

# Spatial Inter-firm Networks in the Post-modernization Era: The Case of Town Factories' Agglomerations in Japan

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## **Emiko Tayanagi**

Doctoral Student in Policy Sciences  
Hosei University Graduate School  
2-15-2 Ichigaya-tamachi Shinjuku-ku  
Tokyo 162-0843, Japan  
Email: taya@mx5.ttcn.ne.jp

## **Ana Colovic**

Doctoral Student in Management  
University of Paris-Dauphine, Research center DMSP  
Place du Maréchal de Lattre de Tassigny  
75775 Paris cedex 16, France  
Email: ana.colovic@dauphine.fr

## **Abstract**

*In this paper we study small and medium-sized enterprises (SMEs) inter-firm networks in industrial agglomerations in Japan. We argue that a common factor found in all types of agglomerations is a transition from the growth or the modernization period to a new era. We focus on some of the most interesting cases observed during our field study in different Japanese regions. These cases indicate that the well-established rules of the game, set during the modernization times in Japan, seem to have lost their power and are gradually being abandoned. However, no new standards seem to have emerged so far, and this situation gives important freedom to SMEs and their networks to adventure themselves in new fields and new forms. Still, we could distinguish some general tendencies such as the dissolution of relationships between large firms and their subcontractors, creation of new partnerships between SMEs, development of new ties between SMEs, research institutions and local officials.*

## **Introduction**

During the last decade major changes and restructuring have been taking place in the Japanese economy. Like other developed countries Japan has been increasingly recognizing the importance of small and medium-sized enterprises (SMEs), inter-firm networks and industrial agglomerations (SME Agency 2002; OECD 2001; MITI 2000). In the background, there seems to be an impact of globalization on Japanese leading industries. In some areas, the pyramid-like hierarchical structure of inter-firm networks has drastically transformed to a multiple one, which could be characterized as a many-to-many type of network. In other areas, the emergence of new agglomerations or clusters can be observed.

Since the 1970s, the Toyota production system has been dealt with as a synonym for an efficient organization. The “Just in time” or the *kanban* system gave an example to

modern manufacturers in other industrial countries in the context of Post-Fordism. Undoubtedly, the so-called Toyota system and some other Japanese institutions could implement the outstanding flexibility, which attracted attention of many social scientists and was the object of numerous studies. However, most of these studies did not take into account an important aspect of such a system - that is the grassroots entrepreneurial networks formed by huge numbers of SMEs, which have made the functioning of such a system possible.

In this paper we look into these grassroots small-firm networks, which are at the base of the entire Japanese economy. We analyze them within the perspective of globalization and the “transition” from the Growth period (to which we refer as the modernization period) to a new one, which follows and could thus be regarded as the post-modernization one. We focus on the change within the urban agglomerations of town factories (in Japanese *machi koba*) and the new directions towards which town-factories networks tend to be moving. In fact, regardless of the type of inter-firm SME networks and the characteristics of their environment, which are different kinds of industrial agglomerations, there seems to be a common factor, which can be observed in all cases. That common factor is the transition from the era during which Japanese economy experienced growth and established some rules of the game for small entrepreneurs to a new era, which is yet to be explored by SMEs. In the following section we will discuss in detail this transition phenomenon, focusing on some of the most interesting cases of inter-firm networks in industrial agglomerations of Japan.

## **Analytical Framework**

### **Spatial Small-firm Networks in Japan: Modern and Post-modern Times**

We would like to start with an analytical description of the actual characters of “SMEs” and “Spatial networks” within the Japanese economy in form of a brief history of the recent transition.

During the last century of industrialization times of Japan, heterogeneity and diversity have consistently been common characters both of SMEs actors and of industrial agglomerations. Regarding regions, there are 47 prefectures, which are more or less based on the territory of feudal domains of the Edo period (1603-1867) in Japan. Each prefecture has a great deal of specificity: nature, climate, culture, food, people, industry etc. Besides, there are no less than 550 industrial agglomerations (*sangyo shuseki* in Japanese) in industries such as textile, machinery, metal or ceramics (MITI 1999). Regarding SMEs there are around 4,837,000 of them and they account for no less than 99.7% of the total number of enterprises (SME Agency 2001). SMEs have always been a crucial element of the Japanese economy (Whittaker 1997).

