Conclusion

CONCLUSION

Mitsuhiro Kagami
Masatsugu Tsuji

Industrial agglomerations are summarized into four categories: (1) clusters where locally specialized items are produced or local product districts; (2) clusters where a large core firm has many subcontracting or parts makers surrounding it or the so-called industrial castle town (*'jokamachi'*); (3) clusters in large cities where lots of basic production processes are treated or urban processing clusters; and (4) government-led industrial parks and estates often seen in developing countries.

Examples of local product clusters are porcelain at Meissen, cutlery at Solingen, textiles at Lyon, kitchenware at Tsubame City, and the famous Italian industrial districts such as shoemakers at Riviera del Brenta. These clusters are characterized by specialized local products and agglomerations of small-scale enterprises with close community networks. Clusters specializing in information, communications and technologies (ICTs) are, in a sense, classified in this category. Examples are Silicon Valley and Route 128 in the US, Bangalore in India, Zhong Guan Cun in China, and newly developed Aguascalientes in Mexico. These clusters are highlighted by the software industry and venture capital with a large pool of computer-literate workers.

The second category includes automotive agglomerations such as Detroit and Toyota City and large-scale capital goods industries such as iron and steel (Pittsburgh and Kitakyushu City) and chemical kombinat (Jurong Petrochemical Complex in Singapore and Yokkaichi City in Japan). These clusters are typified as one large company surrounded by many layered parts and component makers or supporting industries.

Examples of the third category are Ohta Ward in Tokyo and Higashi Osaka in Osaka where small- and medium-scale firms are specialized in basic processing such as casting, forging, molding, welding, plating, heat treatments, gliding and polishing. These areas feature a concentration of high-skilled manpower and closely interwoven specializations among small firms.

Examples of the fourth category are Chu-Chiang River Delta in China, Hsinchu Science Park in Taiwan, Penang (Bayan Lepas, for example) in Malaysia, Leam Chabang in Thailand, and Haiphong in Vietnam. These

areas are assigned by central as well as local governments as industrial zones (IZs) or export processing zones (EPZs) and given incentives such as tax holidays and preferential loans. Thus, mainly foreign multinational corporations (MNCs) gather in these zones. Nowadays, even private companies themselves participate in development of these industrial estates.

These industrial clusters have several shared features despite differences according to category. First, there exist strong externalities derived from vertical as well as horizontal transactions through subcontracting and inter-firm collaboration that produce 'collective efficiency.' Accumulated knowledge is also shared among firms and knowledge spillovers also create externalities. Second, increasing returns work in clusters as a whole because constant returns to scale and the perfect mobility of factors cannot explain spatial differences ('world without cities') (see Fujita and Thisse [2002], p. 6). Increasing returns to scale are inevitable elements of industrial agglomeration. Third, transportation costs and communication costs are also unavoidable factors. If these costs are expensive, firms have incentives to concentrate on each other. Fourth, knowledge is crucial in any cluster. R&D activities, new devices and skills are shared in the community. High quality workers are also essential. Especially, software clusters need these factors. In addition, face-to-face communication is quite valuable when 'tacit knowledge' is exchanged. Thus, knowledge-based clusters will have more successful results. This implies the importance of vocational training and education. Fifth, demand is vital for the existence of industrial clusters. Particularly, urban processing clusters and *jokamachi*-type clusters can exist so long as there is stable demand for their products. As shown later, how clusters correspond to demand shift is critical. Lastly, the role of government, whether central or local, is also of significance, particularly, in developing countries. These clusters mainly consist of small- and medium-scale enterprises (SMEs). Industrial clusters include, therefore, government policy matters for SMEs.

The most crucial question is why agglomeration occurs in a given location and not in others. Our study did not clarify this point. However, the only explanation is that it depends on endowment of natural resources in a given geographical location such as the existence of raw materials and important transportation crossing points, and historical and cultural factors. Toyota City has its auto cluster because the Toyoda family came from there and Sakichi Toyoda invented the first textile weaving machines in Japan and founded an auto assembling company, later called Toyota Motor Corporation. Sialkot in Pakistan is famous for its surgery-related medical

products because, originally, a field hospital was constructed in that locality in the British colonial era. Yawata Works chose Kitakyushu City because coalfields were nearby, and for the natural defenses offered by the inland bay. We need further investigation in this respect because endogenous interactions of economic actors may produce the starting location of industrial clusters.

Changing Clusters in Advanced Countries

Industrial clusters in developed countries have recently faced difficulties due to mainly three reasons. First, catching-up by developing countries affects a number of industries in advanced countries and hence industrial clusters. For example, traditional light industries such as textiles and food processing face severe competition from imports from developing countries. Heavy industries such as iron and steel and shipbuilding face similar competition from middle-income countries like Brazil and Korea. Even the software industry is confronted by rapid catching-up from some developing countries such as India and Israel.

