A Review of Geographical Studies on Manufacturing Industries in Japan

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Abstract This paper aims to review geographical studies on manufacturing industries in Japan over the past two decades, with particular focus on industrial agglomeration, the geography of large manufacturing firms, and industrial regions. Academic discussions on industrial agglomerations in Japan have shared some common subjects with those in North America and Europe, but took a different direction from the latter in the Japanese economic context. Empirical studies on industrial agglomeration have been tackled from diverse viewpoints. It is not easy to sum up their main view. In order to prevent the discussion from scattering, empirical studies have to be particularly sensitive to the geographic scale and its spatial characteristics. It is also important that the many theoretical works, conducted more than in other countries, provide the common base of discussion in empirical studies. Since the 1990s, globalization has brought about a rise in foreign direct investment in Asia through Japanese multi-national enterprises (MNEs), and at the same time, “hollowing out” of industries appeared on the Japanese manufacturing landscape. However, studies on shifting spatial systems within Japanese manufacturing remain insufficient in their attempt to understand the real character of spatial systems in terms of the international division of labor in East and South Asia. It is necessary to take up the following three issues both theoretically and empirically: first, the production systems of the Japanese MNEs in East and South Asian countries; second, inter-regional and international division of labor in East and South Asia; and third, the repercussions of locating abroad and offshoring manufacturing on industrial regions within the home country. Relocation abroad and offshoring of manufacturing have brought about an unequal development among industrial regions. Empirical work on the economic and social effects through the increasing reorganization of industrial regions has emerged as important. In addition to these issues, seeking an alternative system of local manufacturing for survival, creating high-value-added jobs and innovative activities, poses the emerging challenge in the study of this sphere.

Key words manufacturing industries, industrial agglomerations, location, large manufacturing firms, industrial regions, Japan

Introduction

This paper is a review of geographical studies on manufacturing industries in Japan, over the past two decades, with particular focus on industrial agglomeration, the geography of large manufacturing firms, and industrial regions.

Industrial agglomeration has been a widely popular topic in the research on Japan’s economic geography, having had considerable academic attention in the country since the 1960s. Academic discussions in the field during this period, however, were stimulated by lively studies of economic geographers in the North American and European countries. The Japanese researches have shared some common subjects with them, but took a different direction in the Japanese economic context: problems related to the restructuring of existing agglomerations in an already shrinking economy. The debates reached a climax at the annual meeting of The Japan Association of Economic Geographers in 2005.

Since the 1990s, globalization has brought about a rise in foreign direct investment (FDI) in Asia through Japanese multi-national enterprises (MNEs), and at the same time, “hollowing out” of industries appeared on the Japanese manufacturing landscape. Their FDIs, especially from electronics and automobile firms, allowed not only the setting up of their own factories abroad, but also component companies’ factories and their subcontractors. As a consequence, the spatial system of the Japanese manufacturing industry has shifted from favoring inter-regional division of labor within Japan to expanding towards an international division of labor in East and South Asia.

Relocation by Japanese manufacturing firms has restructured manufacturing systems as well as industrial
regions within Japan, particularly in and around metropolitan areas. Relocation abroad and offshoring of manufacturing have brought about an unequal development among industrial regions. There has been a drastic slowdown in the inner-metropolitan areas, a restructuring and renovation in the old industrial regions and newly emerging industrial agglomerations, as well as a transformation of the innovative character in non-metropolitan areas.

(MATSUHASHI, K.)