The well-known role of Japanese SMEs’ agglomerations is the formation of hierarchical subcontractor networks as a part of the so-called *Keiretsu* system (Asanuma 1989; Gerlach 1992). In the industrial districts of the “company-castle-town” type (Japanese Small Business Research Institute - JSBRI 1998) such as Toyota-city or Hitachi-city, we could observe how geographical networks formed such hierarchical structures. However, it is less-known that other types of networks could be observed in industrial agglomerations of the “city” type (Whittaker 1997; Perry 1999; JSBRI 1999; SME Agency 2000) such as Ota ward in Tokyo or Higashi Osaka. In such agglomerations, small firms created many-to-many supplier networks not depending on a single large company. In agglomerations characterized by a mixture of various leading industries,

such many-to-many networks tend to be embedded naturally and historically in the region.

Thus, each region has generated its own characteristic formation of SME networks. This suggests that after all, there is a third factor - “networks” of each region, which also shares the common characters of heterogeneity and diversity.

During the 1980s the Japanese economy had already slowed down its growth. Moreover, the Plaza Accord brought a striking damage to the SMEs and industrial agglomerations. At the beginning of the 1990s the Chinese economy started to enhance its industrial capacity and value on large scale. As a result, serious phenomena of hollowing-out of industry have struck almost all industrial agglomerations in Japan. Since the large companies have transferred their production processes or supplier systems from Japan to China, the managers of Japanese SMEs have recognized that such a situational change is severe. In the past, SMEs were able to survive just by playing in the ground - the hinterland of the Japanese economy. They were not pushed to search a new space for their existence. However, from the 1990s they are struggling in a trial ground for their ability to survive with their own self-support and self-responsibility.

The time of work abundance for SMEs seems to have gone. The hierarchical subcontracting structure, well established in the period of modernization is no longer a compulsory way of existing (Watanabe, 1999). While other developed countries work on transferring the Japanese practices, such as the Toyota system into their industries, in Japan a new phase seems to be well on its way (Leclerc, 1999). Old rules and structures are replaced by new ones, which no longer fit to the well-determined dimensions of the modernization times. In such circumstances, networking seems to be undergoing a significant revision and transformation. Thus, new forms of spatial networks are rapidly proliferating showing that this new period, instead of setting frameworks is giving more freedom to organizations.

### **Agglomerations of Town Factories – a Typical Form**

Agglomerations of town factories (*machi koba*) have characterized Japan for several decades. Within them, SMEs that concentrate in relatively limited areas are engaging in cooperative relationships forming inter-firm networks. The organization and functioning of such networks are in many ways influenced by the characteristics of the space in which they emerge. In some areas, very dense and dynamic network forms can be observed with the entrepreneurs adopting proactive attitudes towards cooperation with confrere SMEs. In other areas, global networking of each company has been developed although spatial networks seem to lack vigor and vitality.

In such circumstances, different questions emerge. What kind of behavior can be observed? How is the space of the small-firm networks transforming? How do the SMEs follow such change? What could be the future for the spatial small-firm networks?

In order to answer these questions and to grasp the phenomenon of this profound change at the very base of the Japanese society, we conducted a field study in Japan. The field study was designed in such a way as to cover all types of industrial agglomerations. Thus, both traditional districts and technologically oriented ones (JSBRI 1998) were studied. However, the most interesting case proved to be the one of town factories' agglomerations in places such as Hamamatsu, Osaka or Hitachi-city. These cases will be presented in this paper.

## **Objectives and Methodology**

During the six-month period from October 2002 to April 2003 we performed a field study in Japan. Our objective was to grasp the transformation of spatial networks and detect the emergence of new forms. By doing so we hoped to contribute to a better understanding of new conditions and new developments at the grassroots level of the Japanese industry.

