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OKAMOTO, Yoshiyuki / 岡本, 義行

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The Evolution of Industrial Districts and the Role of Community[1]

Yoshiyuki Okamoto

Faculty of Social Sciences, Hosei University

1. Introduction

The industrial district is an economic concept[2], but from a dynamic point of view[3], the performance of an industrial district seems to depend on the activity of the local community around it. The reason for this is that this activity influences the adaptability of the district to its external environment, which is the most important factor for its survival. In this short paper, we will explain how the performance of an industrial district is affected by the activity of the local community.

Industrial districts or clusters, which are the accumulations of firms in a region, have emerged all over the world since long ago. Thus, we will not discuss the definition of industrial district in detail, but generally speaking, "The districts are geographically defined productive systems, characteristics by a large number of firms that are involved at various stages, and in various ways, in the production of a homogeneous product. A significant feature is that a very high proportion of these firms are small or very small." [4] Actually there are large differences between districts depending on industries, countries and regions, these differences are not crucial from a dynamic point of view.

The concept of community may be not clear. Community refers to a group of people with common interests living in a particular area. Two factors have been pointed out as a minimum necessary conditions for the concept of a community: an "area" and "common interests." People in a community have common ties and social interactions, and form a human network, which is sometimes called culture[5].

Hence, an industrial district is in an area, and the members in an industrial district form a community, so there are dual communities[6], where people are both residents and people working in the business world.

These individuals must protect their common interests in the area. They must formulate plans for the future of the local economy, and for the welfare, infrastructure, etc, of the community. In particular, the members in the business community concern themselves with local economic development.

Even when people have common interests, it is never easy to formulate plans for the future or to reach consensus on a future vision and policies to achieve it. In addition, some people may put higher priority on their individual interests to those of the whole, and stand firm in this position, because they are often mutual competitors. Of course, the amount of resources held by the community is an important factor in formulating a future vision. However, the most important characteristic of the community which will influence the adaptive capability of an industrial district is whether

a consensus has been reached on a vision for the future or not.

2. The "evolution" and "transformation" of industrial districts

In Japan there are 483 industrial districts[7] in 1994, in industries such as textile, machinery, metal, furniture, and ceramics. Some were formed before the Meiji Restoration of 1867, and some after World War II. In each industrial district many small- and medium-sized firms engaged in the industry and in related industries are located, so local economies depend to some extent on the performance of the industrial district and these firms.

In recent years, many industrial districts have faced collapse due to increasing imports and the recession in the Japanese economy. A typical example is one industrial district which only manufactured simple "white textile."[8] In many districts, some firms have been forced to close down or to change their lines of business, and the districts have lost their ability to function as complete units, and have lost their comparative advantage. The bankruptcy of a single firm can disrupt the entire productive network link or division of labor in a district[9], because of the loss of a production process. Moreover, when this happens, the productive know-how and the technology on process are permanently lost. It is very difficult to recover the know-how and function of an industrial district once the linkage is broken.

In the market economy, industrial districts must also, like single firms, adapt to changes in the volatile economic environment. If they fail to do so, they lose their competitiveness in the national market or world market. Of course, the management of each firm in the process must be adaptive. Adaptability means that of individual firms, as well as of the system as a whole, which depends on the relationship between firms and the structure of the division of labor. The latter is not only determined by economic factors, but also depends on the cooperation between entrepreneurs, even when they are mutual competitors.

These entrepreneurs for their part must cope with changes in the economic environment for their own survival. The main changes in the environment involve the exchange rate, innovations (change of technology), and changes in consumers' taste. Within a certain range, firms can cope with these changes independently, by improving their products and process. However, when changes go beyond a certain limit, which is very difficult to judge on a real-time basis, firms must change not only themselves but also the total production system of their industrial district or production network. Incidentally, production networks aimed at producing goods on a large scale and cheaply are completely different from those producing a wide variety of products.

In order to change the system, the firms must find new managerial resources. In general, the more success the firms have experienced, the more reluctant they are to change their own management and the systems of their industrial districts. For this reason, it is difficult to reorganize the system or division of labor in an industrial district. In the process of change, some firms may lose their individual interests in transaction or some advantages, and others may have to bear some short-run costs.

