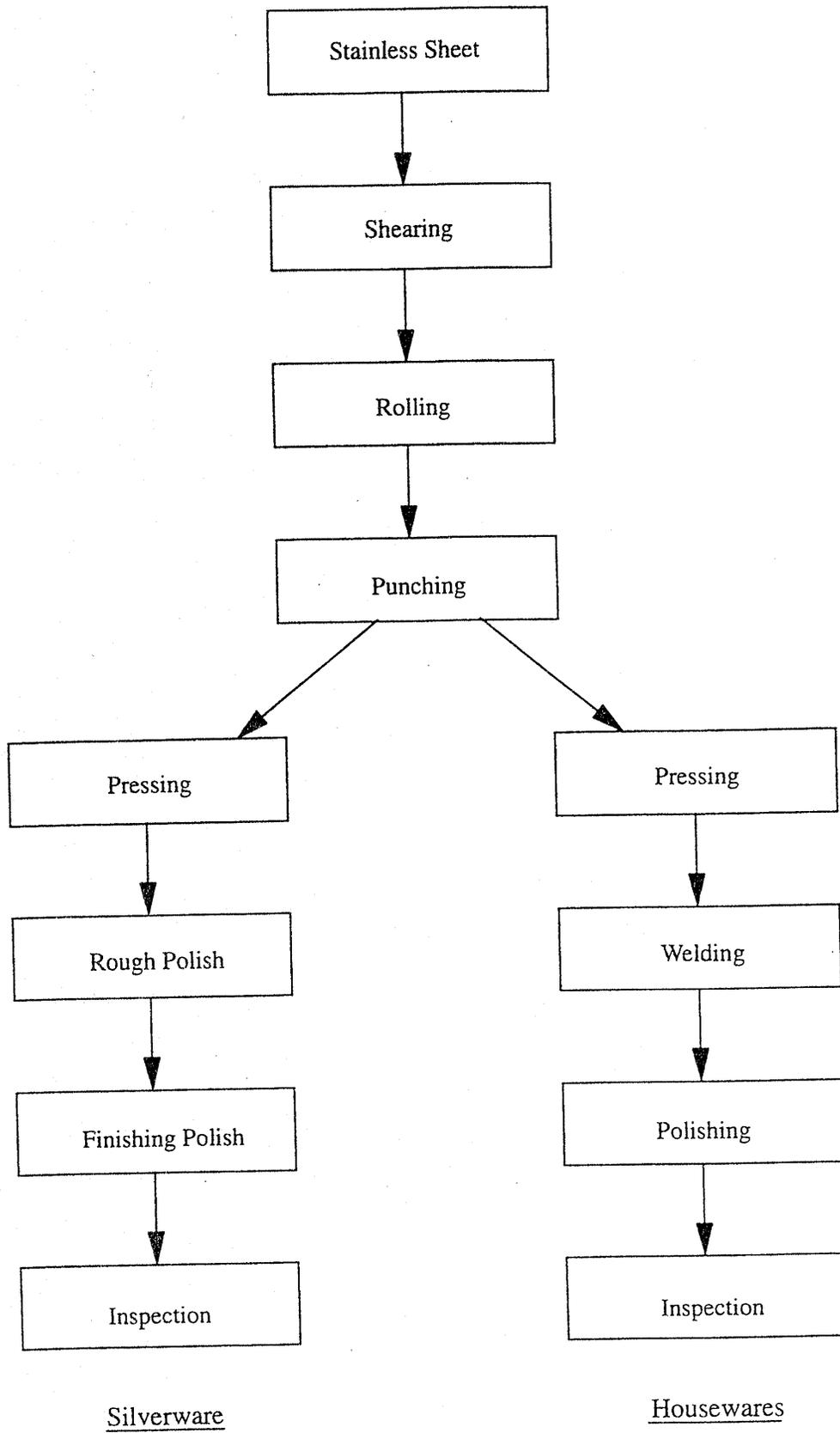
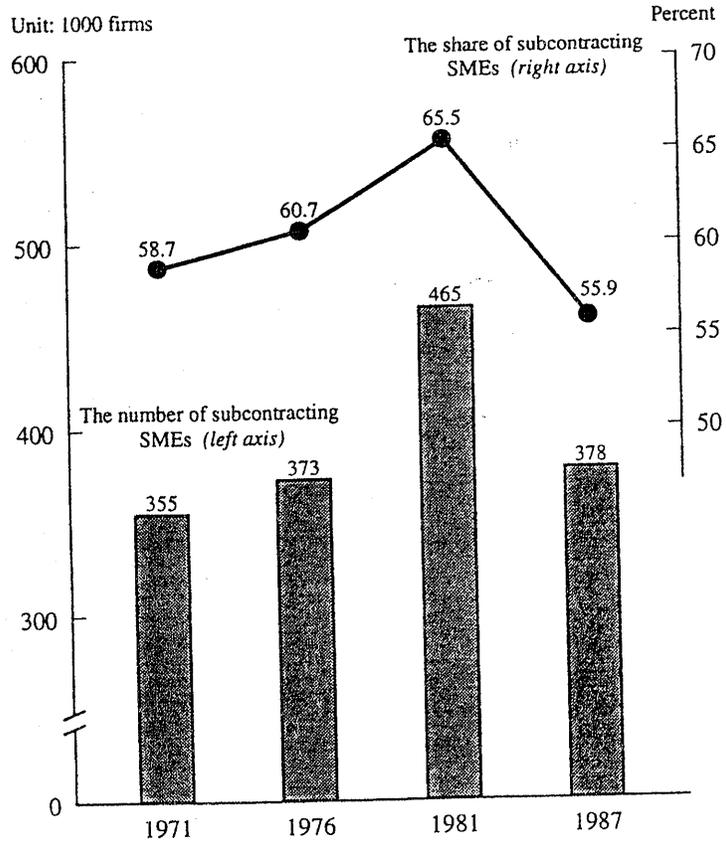