We chose to apply a qualitative methodology based mainly on interviews with SME managers and local government officials. We estimated that it was the only appropriate way to grasp the phenomenon taking into consideration as much of the local context as possible. As we mentioned earlier, Japanese regions differ significantly one from the other in many aspects and it was therefore necessary to include the local characteristics in this study.

A total of 42 semi-structured interviews were conducted in Japanese with the SMEs and local government officials in 9 industrial agglomerations. We took care to interview at least three companies per agglomeration although in at least half of them we could interview 4 or more SME managers. Interviews lasted from 45 minutes to around two hours with an average of around one hour and 15 minutes. An interview guide was developed before the field study, but it went under considerable change as the field study advanced. Some questions were omitted and some new ones were added to the list. Thus, new interesting elements were included in the study as they emerged and the focus of the study could change flexibly in necessary directions. Interviews were transcribed and then analyzed using the techniques proposed by Miles and Huberman (1991).

In addition to interviews, we were able to make observations, within the SMEs and around them. We also visited some parts of towns in which SMEs were located. These visits proved to be valuable for our comprehension of the atmosphere in which SMEs work and create networks. We also took a significant number of photographs.

The third source of evidence was the secondary data contained in all kinds of brochures, official statistics, articles, books, magazines etc. Most companies provided a "Company profile" brochure, and some of them other written material on their activities.

The three data sources: interviews, observations and documents were useful for the process of "triangulation", which upgrades the validity of our research.

In the following section, we will present some of the results of our field study focusing on three cases of town-factories agglomerations.

### **Three Distinctive Cases**

The results of our study indicate that for example, in regional industrial agglomerations in which SMEs used to work as subcontractors for large firms, there has been a drastic change of situation for these SMEs. This change will be presented through the case of Hamamatsu. On the other hand in dense concentrations of small firm networks in large urban areas a bottom-up emerging of networking and cooperation has been taking place. The case of Higashi Osaka deals with such proactive networks. At last we will show that even in the typical and the most conservative company-castle-towns such as Hitachi-city the common character of transition to a new era can be observed.

## The Releasing of the Goldfish - Town Factories in Hamamatsu

Hamamatsu is the city of “multiple pyramids”, or multiple *keiretsu* systems as opposed to a single pyramid structure in the company-castle-towns such as Toyota-city or Hitachi-city. Indeed, several large enterprises (Yamaha, Suzuki, Honda, Kawai...) have coexisted in and around Hamamatsu and the great majority of SMEs worked as subcontractors for these companies during the modernization period, forming pyramid-like structures. Even though belonging to such a structure in a city like Hamamatsu is quite different from being a part of Hitachi or Toyota *keiretsu*, the tendency was clearly a vertical one and most SMEs worked for one or only a few clients. Thus, many of them had their “space” of existence well defined, within one (or a few) *keiretsu* systems. However, following the rapid growth of the South-East Asian countries, large enterprises in Hamamatsu have been placing fewer and fewer orders locally, opting rather for the low-cost parts in the South-East Asian region. This new strategy change of large firms has brought some SMEs into a difficult situation of having to find other sources of revenue in a relatively short period of time. Many SMEs cannot live up to such conditions and perish. However, others do not give up easily to pressures. By seeking new partnerships with the local government officials, universities and other SMEs, these companies are beginning to realize that there are still so many opportunities around them in all kinds of fields. The most interesting fact is that these SMEs had no idea that they could seek their place in another framework and in other activities. As some of the entrepreneurs admit, for many years they were as “blind”, they had no need to look around them, they could survive and prosper by following their “parent-companies”. One entrepreneur told us: “ It seems as if they released us from the goldfish bowl. We, the goldfish must now swim in the open sea.” This perception by a local man confirms our idea about the transition from a well-established structure and rules of the modernization times to a new period in which, at least for the moment, no rules seem to be fixed. The same entrepreneur added: “It is difficult, that is sure. But, oh, how interesting it is! To explore all these things that were so close to us and we ignored their existence.”

