

Industrial clusters and regional development

Eastern and Western approaches

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Globalization offers immense opportunities for enterprises to make themselves technologically competitive and financially viable. Small enterprises are no longer entirely dependant on their own limited resources of specialized skills and technological capabilities. On the other hand, they have much to gain from opportunities abroad. In addition, local clustering and networking among smaller enterprises enhances their capability of acquiring and integrating new and advanced technologies, processes and know-how from the global market. This article discusses the benefits of the industrial cluster approach.

Introduction

In this era of globalization, every product, service or business activity faces both global market opportunities and global competition. Most SMEs in manufacturing industries have traditionally depended on specialized market segments or niches. They find now, however, that global competition can threaten both their existing base and their competitive strength. But they may also find potential market opportunities and business partnerships in unknown countries or territories. At the same time, their existence and competence have so far been supported by regional or local businesses and networking, which in turn is based on social divisions of labour and specialization. This could typically include subcontracting

systems controlled by a big manufacturer, as well as industrial districts where small manufacturing or trading firms come all together. In general SMEs cannot survive if they depend solely on their own limited resources or specialized skills and technological capabilities.¹

A globalizing economy eventually tests the survival capabilities of individual regional economies and the SMEs in them. Earlier it had been widely believed that the development of transportation and information technology and a borderless economy would inevitably break the barrier of distance and make regional economies and industries almost meaningless. Surprisingly, in the 1980s, however, a reincarnation of regionalism

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began. Academics and researchers debated the issue and several empirical research works sprang up on the importance of regional industrial agglomeration and local networking.

The most popular of these is M. Porter's 'industrial cluster' thesis, which is based on his own 'diamond theory' and economic geography principles. Many governments and organizations throughout the world adopted the idea to deploy new policies to stimulate their own regional economies and to strengthen global competitiveness.

This article examines and compares ongoing policy developments based on this thesis and their effects on regional economies and SMEs in both Japanese and European regions. Unsolved problems or good lessons are also picked up and discussed.

Many examples and research materials were found and applied in a series of empirical research projects, one of which is the JASMEC's comparative research project last year, and another is funded by the Japanese Government's research grant.² Secondary sources are also occasionally used.

Resurgence of local economy

As already mentioned above, a sort of reincarnation of regionalism occurred, and many researchers have been discussing the importance of regional industrial agglomeration and local networking and their contemporary meaning in the age of globalization since the late 1980s. Names like Piore & Sabel, Krugman, Scott, Storper, Saxenian, Florida, Keeble & Wilkinson were earlier popular in Western academic societies, but are now well known to their Japanese counterparts and policy makers. Local economies are among the foci of academic and public attention. The socio-economic background, however, is not necessarily favourable for local economies and communities. Slacking economies, declining industrial districts and threatened local community life in Japan since the 1990s have been widely recognized and a variety of policy measures have been launched to rescue and stimulate existing local industries. The industrial 'hollowing' problem and a growing rate of unemployment, as

well as the decreasing number of SMEs with lower birthrates and higher death rates have not yet been reversed in most regions. It is now widely believed that creating new industries which can be competitive and sustain economic society must be solely on top of the agenda.

Porter's theory of 'industrial cluster' and competitiveness³ is now the most popular one in Japan, and many governmental ministries, local governments and public organizations are enthusiastically trying to apply it to seek regional innovation systems, promotion of local business networking and new industrial development. Not only the theoretical idea, but its practical deployment and achievements in Western countries, such as Finland, Ireland, Sweden, the UK or the USA, are also attractive and frequently visited. As a result, new expected players are not necessarily existing local SMEs and skilled craftsmen, but universities, research institutes or public institutions, which themselves may be linking together and creating a critical mass for further innovation and industrial development.

