

Small and Medium-Size Enterprise Support Policies in Japan

Motoshige Itoh
Shujiro Urata

Technical and marketing support for small and medium-size enterprises (SMEs) in Japan comes mostly through private networks. Public support is more important in the area of finance. Three sources of directed credit—loans from specialized parastatals, loans channeled through local governments, and loan guarantees—account for about 20 percent of all SME borrowing and 35 to 60 percent of investment borrowing.



Summary findings

Itoh and Urata examine how Japan's public and private sectors support small and medium-size enterprises (SMEs). They focus on technical, financial, and marketing assistance.

Their findings are based on a survey of 107 firms: 40 that produce silverware, 33 engaged in synthetic textile weaving, and 34 that manufacture auto parts. Each sector represents a distinctive form of industrial organization, but they also share several characteristics: Each industry is concentrated in a particular region, each involves close subcontracting relationships, and each has overcome difficulties and achieved a certain measure of industrial success.

Technical support for these SMEs came largely through private channels, including parent firms, equipment suppliers, and other firms in the same line of business. Public institutions played only a subordinate role. Marketing support also came largely from parent firms, trading companies, and other private sources. Producers of intermediate goods in particular — such as auto parts and synthetic textiles — relied heavily on subcontractors.

Most loans for Japan's SMEs were provided under competitive market conditions but three sources of directed credit — loans from specialized parastatals, loans channeled through local governments, and loan guarantees — accounted for about 20 percent of all SME borrowing and 35 to 60 percent of investment borrowing. Default rates averaged less than one-half of one percent of outstanding loans, and real interest rates were positive. The majority of firms surveyed used and valued directed credits. The smallest firms in particular valued them.

Public institutions complemented the private marketplace in all three areas. Public technical and marketing support helped create and maintain private networks. In finance, Japan successfully embedded directed credit in a well-functioning, predominantly private, competitive, and prudential financial system. Through partnerships, public support continues to play both a direct and an indirect role in supporting the development of SMEs in Japan.

This paper — a product of the Finance and Private Sector Development Division, Policy Research Department — is part of a larger effort in the department to examine the impact of proactive intervention on SME performance. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Daniele Evans, room N9-055, extension 38526 (82 pages). December 1994.

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I. Introduction and Overview

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. Then, between July and December 1992, we conducted intensive interviews with SMEs in three target industries based on common survey questions. 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.

The three industries selected for this analysis – the silverware industry, the synthetic fiber-weaving industry, and the auto parts industry – represent three distinct prevalent types of industrial organization in Japan. Despite differences in industrial organization, the 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

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).

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.

Small and medium enterprises (SMEs: defined as enterprises with less than 300 employees) 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.² 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.³

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. 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 encouraging growth-oriented, larger-scale production

²Between 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.)

³ The 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.

supporting to high quality, information-intensive production. Moreover, since the 1970s, policies have encouraged SMEs to shift from declining to growing sectors, and to cope with rapidly changing economic developments such as yen appreciation, two oil crises, labor shortages, and environmental problems.

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-I). Most 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.⁴

Even at its peak (in 1970), just over half of one percent (0.61 percent) of the national budget general account was allocated to SME measures. 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. In 1980, ¥4,500 billion was allocated to SMEs through the FILP, compared with ¥195 billion through the general budget.

⁴ 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)]

II. Industrial Organization and the Role of SMEs in Japan

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

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 requisite processes 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.

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. Asymmetric information and conflicts of incentives between firms can make it difficult to establish efficient transactional relations. These problems can be solved neither by vertical integration, in which these problems are solved as internal allocation problems inside a firm, nor by complicated inter-firm contracting mechanisms.

In Japan, the problems seem to be resolved by interfirm contracting rather than by vertical integration, at least in comparison to other industrialized nations such as the United

States. This reliance on non-integration solutions creates considerable opportunities for SMEs to play important roles in the social division of labor. While we do not have space here to discuss fully why many Japanese industries choose non-integration solutions, some of the key reasons include:

- **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.
- **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 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.⁵
- **Geographical concentration:** 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. Very high population density makes it easy for firms to find business partners with which they have repeated transactional relations; public institutions also played a key role in enhancing the function of local production networks.
- **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.

II-2. Automobile Industry: An Example of Subcontracting

The automobile industry provides a classic example of the role of subcontracting. According to one study, 55.9 percent of the SMEs in Japan were involved in subcontracting relations in 1987.⁶ As shown in Table II-1, the ratio of internal to total production of large

⁵On this point see Klein, Crawford and Alchian [1978] and Itoh and Matsui [1987].

⁶ These numbers change considerably depending on the definition of subcontracting relations. The definition used in this figure is not clearly stated.

auto assembling firms tends to be usually low in Japan.⁷ 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). The production structure of the Japanese motor vehicle industry is sometimes called a "pyramid" or "multi-tier structure." 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. A MITI study of the subcontracting relations of a Japanese automobile producer illustrates the resulting pattern (see Table II.2).

The automobile industry in Ohta is structured in pyramid-style, with Fuji Heavy Industries on top as an assembler. 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 (5 to 78), and 6 (1 to 30).⁸

In 1989 there were 73 establishments in Ohta's transport machinery sector.⁹ (Table II-3). 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.¹⁰ 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.