There are two ways for an industrial district to adapt to its environment. We call

the first, "transformation type," and the second "evolution type." In the case of the "transformation type," the industrial district regains its competitive advantage without changing industry, by changing the target market segment, production method, or by restructuring the system or the division of labor. This pattern is common in the textile industry: most industrial districts here have tried to remain within the same industry. For example, districts specializing in silk products have shifted their production to cotton or synthetic fiber products, have replaced low-priced standard products with a wide variety of high-end products, or have moved from the domestic market into foreign markets[10].

On the other hand, under the "evolution" type, a district moves from one industry into another. It is a kind of "mutation." In many cases, one industry has given rise to others. For example, the textile industry gave rise to the loom industry, which further led to the machinery and metal industry almost all over the world. Actually, some industrial districts in the textile industry have been completely converted into the machinery industry. They include Bologna, Empoli, Varese, Lyon (Rone-Alpes), Frandlers etc. in Europe and Suwa, Hamamatsu, Tsubame etc. in Japan. In many cases it is difficult to clearly classify a change into one of the two types. In any case, some resources of an industry must be handed down to another industries, but the most important resource for evolution is "entrepreneurship," which can be inherited from one industry to another (see Figure 1).

As examples of an "evolution type," we can point to Silicon Valley, which succeeded in transforming its main industry from semiconductors to information and communications in the latter half of the 1980s[11]. In Empoli, near Florence, Italy, an industrial district that specialized in the glass industry was converted into one that produced raincoats, then women's garments, and finally leather goods[12]. In Varese near Como, a mountainous region in the Alps that produced silk, the industry was converted into cotton. The textile industry then gave birth to a loom industry, then a machinery and metals industry, and a plastic products industry. It then developed