**Studies on Industrial Agglomeration in Japan**

**Increasing interest and shifting focus**

The “resurgence” of the Japanese economy in the 2000s, before the global financial crisis in 2008, increased interest in innovation among economic geographers. As this interest has grown, the focus of study has shifted from economies of scale to coordinating linkages and combining knowledge, in other words, to flexibility and innovation (Kato 2004). Japanese manufacturing industries, especially machinery industries, had suffered pressure in the 1990s due to hollowing out and shrinking. However, during the 2000s, they recovered with the rise in exports that was accelerated by the relatively weak yen. A key determinant of international competitiveness is the research and development (R&D) capabilities of material and parts suppliers, as well as those of machinery manufacturers. Interactive, cooperative and continuous knowledge transfers between manufacturers and suppliers facilitate their R&D activities and technological innovations. Industrial agglomeration has been one of the factors that encouraged transfers of knowledge and technological innovation. The geographical and cultural proximity of firms plays a particularly important role in enhancing transfers of knowledge and technological innovation (Mizuno 2011). The renewed focus on the importance of proximity underpins the increasing interest in industrial agglomeration and the shift in focus regarding technological innovation.

Thus, economic geographers in Japan have focused on the relationship between industrial agglomeration and innovation. In 2005, for instance, a symposium entitled “On the innovativeness of industrial agglomerations” was held at the annual meeting of *The Japan Association of Economic Geographers* (Annals of the Japan Association of Economic Geographers 52, 2005). This tendency is also partly reflected by geographers in North America and Europe. The argument concerning industrial agglomeration amongst Japanese economic geographers may well peak in this decade.

**Agglomeration, innovation, and networks**

Innovations through industrial agglomeration are increasingly discussed in relation to the concept of social networks. They should be understood as a social process; in many cases, new knowledge is created through business interactions between a number of actors, such as firms, research institutes, and individuals. Thus, the process of creating new knowledge is embedded in social networks (Mizuno 2005, 2007; Yokura 2008).

A number of studies have argued qualitatively in favor of industrial agglomeration from the perspective of social networks. Oda (2004) argues that one of the competitive advantages of the metals and machinery industries in the southern Tokyo area is the mix of strong and weak ties among small and medium-sized enterprises (SMEs). This provides “social capital,” which supports flexible linkages and exchanges of goods and knowledge. Similarly, in some industrial agglomerations outside the metropolitan regions, informal networks among firms, universities, public research institutes, local government, and Non-Profit Organizations (NPOs) facilitate learning and technological innovation (Yamamoto 2002; Matsushashi 2002, 2005; Hatsuzawa 2005; Fujita 2007; Yokura 2012).

However, we should not focus exclusively on localized networks within agglomerations. Yamamoto, K. (2005) insists that the theoretical arguments regarding industrial agglomeration tend to overemphasize the relationship between transfers of tacit knowledge and spatial proximity, while downplaying the role of extra-local networks. The important point is the creation of new combinations of diversified knowledge, whether it is codified or tacit, local or extra-local.

There have been quantitative studies of the relationship between technological innovation and inter-organizational networks. Using patent data, Mizuno (2004) explores how and to what extent geographical proximity affects SMEs’ collaboration with other firms or organizations in technological innovation. Various types of collaboration networks are found, varying in spatial scale, firm size, and industrial sector. Yokura (2009) spatially and quantitatively examines the structure of the networks involved in joint research projects between firms and research institutes in Japan. The results show that the spatial scales of projects differ considerably depending on their technological characteristics (for example, whether they are manufacturing based or science based).

These empirical studies suggest that the types of knowledge base differs between the various industrial
sectors involved in exchanging and generating knowledge, furthermore, the importance of geographical, organizational, and cultural proximity varies according to the type of knowledge base (Matsubara 2007; Mizuno 2007).

Back to the classics

Industrial geographers in Japan have an intense interest in examining classical location theory in the context of the present socio-economic environment. Their interest differs from that of Anglophone geographers, who now make little reference to the classical theorists, such as A. Weber and A. Marshall.

Matsubara (2006) reconsiders the arguments for industrial agglomeration found in the classical location theories of Weber and Marshall. He re-evaluates the advantages of Weber's theory, in particular its rigorous examination from the perspective of cost minimization, and contrasts it with Marshall's theory, which highlights the qualitative and hard-to-measure factors (the concept of "industrial atmosphere" leading the view of innovation from a dynamic perspective).