⁷ 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.

⁸ Ohta city office, internal document.

⁹ Lack of detailed statistics precludes one from isolating the automobile and automobile parts industry from the rest of the transport machinery sector.

¹⁰ 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.

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,¹¹ although Fuji heavy industries dominates. (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).

Despite the dependence of local Ohta auto parts suppliers on Fuji Heavy Industries, they also have extensive business relationships with assemblers outside of Gumma. 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. Overall the transactional relationship between subcontractors and their parents in transport machinery production is not as rigid as the relationships observed in the electronics industry, which also follows a pyramid-style subcontracting pattern.¹² The average number of parents per subcontractor has risen from 4.8 in 1990 to 5.3 in 1992. Similarly, over the same period, the share of subcontractors whose sales-dependence on their primary parent firm exceeded 80 percent, dropped from 36 percent of subcontractors to 30 percent.¹³ 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 1992.¹⁴

The degree of dependence on single parent firm 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. Thus, a survey of subcontractors

¹¹The 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.

¹²The 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.

¹³ Ohta City Office [1990 and 1992].

¹⁴ Ohta City office, Internal document.

associated with Fuji Heavy Industries (conducted by the Ohta city office) found the sales dependence of first-tier subcontractors on parent firms to be 43 percent, while the corresponding number for second-tier subcontractors was a much higher 75 percent.¹⁵ Although the statistics are not available, this dependency appears to be even greater degree for the third-tier suppliers.

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

Many of Japan's SMEs have origins in Japan's traditional craft activities. Often these craft-based industries were concentrated in a particular geographic locality, where various factors such as natural environment and merchant activity contributed to the area's development. Many of Japan's local production areas can be traced back to the Edo period (1603-1867) when handicrafts and local produce from around the country were brought to central economic areas such as Tokyo and Osaka for sale. Tsubame city can be classified as such a case. Located nearby a copper mine, Tsubame became a center of nail-making, a traditional handicraft industry in the feudal period. 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 currently are embedded.

Tsubame city is the center of silverware production not only in Japan but also in the world.¹⁶ 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-1,¹⁷ requires a number of subprocesses.¹⁸ Only a few firms undertake the entire production process, while most focus on just one or several of these

¹⁵ Ohta City Office, Internal document.

¹⁶ According 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.

¹⁷ For 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).

¹⁸ The 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.

processes, with the production system organized as a pyramid-style subcontracting system. This 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.

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.

The silverware and housewares industries had 148 and 127 parent firms, respectively, in 1991, according to statistics reported by the city office (Table II-4). There were 182 and 265 first-tier subcontractors, respectively, plus 1014 second-tier subcontractors, who specialize in polishing for both silverware and 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.¹⁹

Parent firms purchase inputs (such as stainless steel from metal producers) and inspect finished products. Since the quality of silverware depends largely on the quality of materials, silverware producers, especially the large ones, actively engage in the development of new materials. Smaller silverware manufacturers generally purchase materials from trading houses.

¹⁹The 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.

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. Simplifying, the production process comprises five steps – (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.

Production steps (2), (3), and (4) take place in Fukui-Ishikawa. Table II-5 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-2 illustrates the transactional relationships within the synthetic fiber textile industry. There are several important players: 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, (out of which Fukui-Ishikawa's synthetic fiber industry evolved). The practice became increasingly dominant after World War II. Thus in 1955 54% of Fukui-Ishikawa's textile production was by fee contract. By 1989, this share had risen to 84% suggesting 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.²⁰

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 or wholesalers.²¹ 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.²²

"Maker chop" products are given the brand names of the large national chemical companies.²³ 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.

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.

²⁰ Internal documents, Fukui and Ishikawa ——. All 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.

²¹ The 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.

²² There 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.

²³ The leading chemical companies include Toray, Teijin and Asahikasei, all of which are classified as large-scale corporations.

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 also get involved in transactions with trading houses or local wholesalers.²⁴ 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.

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

As the three cases have illustrated, the Japanese economy incorporates SMEs in a number of noteworthy ways. 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.

Most SMEs depend upon the help of local production networks and subcontracting relations for survival. They 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 their role can be evaluated only in relation to the industrial organization surrounding SMEs. Indeed, 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 thus, not only the SMEs that require local production networks and subcontracting relations to survive, but also

²⁴In our sample, 27 out of 33 firms are involved in both types of contracts.

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

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

As discussed further in sections IV-VI, three types of institutions generally provide support to SMEs, regardless of the locality (See Table I-1). 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 general 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.

Before we begin our analysis of the operation of technical, marketing, and financial support systems, this chapter will review some background features of the institutional environment specific to Tsubame, Fukui and Ohta, followed by an introduction to the firms surveyed in each locality.

Tsubame: Table III-1 shows important SME public support institutions for silverware producers in Tsubame. Support provided by non-sector specific institutions is often focused on the silverware industry since it has a significant position in Tsubame's economy. 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.