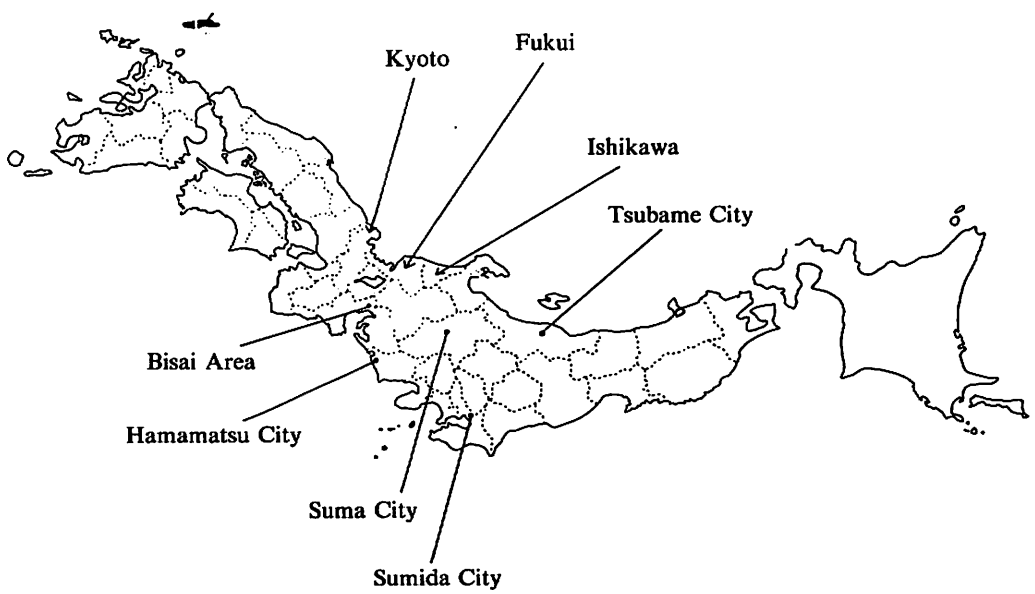

Figure 1

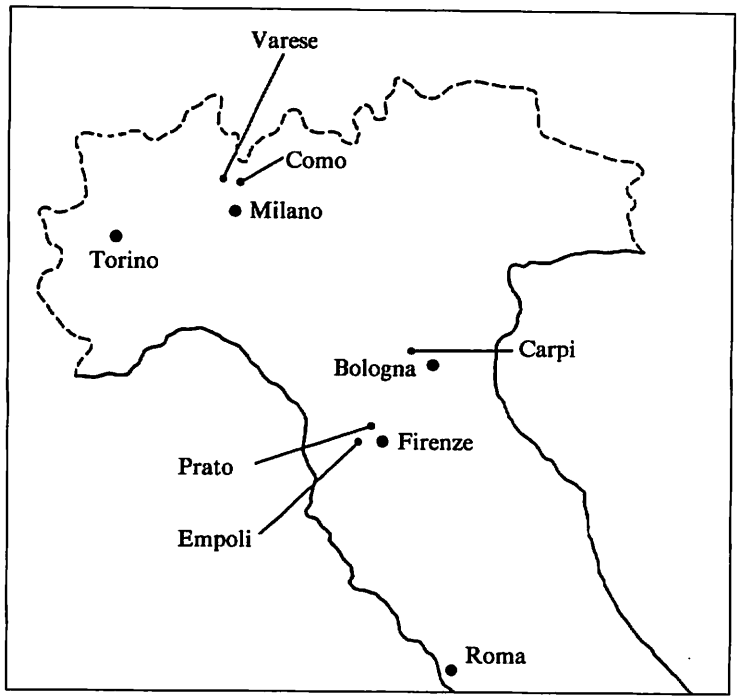

Figure 2

into a car alarm (antifurto) industry, which is an application of electronics (see Figure 2) [13].

Another example can be taken from Japan. Hamamatsu was an industrial district in the cotton industry, located between Nagoya and Tokyo. Before World War II, a musical instrument industry emerged in the district, producing in particular pianos, and as another direction, a motorcycle industry was born, which gave rise to world-known firms such as Yamaha, Honda and Suzuki. In addition, the parent company (Toyota Shokki) [14] of Toyota Motors, which produced looms, was born as a joint stock company in this industrial district, in 1926.

As another example, Tsubame was a typical house ware industrial district, producing spoons, forks, knives, and pots and pans[15]. More than a half of its products were exported, in particular to the United States. But when the yen appreciated suddenly in the mid-1980s, most of the firms there found themselves unable to compete, both in the domestic and export markets, with cheap products from developing countries. As a result, a few firms disappeared from the industrial district, but others succeeded in using R & D to move into new products, such as golf club heads, automobile parts, and equipment for disabled people.

3. Autonomy and cooperation in industrial district

Of 483 industrial districts in Japan, only a few have succeeded in "transformation" or "evolution." A similar phenomenon has been seen in all over the world. Many industrial districts have already disappeared from European countries, including most of those that emerged during the period of the industrial revolution in the

United Kingdom. Even when an industrial district is facing potential collapse, we see that some firms in the industrial district are often slightly reluctant to abandon their own interests. This is a condition of "social dilemma." It is necessary to ask why some have been able to survive by transformation or evolution, while others have disappeared.

First of all, to be successful an industrial district must have autonomy to the outside world. It must have the freedom to make decisions as well as the capability to carry them out. It must be able to feel changes in the environment of a particular market. This role is played by what we call sensor firms. It is important for an industrial district, or at least for a few of the firms in the industrial district, to quickly grasp accurate information on the outside world[16].

Sensor firms can be located in an industrial district or outside it. The sensor firms in a district are interested in the future of the district, but the sensor firms outside it can transact with other districts and are not interested in the future. We have seen that the firms in a district and the district itself can be exploited or controlled by the sensor firm outside it in Japan, using asymmetry of information and controlling distribution channels. If every firm in a district does not have any way of getting market information, it is unable to cope with the changes of market. A district will not have the autonomy in choosing the future by itself.

Whatever products are manufactured, there is always a firm that manages the overall project, even if it outsources the manufacturing process or collaborates with other firms. In Japan, project firms (almost sensors are project firms) were typically found in industrial districts, but they have lost their capability of managing projects, as product life cycles have shrunk and consumers come to demand a wider variety of products.

On the hand, firms such as retailers and trading companies, which are located in big cities and thus are closer to consumers, can get better information on markets and can plan goods adapted to the market. In Japan, firms tend to rely on outside information, because it is easier than getting information by themselves, though in Italian districts, by contrast, firms in a district often cooperate and establish organizations to get market information by themselves[17]. As a result, in Japan the firms in industrial district have fallen under the control of the outside firms, and have come to specialize in the function of manufacturing only. This is one of the reasons why transformation and evolution have been not done on time.

Actually many firms in industrial districts in Japan cannot or do not behave freely, because the firms and industrial districts do not have adequate information on markets and sufficient managerial resources. In particular, it is the case that they are controlled by outside trading companies or retailers (through their keiretsu), though the keiretsu system is now collapsing in Japan.