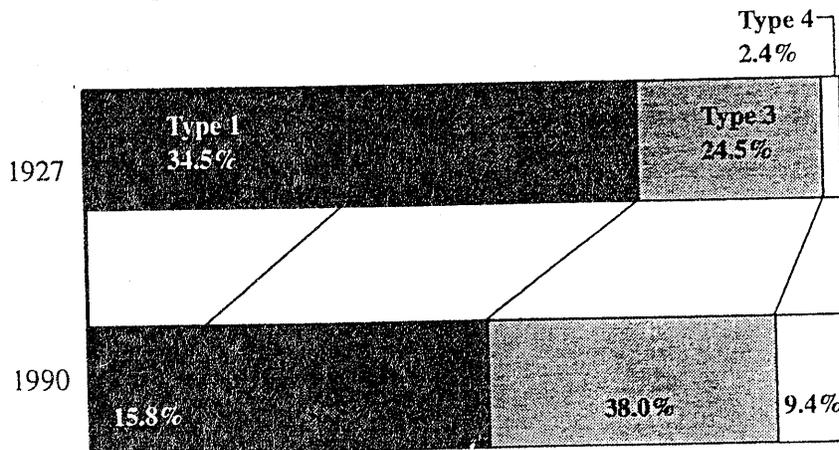