Support 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. 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 meetings with producers. Through this network, the city has developed an effective system making its needs known to the central government. Indeed, Tsubame has long been a recipient of special central government assistance for local production networks (Table III-2). 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: While textiles producers in Fukui-Ishikawa receive support from a number of institutions, this section focuses mainly on industry associations. Several voluntary associations are organized at the subsectoral level, such as the Industry Association of Twisting Firms and the Industry Association of Local Wholesalers. More important are two semi-public 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). Subsector industry groups maintain close associations with the two semi-public industry associations; indeed in Fukui prefecture, many have their offices on the same floor of the same building.

Industry associations do not offer technical or financial assistance to firms. Rather their main functions are to improve communication among firms, 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 fewer than 10 officials, 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. Although the association has a tradition dating back to the late 1800s (Table III-3), since 1967 it has become the window for various public loan programs and subsidies. These public financial support programs have been used extensively for replacement of old machines by new equipment (such as water-jet looms, air-jet looms, double twisting machines, and repia-type looms; see Table III.3).

Ohta: 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.

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). 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. The Subaru Hiyu-kai association has 217 auto parts producers affiliated with Fuji Heavy Industries, 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.

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 this lack of sectoral focus, 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.

Tsubame: All of the sample firms in Tsubame are silverware producers rather than polishers. Our 40 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 consign processing to subcontractors. Most of the parent firms are also engaged in subcontracting. Although the precise number was not obtained, the average number of subcontractors per parent was approximately 20.

All but one of the sample firms were set up before the 1980s, with most of them starting operations in the 1950s or 1960s. In general the larger the firm, the longer the years in operation. Most 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, 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. 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.

Only seven 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 some basic characteristics of the sample firms in Ohta. 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. 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 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.²⁵ The background of the smaller firms is more diverse. Among the 30 firms that provided information, 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 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, this section will conclude by discussing lessons for SME technology policies.

Collective technical support acted as both a direct and indirect catalyst to innovation in the initial period when these industries took root. In subsequent periods, private channels, such as subcontracting parent firms and material and equipment suppliers, have generally been the dominant source of technical support. Public technical support at the local level functions

²⁵We could not get an answer to the company origin question from one firm.

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.

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.²⁶

Preferential loans have been provided to SMEs since 1954 under the Chusho Kigyo Shinko Josei-Ho [The Law on Financial Assistance on SME Promotion]²⁷ for investment to modernize and upgrade facilities. The loans, for up to 50 percent of the investment cost, 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 under this program in 1965, equivalent to 2.1 percent of fixed investment (704 billion yen) by SMEs in manufacturing.²⁸

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, only 0.8 percent of fixed investment by SMEs in manufacturing. These public loans did, however, facilitate additional SME loans from other sources.

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

²⁶ See Small and Medium Enterprise Agency (1991b and 1992) for details.

²⁷ See section VI for more details on financial assistance.

²⁸ Shoko Chukin Bank (1987), p. 335.

subsidies.²⁹ 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.³⁰ Seminars on technologies are offered by local governments as well as by such SME-related institutions as the Japan Small Business Corporation. These seminars 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 governments also offer individualized technical advice and information to SMEs. Under this program, a technical adviser or team of technical experts (from the private sector, public research institutes or 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.

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

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.³¹ Major technological breakthroughs included: the start of nail production (1700s), the start of fork production (1911), the mechanization of silverware production

²⁹ Small and Medium Enterprise Agency (1991a), appendix p.22.

³⁰ For details, see Small and Medium Enterprise Agency (1992).

³¹ See Shimoda and Kasahara [1991] and Sasage [1971 and 1977] for detailed descriptions of the history of Tsubame.

(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 a private equipment manufacturer located near Tsubame.

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 the new material.

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. Indeed, 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. In the mid-1980s, rapid yen appreciation caused a drastic decline in export sales and posed a serious challenge to silverware producers.

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 technological upgrading (Table IV-1). 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. 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 these formal channels with greater frequency than small firms.

Silverware producers have utilized various types of technological support (Table IV-2). 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 over a total of 240 work-days. Very small firms do not use technical centers as much as large firms (Table IV-3), 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 sources 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). 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. Four users, all of them relatively large firms, gave high scores, but other respondents felt that the assistance provided by these public support institutions was out-of-date and/or difficult to use commercially.

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, 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.

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. Even so, the technical center remained important as a disseminator of technologies that large firms would not readily disclose to SMEs. Since 1971, the public technical centers have been engaged mainly in testing materials and products for SMEs rather than in disseminating technical skills. The focus of public support for the industry shifted to providing financial support for the installation of new machines.

The Impact of Recent Yen Appreciation on Acquisition of Technologies by SMEs: The rapid yen appreciation after 1985³² 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. 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. As Table IV-4 indicates, more than half the respondents relied in this effort on technical support from various sources, in particular from parent firms, equipment suppliers, and the public technical center. In contrast, technical support from other firms in the weaving industry, industry associations, and universities was very limited.

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. The smallest weaving houses in particular gave technical assistance from their parent firm the highest score (Table IV-5). These results highlight 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. Some weaving houses teamed with chemical firms in a partnership to develop new products. 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 for the introduction of such items as new synthetic fiber products, computer ribbons, new industrial materials, and synthetic fiber kimonos.

Next to the parent firms, equipment suppliers are a popular source of technical support (Table IV-4). Ten of the 20 firms utilizing such assistance give it a score of 5, although 6 firms gave it a score of 2. Relatively small firms gave such assistance a higher score (averaging

³² The yen appreciated from 250 yen per dollar in 1985 to 125 yen per dollar in 1988.