When the industrial districts in the United Kingdom faced international competition, firms, as a policy, promoted to be merged into a large firm in or beyond a district. As a result, this policy was effective in the short run, but it failed in the long run. Most of the large firms could not survive because the size became only larger, and districts also disappeared. If firms were emerged beyond a district, one firm was only a part of large firm, so that the firm was controlled by the outside large firm. As a result, many districts lost their autonomy, and they could not have a way to cope with the change of outside environment as a district.

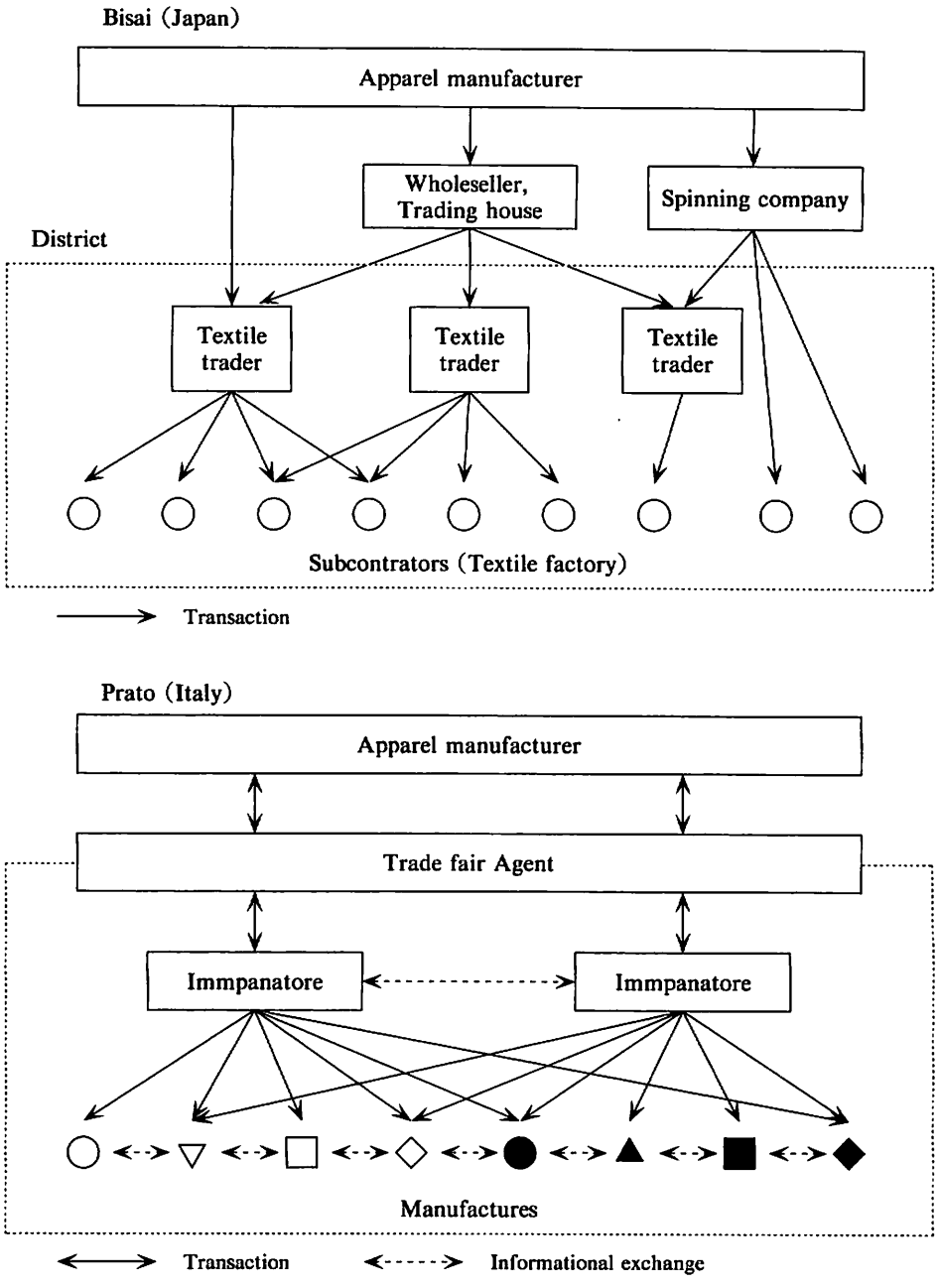

Figure 3

As a second point, cooperation among firms in a district is necessary for transformation or evolution, and for having its autonomy. Because each firm is a part of the district, the system and the firms have to change in connection with each other. Each firm must change together with the systems, such as relationships between firms and division of labor. Even if a project firm decides its own transformation or evolution, it is not easy to do it unless new resources on technologies, materials, know-how, information or human resources are used or supplied. The firm and the other firms in the district are very small and do not have resources enough to transform or evolve

themselves. There is no way to survive without cooperating with each other by compensating scarce resources.