Figure II-2

THE NUMBER AND SHARE OF SUBCONTRACTING SMEs



CLASSIFICATION OF SUBCONTRACTING SMEs



- Type 1: 90% of the products are supplied to one parent company.
- Type 2: 90% of the products are supplied to 2-5 parent companies.
- Type 3: Less than 90% of products are supplied to 2-5 parent companies.
- Type 4: Less than 70% of products are supplied to more than 6 companies.

Figure II-3 THE STRUCTURE OF SUBCONTRACTING RELATIONS IN JAPAN'S AUTOMOBILE INDUSTRY

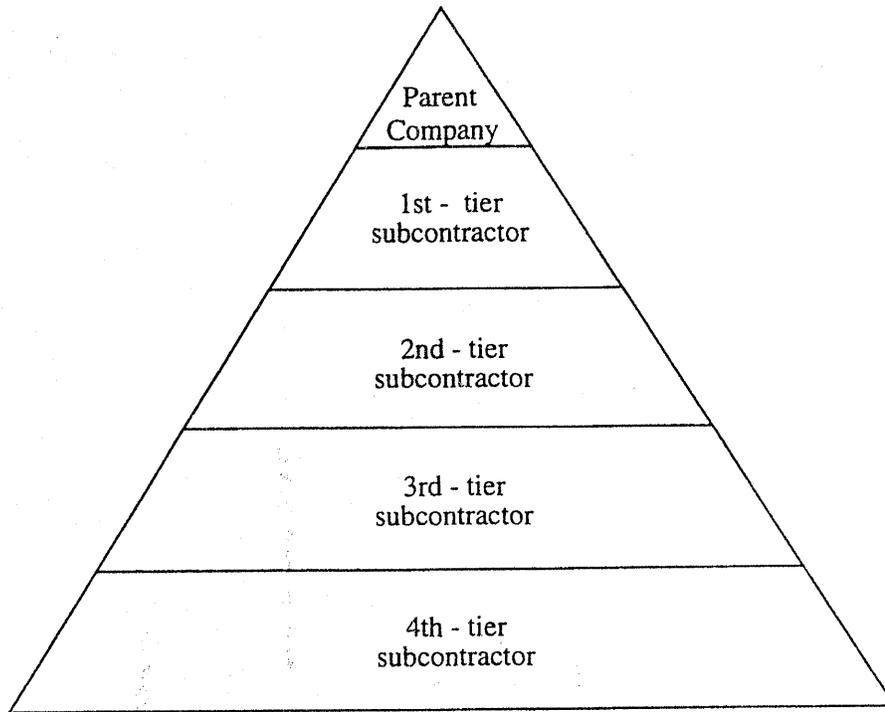


Figure II-4 SUBCONTRACTING SYSTEM IN TSUBAME

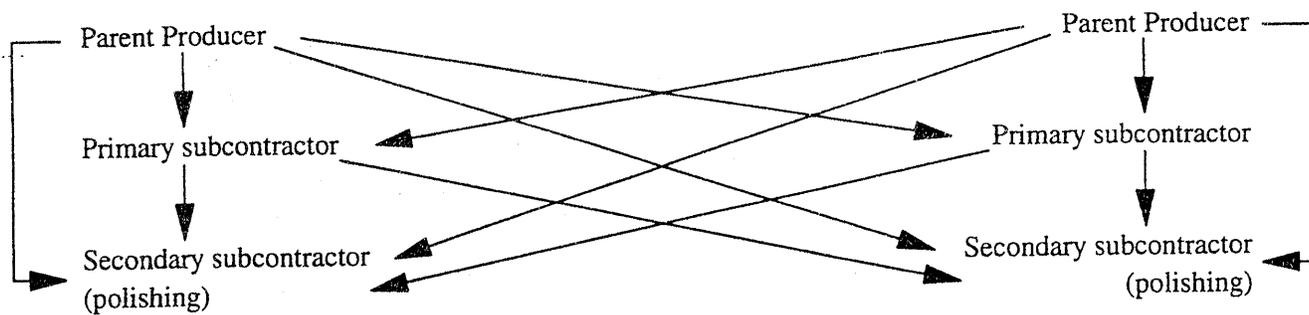


Figure II-5 THE FLOW OF SYNTHETIC FIBER PRODUCTION

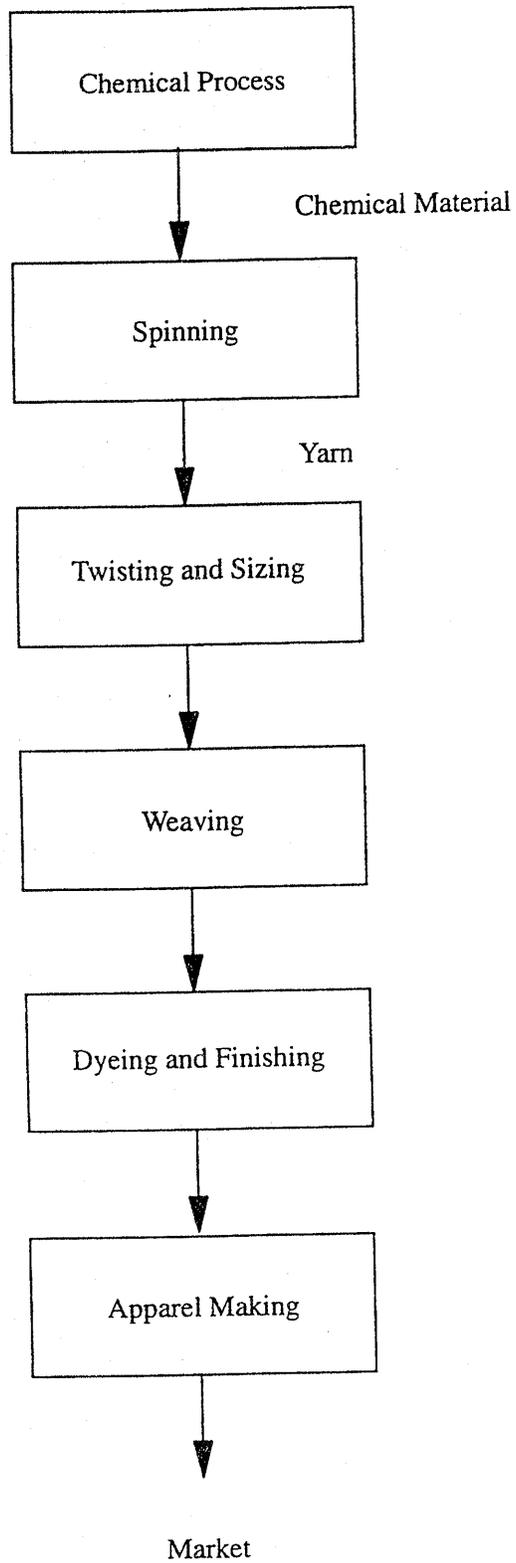