Several articles attempt to reinterpret the classical agglomeration argument in light of the contemporary industrial economy. First, Fujikawa (1999) examines the classical theories and interprets them in the age of flexible production, viewing the advantage of agglomeration as "the advantage of coordination in variable linkages"; that is, one firm can link to another even if one of the firms is a newcomer to the industrial sector. This implies that the number of potential transaction partners nearby is one of the advantages brought by agglomeration.

Second, Oda (2004) discusses the agglomeration theory of Marshall, returning to his original literature and viewing it from a location dynamics perspective. The theory assumes the localization of small plants realizes economies of scale similar to those of large plants. Furthermore, in accordance with the theoretical discussion, Oda (2005a) insists that Japanese mass production is characterized by intermediate-scale production with a mixed system, containing elements of both the American System and a Marshallian localization economy. The American System, namely mass production, had already developed by the time of Marshall's work and it led industrial locations to be dispersed, moving closer to less skilled and lower-cost labor. In the flexible specialization thesis by Piore and Sable, Oda rediscovers that Marshall's argument of industrial districts lives, even in the midst of contemporary capitalism.

(MIZUNO, M.)

Geographies of Large Manufacturing Firms in Japan

Many economic geographers in Japan have studied both theoretical and empirical perspectives of locational behaviors of large manufacturing firms, and have, compellingly, related this behavior to the spatial system of the Japanese manufacturing industry. This chapter illustrates two trends in the research after the 1990s: on locational behavior of individual Japanese firms and their domestic spatial systems, and on overseas location preferences of these firms and their local impacts.

Corporate location behavior and nationwide spatial system of industries

Studies until the 1980s described three features of the spatial system of the Japanese manufacturing industry during the rapid growth period (Kitamura and Yada 1977; Matsuhashi and Togashi 1988). The first feature was the overall concentration of the industry around the Pacific Coastal Belt. The second was the predominance of industrial districts in Eastern Japan, with the Tokyo metropolitan area (Keihin area) as their core. The third was the spatial segmentation of national markets, wherein researchers had analyzed strategies of large corporations in terms of multi-plant location and division of markets among their factories.

After the second half of the 1960s, the labor-intensive factories were decentralized from existing industrial districts. During the recession that followed the first oil crisis in 1973 and the economic bubble of the 1980s, large firms' headquarters and their R&D functions tended to concentrate around the three metropolitan areas of Osaka, Nagoya, and especially Tokyo. This strengthened the core–peripheral spatial system, with these three metropolitan areas constituting the core.

Some studies (such as Aono 2011) attempted to understand the large (branch) factory's hierarchical organization of suppliers, which characterized the Japanese machinery industry in the peripheral regions. These studies emphasized the social relations of production, their historical perspective, and the national economic context. However, they did not adequately connect the spatial system at the national level with that of the local level. Some researchers (Sueyoshi 1999; Tomozawa 1999) attempted to address this problem. Influenced by the theory of the spatial system of the national economy (Yada 1982) and the structural approach (Massey 1984), they approached the issue from the viewpoint of the intra-firm interregional division of labor, and attempted to understand
local production systems as a part of the hierarchical location system of large firms. Their studies pointed out that production systems in peripheral areas linked regional dispersion of plants with occupational diversity among part-time farming households.

The Japanese economic bubble reached its peak around 1990. After the collapse of the bubble, Japanese industries, influenced by the rapid appreciation of the yen and intensifying competition with other Asian countries, faced the consequences of globalization and hollowing out. Japanese large enterprises rapidly developed with reorganization of location based on “selection and concentration.” Economic geographers in Japan shifted their interests from researching nationwide spatial system of industries to studying spatial systems and networks of these large enterprises, especially electronics and automobile enterprises (Yamakawa and Yanai 1993).

Studies on NEC (Kitagawa 1994, 2005) and Sony (Aoki 2000) focused on locational behavior, especially interregional division of labor by enterprises. These studies argued that such companies located their branch plants in non-metropolitan areas, hiring inexpensive workers for mass production, while simultaneously upgrading (e.g., R&D or trial production) existing facilities in those plants that were located in metropolitan areas. The studies emphasized inter-firm linkages between a large firm’s plants and its suppliers (see Ogawa 1994, 1995; Mizuno 1997a, 1997b; Fujikawa 2001 on automobile enterprises; Kashima 1995; Kondo 2004, 2007 on electronics; and Goda and Asai 1998 on aircraft).