### Box 1. Case 1 - Hamamatsu town factories

#### Releasing of the goldfish - the case of Hamamatsu town factories

In Hamamatsu, an agglomeration of more than 10000 firms, of which the great majority are SMEs, small companies used to work as subcontractors for large firms (such as Yamaha, Kawai, Honda, Suzuki...), called “parent companies”. SMEs lived calmly and had a kind of a privileged life under the protection and within the territory of their parent companies. In fact, the metaphor of parent-child companies had its source in such a relationship between the assemblers and their subcontractors. However, since around ten years ago these parent companies are gradually shifting their supply systems to South-East Asia and especially China. Due to this development, hundreds of SMEs have seen their once stable orders diminished or even completely stopped. Thus, it seems as if the large companies proceeded to a “releasing of the goldfish” by leaving their “children” out of work. The goldfish, once protected by their parents are now learning to swim in the open sea. In such circumstances, they need to seek partnerships with the local officials, universities and other SMEs and work on creating new types of networks - the ones in which the difference in power would be replaced by coexistence through cooperation.

What can we learn from the goldfish case? First of all, a lesson for all SMEs would be to stay away from “parent-child” kind of dependence. Accepting such dependence seemed to be a comfortable strategy during the stable growth of the Japanese economy and work abundance. However, most SMEs that engaged in such asymmetric relationships have not developed any commercial skills and are not able to deal with the new situation with confidence. Second, SMEs should benefit to a greater extent from other neighboring SMEs. Relations between SMEs of similar size and potential seem to present little risk of dependence one from another, offering on the other hand advantages in terms of sharing resources, obtaining joint orders or engaging in joint R&D projects. And the third lesson that we can learn from the Goldfish case is that it is important to seek information and to explore new possibilities in all cases. Firms should not satisfy themselves just by doing the same kind of work for the same client, even if this work seems to have a great perspective. By keeping in mind the “you never know” idea, they should at least invest in being informed of what is going on in their potential fields of interest.

### **The Higashi Osaka Satellite Project**

As we have seen above, entrepreneurs in Hamamatsu used to belong to pyramid-like structures organized by several large companies in the region. In Higashi Osaka the situation was quite different. Historically, SMEs in Higashi Osaka did not tend to belong to any *keiretsu* system even in the stable growth period. Rather, they opted for working for several clients. Thus, the most representative cases of grassroots entrepreneurial networking can be found in the Higashi Osaka district.

The Higashi Osaka district is at the borders of historically the most mercantile city in Japan, Osaka. At the beginning the cotton industry emerged there as a local industry in the Edo period. Then twisted yarn, *Tabi* (Japanese traditional socks) and towel industries were introduced in the Meiji period. Even after, entrepreneurs continued to show a tendency towards producing various end products, such as iron wires or nettings, tools, toothbrushes, toys, stationery and so on. When the local industries transformed into metal or machinery manufacturing industries, such a way of merchant thinking seems to be inherited by modern entrepreneurs.

Since several decades ago, especially from the after war time to the high growth period, a very characteristic agglomeration of numberless micro companies, sharing terrace house type factories partitioned into more or less than 5 units, has emerged.



Picture 1. Town factories in Osaka



Picture 2. Town factories in Osaka

As the second largest city in Japan various leading companies such as Matsushita, Sharp or Sanyo were located and the agglomeration has expanded as a hinterland of such a megalopolis. While there were 2053 factories in 1955, the number increased to 9479 in 1975 (Konaka, 1995). However, the serious recession stroke Japan as mentioned above and almost all of the SME factories have been suffering a serious decrease in sales. Even though a lot of companies have diminished or disappeared completing their roles of the modernization era, new leaders within new spatial networks have recently emerged, especially in the last decade. The most symbolic case among a number of projects is the Higashi Osaka Satellite Project, the project to build a satellite by joining forces of around 40 local SMEs. Although the project aims to promote their activities and technological abilities, it seems that it is not just the boldness of the SMEs presidents. National and regional governments as well as large enterprises are expressing their readiness to push the project with financial support and promotion although such behaviors within the superstructure were quite unthinkable before. The case of the Higashi Osaka Satellite project is presented in the Box 2.