If, however, we are examining possible and sustainable development of new local industries and economic revitalization of local communities as a whole, we must be careful, about whether the vast majority of SMEs and human resources have a role to play. If so, can they contribute as 'interconnected companies,' 'specialized suppliers' or 'service providers', which are exploiting 'geographic, cultural and institutional proximity' and maximizing the advantages of 'knowledge, relationships and motivation,' concerning the real formation and development of industrial clusters. Unless many competent and vital SMEs join, critical mass formation and robust business linkage cannot be completed, and local economies cannot enjoy sufficient spillover effects and balanced development.

EU's strategies

In the early 1990s the European Union (EU) and its member states admitted their weak industrial competitiveness and planned to deploy more interventionistic policy measures to enhance the competitive power of Eu-

ropean industries. At the same time EU's regional policy, which had mainly aimed to minimize regional disparity and promote economic and social cohesion, was more oriented to developing new local industries and stimulating innovation. Regional Innovation Strategies (RIS), originally formulated in 1994 and launched in the late 1990s, are a new challenge to combine regional, vocational training, RTDI, industrial and enterprise policies at the individual local level. In addition, in the 2000s, more attention has been given to a new knowledge-based economy. Innovative activities, technology transfer, inter-firm cooperation and cooperation with higher education institutions and research centres were strongly encouraged by using the concept of inter-firm 'cluster' development. Joint activities and project approaches were recommended.

There are a number of examples of practical applications of the industrial cluster model and policy measures in the EU countries. One of them is the case of Western Scotland, where former traditional heavy industries had dominated but declined for decades. Scottish Enterprise (SE, former Scottish Development Agency) attracted FDI in the 1980s and made it 'Silicon Glen.' Later in order to be not depending on FDI alone but to promote sustainable and indigenous economic development, Scottish Enterprise Glasgow (SEG) and Strathclyde European Partnership jointly developed RIS, and in 1999 SEG and Glasgow City Council Released *Joint Economic Strategy*, which aimed at sustainable economic growth, the creation of jobs, the tackling of social exclusion, the development of a competitive workforce and the improvement of Glasgow's competitiveness. Thanks to the EU's structural funds, the UK or Scottish government's support⁴ and SE's own budget and power, JES has been successful not only economically but socially. JES is now oriented to an 'industrial cluster approach,' with target industries and seed technologies designated universities, science parks, and incubators, and public agencies encouraged to join and link together, and strongly promoting partnership and project development.

Clear developments can be found in biotechnology and life sciences, software, optoelectronics and health care industries, and universities' positive efforts promoting spin-outs and technology licensing have been reflected in many success stories of the growth of high-tech SMEs, and have helped support local supplying firms. JES is now under evaluation and modification, with more emphasis on the linkage between universities and industries. More infrastructure investment is also expected, as well as HR development and regional learning programmes.

Besides Western Scotland and Glasgow city, similar experiences were found in the West Midlands, UK, and Shannon district, Republic of Ireland. The common lessons are:

- A strong commitment to 'cluster' policies;
- A powerful autonomous core body and its own budget and authority;
- Cooperation and partnership with regional bodies and local governments;
- A comprehensive strategy and policy, with individual projects development;
- A wide range of targeted industries;
- Positive roles played by universities, promoting partnership between education and research activities;
- Joint actions on regional and social issues and community developments; and
- Attention to human capital and development.

METI's plan

METI, the ministry in charge of economy, trade and industry in Japan, has been concentrating its efforts on the recovery of the economy and industrial revitalization. In 2002, METI announced its 'New strategy and promotion of technological innovation' plan, and designated target technologies. FY 2002's key measure was "formation of industrial clusters" to create new local industries and employment; and ¥ 29.4 billion (later increased to ¥ 52.2 billion) was allocated to industrial cluster development measures.

METI approved 19 industrial cluster plans, based on its own individual

regional bureaus. Bureaus are expected to develop plans and to become nodes to coordinate local networking and alliances. Targeted industries are mainly biotechnology, ICT, electronics, neo manufacturing, new energy, ecology and recycling, which reflect an individual region's own background, scientific R&D activities and COE quality or existing industrial agglomerations. Each project plan promotes technology licensing, university spin-outs, incubation activities, and venture investments. 3000 SMEs are likely to be involved. To implement these plans, it is expected to exploit the Government's variety of subsidiaries and grants for science, R&D, trial experiment, business development and marketing operations.