In contrast, studies on basic materials industries discussed the reorganization of location by means of merger and business integration (Sugiura 2001; Goda 2009). Matsubara (2009), for instance, described the geographic influence of business restructuring, referring to the concept of locational adjustment (Watts 1987). Large enterprises in basic materials industries developed the locational selection and concentration of their production by, on the one hand, closing down old and inefficient factories in the metropolitan regions, and on the other hand, shutting down the manufacturing of unprofitable products or parts, and/or evolved into the mother factory with a R&D function in the non-metropolitan regions (Togashi 2003). On reorganizing the existing spatial hierarchies, networked structures with various linkages began emerging in the national industrial landscape.

In the 2000s, exports of automobiles and electronics, supported by the relatively weak yen, led to a slow economic recovery. The number of plants located within Japan began to increase, this phenomenon being termed as a “homecoming.” Some Japanese MNEs, especially in the electronics industry, chose to locate their manufacturing of advanced products in domestic regions in order to prevent the transfer of advanced technology to Asian countries and to integrate their R&D and production. Two examples can be found in the flat panel display industry: Sharp plants located in Kameyama and Sakai (Kashima 2010) and Panasonic plants located in Amagasaki and Himeji (Kondo 2008). Because of their presence in these cities, the Osaka Bay area came to be called the “Panel Bay.”

Following the world financial crisis that began in the late 2000s, many plants in the semiconductor and information appliances industries closed down, leading to unemployment. Plant operations slowed down in the Panel Bay too, diminishing earnings in both companies.

The manufacturing industry suffered further damage due to the Great East Japan earthquake in March 2011. This included physical damage to plants and led to severe disturbances in supply chains when physical damage to upstream factories caused production suspension affecting downstream plants. This was also, partly, a result of the risks inherent in a just-in-time (JIT) system and in the consolidation of production between a few factories (Oda 2012).

**Overseas locations of Japanese firms and their local impact**

Globalization of manufacturing industries has also attracted a growing interest among economic geographers in Japan. The studies can be classified into three types.

First, there is the approach based on location theory (Suzuki 1994, 1999; Suzuki et al. 2005). Suzuki's studies, based on the classical location theory as well as the multinational enterprise theory, explained two types of location behavior among MNEs: market-oriented location in advanced countries and labor-oriented location in developing countries. Based on this, these studies attempted to understand domestic and overseas locations of the Japanese MNEs as well.

Second, there is the investigation into production systems in foreign countries established by the Japanese MNEs. These studies carried out detailed field surveys and analyzed various aspects including transactional linkages between Japanese transplants and their local suppliers, labor-force structures, logistics systems (such as JIT), industrial estates, local government policies, and so on. In this respect, the automobile industry has been analyzed often (Tomozawa 2004, 2007 in India, Une 2006, 2009 in Thailand, Oda 2006 in the Philippines; Saito 2001 in
Spain), with significant attention to the JIT system. They surveyed how the system has adapted to actual local situations, and therefore, clarified that it was not applicable across the board and does not always bring spatial concentration of suppliers.

Third, there is a focus on localization of production systems of Japanese MNEs in overseas countries, which illustrates how these overseas plants adapted themselves to regional environments, labor force structures, and so on (Taira 2002, 2005; Shulunze 2003). There have been similar studies investigating infrastructure development by developing countries with the intention of attracting foreign companies (Ji 2007; Abe and Fang 2010 in China; Ishizutsu 1998 in Malaysia). These studies analyzed the maintenance of industrial and living infrastructure with invitation policies by national and local governments, the operating environment for enterprises in the location, and so on.