4.1), and highlighted the usefulness of engineers sent by the equipment firms to teach employees to use new machines, such as modern waterjet and air-jet looms and double twister machines. Firms with 100 or more workers gave support by equipment suppliers an average score of only 2.3. This contrast reflects differences in the internal technological capabilities of firms of different sizes.

More than half of the respondents listed the public technical center as a source of technical support. Large firms were the most common recipients, while none of the smallest firms reported using the center. 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." 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. Most inquiries came from very small weaving houses, which seems inconsistent with the interview findings. 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 the smallest firms use the technical center for problems that arise from normal business practices such as equipment operation, but not for technical assistance with innovations.

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 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 technology level has become so sophisticated that only large companies such as chemical firms and machinery manufacturers can keep up. Technical centers still play an important role in providing inspection and technical analysis services, however.

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 shot up 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. 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 product lines and to improve efficiency in production. Some automobile parts producers started producing parts such as electric wires and floppy disks for the electronics industry. The technologies required for the production of these electronic parts were basically the same as those used for auto parts production. Moreover, 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-6). The next important source of ideas was the suggestions of parent firms, with close to 50 percent of the respondents acknowledging such support. These two sources can be closely related: A suggestion is often given by the parent firm, based on which the parts producers will come up with their own more concrete ideas. 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. 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-7 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-8). 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.

Equipment suppliers are 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 Ohta's automobile parts producers.

Turning to the evaluation of technical support, one finds a relatively low score of 3.3 given to support provided by the parent firms. The help of equipment suppliers, who provide such services as training workers for the use and maintenance of new machines, is more highly rated. 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 have the necessary skills to develop new technologies itself, 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-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.³³ Public technical support, provided mainly through technical centers, plays a subordinate role -- although its role was more important in the early stages of industry development. 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

³³ Surveys conducted by MITI's small and medium enterprise agency in the mid-1960's yielded similar results.

technological capabilities of the private sector, especially large parent firms and equipment suppliers.

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 access to private sources of technical assistance can be limited.

V. Marketing Support Systems

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. Silverware is a final product, and marketing efforts of silverware manufacturers and trading houses are important. By contrast, for synthetic fiber textiles and automobile parts both intermediate product, subcontracting relations and local production networks play key roles in marketing.

In all three subsectors, most firms find their marketing needs satisfied by these inter-firm relations, and they make no use of public marketing support. 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. 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).³⁴ 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 1970.³⁵ Requests from Japanese

³⁴In 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).

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.³⁶

V-I. Silverware

Table V-I summarizes the distribution channels for 29 sample silverware firms from Tsubane. Channels vary, depending on whether the product is destined for the domestic or export market. On the domestic market, as much as 90 percent of all products coming from Tsubane pass through trading houses before reaching retail stores, with the remaining 10 percent sold directly to retail stores. Presently, approximately 40 percent of total domestic product sales rely on trading houses in Tsubane, and 50 percent go directly to trading houses located in the place of consumption.

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. Indeed, 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.

Export marketing by small and medium producers has been conducted mainly through export trading houses located in large cities like Tokyo and Osaka. These trading houses, plus foreign importers played a major role in the expansion of silverware exports, prior to World War II, although efforts by trading houses in Tsubane also contributed. 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 silverware exports are handled directly by the producer.

³⁵ JETRO, *ibid.*, p.273.

³⁶The 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.

Marketing support has been provided mainly by industry associations and the chamber of commerce, and usually consists of hosting trade fairs and sending interested buyers to local manufacturers. Often public institutions such as JETRO and the Tsubame city office provide additional assistance.³⁷ The Tsubame Wholesalers Cooperative Association specializes in assisting wholesalers in Tsubame, and thus indirectly supports silverware marketing.

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.

Given the strong direct links among silverware producers, trading houses and their customers, marketing support from public institutions was not much utilized by the sample silverware producers, 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; these firms highlighted the usefulness of market information and exploratory tours.

V-2. Synthetic Fiber Textiles

Textile weaving firms produce intermediate goods for chemical companies, trading houses, and wholesalers under fee contracts or sales contracts. 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.

As noted earlier, in order for weaving houses to increase their production and sales, they must introduce new products. Indeed, about 40 percent of the sample firms began to produce entirely new products in order to deal with the problems brought on by the substantial yen appreciation. 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.

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

³⁷For example, the Tsubame chamber of commerce hosted or co-hosted four trade fairs in Tokyo and in Tsubame in fiscal year 1991, and transmitted 628 inquiries to Tsubame manufacturers.

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. 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.

V-3. Automobile Parts

The industrial organization of Ohta's automobile parts industry, discussed in section II, is such that auto parts suppliers are tightly organized under the subcontracting system of Fuji Heavy Industries, a major automobile assembler in Ohta. The evaluation of marketing assistance by auto parts producers in Ohta is shown in Table V-4. As expected, the subcontracting auto parts suppliers, especially the smaller ones, have a relatively high regard for marketing support 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. Support from the SME Promotion Center, run by the prefectural government, was especially 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-4. Lessons for Marketing Support Policies

Our field research indicates that SMEs have not utilized public marketing support much in recent years. 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. Usefulness of public marketing support depends on the availability of support from other sources. For automobile parts and synthetic fiber textiles, subcontracting relations are well established, and there is not much room for public institutions to offer marketing support. Public support is somewhat more popular among producers of final products such as silverware.