#### Box 2. Case 2- The Higashi Osaka Satellite Project

##### The Higashi Osaka Satellite Project

The Satellite project of Higashi Osaka is a plan to design, develop and produce a satellite by joining forces of around 40 SMEs, mostly based in Higashi Osaka, a city within the Osaka agglomeration. The idea for this project came from an entrepreneur whose company makes airplane parts. He saw the potential in the SMEs of Higashi Osaka, many of which are narrowly specialized in their fields and which have developed distinctive competencies. Most of the companies produce metal and machine parts and work for numerous clients. This group of entrepreneurs, under the leadership of the airplane parts manufacturer has searched a partnership with some researches in the neighboring universities. However, there seemed to be major discrepancies in mentalities between the two sides and the relationship could not take a successful route. Nevertheless, the SMEs continue to seek support and have recently obtained a grant from the government.

Why is this case so significant? First of all, there seems to be a complete turnaround in attitudes of SMEs networks toward what is reserved for large companies and what is supposed to be done by the SMEs. In fact, by engaging in this project, this network entered into a direct competition with a famous large Japanese company, which is working on the development of a satellite and seeks the same kind of financial support from the regional and national governments. Thus, it seems as if the perception of “space” in which the SME network is supposed to exist is changing radically since the network dares to enter the space reserved for such large companies. This was unthinkable in the modernization era, when SMEs were supposed to act as subcontractors for larger firms.

Second, because this case gives incentives and encourages other entrepreneurs to engage in new projects. An entrepreneur of Higashi Osaka, who is not taking part in the Satellite project, told us “When we, the other SMEs, see such attitude and behavior, we get health and strength too.” This shows that by looking up to examples of leadership and joining forces, other networks in the surroundings can also get positive impulses to undertake similar efforts. Such examples seem to act as multipliers of proactive behavior within the town factories agglomerations.

## **From Subcontracting to Original Equipment Manufacturing - Evidence from Hitachi-city**

As we have seen above, the transition to a new era can be seen in regional agglomerations of "several pyramids" such as Hamamatsu district and large urban area zones such as Osaka district. However, even in the most hierarchical agglomerations that have made the glory of the Japanese subcontracting system, such as Hitachi-city, such transition trend can be distinguished. A characteristic case is that of a transition from subcontracting to original equipment manufacturing, once again a non-standard phenomenon for the modernization period. This case will be presented here.

The hollowing out process in the Japanese economy has particularly hurt SMEs in Hitachi, the city of Hitachi enterprise. Many subcontractors of Hitachi have thus completely lost orders and have passed, as one of entrepreneurs told us "from only Hitachi to zero Hitachi". This means that many SMEs in Hitachi-city that subcontracted exclusively for Hitachi Co. have been left without any orders from their "parent" company - Hitachi. This is mostly due to the delocalisation of subcontracting in the South-East Asia and especially China.

In such circumstances a large number of SMEs have ended their operations and perished. However, there are others that do not wish to give up and that try to find other ways to survive. One possible strategy is to look for new clients and sell the same kind of products, but this is not an easy task for a company that is based in Hitachi-city. In fact, most large companies do not wish to enter the "territory" of this company-town, so, getting orders from new clients proves to be complicated.

In order to help the Hitachi-city SMEs to "reinvent" themselves, the government established an "Industry support center", which provides help to local SMEs during the transition process. The officials of the center build close links with the enterprises and also promote University-Industry-Government (U-I-G) relationships, between the universities of Ibaraki and neighboring prefectures and local SMEs.