MEXT, the Ministry of Education, Culture, Sports, Science and Technology, also launched its own 'knowledge cluster creation scheme,' in 2003. The scheme is based on national universities, institutes and MEXT's science promotion measures, and partnership between university and industry is emphasized. As many as 10 regions have been selected.

SME's and regional clusters

Hokkaido, Okinawa and Kansai

Even if the word 'cluster' is popular and 'industrial cluster policies' are prominent, local SMEs' practical roles or their possibilities within the policy frameworks are not necessarily clear. Obviously university spin-outs can be another example of growing SMEs based on new technological outcomes, but their number in Japan does not seem impressive despite the government's targets, and mostly depend on government grants or subsidies, besides, of course, good returns from some successful products in the market, which help to cover expenses and investment. Some distinguished academics, who had been believed to be entrepreneurs who could start and manage business ventures, have however been unimpressive and unconvincing.

Some SMEs however have been rather successful in taking advantage of local industrial cluster policy measures or in developing their own link-

ages with other firms or institutions to exploit new technological outcomes and untapped local resources. Geographical, cultural or institutional proximity, as well as considerable business accumulation and regional concentration, are among the keys to their success.

In Hokkaido, before the launch of METI's cluster plan, local business leaders had taken the initiative to investigate the cluster concept and to study Western experiences, especially the Finnish case. Their eagerness resulted in local cluster study groups, voluntarily organized from local business communities, farmers, government staff and academics. Groups have been trying to use local resources, existing business networks, technology accumulation and skill sets. As the METI bureau's 'super' cluster plan is targeted to IT and new biotechnology alone, both cluster ideas should be combined and show synergy and spillover effects.

Hokkaido Bio-industry Ltd., a joint venture among local entrepreneurs, has been concentrating on developing one of the R&D outcomes produced by a local cluster study group and using local natural resources. Though its marketing effort was not easy, the academic researchers' support and advice, along with various research and commercialization grants, helped it to complete its development and promote the sales of healthy foods products. Job creation is evident.

Bio Science Ltd. and Hokkaido System Science Ltd. are both engaged in custom DNA synthesis business for research laboratories, and are successfully growing, even if their customers are not necessarily proximate ones. The highly entrepreneurial founders of both firms are putting together their rich experiences and marketing skills, and are displaying both rivalry and cooperation in promoting local high-tech cluster development. As typical supporting businesses for emerging technology development, both prove that committed efforts are rewarded and both maintain unbeatable positions in the high-tech field. The fact that they have local subcontractors are also a proof of the spillover effect.

Okinawa's lower profile in industrial development and scientific R&D,

as well as its remote and scattered location, has not prevented the region from working on the cluster idea. Typical examples can be seen in ICT, call centre businesses, and applied (old) biotechnology. Okinawa Bio 21 Ltd., a new firm producing cosmetics from local natural resources, takes advantage of Okinawa's unique image of healthy life styles and longevity. The prefectural government gives a wide range of support to technology, management and sales, and word-of-mouth publicity. Unfortunately the successful entrepreneurs in Okinawa are not necessarily from the native Okinawan community, but are migrants.

As for Kansai (Kinki), although it covers a huge metropolitan area and has an industrial, cultural and institutional complex, its economy has been gradually declining. METI authorized four cluster plans, biotechnology, revitalized manufacturing, IT, and energy and ecology. A very attractive success story is Millennium Gate Technology Ltd, which was once a small metal-plating subcontractor, but is now making itself indispensable in the production of high quality DNA chips by applying its own fine precision processing technology and licensed patent. Its skill and products are worldwide attention, and in its local industrial district, a number of small manufacturers are stimulated or offered alliance opportunities.