VI. Financial Support

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. SMEs have limited savings and other forms of internal funds almost by definition. Lack of market credibility and small size 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.

During Japan's high growth period of the 1950s and 1960s, SMEs relied heavily on external sources for fixed investment funds. Since the 1970s, they have begun to rely more on internal sources of funds. SMEs 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.³⁸ The share of long-term borrowing in total SME 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 1984.³⁹

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.⁴⁰ A survey of loans for fixed

³⁸ 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.

³⁹ 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.

⁴⁰ 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

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.⁴¹

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 Shoko Chukin Bank [The Central Bank for Commercial and Industrial Cooperatives], 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, in 1984, the Small Business Finance Corporation began to raise funds by issuing government-guaranteed debt.

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 to SMEs from these public financial institutions are more favorable than those of private lenders. In particular, these public institutions set up special

fluctuated at close to 40 percent with a slight downward trend, while the corresponding proportion for large firms was around 30 percent.

⁴¹See Chushokigyo Kinyu-koko [1984], p.189

loan programs in accordance with SME policies, the terms of which are even more favorable to SMEs than their general program loans.

Between 1960 and 1985, the share of public financial institutions in total SME lending hovered around 10 percent, with small fluctuations and a slight upward trend. In the early post-World War II period, their share in total lending for SME fixed investment was substantially higher -- 30 percent in the 1960s (See Table VI-1). 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 of investment lending by public institutions has since declined notably, it was still the highest of the three financial institutions at the end of 1989, at 44 percent. By contrast, the Shoko Chukin Bank has the largest share of lending for working capital.

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: 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.⁴² 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.⁴³

Local governments also 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.⁴⁴

The central government also operates a credit guarantee and insurance program, called the public credit supplementation system.⁴⁵ The Credit Guarantee Associations, located in 52

⁴²For 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.

⁴³These values are for the 1971-74 period. See Chushokigyo Kinyu Koko (1984), Tables 4-2-26 and 4-2-29.

⁴⁴The 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 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.

⁴⁵In 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.

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. As Table VI-2 shows, the amount of loans guaranteed by the Credit Guarantee Associations and insured by the Small Business Credit Insurance Corporation has increased remarkably over time.⁴⁶

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.⁴⁷ The question is whether such measures were effective in enhancing the position of the SMEs and inducing investment expansion by the firms. While it is difficult to directly evaluate the effects of the financial support measures, the field studies help clarify how the sample firms viewed various financial support policies. Tables VI-3 through VI-7 illustrate the sample firms' evaluation of the various sources of financial support, including public loan programs. From the distribution of scores, one can get a sense of the relative usefulness of financial supports in the three industries.

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: 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 of 1992, six financial programs were available in Ishikawa

⁴⁶The 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.

⁴⁷It should be noted that in dealing with business fluctuations, public loans were a much more stable source of finance for SMEs than private loans.

prefecture.⁴⁸ These programs consisted of the following: (1) Sen'i Kogyo Kozo Kaizen Jigyo (Structural Reform Project of the Textile Industry)⁴⁹, (2) Setsubi Kyodo Haiki Jigyo (Coordinated Equipment Abolition Program)⁵⁰, (3) Sen'i Sangyo Chukaku Kigyo Ikusei Yushi Seido (Loan Program for Nurturing Leading Textile Companies)⁵¹, (4) Tokutei Chiiki Chusho Kigyo Taisaku (SME Support Policy for Special Regions)⁵², (5) Chusho Kigyo Setsubi Kindaika Shikin (Loans for Modernization of SME Equipment)⁵³, and (6) Chusyo Kiyo Koudo ka Kashitsuke Jigyo (Loan Program for the Sophistication of SMEs).⁵⁴

Tables VI-4 and VI-5 show the average evaluation scores textile firms gave to various external sources of finance. 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.⁵⁵ These observations

48 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.

49 This 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.

50 This 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.

51 This 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.

52 The 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.

53 Under 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.

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

55 Although 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.

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.⁵⁶

Table VI-6 desegregates the scores from Table VI-5 for four subcategories of firm size. Local banks scored considerably higher among larger firms. In contrast, smaller firms depend more heavily on public loan programs, and gave relatively high scores to national government loan programs, prefectural government loan programs, the Small Business Finance Corporation, and the People's Finance Corporation. Only four firms among the 31 firms surveyed did not make use of the public financial loan program.⁵⁷ Even excluding Shoko-Chukin, which is somewhat different in character, 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. 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.⁵⁸

Automobile Parts in Ohta: Faced with an unfavorable business climate in the mid-1980s, auto parts producers in Ohta invested heavily in process innovation and equipment upgrades. About 60 percent of the firms use public loans for more than 30 percent of their

56One 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.

57We could not get answers from two firms on this question.

58Most 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.

investments, with about half of them financing more than 60 percent of their investments with public funds.

Tables VI-7 and VI-8 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-8). 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 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. 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.