During the last decade, several work groups composed of local SMEs have been formed with an objective to develop and commercialize new original products. One of the groups gathered nine local SMEs, once subcontractors of Hitachi, which belonged to the same Subcontracting association. In Hitachi-city there are several subcontracting associations composed of firms that subcontract for Hitachi Co. These associations have basically served to transfer the payments from Hitachi Co. to each individual subcontractor, member of the association. Apart from this, enterprises members of the association did not build any other kinds of ties until recently, i.e. since the beginning of the restructuring period. The 9 SMEs in question developed an original product, a bioreactor called Bioclean, which transforms garbage into water. During the innovation process this group benefited from the help of the local government and the Industry promotion center and from the university researchers.

### Box 3. Case 3 - The Bioclean Project - Hitachi-city SME network

From subcontractors to original equipment manufacturers- the case of Hitachi-city SME network

Hitachi-city is a representative case of a company-castle town (*kigyo joka machi*). The designation “castle-town” has its origins in the feudal era of Japan when castles and their masters owned entire cities all over Japan. As a parallel to such a monopolistic situation, the expression “company-castle-town” refers to an economic (and in most cases even political and social) monopoly of a single firm over the entire city in which it is situated. The large majority of manufacturing SMEs in Hitachi-city used to work exclusively for Hitachi-Co., the company that transformed the town to its own, making it, along Toyota-city one of the most representative cases of the “company-caste-town”. SMEs relied on Hitachi Co. to place orders and bring prosperity both to them and to the city as a whole. During the stable growth period, SMEs had few contacts with each other, and did not engage in any kinds of cooperative relationships. However, since Hitachi Co. has started to break the partnerships with local SMEs, transferring the subcontracting work to other countries, SMEs have been facing a new condition in their environment. In such circumstances, they have tried to seek partnerships with other SMEs and local officials and to invest in R&D, adventuring themselves in completely new fields. The Bioclean project is a representative example of such behavior. A group of nine ex-subcontractors of Hitachi have developed a bioreactor through a partnership with local officials and university researchers.

The case of the Bioclean project is an example of a successful alliance of local SMEs, local government and university researchers. In the case of Hitachi city we could observe that even the local actors, who had never had strong social ties except the indirectly relations of the industrial networks of Hitachi Co., have generated new spatial networks. The local officers of Hitachi city aggressively share the crisis with the SMEs and the local universities and have generated horizontal networks within individually face-to-face relationships rather than formally institutional relations. The phrase “from only Hitachi to zero Hitachi” means that all actors must search and create new fountainheads instead of letting themselves dry up.

Again, it confirms our suggestion that we are witnessing the drastic transformation as a common factor of the Japanese economy.

## Conclusion

In this paper we have seen that there is a transition from modernization to post-modernization, which is reflected in the change of the organizational structure of the Japanese production system. The new era seems to impose fewer constraints on SMEs and their networks in terms of respecting the well-established forms, structures and practices. Although it seems difficult to define the general practices during the transition process, a few implications can be observed.

### Dissolution of the *Keiretsu* Structure

The first implication is the dissolution of relationships and the loosening of strong ties between large enterprises and their smaller subcontractors. This tendency could be observed in the cases of Hamamatsu and Hitachi-city.

## **Creation of New Small-firm Networks**

The second implication is the creation of new small-firm networks, new partnerships between SMEs in order to enter new fields, organize joint research and development and enhance the commercial and other skills required in new conditions. This could be seen in the case of Hitachi-city and Higashi Osaka and to a certain extent Hamamatsu.

## **New Partnerships with Local Government and University**

And finally, the third implication is the fact that in order to overcome the dissolution of parent-child relationships and engage in new activities through partnerships and cooperation, SMEs obtain significant support from the local governments and university researchers. This point emerged especially from the Bioclean case in Hitachi-city.

This research is just the beginning of a larger inquiry on the transition process of the Japanese industry. Since the process is still underway, longitudinal study needs to be envisaged in order to provide a more complete understanding of this phenomenon. Another research direction would be to design comparative studies in several developed countries to see whether a similar kind of transition is taking place simultaneously in different countries.

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