Kinki's energy and ecology cluster project has attracted many local SMEs to join and develop partnerships with other businesses and universities. Adhoc Kobe, WATT Kobe, and EE Net are typical project groups or joint ventures among these, supported by public bodies, academics and volunteer consultant engineers. It is not easy for these groups to get under way and to make stable returns, and voluntarily supporting consultants and coordinators frequently face difficulties. SME members are not often rewarded financially, but they earn reputations outside and enjoy revitalized organizational set-ups inside.

Conclusion

A comparison of Western and Eastern experiences, mostly Scottish and Japanese, lead to some lessons.

Generally speaking, Japanese approaches so far have been:

- Weak local initiatives, with less systematic decision-making and policy development;
- Insufficient local partnership with different parties;
- Weak combinations of industrial, regional, and science and education policies, lacking a comprehensive philosophy or concepts and often obstructed by vertical barriers;
- Vague about the presence and strengths of core bodies as well as of strategic players;
- Narrow in their choice of strategic targets, with a continued obsession with high technology;
- Unclear in their relationships with existing industrial agglomeration and local resources;
- Short of effective joint measures and policies for SMEs (start-up, technology transfer, product development support);
- Too overwhelmed by the presence of an existing public body and too full of expectation on university spin outs; and
- Short on learning region and human development concepts.

If these problems cannot be solved or minimized, the idea of 'cluster policy' might actually work adversely, as indigenous local development can be sustained through central government regulations, initiatives, budget and policy supports.

For SMEs, industrial cluster developments and technological linkage and transfer may be opportunities, but they must understand some empirical implications.

- 'Supporting business' concept should be understood as a good opportunity;⁵
- A variety of potential needs generated within the cluster development or R&D activities should be exploited;
- Core/basic technological competence should be retained and applied, or utilized in new business opportunities;
- Entrepreneurial challenge and devotion are indispensable;
- One should never wait for technological seeds/fruits to spill out from universities/research institutes;

- It is necessary to retain management control on product development process and marketing efforts;
- There should be committed alliances with other businesses and a powerful leadership is necessary;⁶
- A collective technological or business supplementing collaboration is demanded;
- Despite many failures and setbacks there is a reputation effect; and
- The company's organizational nature and culture receive a vitalizing effect.

In all cases, the final lesson is that 'Entrepreneurs must be leaders. Only then will cluster policies truly make sense. It is clear that cluster policies are useful and have much potentials. They must be developed by depending on local industrial clusters, focusing on national markets and yet looking for expanding worldwide opportunities. Given this approach, cluster developments may be ideal for SMEs.

Notes

1. These viewpoints were argued in my former presentations at the 19th and 26th International Small Business Congresses, in 1992 and 1999.
2. The former report was published in 2003 and can be downloaded from the JASMEC website: http://www.jasmec.go.jp/ck/cyousa/pdf/cy_ventureh14.pdf. The latter is a two-year project, organized by Mitsui's research office, FEIS, YNU, and its report will be published in 2004. Nevertheless, descriptions and opinions in this paper are solely the author's personal ones.
3. M. Porter's 'diamond theory' stresses the value chain, competitive scope, competitive advantage of nations and global platform, and picks up four determinants, i.e. factor conditions, demand conditions, related and supporting industries and firm structure, strategy and rivalry. He extended his idea to an 'industrial cluster' model, as that of keeping or strengthening high productivity, innovation and new business creation plus a spillover effect. His 'cluster' concept is defined as "geographic concentrations of interconnected companies, spe-

cialized suppliers, service providers, and associated institutions in a particular field that are present in a nation or region.”

4. In 1999, Scottish Executive and Scottish Parliament were established, as a result of the UK government's decentralization policy. SE is now under the Scottish Executive's direct control.
5. This is confirmed by Mitsui's office postal survey of 2003.
6. METI's own survey shows that those SMEs that maintain good partnerships tend to participate more frequently in cluster organizations. Nevertheless, cluster advantages are still under-used compared with the USA, and most SMEs are not stimulated by local rivalry. Industrial cluster plan office, METI (2003)

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