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 surveyed firms in each industry on the effect and perceived usefulness of SME policies and institutions related to technical, marketing and financial 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.

In the area of technical assistance, we found significant differences in effectiveness among the three industries. For the silverware industry in Tsubame and the fiber weaving industry in Fukui-Ishikawa, the prefectural technical center and other public R&D institutions contributed notably to the development of new products, especially during the industry's early development stages. However, in both industries, the role of technical centers seems to have become more limited in recent years, as they can no longer keep pace with sophisticated technologies. They have come to focus increasingly on auxiliary functions such as product quality testing and technical assistance. Technical centers never played an important role for the auto parts industry in Ohta, mainly because auto parts producers were heavily involved in subcontracting with Fuji Heavy Industries, a large automobile producer.

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.

Finally, public financial support was found to be particularly useful to the synthetic fiber weaving and auto parts industries, which require substantial financial resources for investment. Among the varieties of public financial supports, 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 region. The construction of industrial parks should be mentioned in this respect.

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 benefits 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
COLLECTIVE ORGANIZATIONS INVOLVED
WITH SME POLICIES (Select List)

National Level

Administration:

MITI, Small and Medium Agency

Technical, Managerial, and Financial Assistance:

Japan Small Business Corporation

Financial Assistance:

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)

Provision of Information on Marketing:

Japan External Trade Organization (JETRO)

Promotion of Organized Activities:

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

Regional Level

Administration:

Regional Bureau of MITI

**Prefecture and Major
City Level**

Administration:

Division in Charge of SMEs at Prefectural Government

Provision of Guidance in General:

Comprehensive Guidance Centers for SMEs (59)

Technical Assistance:

Public Research and Testing Centers (170)

Provision of Information:

Regional Information Centers (47)

Financial Assistance:

Small Business Finance Corporation (583)

People's Finance Corporation (151)

Shoko Chukin Bank (90)

Credit Guarantee Association (52)

Promotion of Organized Activities:

Prefectural Federation of Small Business Associations

Small Business Associations (cooperatives)

Assistance in Broad Areas including Managerial and Marketing Assistance:

Chamber of Commerce and Industry (507)

Boards of Commerce and Industry (2,384)

Note: Figures in parentheses indicate the number of offices.

Source: Small and Medium Enterprise Agency (1991 and 1993b).

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
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, MITI 1977

TABLE II-3
TRANSPORT MACHINERY INDUSTRY IN OHTA - 1969

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, Internal Document

TABLE II-4
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-5
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 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)	R&D

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, ¥2,856 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

Source: Interview Results

TABLE IV-1
SOURCES OF TECHNOLOGY ACQUISITION IN TSUBAME
(PERCENTAGE SHARES OF FIRMS INDICATING THE SOURCES
OF TECHNOLOGY ACQUISITION)

Source	Firm Size				
	E < 10	10 < E < 30	30 < E < 80	80 < E	Total
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-2
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-3
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-4
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-5
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-6
SOURCES OF IDEAS FOR NEW PRODUCTS AND
NEW MANUFACTURING PROCESSES IN OHTA

Recipients			Respondents
Size of Firm	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-7
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-8
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 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
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 30 Nenshi [30 Year History of the Small Business Corporation, 1984], Chushokigyo Kinyu Koko, 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-2
PUBLIC CREDIT SUPPLEMENTATION SYSTEM
(Billion Yen)

		1950	1960	1970	1980	1984
<u>The Credit Guarantee Association:</u>						
Value of loans guaranteed	Annual	25	177	1,364	5,203	5,712
	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	Annual	57	142	1,274	5,118	5,585
	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-3
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-4
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-5
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-6
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-7
USEFULNESS OF FINANCIAL SUPPORT SYSTEMS IN OHTA

	Recipients/R espon-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.

TABLE VI-8
FINANCIAL SUPPORT IN OHTA

		Recipients/Re spondents	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
Commercial banks	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
Credit associations	>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
Loans from governments:	>50	5/6	4	0	0	0	1	1.8
Central government	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
Prefectural 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
City 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
Public loans from:	>50	6/6	3	0	0	0	3	3.0
Small Business Finance Corp.	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
People's 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