Economic geographers in Japan have been attempting to comprehensively understand domestic and overseas locations of globalizing enterprises. In particular, they have accumulated both theoretical and empirical results that have attempted to establish the relationship between intra-firm divisions of labor on a global scale and production systems on a local scale. This perspective has been useful in understanding how the reorganization of industrial locations within and outside Japan caused by globalization has brought local impacts.

(KASHIMA, H.)

Studies on Industrial Regions

This chapter outlines the changing economic circumstances in industrial regions, followed by a brief review of studies on changing regional manufacturing characteristics in the inner-metropolitan areas, the old industrial areas, and the non-metropolitan industrial districts.

Changes in industrial regions in Japan

Research on economic geography in Japan has had a long tradition in field research on industrial regions, especially on networked SMEs that produce various capital goods, daily use products, and parts of durable consumer goods. There has been considerable analysis and description of territorial industrial systems in terms of their geographical distribution, inter- and intra-firm division of labor, inter-firm and inter-regional input-output linkages, and transactional and labor arrangements. This approach, substantively launched during the late 1950s, focused on intra-metropolitan manufacturing areas, subcontracting systems under larger manufacturing firms (including automobile makers and electrical/electronic equipment makers), non-metropolitan or rural industrial districts, and manufacturing towns. By the 1980s, a number of empirical studies had already been produced, providing substantial material on domestic spatial divisions of labor in Japanese manufacturing.

After the Plaza Accord in 1985, Japanese manufacturing firms stepped up offshoring to prepare for the appreciation of the yen. In addition to currency appreciation, the diffusion of microelectronics (ME) equipments such as NC machine tools and CAD/CAM systems within the Japanese manufacturing industry also had direct and significant effects on many domestic industrial regions and on the management strategies within SMEs. During the past two decades these changing circumstances also stimulated industrial geographers and redirected their research issues (Edgington 1994; Takeuchi 2005, 2006; Matsubara 2009). It has been pointed out that while recent studies have detailed the changing geographical conditions of industrial regions with respect to the rescaling spatial aspect, they have also more or less actively engaged in concepts around theoretical frameworks in industrial agglomeration such as mutual trust, transactional cost, social networks, knowledge transfer, and innovativeness.

What follows is a brief review on the studies of changing regional manufacturing characteristics in inner-metropolitan areas, old industrial areas, and non-metropolitan industrial districts.

Manufacturing activities in the inner-metropolitan areas

Tokyo is Japan’s largest industrial region in terms of the number of manufacturing establishments. In general, the inner-Tokyo area has been characterized by a mixture of residential land use and industrial land use, as well as by industrial communities in which manufacturers have made full use of their territory-based social networks to assist in improving flexibility and innovation-orientation of production. However, the size of industrial agglomeration decreased during the 1980s when plant and equipment investment was stimulated by a series of process innovations in machinery.

Oda (2005b), who studied the southern Tokyo area, redefined the characteristics of industrial agglomeration employing Marshallian terms such as “industrial atmosphere” and “mutual trust and knowledge.” He elucidated the spatial transformation of the agglomeration during the ME revolution era through the example of the plastic-
mould industry, one of the typical capital goods industries supporting new product development in larger manufacturing firms (see also Oda 1997, 1998a). Following the ME revolution era, the globalization era was ushered in, wielding its effects on the intra-metropolitan industry. Offshoring of manufacturing forced existing domestic suppliers to seek alternative consumers to ensure their survival. One study looking at this was Maruyama (2007), who demonstrated how small-sized manufacturers in Itabashi Ward sought new transaction partners with the aid of their non-transaction social networks. According to Takeuchi and Mori (2001), an effective blend of the traditional skills of machinery- and metal-processing and the locally accumulated electronics technology by new-generation successors in the southern Tokyo area was instrumental in reviving inner-city manufacturing as a national center of the "mechatronics" technology.