Second, globalization and deregulation anywhere results in the penetration of MNCs and relocation of their factories and offices into strategic locations, thereby reforming global value chains. New ties between MNCs and traditional local product districts ('external linkages') are in progress in order to maximize total value chains. Does this influence local product districts negatively or positively? Furthermore, globalization produces intense complications for clusters. A typical example is the Japanese MNCs' move into China. This creates fears of job losses for traditional industrial clusters, particularly, urban processing clusters, the so-called 'hollowing-out' of manufacturing industries.

Third, the ICT revolution leads to a world without distance. Using e-commerce (electronic date interchange) assemblers can purchase parts and components with high quality at lowest cost anywhere in the world. This is a fundamental change for industrial agglomerations, especially, *jokamachi*-type clusters where parts and component makers closely reside to a large assembly maker.

Our studies show some efforts by clusters themselves and interesting empirical evidence against such difficulties. Catching-up issues can be summarized as follows:

- Regarding light industries, local product clusters in developed countries shifted toward more value-added and knowledge-intensive prod-

ucts such as the textile and garment industries in Fukui and Lyon. Some firms in Emilia-Romagna began to have linkages with non-district firms, i.e. the emergence of the 'multi-located' industrial district. A number of local clusters struggled with community efforts to market new products such as shifting to sports and outdoor instruments from kitchenware in Tsubame City.

- In the case of heavy industries such as the iron and steel industry, Kitakyushu City realigned its accumulated resources and knowledge for completely new businesses such as the 'vein industries,' i.e. recycling of PET bottles, automobiles, electronic and office machines and ecology businesses.
- With respect to software clusters, the US hegemony may not be eroded in the near future but the study suggests the possibility of the emergence of 'nearshore' platforms in neighboring countries such as Mexico, and those of Central America and the Caribbean. The case of Mexico is most likely related to its NAFTA status. In this connection, the establishment of the Free Trade Arrangement for the Americas in this decade will reinforce such tendencies in those countries.

Globalization has drastically shaken and affected industrial districts. In the case of the Italian shoe industry at Riviera del Brenta, it was integrated into global value chains of famous fashion industry brand names by subcontracting the production processes. This ended up with the abandonment of key activities such as design, sales and marketing of local traditional firms and weakening of the district's power. However, in this case, the shoe industry may become more effective due to this specialization because many of these large famous brand companies are Italian.

Urban processing clusters confronted the'hollowing-out' phenomena in Japan. They tried to transfer more sophisticated, high value-added areas with super-precise and super-difficult processing skills. Especially, they participated in new product development and design with Japanese MNCs by playing the role of seed finders or seedbed functions.

ICTs' influence on purchasing parts and components was enormous. Japanese automakers such as Nissan and Mazda had to sell their majority holdings to foreign hands and start cost-cutting reforms especially by re-organizing their subcontracting systems. However, automakers' headquarters relocated plants from Central Japan to local areas during the bubble-economy period in the early 1990s because of land congestion and labor shortages. This was made possible since distance was overcome by use of the Internet

between headquarters and local plants.

Although Toyota opened a new Kyushu plant in 1992, overall concentration near its headquarters in Aichi Prefecture has been strengthened. Only Toyota seems to have remained intact from the globalization and ICT revolution and prolonged recession after the bubble burst, accumulating large profits and running the company without debt for the last fifty years. The distribution of parts and components cannot be substituted with ICTs, but the supply chain management (SCM) applied by ICTs can reduce time and costs. In this context, the just-in-time (JIT) system, Toyota's well-known invention, is essential for parts suppliers to concentrate into Toyota's *jokamachi*.

Industrial Agglomerations as an Engine of Growth in Developing Countries

Industrial parks in developing countries are of importance in terms of economic growth of those countries. East Asian countries utilized such parks and zones as momentum for growth. At present China is exploiting such parks utilizing foreign direct investment (FDI) on a large scale. Creation of regional industrial agglomerations may help a developing country grow as a whole over time. Particularly, the development of the software industry might be a detonator for growth. The Indian software industry suggests that certain developing countries may follow a different, not the traditional path, to successful industrialization ('leapfrogging' industrialization) (see Kagami and Tsuji [2002]).

The success of these industrial agglomerations depend on (1) infrastructure (highways, ports, electricity supply, etc.); (2) institutional frameworks (legal systems, participatory actors, coordination among actors, etc.); and (3) government support (or foreign assistance) in terms of laws, taxation and finance. As shown in this volume, the case of northern Vietnam provides good examples where collaboration in these three areas worked well. However, if one place grows, often other places are left behind. Regional disparity is a big issue as illustrated by the large income differences between western and eastern parts of China.

Finally, we have to deepen our theoretical background on this matter, i.e. the fundamental question here is how growth and location affect each other (or whether regional discrepancies widen or narrow over time).[1]

Note

[1] More precisely, we need dynamic core-periphery theories in this respect (Fujita and Thisse [2002], p. 388).

References

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