Figure II-6 THE FLOW OF YARNS AND TEXTILES AMONG FIRMS IN FUKUI-ISHIKAWA

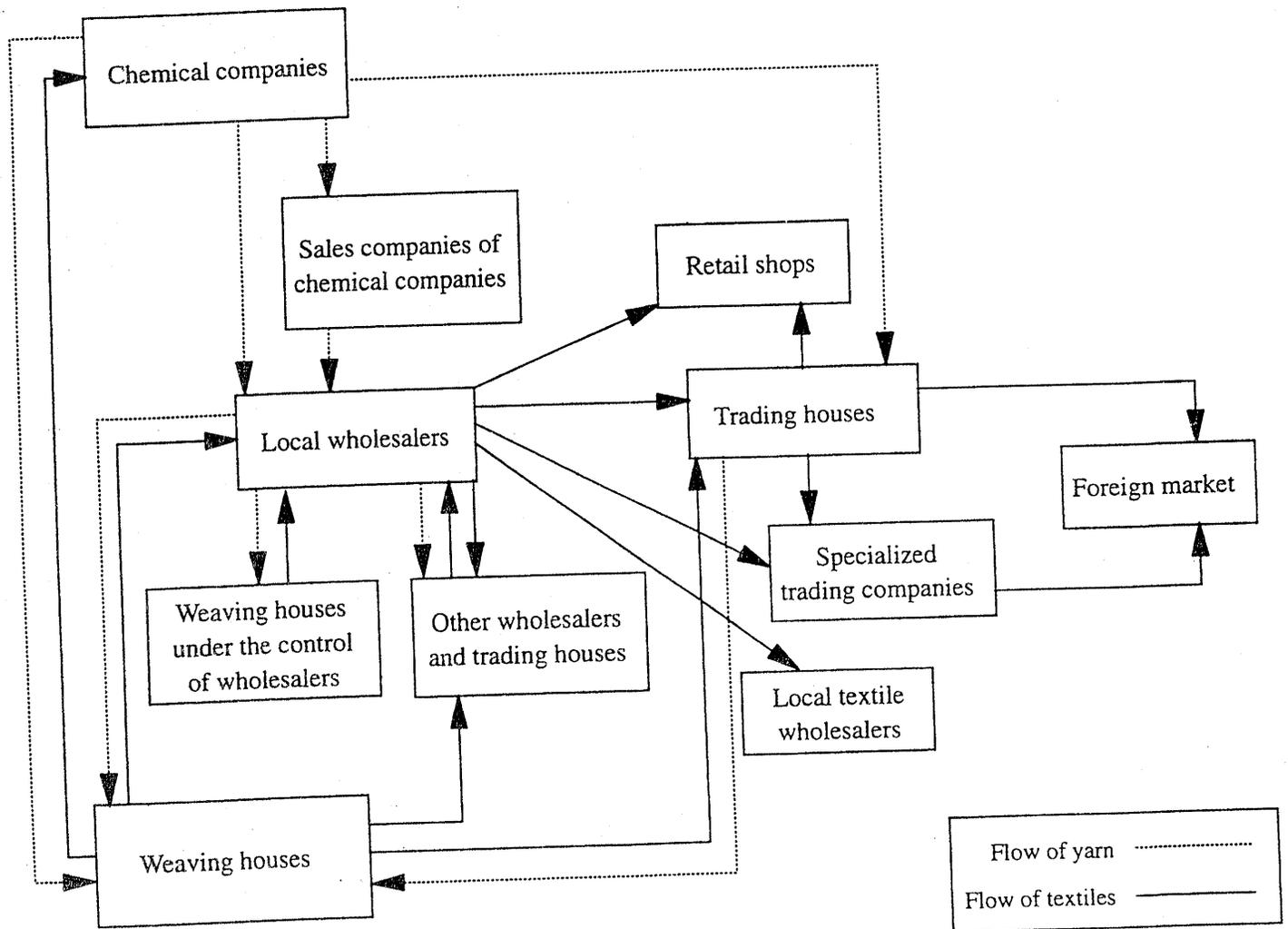


Figure IV-1 SILVERWARE SALES

Billion yen

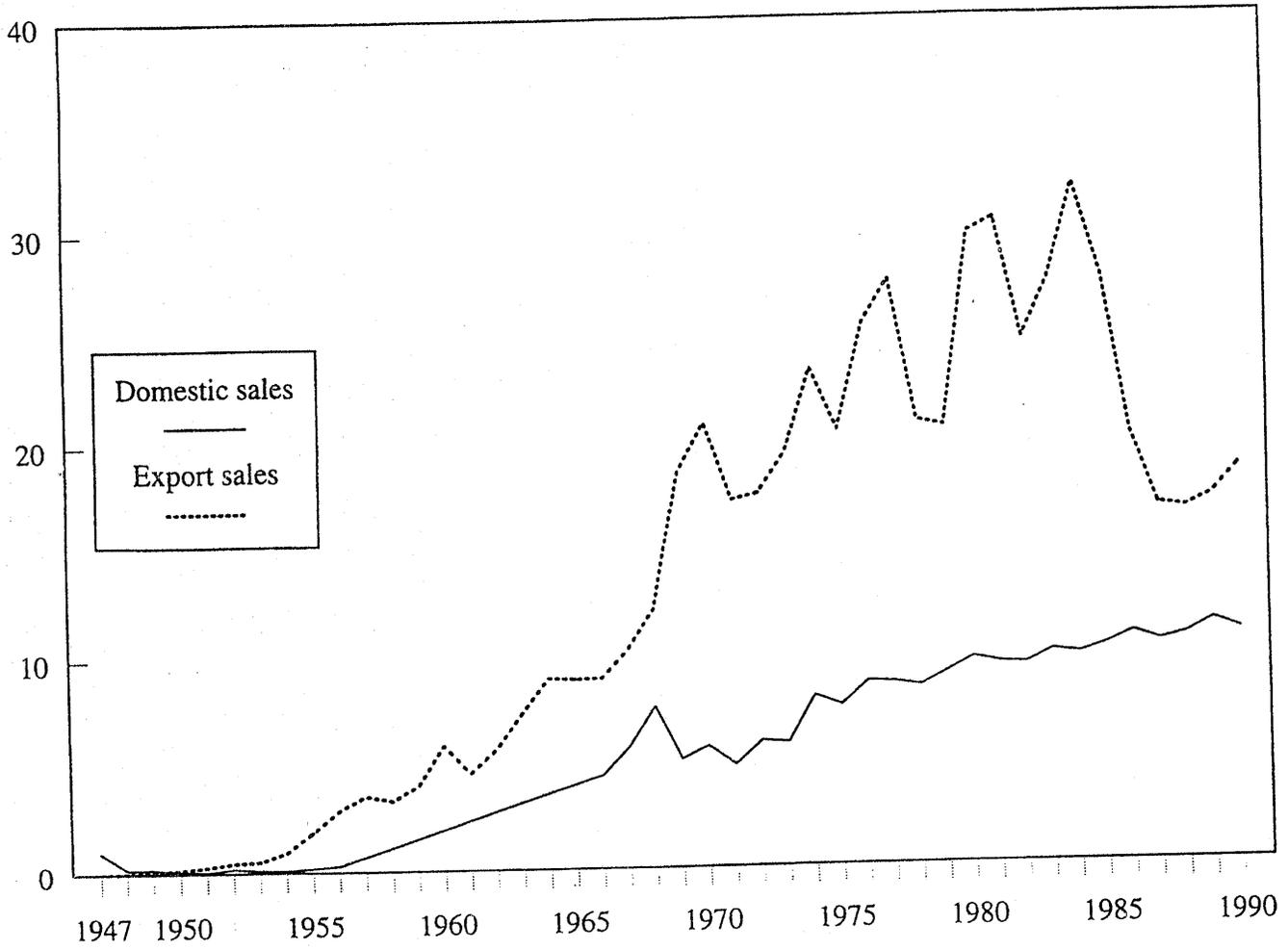
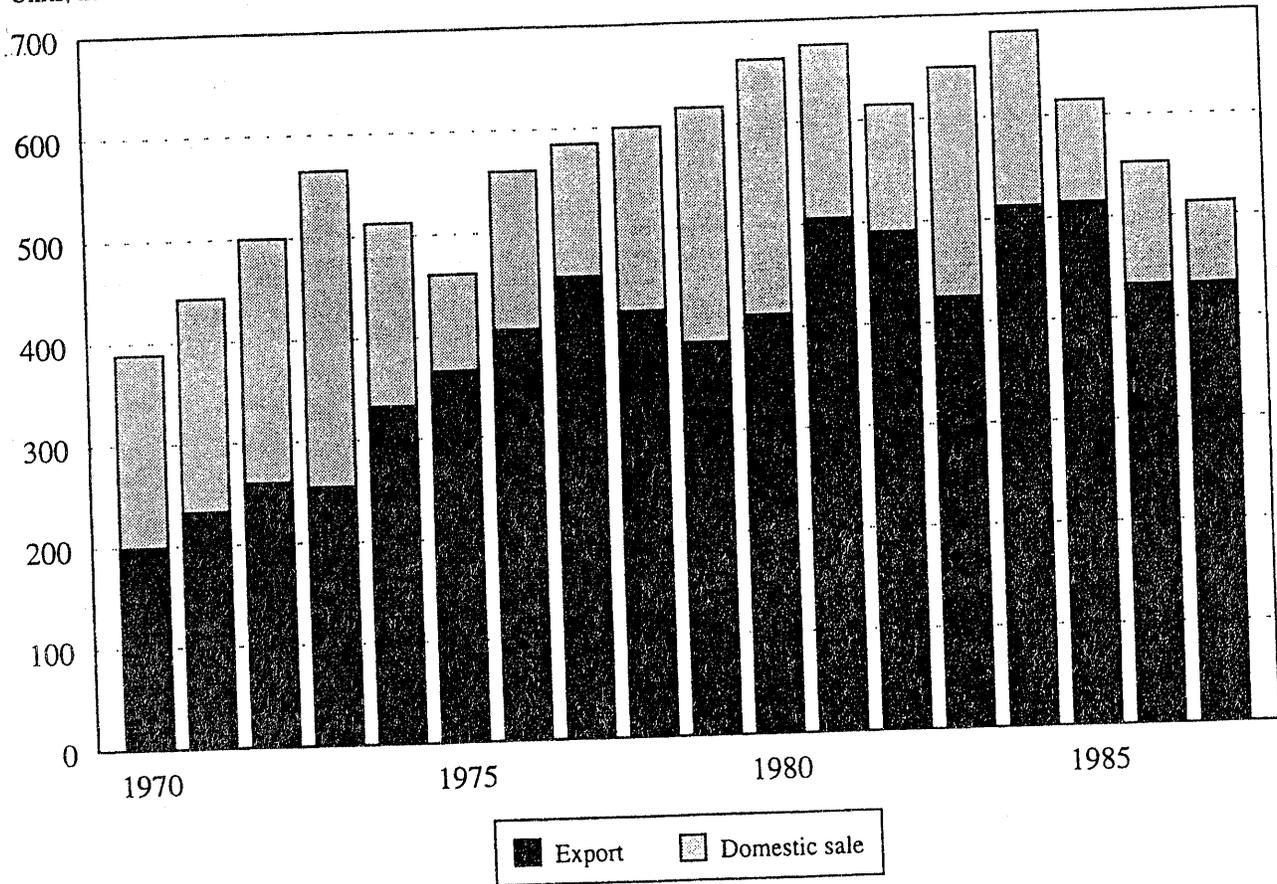