Consumer goods industries in the eastern Tokyo area have also faced a drastic decline in the number of factories, during the past quarter century. Nevertheless, manufacturing wholesalers and manufacturers strived to adapt to high added value small batch production. Hatsu zawa (1995, 1997, 1998, 2000) focused on fashion-related industries and described their reorganization efforts towards design-intensive orientation of the Tokyo agglomeration. Yamamoto, S. (2005, 2008), who studied the leather shoe industry with emphasis on inter-firm trust, showed an increase in design-intensive orientation in the industry. Endo (2012) focused her study on factors sustaining local agglomerations of the leather handbag and purse industry, illustrating how close communication by means of face-to-face contact enabled speedy exchange of design ideas and information about quality of raw materials between design-creators, mediators, manufacturers, and processors.

Besides Tokyo, manufacturing activities in the Osaka metropolitan area, especially Higashi-Osaka City, have attracted a great deal of attention from researchers. For instance, Ohsawa (2005) analyzed the experiences of "top-share companies" from the aspect of their distribution channels to examine the innovativeness of SMEs. Edgington and Nagao (2011) illustrated how public policy has played a role in supporting new technologies and innovative small firms in this region. Yamamoto (2004) examined the Osaka bicycle industry with particular focus on how local firms have selectively developed and maintained production linkages at different scales, including at the international level.

Renovation of the old industrial regions

There has also been study on recent restructuring or renovation experiences of the old industrial regions that were developed up until the 1960s and that had mainly consisted of heavy and chemical industry plants located at coastal areas. These plants faced excessive production capacities from the 1970s, rendering "brown fields" (idle lands) prominent. The various experiences of recent regional restructuring attempts have attracted significant research interest. Kawasaki and Kita-Kyushu City were once both typical industrial cities dominated by the iron and steel industry, but they now promote environmental industries such as the recycling industry, which enjoy the advantages of local agglomeration (Matsunaga 2004; Asazuma 2004). Similarly, in the Osaka bay area, former electric generation plants and steel plant sites were diverted to the production of liquid crystal and plasma. Nagao (2010) examined the centralization of investment around the Osaka Panel Bay, listing out location-related factors as follows: (1) intra-firm proximity, (2) agglomeration of related manufactures, (3) infrastructure for export, and (4) rapid land supply. In addition to the above focus areas, some researchers published studies on the new directions of restructuring in old industrial areas such as the Yokkaichi petrochemical complex (Kashima 2004), the Nobeoka chemical industry (Sotohebo 2007) and the Ube cement industry (Sotohebo 2009).

Evolution of manufacturing activities in the non-metropolitan areas

Research on non-metropolitan manufacturing activities has had two orientations. The first was towards the localization of daily consumer goods industries that relied on local communities and traditional handcraft skills (known as "jiba sangyo" in Japanese), and second was towards industrial regions that were subsystems of the nation-wide production system in the machinery and electrical/electronics equipment industry and in the garment industry.

In the first, as Patchell and Hayter (1992) refer to "jiba sangyo" as "community-based industry" (CBI), the agglomeration of various daily consumer goods industries are embedded in social relationships which have an influence on skill formation among labor and adaptation to environmental change or innovativeness among producers. In this respect, some geographers have focused on dynamics and sustainable factors within CBI districts (see for instance Suyama 2004; Kitamura 2006; Ueno 2007; Ueno and Institute for Policy Science 2008).

In the second, as previously discussed, Japanese indus-
trial geographers were, up until the 1990s, strongly concerned about geographical dispersal of industrial facilities to non-metropolitan areas. During the 1970s and 1980s, labor intensive sectors such as electrical/electronic components and garment manufacturing dispersed across rural neighborhoods in peripheral or intermediate areas in order to seek abundant and cheap unskilled labor. The focus of research in the 1990s was on the formation of newly emerging industrial agglomeration such as the Kitakami district, Iwate Prefecture. This was a typical labor-intensive rural industrial district until the early 1980s which, during the ME investment boom the mid-1980s and the mid-1990s, attracted high-tech sectors and various supporting industries. As a result, densely intra-regional linkages emerged and the district is seen to have played an important part in the Japanese machinery production system, emerging as a regional center of basic metal works and capital goods production (Oda 1998b; Matsuhashi and Sasaki 1998).