In general, the entry of new firms can effectively promote the transformation or evolution of the industrial district. If an industry is growing, there is a wider place for entrants, but if an industry is mature or declining, it is difficult for entrants to find out their market. In this case, existing firms must transform or evolve themselves.

For the transformation or evolution of production system, a district has to accumulate necessary resources by itself. To do it in cooperation as a district, the people in the community must have a more-or-less common vision or a strategy in order to develop the district.

As stated earlier, some firms in a district can play the role of sensors, directly feeling the situation in their market. If the sensor firm can get information from the market and recognize, to a greater or lesser extent, what is taking place, and if this information is sent to participants or spills over into the district, some firms will try to change their policies and capabilities. Some of the firms in the first category may succeed, and others may not. In fact, many firms have tried to change themselves into diverse directions individually, but only few of the trials can succeed, which have triggered the transformation or evolution of the system as a whole.

In the transforming or evolving process, a variety of resources are necessary. Policies may be established to promote the change through the local government or the association of firms in the district, through technology transfer, advisory systems, vocational training courses and so on. This type of cooperation, if based on a common vision, may be easy. Recently districts in the world seem to compete with each other for establishing the system and organizations of innovation and vocational training[18].

The cooperation as well as competition among firms is related to the process of "transformation" and "evolution." In general, the cooperation among entrepreneurs is not easy, because they are potentially competitors in the same district and industry. Therefore, there must be some mechanism to restrain competition and to promote cooperation.

In the industrial districts where firms compete with each other for supplying a homogeneous good, there is keen competition among them for the price, so that it may be comparatively difficult to cooperate with each other and even to communicate with each other for cooperation. For example, in the district of the "white textile" which is mentioned earlier, the product is simple and homogeneous, there is no way to compete with each other without price competition. Under the price competition, the cooperation is not easy.

On the other, in many Italian districts, generally speaking, firms compete with each other for developing differentiated goods. Under the product differentiation, it is possible to coexist and further to cooperate with each other. The product differentiation requires wider and more resources than the price competition in general.

Even if under the product differentiation, entrepreneurs compete with each other actually and potentially. However, in industrial districts, community has restrained the competition. A district must compete with the other districts in all over the world, so the residents will unite as community members. In particular, the community of residents seems to restrain more strongly than that of people working in the business world, but the extent of restraint depends on the characteristics of the

community.

In this way, if cooperation among firms is lacked as a district, the firms and the district did not cope with international competition. If firms in a district can not have any system of getting market information, of upgrading their technology, and/or of accumulating know-how and resources in cooperation with each other, they (and, of course, the district) will not survive. As an industrial district or as a group of firms, they must continue to create resources in the direction of a common vision or a strategy, which is based on the consensus of community.

4. The role of community

For the success of "transformation" or "evolution," the firms, or more precisely the entrepreneurs and managers in industrial districts, must cooperate with each other to some extent. The market mechanism plays an important role in sending the entrepreneurs signals hinting at the need for "transformation" or "evolution." But cooperation between entrepreneurs in the community of industrial district has decisive importance in reaching consensus on a vision or strategy for the future.

In practice, it is not easy to reach consensus in a community. The characteristics of the community seem to determine how easy it will be to reach a consensus. The consensus may be forming, being based on trust and attachment for the community among the members. Generally speaking, the more the members of the community have "common ties and social interactions," the more easily they will reach consensus. The extent that the people in a district hold them in common can determine the degree of trust among them and the characteristic of the community. Holding not just culture and tradition, but also a variety of information and knowledge on society in common can make forming a consensus easier.

As stated earlier, a district's community has a dual structure, as it is a community of residents and a community of businesspeople. The interests of residents do not always coincide with those of businesspeople. For example, the divergence of these interests can be tremendous when some manufacturing activity creates an environmental problem. In general, the time perspectives of residents are longer those of businesspeople, but it is easier to reach a consensus in a regional community than in a business community. This is, of course, because complicated interests as well as severe competition exist among businesspeople. The extent of the ease or difficulty seems to depend on localities and cultural characteristics.