Figure IV-2 OUTPUT AND EXPORTS OF SYNTHETIC FIBER TEXTILES IN ISHIKAWA

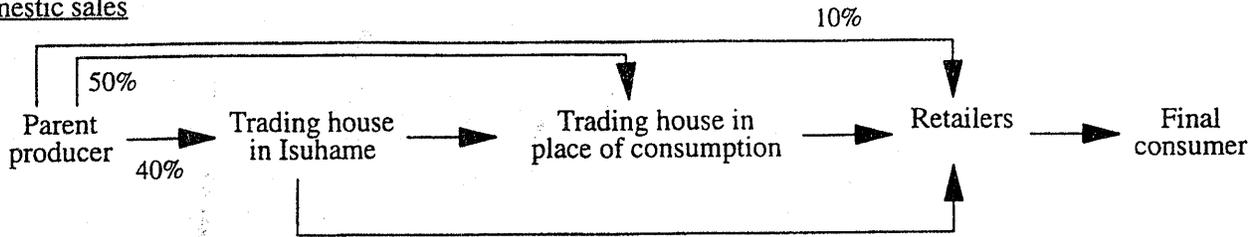
Units, hundred of millions



Source: Hokuriku Keizai Chousakai, Ishikawa-ken Yushutsu Zittai Chousa, Ishikawa-ken Toukeisho, Ishikawa-ken Seisan Doutai