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

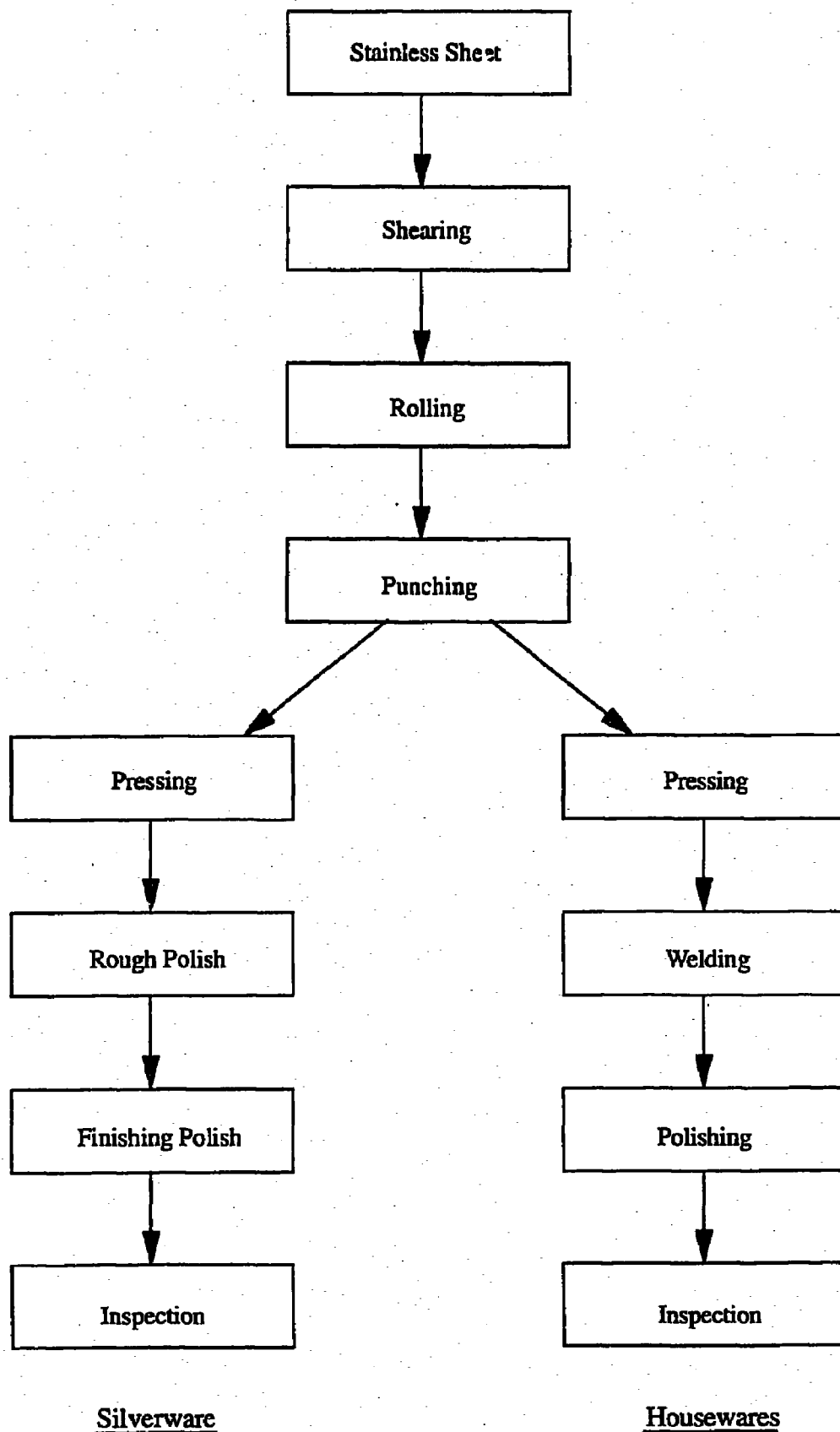


Figure II-2 THE FLOW OF YARNS AND TEXTILES AMONG FIRMS IN FUKUI-ISHIKAWA

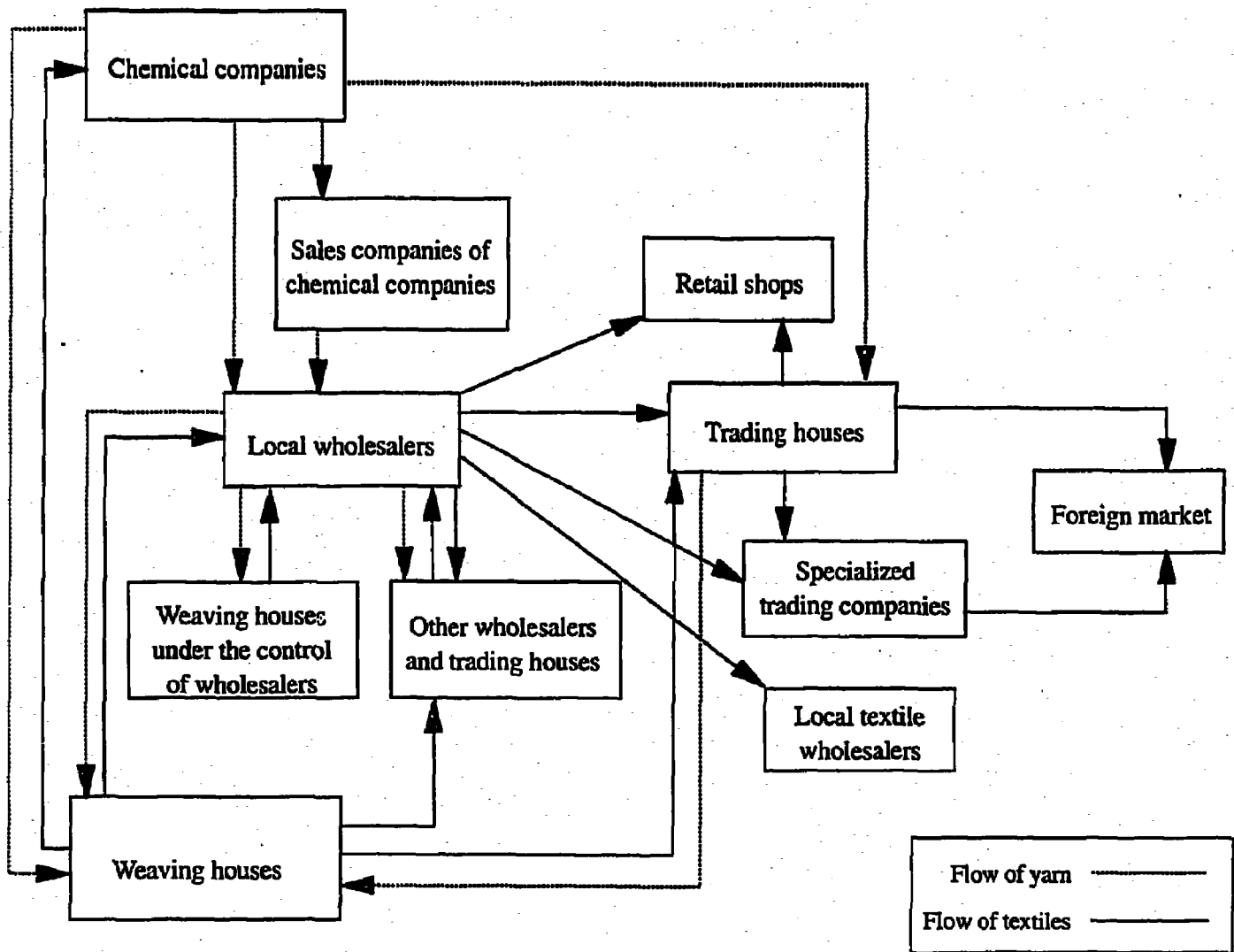