From a informational point of view, the people in any community hold many kinds of information on business in common. If the information dealing with business activities, such as market information, know-how, and technology, is monopolized by a single firm, the industrial district will suffer. Generally speaking, any entrepreneurs do not want to open the information on their own business to the others. In fact, to some extent, the information is exchanged among them and it will be useful to them as well as to the district. If the industrial district becomes replete with information, it will be able to gain greater profits. Even if the firm that has been monopolizing the information might lose some of profit, but the district will gain more profits overall due to the good performance as a whole.

According to my comparative research, Italian residents tend to be attached to

their hometown, whereas the Japanese are attached to prospective business opportunities. Therefore, in Italy the rule of the community of residents seems to take priority over that of businesses, while in Japan the converse is true. It will be easier to reach consensus in Italy than in Japan. The Italian community may constrain the competition and promote the cooperation among firms in a district.

Members of a community can come to agreement on a future image or policy more easily from a residents' point of view than from the point of view of businesses. Business units are apt to lack the autonomy for decision on the future.

In reality, each industrial district competes with others around the world, so the entrepreneurs in the industrial district must cooperate with one another. In order to succeed in "transformation" or "evolution," the members need to contribute, explicitly and implicitly, for establishing organizations for R & D and technology transfer, vocational training, marketing and so on, even if voluntally. For example, many entrepreneurs in Silicon Valley reached, as mentioned above, a consensus on activating the community, and established the "Joint Venture: Smart valley Network" in 1992[19].

In any industrial district, cooperation is necessary with competition, and the extent of cooperation depends upon the community, in particular the community of the residents.

5. Final remarks

Industrial districts are very important from the perspective of regional economies. Thus, it would be useful to put policies in place to promote effective "transformations" and "evolutions." When enacting these policies, however, sociological as well as economic factors must be taken into consideration. In particular, the aspect of an industrial district as a community seems to be important. Therefore, it is necessary to activate the function of community. In addtion, for the transformation or evolution of districts, there is no way to obtain and accumulate many kinds of resources by themselves.

Notes

1 This research is supported by Toyota Foundation.

2 In Japan, industrial districts have been understood as an economic concept, but as will be seen, it is also a sociological concept. As Becattini has pointed, they are "a socio-territorial entity".

3 There are few researches on industrial districts from a dynamic point of view.

4 Quotation from Pyke and Sengenberger (1990) p. 2.

5 "The most important trait of the local community is its relatively homogeneous system of values and views". Quotation from Becattini (1990) p. 39.

6 Of course, they are overlapped.

7 They are defined as the industrial district which sales more than 400 millions yen.

8 The districts are located mainly in Fukui, Ishikawa, and Kyoto.

9 For example, Sumida in Tokyo was an industrial district of knitwear, where a related production processes, namely check and amendment, discontinued its business, so that it lost the function as an industrial district.

10 For example, In Prato, Italy, large companies vertically integrated had manufactured low quality textiles in mass production after World War II, but the production system was changed into that of many small firms with a wide variety of products, being changed into the system integrated again, though flexibly, for manufacturing high-end textiles.
11 For example, Saxenian (1994).
12 Our research.
13 Our research.
14 Sakichi Toyota had invented new types of loom scince 1886.
15 Tsubame began to produce Japanese type of nails around 1620 by the introduction of technology, and diversified the products into files, copperwares, Japanese pipes (kiseru), Japanese pencil's (fude) covers and so on. However, after Meiji Restoration, the prevail of Western import goods expelled Japanese traditional products, so that Tsubame industrial district faced serious crises in 1910's and changed their main products into Western house wares such as spoons, forks, knifes etc.
16 Each economy has its different structure of distribution channels which have influenced the behavior of manufactures and industrial districts. In Japan, the channels are very complicate traditionally, so the distance between a maker and a retailer is longer than that in other countries. In textile industry, more than two wholesaler or trading houses intermediate the transactions, which complicate the relationship of their interests and obscure their each risk.
17 Not only in Carpi the "CITER" which was established by local governments as well as entrepreneurs, but also in Prato the "Prato futura" which a group of entrepreneurs established have a function to research the information on markets in all over the world.
18 For example, the cases of the Steinbeis Foundation in Germany and the ERVET in Italy.
19 See Joint Venture Silicon Valley Network (1996).

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