Figure V-1 DISTRIBUTION OF SILVERWARE AND HOUSEWARES

Domestic sales



Export sales

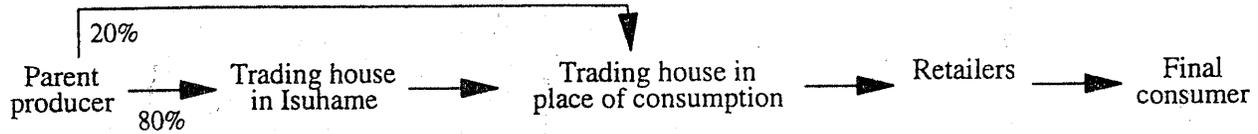
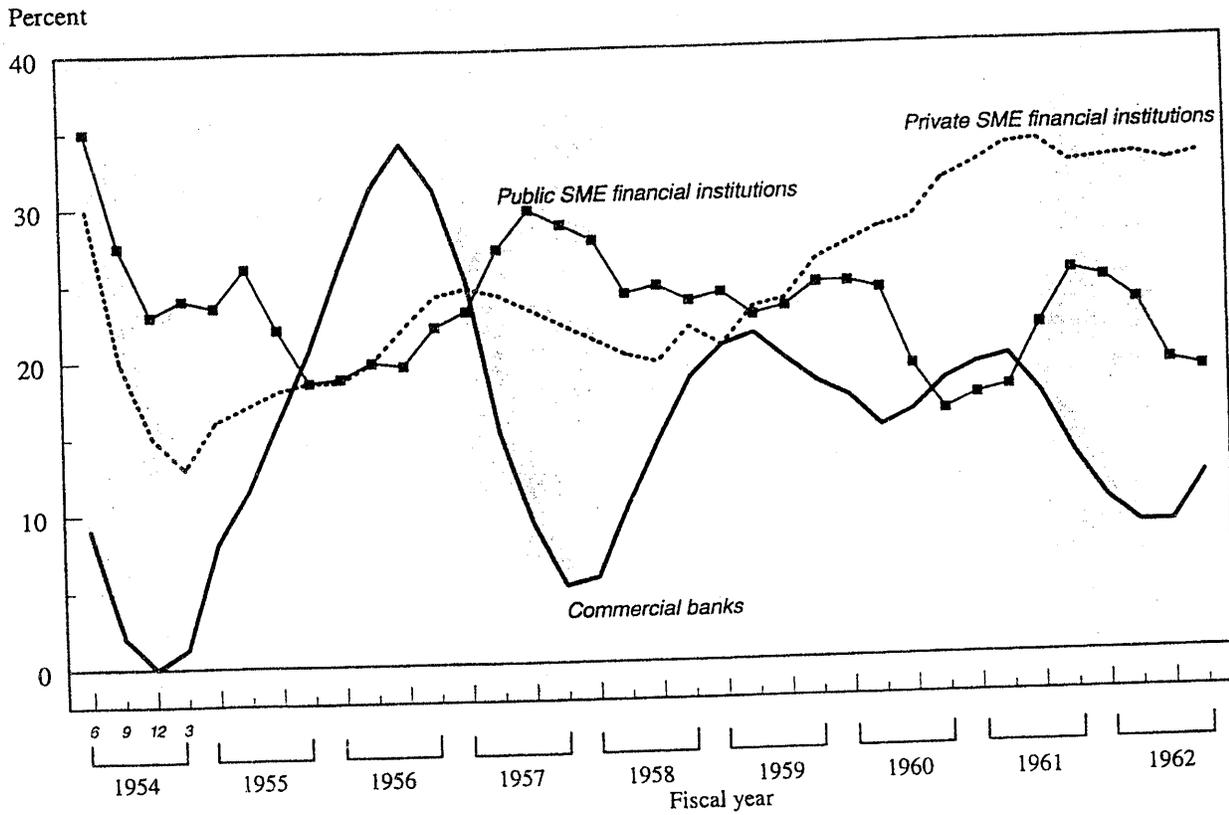


Figure VI-1 LOANS TO SMEs BY SELECTED FINANCIAL INSTITUTIONS



Source: Chusho Kigyo Hakusho, "White Paper on Small and Medium Enterprise"