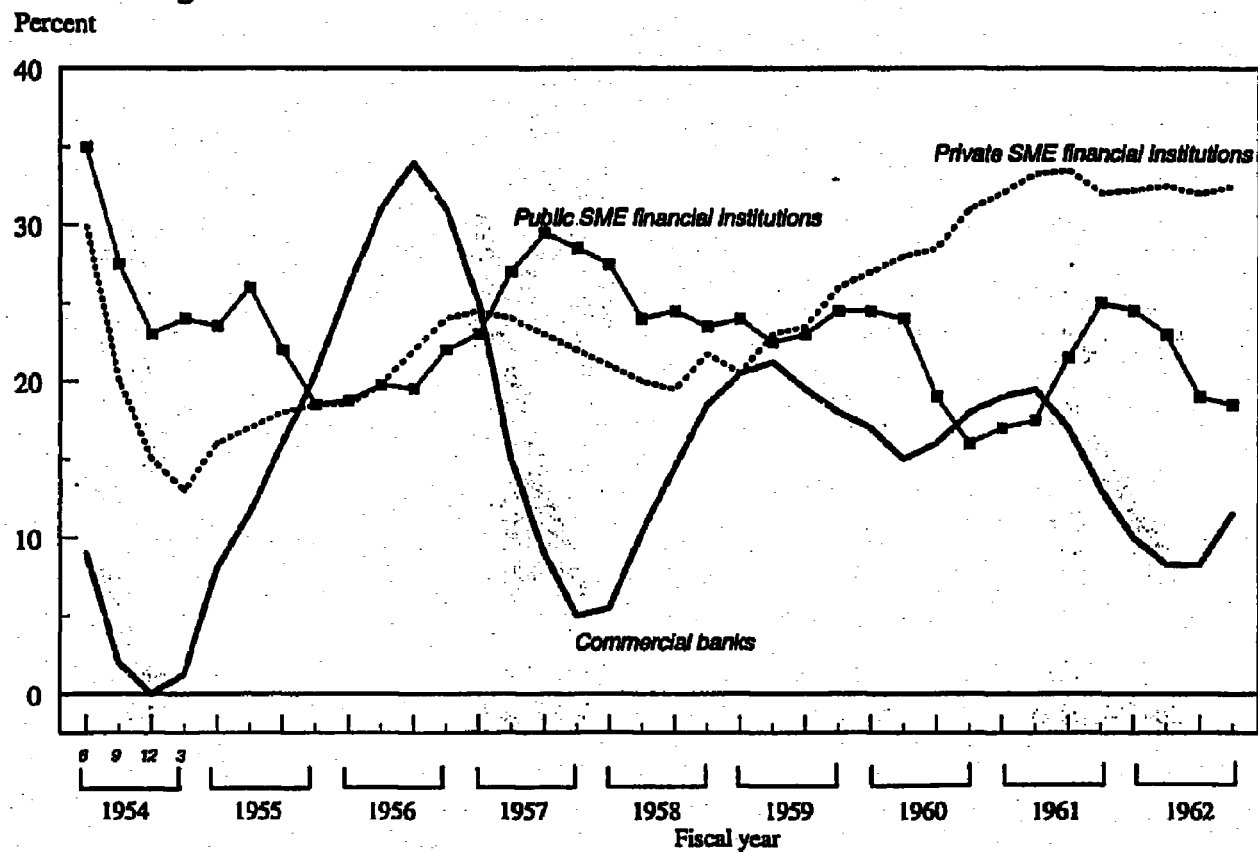


Figure VI-1 LOANS TO SMEs BY SELECTED FINANCIAL INSTITUTIONS



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

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