After the year 2000, industrial geographers began to draw their interest towards the innovative characteristics of industrial districts in non-metropolitan areas. In the Suwa district, Nagano Prefecture, large companies in the precision instruments and electronics apparatus industries (such as Yashika (Kyocera), Olympus, Sankyo Precision, and Epson) have relocated their large-volume production to China and the ASEAN over the last two decades. Local SMEs progressed from being merely subcontractors, improving their innovativeness to sustain a large-firm’s R&D or to produce their own products. It was necessary for such regional/managerial reversal, as there were significant external economies and social support against institutional change (Yamamoto 2002; Fujita 2007, 2008).

Another example is the Yonezawa district, Yamagata Prefecture, which had a relatively labor-intensive character, despite the presence of a vertically disintegrated production system under a few core large plants, similar to the Suwa district. The horizontal networks among local firms in Yonezawa have gradually grown since the 1970s, with the prefecture, the city authority, and the university also joining these networks. The “social environment network” facilitated collective learning, which opened the path towards emerging as an innovation-oriented district (Matsuhashi 2002, 2005; Sueyoshi and Matsuhashi 2005).

The above-mentioned empirical studies by industrial geographers have elucidated the evolution of some Japanese industrial regions during the last two decades. However, they have shown interest not only in the dynamics of each region, but also in the transformation of the overall spatial division of labor at the domestic and international scales. The nation’s territorial production system has been on the road to reorientation from mass production systems to small-batch high value-added production systems.

(Oda, H.)

To Strengthen Geographical Studies on Manufacturing Industries

Studies on industrial agglomeration have been tackled from the diverse viewpoints. It is not easy to sum up their main view, especially in empirical studies. In order to prevent the discussion from scattering, many researchers pointed out that the studies on industrial agglomeration have to be particularly sensitive to the geographic scale and its spatial characteristics. It is also important that the theoretical studies provide the common base of discussion in empirical studies.

Studies on shifting spatial systems within Japanese manufacturing remain insufficient in their attempt to understand the real character of spatial systems in terms of the international division of labor in East and South Asia. It is necessary to take up following three issues both theoretically and empirically: first, the production systems, including supply chain and distribution, of the Japanese MNEs in East and South Asian countries; second, inter-regional and international division of labor in East and South Asia; and third, the repercussions of locating abroad and offshoring manufacturing to industrial regions within the home country.

As far as studies on restructuring industrial regions is concerned, empirical work on the economic and social effects of increasing reorganization of regions through the overseas location and offshoring of manufacturing, have emerged as important. In addition to these issues, seeking an alternative system of local manufacturing for survival, creating high-value-added jobs and innovative activities, poses the emerging challenge in the study of this sphere.

(MATSUHASHI, K.)

References


Aono, T. 2011. Shitauke kikai kogyo no shuseki (Agglomeration...
of subcontractors in the machinery industry). Tokyo: Kokon Shoin. (J)


Kitamura, Y. 2006. *Kougei sangyo no keizai chirigaku (Studies on the geographical structure of the crafts industries in Japan)*. Tokyo: Hara Shobo. (J)


Kondo, A. 2008. *Gijutsu saikuru to setsubu toushi no kanten kara mita kojo ricchi no hendo (The changes of industrial location in terms of technological cycles and capital investment)*. *Real Estate Research* (Japan Real Estate Institute) 50(1): 30–39. (J)


Matsushashi, K. 2005. Implications of SMEs networks proposing collective learning in agglomeration areas of non-metropoli-
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tan region: Case studies on Yonezawa City in Yamagata Prefecture, Kitakami City and Hanamaki City in Iwate Prefecture. *Annals of the Japan Association of Economic Geographers* 52: 443–464. (JE)


Mizuno, M. 2011. *Inobeshon no keizai kukan (Economic spaces of innovation)*. Kyoto: Kyoto University Press. (J)


Tomozawa, K. 1999. *Kogyo kukan no keisei to kozo (Formation and structure of industrial space)*. Tokyo: Taimeido. (J)


